UNIVERSITY OF STRATHCLYDE

Department of Management Science

"The Impact of applying Structured, Object Based Software Modelling Techniques on the Design and Implementation of Business Processes, Business Performance Management and Business/Operational Risk Management Systems"

Thesis submitted in fulfilment of requirements for DBA.

DBA Project

Raymond Flanagan 2006

Abstract

This thesis examines the implementation of a number of business change programmes completed within three specific organisations; PSNI (Police Service of Northern Ireland), BAA plc and Govan Initiative (Scottish Enterprise). Specifically the study focuses on the methods of implementation employed and the corresponding results.

The study examines, on the basis of case study evidence, the impact of employing contrasting approaches to the documentation of business change programmes. The projects studied range in approach from those which employ manually documented methods to those which use structured software modelling technique for the design and implementation of business change programmes. The programmes considered fall into the areas of Business Processes, Business Performance Management and Risk Management.

The study finds that there is a case for the use of structured, object based methods supported by modelling software, particularly in relation to the implementation of change programmes with a significant IT basis or where there is complex relationship between activities and supporting human resource interface. The study concludes that the use of a structured, software supported implementation methodology can be employed to improve the quality of implementation, mitigate risks of conflict and resistance, decrease the cost and effort associated with modification and re-engineering, and contribute significantly to the sustainability of the implementation objectives under certain circumstances.

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1. Chapter 1 – Introduction, Background and Project Objectives

1.1 What this research is about

This research project seeks to identify the relevance and impacts of selected implementation methods and tools on the prospects for successful business change implementation. In particular this study is interested in examining the impact of employing software modelling as opposed to manual; paper based "traditional" methods of documentation and communication.

At the outset of this study the writer was faced with the prospect of managing and consulting on the implementation of a range of significant business process change projects. In seeking answers to questions relating to effective implementation strategies which mitigate the risks of project failure, the writer completed a literature review. In the light of gaps identified, a methodology of research by case study was devised. From this empirical evidence, emerging themes have been identified relating to sensitivities of implementation. The study concludes with a prescribed framework of implementation considerations according to the theme criteria.

The writer wishes to determine to what extent the use of software modelling mitigates or exacerbates the risks and causes of implementation failure. This study identifies from a review of the literature, a lack of understanding of sources of mitigation relating to the reasons for implementation failure of business change programmes, particularly with respect to communication and documentation. Much is written about the reasons for failure in corporate implementation projects particularly those relating to BPR (Business Process Re-Engineering) projects. Much is also written regarding the identification of conceptual and theoretical solutions. Little is referred to however relating to the impact of the chosen implementation methodology and in particular the potential for the selection of software modelling to influence either positively or negatively the reasons for and risks of failure. There is little evidence within the literature of cross-case analysis with respect to implementation method comparison.

This study adopts a case study approach to explore the implementation experiences of a range of projects and examines in particular the issues arising and the relevance of implementation methodology for the success or otherwise of the projects. This study extends to categorise the arising issues and qualifies the impacts of modelling on the basis of these categories. The study concludes with a prescription for a framework approach to the modelling of business change programmes.

1.2 Research Questions

The research questions which this study seeks to provide answers to are as follows:

Q1. To what extent are the reasons for implementation failure provided by the literature related to the implementation methodology?

Q2. To what extent if any would these reasons or risks of failure have been influenced by use of structured modelling techniques and software support?

Q3. To what extent does the nature of the organisation e.g. public/private sector, large, small etc. influence either the selection of the implementation methodology or influence the prospects of successful implementation?

Q4. What project parameters should be used to determine the selection of implementation method i.e. traditional or software modelled?

Q5. Can a framework be developed which articulates mandatory change model attributes?

These questions have emerged following a review of current literature and the identification of gaps relating to the implementation methods in particular. In response to the research questions a series of project case studies has been selected and examined. Nine projects are studied, selected from three diverse organisations in order to test the both the impacts of the change programme type and also of the organisation type. A case study methodology is adopted in order to identify themes. The themes are examined against the criteria of the research objectives i.e. an examination of the impact of implementation methodologies with respect to the issues arising and success or otherwise of implementation.

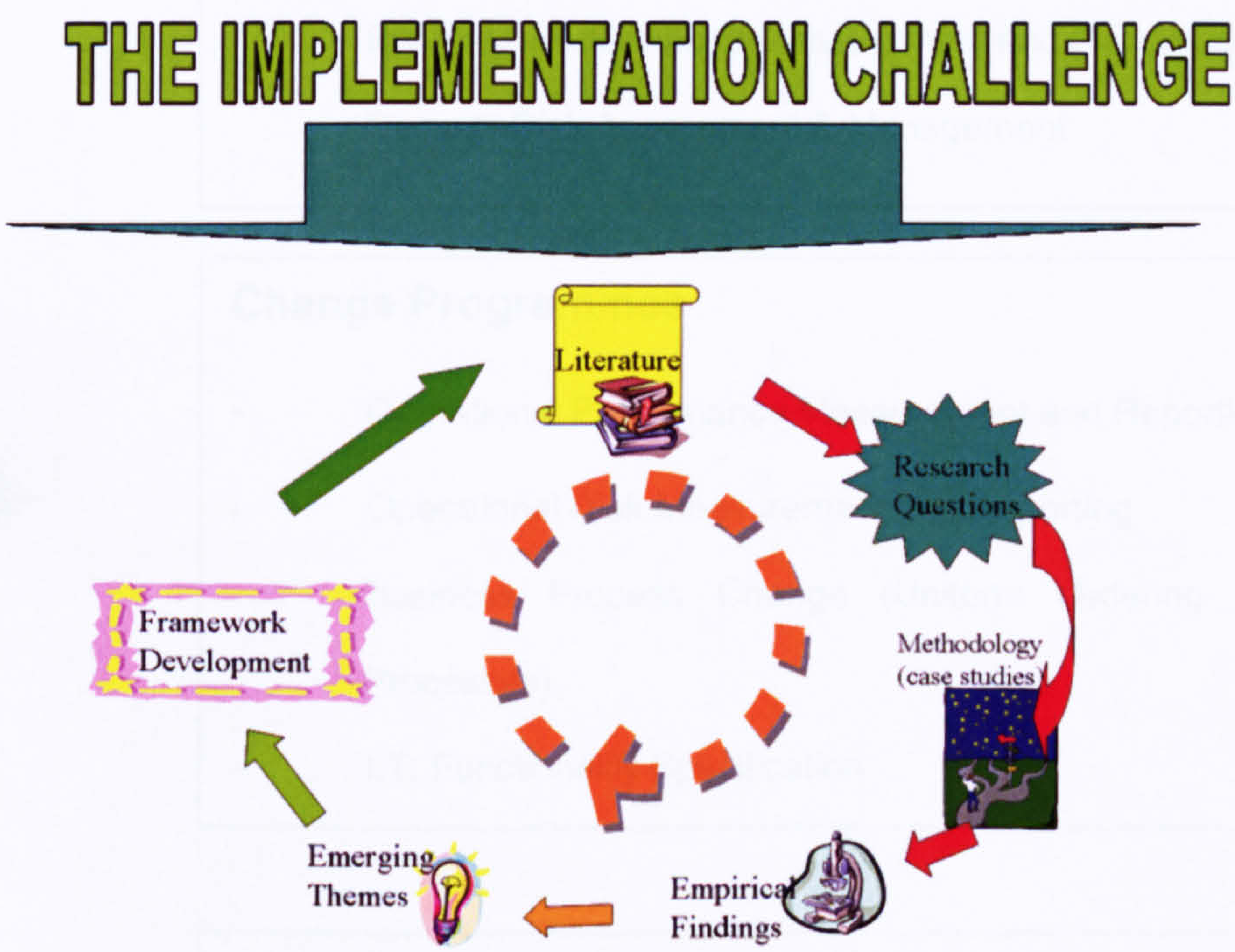


Figure 1.1 The Research Activity Cycle

1.3 Background

This DBA thesis considers the impact of utilising a structured; software supported modelling approach to the documentation and implementation of business change programmes within three differing organisations. A number of projects are examined both during the design and implementation phases and also post implementation. The three organisations examined are BAA plc, PSNI (Police Service of Northern Ireland) and Govan Initiative Ltd. (Scottish Enterprise Group). The projects examined within each organisation are as follows:

BAA

Change Programmes

- AOS (Airport Operational Systems)
- Oracle ERP (Enterprise Resource Planning) Implementation - back office business processes
- Business Performance Measurement and Reporting
- Security Risk Assessment & Management

Change Programmes

- Operational Performance Measurement and Reporting
- Operational Risk Measurement and Reporting
- Business Process Change (Uniform Ordering & Supply Chain Processes)
- I.T. Functionality Specification

Change Programme

- Business Performance Measurement & Reporting

The implementation approaches taken for each fell into one of two categories: 1) manual, paper based documentation and communication methods and 2) software supported, structured modelling methods.

The table below identifies the approach taken for each project covered by this study.

APPROACH	BAA								
	AOS	ERP	OGSM Perf.	MATRA Risk	Perf.	Risk	Unif Proc.	I.T. functionality	Performance
Traditional (paper based)									
Modelled (software)									

Table 1.1 Case Projects By Implementation/Documentation Method

1.4 Chapter Outline

Chapter 1 – Introduction, Background and Project Objectives

Chapter 1 introduces the research project aims and sets out the questions which the project seeks to answer. Chapter 1 then introduces the case organisations and the projects examined. Detailed background is provided to the relevant cultures impacting on the implementation styles and methods adopted. The projects and the implementation stakeholders are placed in the context of the overall organisational priorities. Finally the key research questions which this thesis sets out to answer are asked.

Chapter 2 – Literature Review

Chapter 2 examines the relevant academic literature concerning the following study areas:

- BPR (Business Process (Re-)Engineering
- Managing Change
- Performance Measurement
- Risk Assessment and Management

These areas cover the subject matter of the project cases. In particular this study is concerned with literature relating to implementation and the design/selection of supporting strategies. Attention is drawn to the failures experienced in implementation and a gap is identified in the literature regarding the effect of implementation techniques used. A gap also emerges relating to a consideration of the impact of software modelling techniques on the prospects of success or failure.

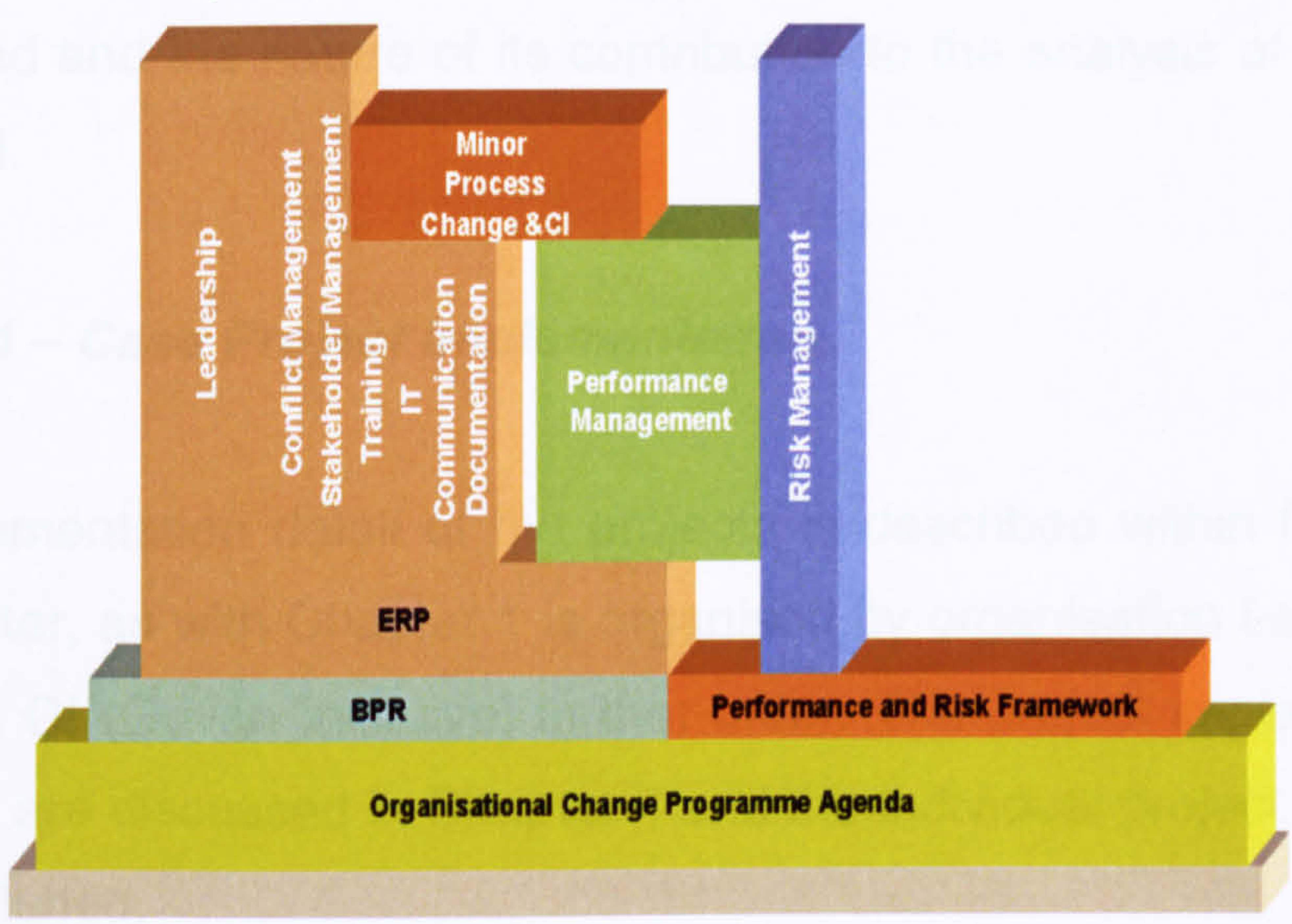


Figure 1.2 Relationships of the Relevant Fields of Study

The literature review considers BPR at the core of the literature study and includes references to related change implementation topics such as, Leadership, Resistance and Conflict and the role of Information Technology. As a number of the case projects being examined by this thesis relate to the implementation of performance and risk management frameworks as business change programmes, literature relating to these areas is also referred to.

Key questions raised by the literature, relevant to this study are highlighted.

Chapter 3 – Methodology

This DBA thesis focuses on a study of the implementation approaches and associated outcomes of a number of specific projects. As such this research project forms a series of case studies. Chapter 3 reflects on case study methodology and outlines the techniques utilised to examine the experiences and scrutinise the results of the implementation for comparison. The writer's role as implementation team member or consultant as appropriate is explained. The source of case study material is identified and the nature of its contribution to the analysis of outcomes is outlined.

Chapter 4 – Case Project Implementation

The implementation detail of the projects is described within Chapter 4. This chapter, as with Chapter 1 is organised by organisation i.e. BAA plc, PSNI and GI (Govan Initiative) in that order. The project implementation strategies are discussed in Chapter 4 and the individual project objectives are established.

Chapter 5 – Implementation Outcomes and Analysis

Chapter 5 examines the results of the project implementations. The post project review detail is examined. The outputs enabled by the respective approaches are discussed and compared in the context of the themes emergent from the project implementations explained within the empirical chapters 1 and 4. The chapter includes commentary on the arising issues and the sources of the issues with particular respect to the employed implementation tools and strategies.

Chapter 6 – Conclusions and Framework Development

The final chapter draws conclusions from the preceding chapters and suggests a framework for the selection of a structured, software based approach to modelling proposed business changes prior to and during the implementation phases. The chapter concludes with reference to the original project objectives and suggests areas for further research.

1.5 Technology & Business Change Programmes

With the objective of achieving sustained or increased wealth creation, many organisations whether proactively or reactively, have historically sought ways of exploiting technology, adopting a relentless pursuit of ever more efficient ways of working. This pursuit is arguably the principal influence in determining the direction and focus of technological development. Of course many organisations are followers rather than leaders and can be described as predominantly reactive in nature. Nonetheless such organisations can still demonstrate tendencies of accepting the critical nature of engaging technologically based solutions as a means of achieving economic objectives. Also and more frequently now technological solutions are being developed by independent 3rd parties with an interest in marketing their products to end-users.

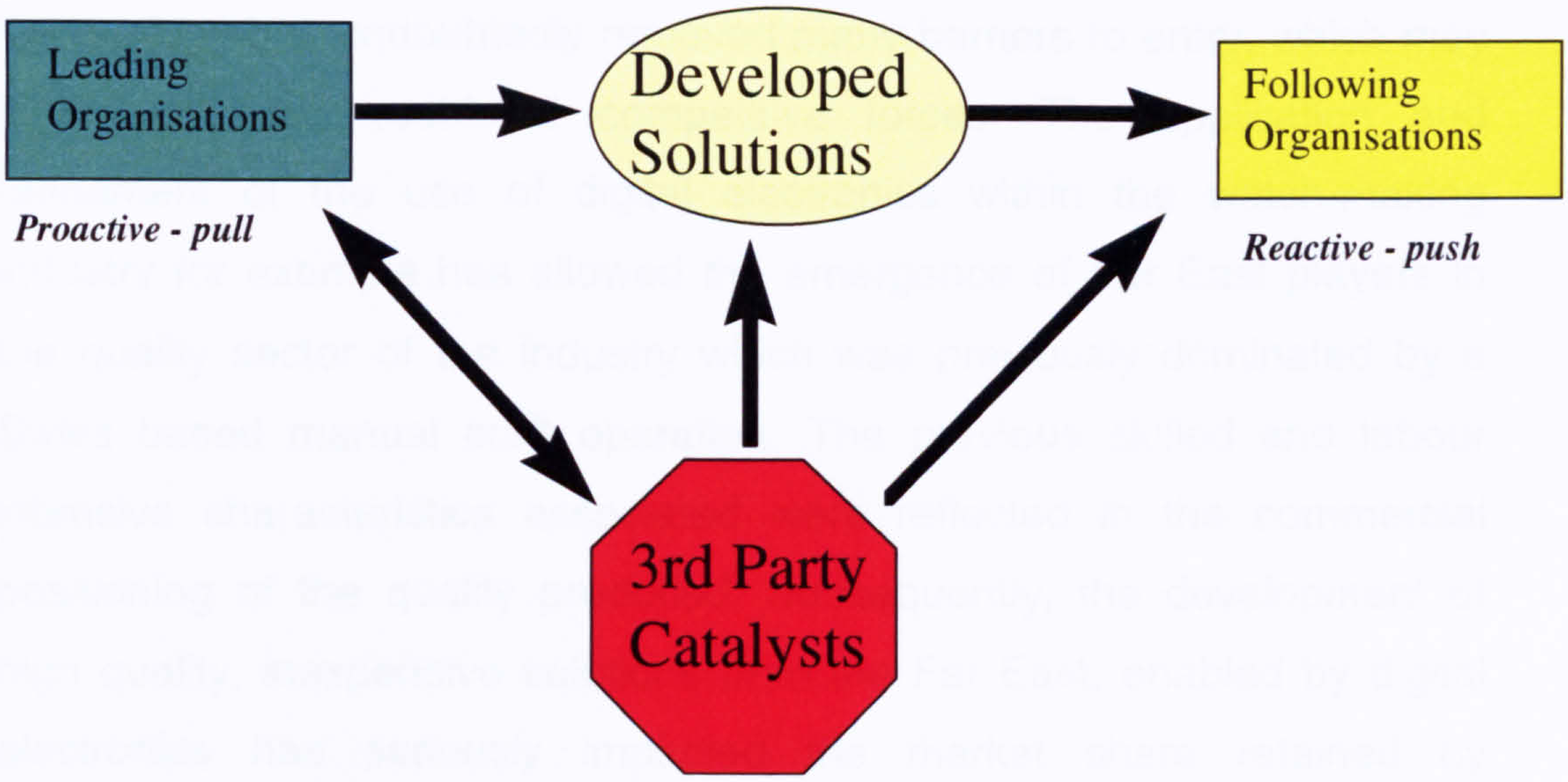


Figure 1.3: Forces Influencing the Development and Introduction of Technology Based Solutions in Organisations

The combination of finite economic resources and an underlying capitalist ethos which prevails throughout most of the developed world has ensured that creative and intellectual effort has tended to be applied in a manner which aspires to "adding value". This is borne out by the continued and increasing application of technology within organisations and industries toward the realisation of economic goals e.g. improved quality or productivity and elimination of avoidable waste. The term "adding value" is commonly used within organisations to refer to the effect of resource(s) which when subject to process are capable of contributing towards a desired objective, often the creation of wealth. Just as commonly used in organisations if not more so now is the term "non-value adding". Technological advancements have provoked more systematic and more frequent introspective examinations of working practices and processes by organisations, particularly those which are large, long established in traditional industries or market sectors, which in themselves may have adopted methods evolved through historical circumstance.

Technology has undoubtedly removed many barriers to entry, which may have previously restricted competitive forces. The application and refinement of the use of digital electronics within the watch-making industry for example has allowed the emergence of Far East players in the quality sector of the industry which was previously dominated by a Swiss based manual craft operation. The previous skilled and labour intensive characteristics associated were reflected in the commercial positioning of the quality produced. Subsequently, the development of high quality, inexpensive solutions from the Far East, enabled by digital electronics has seriously impacted the market share retained by traditional Swiss manufacturers as the price sensitivity of this particular market has been redefined. The failure of the Swiss watch-making industry to react significantly to the shift in consumer preference is demonstrated by the associated fall in World market share. The absence of a dynamic and maintained approach to corporate risk management in particular could be blamed at least in part for the lack of timely response.

The prospects for the operational or commercial success of organisations is now often assessed on their evaluation of technology development and application within the S.W.O.T. quadrants; Strengths, Weaknesses, Opportunities, Threats.

1.6 SWOT

Strengths

Those with strengths in the development or application of technological solutions may well be perceived to be likely market leaders, first to deliver new solutions and realise greatest returns on investment through innovation and efficient ways of working. Those with a capacity to embrace technology based solutions reduce their exposure to risks associated with implementing changes to business processes. The capacity to effectively implement technology solutions quickly in response to process optimisation requirements demonstrates that the organisation is led only by factors which add value.

Weaknesses

Those with weaknesses in this area may be quickly perceived to lag behind competitors and unlikely to deliver the highest returns through innovative delivery of product or efficiencies. They may be viewed as old fashioned and incapable or resistant to change. The inefficient employment of scarce and subsequently expensive resource results in an adverse competitive position. The incapacity to implement process related change solutions may suggest that the organisation's structure and/or focus is distracted from adding value.

Opportunities

Those that have clearly identified opportunities for technological applications and solutions, to either replace traditional resources or optimise their use, are likely to be regarded as having potential for wealth creation and penetration of existing markets or the development of new ones. They will significantly be identified as those able to react swiftly to qualified "signals" of performance and risk and in so doing safeguard the interests of its stakeholders. By exploiting technological solutions they are likely to equip their stakeholders with higher quality and more timely data. The resultant decisions made based on this data will also be of higher quality and may be sufficient to maintain or extend a competitive position. For those in the public sector it is likely that they will be able to demonstrate more easily the efficient and most appropriate deployment of tax-payers resources.

Threats

Organisations threatened by technological development may be perceived as being inflexible, unresponsive to change and vulnerable to a sustained pattern of loss of market position to competitors and new players. They will be reactive in nature and will typically not have a culture of signalling and review.

Practical experiences however raise significant questions regarding the possibility to form a reliable perception of an organisation's prospects on the basis of their readiness to engage technological solutions. There is a growing body of evidence to support a contrary view that commitment to pioneering or radically new technology can subject an organisation to a situation of heightened risk.

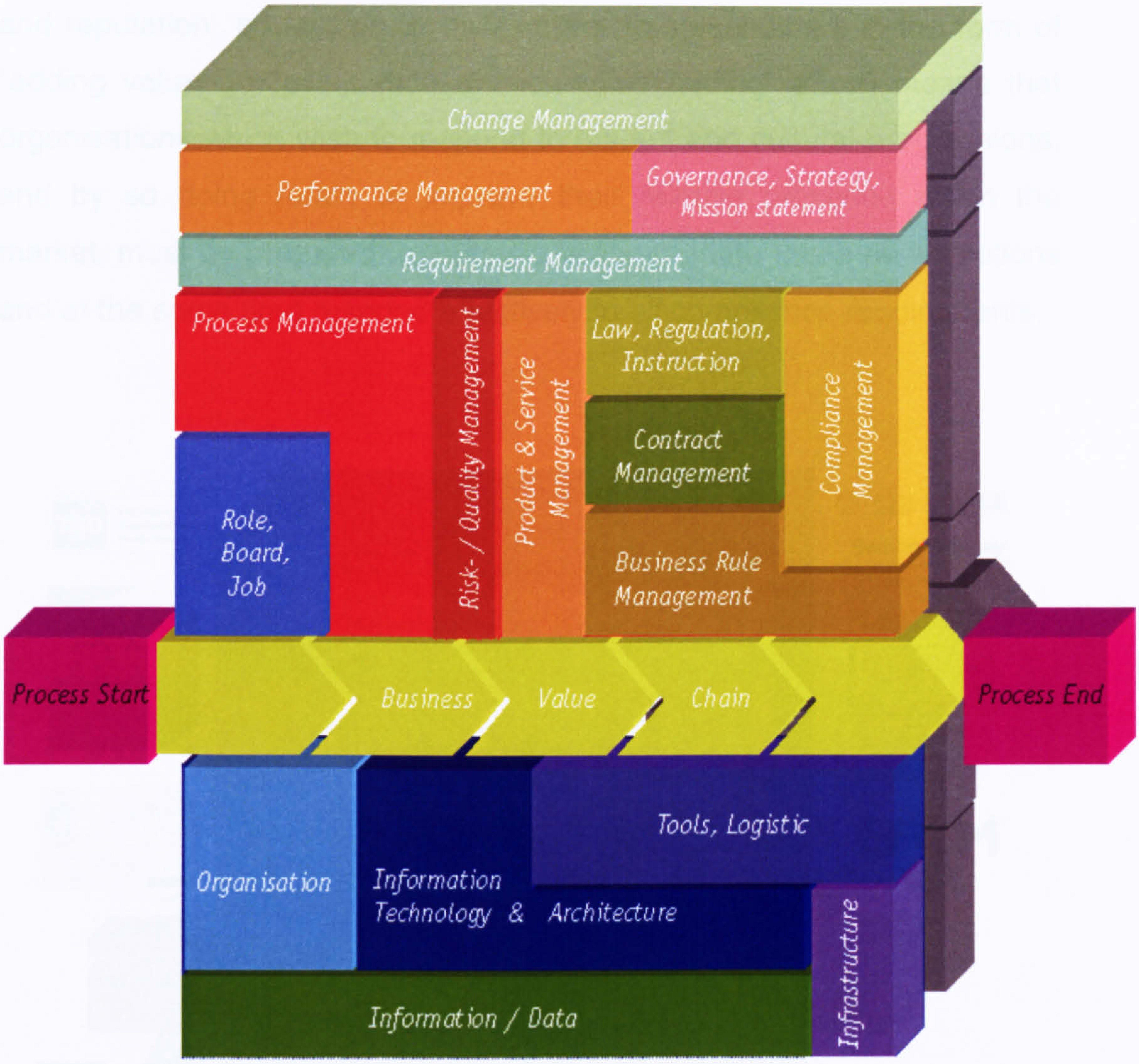


Figure 1.4: The Corporate Management Landscape

The figure above identifies the landscape which must be managed. Organisations must accommodate requirements, some of which are derived from policy or legislation. The top half of this diagram illustrates the compliance environment. This articulates the considerations of the organisation which must be delivered by the value adding activities of the business or organisation (Business Value Chains). The processes in turn must be supported by a network of organisational resources including human resources, IT and other tools. In any event the general propensity for the application of new technologically based solutions in organisations, supported by the perception of inherent economic, social and reputation benefit which they deliver to stakeholders in the form of "adding value" (or elimination of "non-value adding" effort) means that organisations which wish to respond to market and cultural progressions, and by so doing retain or improve their relative presence within the market, must be prepared to routinely accommodate these new solutions and at the same time respond effectively to all compliance requirements.

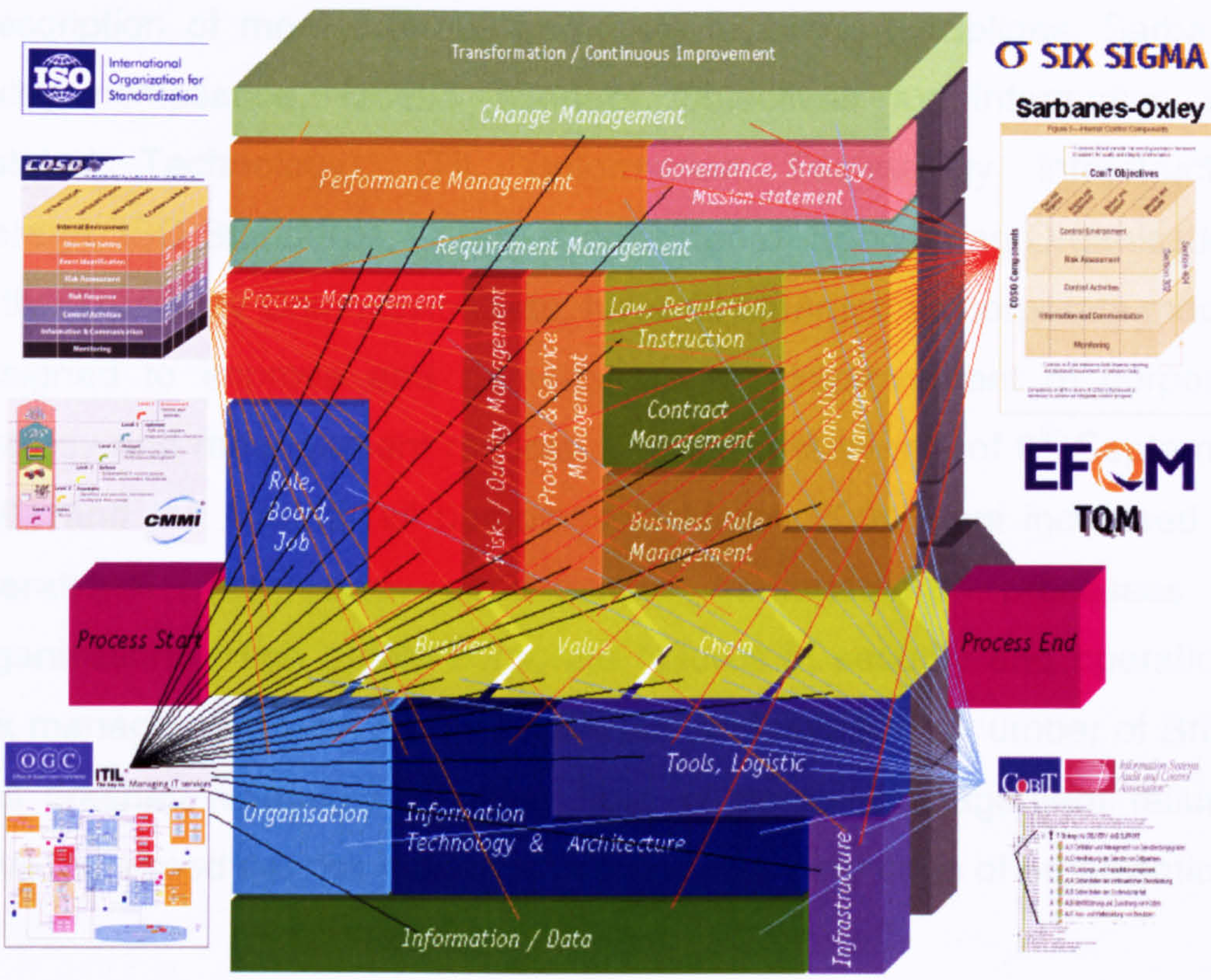


Figure 1.5: Management Landscape Overlaid with Typical Modern Compliance Environment

This means being receptive to and accommodating of the changes in processes, systems, organisation design, culture and attitudes associated with the introduction of technologically enabled solutions. It also means embedding the mechanisms within the organisation which allow it to identify performance trends comprehensively and also to continue to be appraised of risks corporately and operationally, and be equipped with a corporate framework to manage and respond.

The requirements of corporate governance models have been increasing significantly. The above figure, now overlaid with examples of Compliance models demonstrates the complexity of the challenge faced by organisations in achieving, let alone sustaining compliance. The Enron, Worldcom, Parmalat etc corporate scandals have provoked the prescription of more arduous corporate reporting disciplines. Sarbanes Oxley compliance, COBIT (Control Objectives for Information and Related Technology), ITIL (Information Technology Infrastructure Library), ISO Standards, COSO (Committee of Sponsoring Organisations of the Treadway Commission) etc. have all emerged as corporate models designed to improve and demonstrate the improvement of corporate strategy and management models. The terrorist events of 9th September 2001 and the Madrid rail bombings of March 2004 have increased the operational risk and contingency management processes of organisations. High profile corporate failures in security and operational risk management such as the Lockerbie bombing and a number of British Rail crashes, allegedly resulting from corporate management failures, have increased the risk management and reporting onus of organisations.

Generally, the compliance requirements, in response to a radically changing governance landscape and the reliance on technology supported process applications has changed beyond recognition the management environment for organisations compared with even 10 years ago. An increased expectation of accountability and performance reporting also imposes new requirements on organisations.

Organisations are facing the requirement to accommodate change more and more frequently. Continual and accelerating progress in the development of digitally enabled technology, both in terms of processing and communications means that obsolescence within the work environment relating to processes and systems is an issue requiring continual reassessment and treatment, more so than in historic times. An increase in the levels of governance disciplines expected of organisations following corporate scandals (Enron, WorldCom, parmalat) and the derivation of new corporate models (EFQM, Turnbull, Sarbanes Oxley) has engendered a corporate culture of increasing transparency. This new culture requires new techniques and tools to serve the appetite for detailed stakeholder information.

The success or otherwise of change implementation can be determined not only by the selection of the changes to be made but critically by the choices made relating to the methods employed to complete the implementation. This thesis seeks to compare approaches and in particular contrast traditional change implementation methods with the application of object based software modelling techniques, particularly in the area of business process, business performance and risk management.

For the purposes of this work reference is made to particular case studies. The writer examines the implementation methods employed during a series of business change programmes within the airport operator and owner BAA plc, which employed techniques which may be described as traditional. In addition a contrast is made between this experience and the results which emerged during the experiences of Police Service of Northern Ireland (PSNI) and Govan initiative Ltd. (Scottish Enterprise Group) which employed a technique including object based software modelling. Further projects within BAA plc are cited which subsequently employed object based modelling techniques. The study draws conclusions from the case studies and qualifies the case for the use of structured modelling techniques in the design and implementation of business change and business management projects.

This chapter continues with an introduction to the organisations within which the change programmes were implemented and an introduction to the programmes/projects involved.

1.7 BAA Change Programmes

1.7.1 Change Programmes – AOS, Enterprise, OGSM (Objectives, Goals, Strategies and Measures) and MATRA Risk Management

BAA plc, previously British Airports Authority has recently completed the implementation of four major change programmes, AOS (Airport Operational Systems) and Enterprise (ERP - Enterprise Resource Programme). This research project forms a case study of the implementation experience and completes a systematic evaluation of the success or otherwise of the undertakings with particular reflection on the selected method and tools used.

The research questions are outlined in chapter 1. Essentially these seek to establish the merits and benefits of adopting a particular approach to the design and implementation phases of business change programmes. Through the finding of answers to these questions it is intended that a framework for the successful implementation of major IT based and other Business Change Programmes can be developed appropriate to a multi-operational, commercial/non-commercial, private/public sector organisation which reflects the appropriateness or otherwise of implementation techniques. In particular the research intends to highlight the applicability of object based software modelling techniques for the purposes of successfully implementing business process change programmes. Further to this the research extends the study beyond the field of BPR and examines the contrast of traditional and object based software methods applied to the areas of performance measurement/management and also risk assessment/management framework implementation.

In the context of sourcing technology based solutions as a means of "adding value" BAA may be described generally as a following organisation. The technical products which provide the system solutions used within the change programmes of AOS and Enterprise (Oracle ERP) have been prior developed by well established 3rd party specialists. The AOS solution has been developed by IBM. The Enterprise programme makes use of market established Oracle IT database applications and front-end modules. Many organisations have preceded BAA in using this particular technology to complete similar change programme exercises. More importantly the methods employed by BAA to facilitate the implementation of these programmes and the implementation of the business performance (OGSM – Objectives, Goals, Strategies and Measures) and risk management (MATRA – Multi-Agency Threat and Risk Assessment) frameworks can be described as traditional, manual and largely subjective in the nature of their analysis.

1.7.2 AOS

The core of GLAL's (Glasgow Airport Limited`s) business, Airport Operations, is reliant on a series of diverse legacy systems. Each was developed to address specific business objectives using the best technology available at the time. Baggage systems, flight information display systems, check-in allocation, aircraft stand allocation, accounting systems etc. require integration within the scope of AOS.

The twenty disparate operating systems at Glasgow Airport only served to highlight the diverse mixture of systems in use across BAA and an opportunity has been identified to improve business processes and the systems that support them. The TAMS (Total Airport Management System) approach proposes systems integration across the full range of business applications. The Enterprise project addresses the integration of back-office systems. AOS is designed to complement these applications and provide the basis for common operational standards across the BAA group of airport companies. In the light of increasing volumes of air traffic movements and passenger numbers and also the scarce availability of capital, BAA is seeking to achieve greater productivity from its existing asset base. The term "sweat the assets" alludes to the desire which BAA has to make the best possible use of its current infrastructure and delay as long as possible the requirement to commit new funds. This deferral of capital expenditure on operational assets allows the organisation to use capital resource for investment in commercially more attractive projects.

1.7.3 Enterprise Business Processes (ERP)

The Enterprise project is the name given by BAA to its ERP implementation. The project is designed to integrate back office business processes, change employee behaviour and complete transactions more efficiently by exploiting technology.

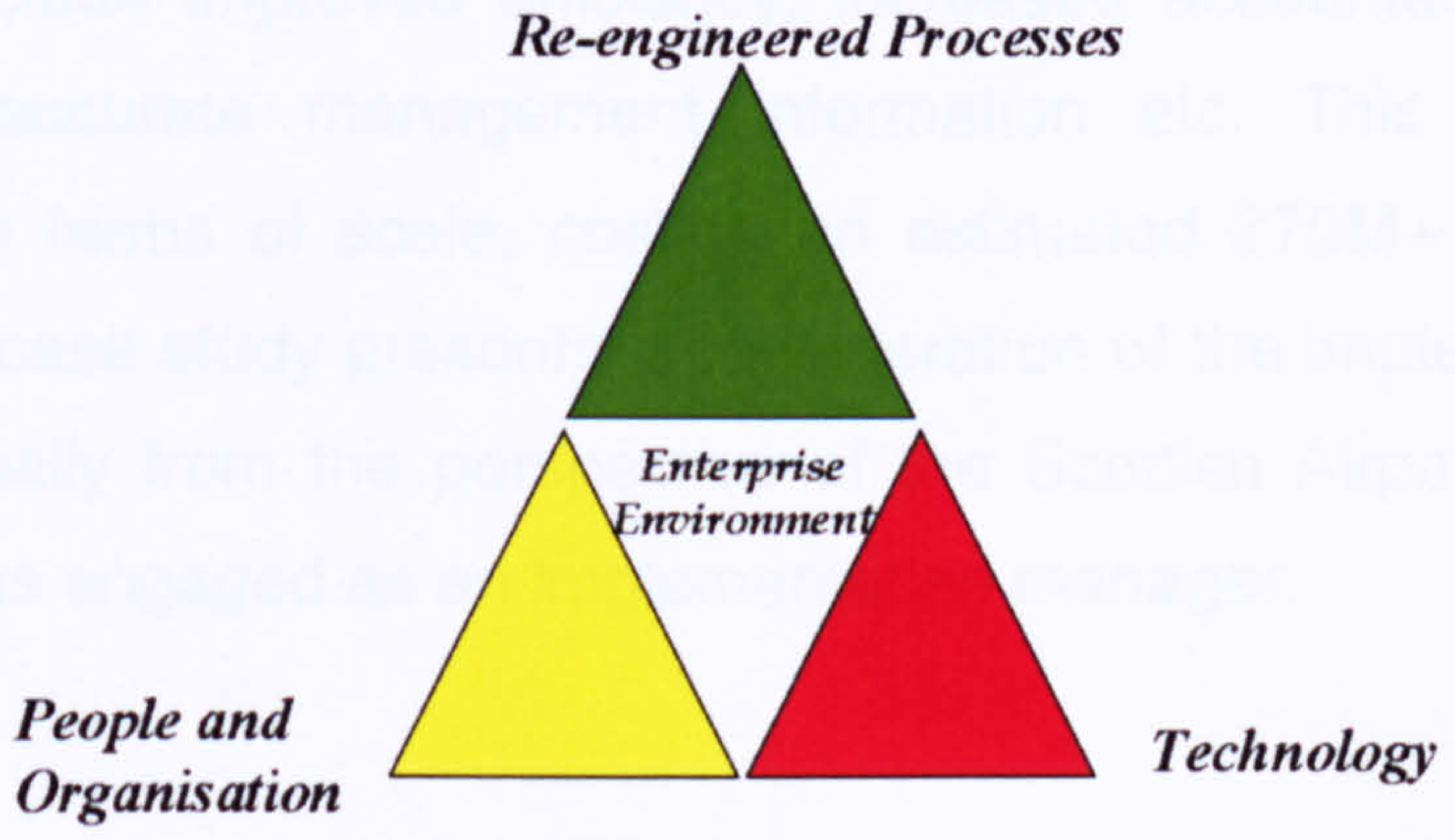


Figure 1.6 BAA Enterprise Programme Corporate Logo – BAA plc

The implementation of such an ERP project requires an organisation to take a "process view" and less of an operational, functional or hierarchical view of the business. The corporate logo employed above to brand all programme documentation endeavours to relay the priority of developing robust and efficient business processes, subsequently supported by a response of resources and technology.

The three ***key*** business process areas within the Enterprise Change Programme are:

1. Plan and Develop the Business (PDB) - Finance, Business Planning, Capital Projects
2. Acquire and Maintain Assets (AMA) - Procurement, Maintenance
3. Resource, Develop and Motivate People (RDMP) - Human Resources Management

The project involves the adoption of new technology, in this case an Oracle® database and front end modules. There is a considerable requirement for training in the use of the technology and also in the change to new processes. Behaviours and responsibilities need to be redefined in order to accommodate the new processes. The outcomes expected include improved efficiency, increased accountability, timelier and more accurate management information etc. This project was significant in terms of scale, costing an estimated £70M+ for the BAA Group. The case study presents a consideration of the implementation of ERP, especially from the perspective of the Scottish Airports Group as the writer was engaged as an implementation manager.

1.7.4 BAA Performance Measurement (OGSM)

BAA has established a theoretical business performance framework referred to as OGSM (Objectives, Goals, Strategies and Measurements). This framework seeks to align the business focus from the strategic level to the formulation of operational plans which will necessarily meet the overall business objectives. The framework works on the basis that Objectives, Goals, Strategies and Measures can be developed and cascaded down through the organisation from an overall set of objectives. The response from the various levels of business performance i.e. departments, airports (business units), airport groups (operating units e.g. Scottish Airports Group) etc. will, upon aggregation demonstrate progress towards the accomplishment of these objectives. The resultant culture is being one which develops operational plans to meet targets set from above and a culture which assesses performance via the direct measurement of indicators.

The framework forms a multi-object model which utilises established relationships such as the organisational hierarchy and the relationship between Objectives, Goals, Strategies and Measurements.

Figure 1.7: Multi-Object Schematic Reflecting Complexity of Relationships

The challenge for BAA is to manage this model, measuring and reporting performance through a multi-layer organisation in an efficient which provides appropriate information quickly, to the correct parties and allows the allocation of corrective decision making within timescales which optimise the organisation's capacity to improve performance throughout the performance year.

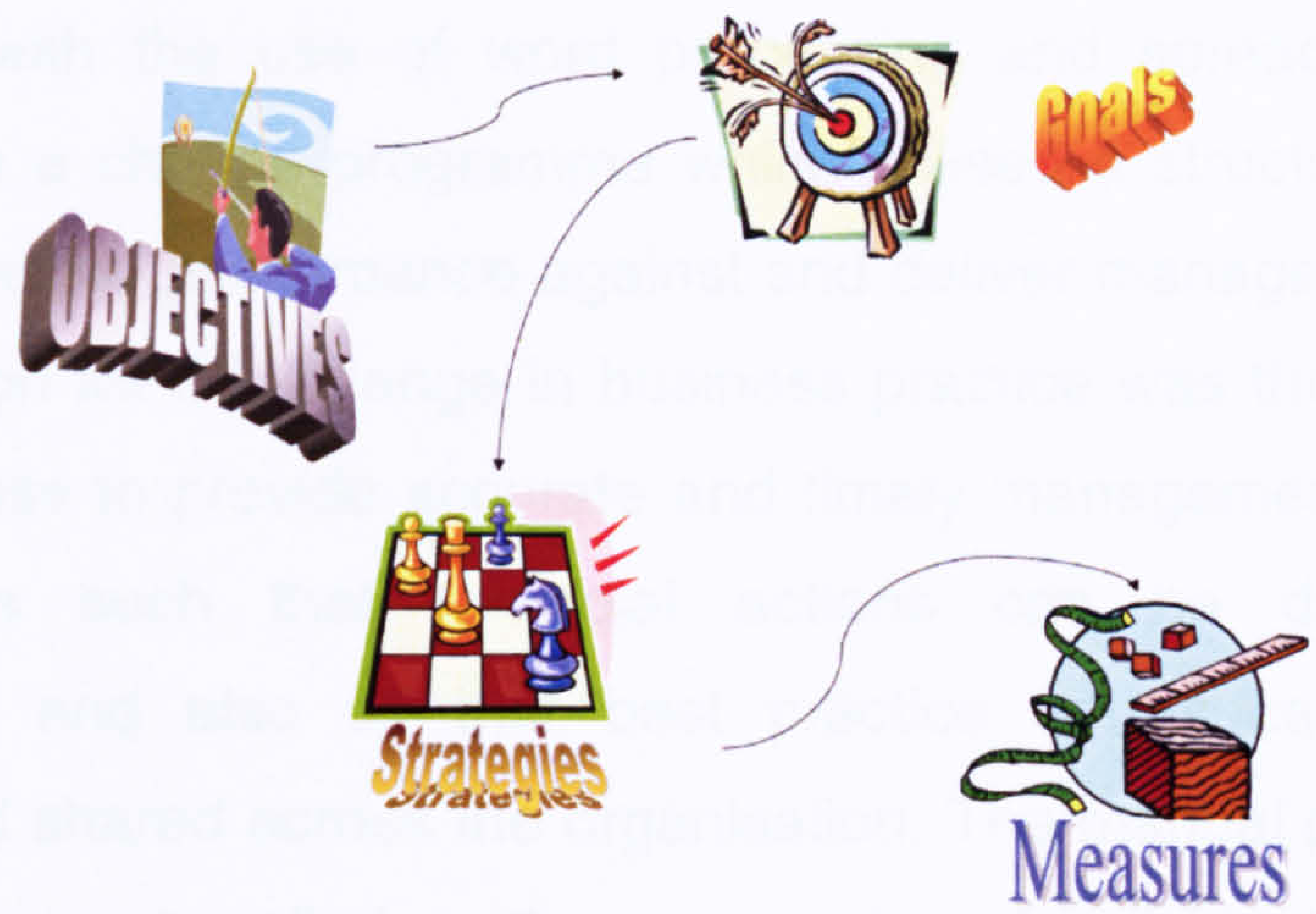


Figure 1.8: BAA OGSM Performance Management Framework – Relationship of Objectives – Goals – Strategies – Measurements

Within the OGSM performance management framework there are a finite number of object variables:

- Objectives – high level statements of ambition relating to the key lines of core business such as expansion of customer base, increased shareholder return, improved standing in the community etc.

- Goals – The targets set relative to the delivery of the objectives e.g. increase passenger numbers by 6% per annum, deliver a return on capital of 15% average, reduce operational emissions by 5% per annum.

- Strategies – The methods employed to achieve the organisation's stated Goals such as the securing of new routes, expansion of services, development of an environmental policy etc.

- Measures – The KPI's (key performance indicators) which articulate specific progress towards the achievement of Goals.

From a position of manual method management i.e. individual unit plan preparation with the use of word processing and spreadsheets, BAA embarked on a change programme which utilised a structured software model to measure performance against and deliver management reports. The motivation for this change in business practice was the requirement of the business to provide accurate and timely management information to managers such that remedial actions can be designed and implemented and also so that best practice trends can be quickly identified and shared across the organisation. The manual preparation of performance reports relied on the aggregation of individual performance reports. These performance reports varied greatly in structure and quality. The result was to make aggregation at best awkward and time-consuming, and at worst impossible or delivered too late to be of any positive influence to future performance. The resultant attitude to the performance framework was to view the exercise as a high -level objective setting exercise with diminished operational reference as the operating year progressed.

The intellectual challenge for managers is to develop their contribution to the model. The framework presents each department head to develop a set of Goals, Strategies and Measures in response to their set Objectives. The OGSM plan is completed and approved in consultation with superior business units. In addition performance targets are also set against the key business processes of the organisations. BAA, like many organisations has recently employed a more process based approach to the delivery of services and the completion of back office tasks. The ERP project implemented is discussed elsewhere in this thesis and demonstrates this approach. The inclusion of process performance measurement to the organisational performance measurement framework adds to the complexities of providing a routine method for global reporting. This complexity poses threats to the sustainability of the performance framework as a really useful management tool. The high workload associated with report compilation and the resultant delays in delivery to the management team often invalidate the exercise as a current comment on performance.

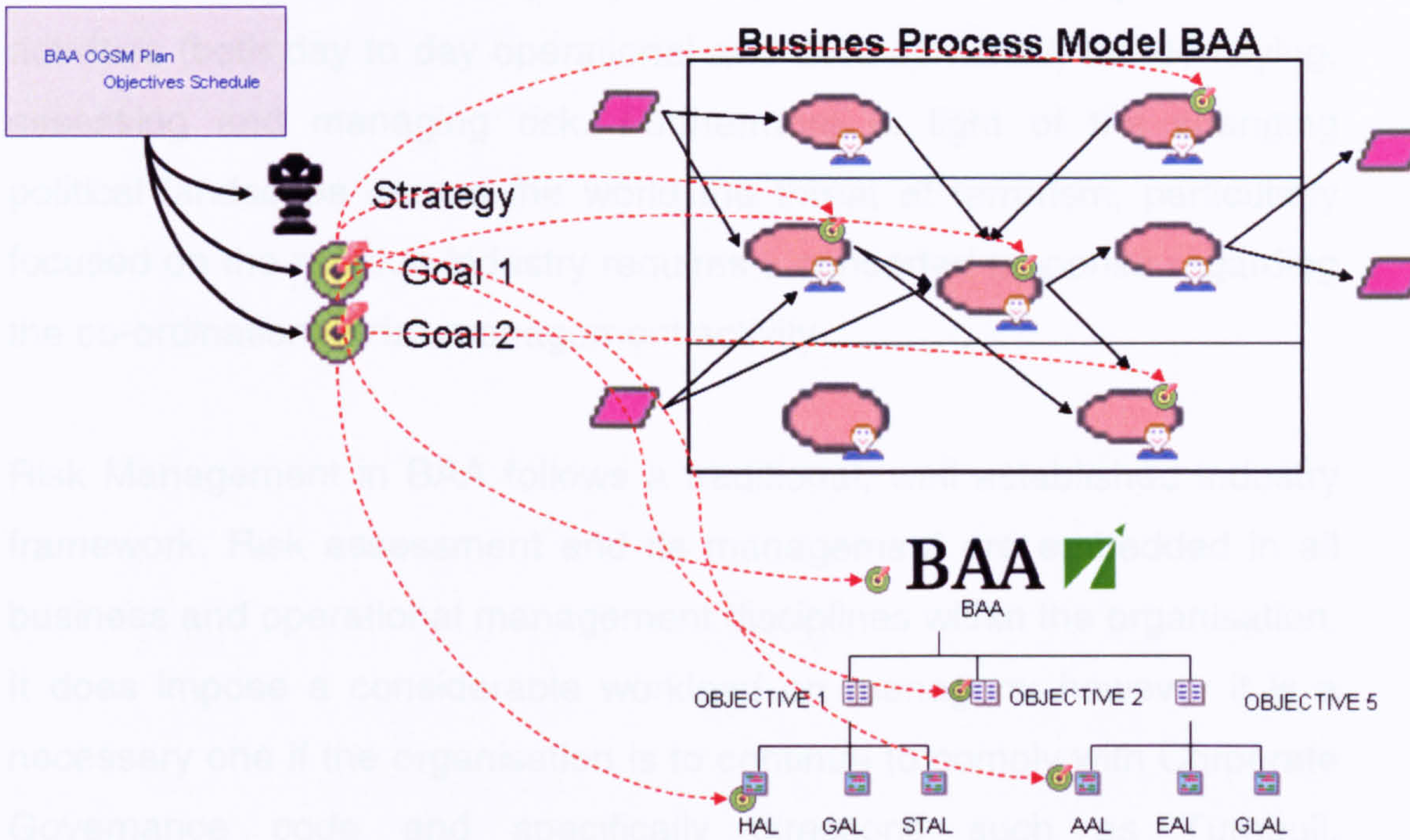


Figure 1.9: Complexity of BAA OGSM Framework Applying to Business Processes and Organisational Units

The above figure illustrates the scattered nature of the performance framework relative to organisational units (HAL – Heathrow Airport Limited, GAL – Gatwick Airport Limited, STAL – Stansted Airport Limited, AAL – Aberdeen Airport Limited, EAL – Edinburgh Airport Limited, GLAL – Glasgow Airport Limited) and also to the recently revised and established Business Process Landscape.

This project is examined in more detail in Chapter 4. The effects of the selection of a software modelling method are reviewed with respect to the outcomes. The outcomes and their analysis are reviewed in Chapter 5.

1.7.5 BAA Risk Management (MATRA)

Risk Management is central to the corporate governance responsibilities of BAA. As a FTSE 100 company investing significantly in capital construction projects within densely occupied areas, BAA must satisfy its auditors that it has a robust policy embedded within the completion of its activities (both day to day operational and developmental) for identifying, assessing and managing risk. Furthermore in light of the changing political landscape across the world the threat of terrorism, particularly focused on the aviation industry requires a concerted response regarding the co-ordination of risk management activity.

Risk Management in BAA follows a traditional, well established industry framework. Risk assessment and its management are embedded in all business and operational management disciplines within the organisation. It does impose a considerable workload on managers; however it is a necessary one if the organisation is to continue to comply with Corporate Governance code and specifically directions such as Turnbull. Shareholders have a keener interest now in the methods and disciplines associated with effective risk management than they would have done prior to the Enron, Worldcom scandals and even 9/11.

1.7.5.1 MATRA

The current worldwide political climate is such now that an increased focus is required on terrorist related activity and the mitigation of risks posed. The response of the UK government through the Home Office is to establish a risk project for the country's ports. Concern has grown that the threat of terrorist attack has increased in recent years at establishments including sea and air ports. The Home Office is determined to establish a framework of risk management which ensures that all responsible agencies at each location are maintaining a co-ordinated effort to assess and manage operational risks. This project is referred to as MATRA (Multi-Agency Threat and Risk Assessment). This project has been piloted by BAA which has employed a structured modelling approach to the provision of a discipline for risk management, supported by software.

This study examines the implementation of a Risk Management solution for BAA, specifically to address the impact of the MATRA (Multi-Agency Threat and Risk Assessment) project, initiated by the Home Office, Dec 2003. A focus is placed on the method of implementation and the impact that this has had on the arising issues and measures of success of the implementation.

1.8 PSNI (Police Service of Northern Ireland) – Change Programmes

PSNI (Police Service of Northern Ireland) is a public sector law enforcement organisation with a staff complement of approximately 9,000. The UK government has engaged with local political parties and also the government of the Irish Republic to formulate conditions and activities related to and referred to as the peace process. The conditions of the peace process impact significantly on the shape, requirements and operating protocols of the police service. Subject to the requirements of the Patten report, written by former Conservative government minister Chris Patten, PSNI must demonstrate that they have implemented a broad scope of change. The recommendations of the Patten report include the devolvement of corporate responsibilities to the operational line elements such as responsibility for budgets, increased accountability for performance and also ownership and management of operational and corporate risk.

In response PSNI has developed an implementation framework to enable these changes. This study includes reference to an analysis of the performance and risk management areas of this framework. PSNI has utilised a modelling technique to complete the implementations. This study reflects upon the impact of this selected method.

1.8.1 DCU (District Command Unit) Operational Performance Management

PSNI is held to account by the Northern Ireland Policing Board. This is a publicly appointed body charged with the monitoring of performance and policy as delivered by the PSNI senior management team. In order to demonstrate progress towards set goals PSNI reports routinely against a set of key performance indicators. The relationship between these indicators, set targets, strategies and aims is articulated and published within a document known as the Northern Ireland Policing Plan. This strategy and performance model is a public document and is intended to explain the direction of the Police Service, what it is required to achieve and how it intends to achieve it. The performance framework dwells within this and details the specific targets and indicators which convey the extent of progress in meeting the requirements. The Policing Plan is reviewed annually and changes are made as the organisation's progress towards the achievement of goals progresses. This results in an evolution of focus and alterations to the Performance framework including targets and performance indicators.

Responsibility for operational performance at the lowest level of the organisation resides with the DCU (District Command Unit) Commander. The operational structure of PSNI is made up of 29 District Commands, within (at the time of starting the project) 3 Regions; North Region, South Region and Belfast region. This organisational structure has subsequently been revised to a two region structure namely Urban Region and Rural Region.

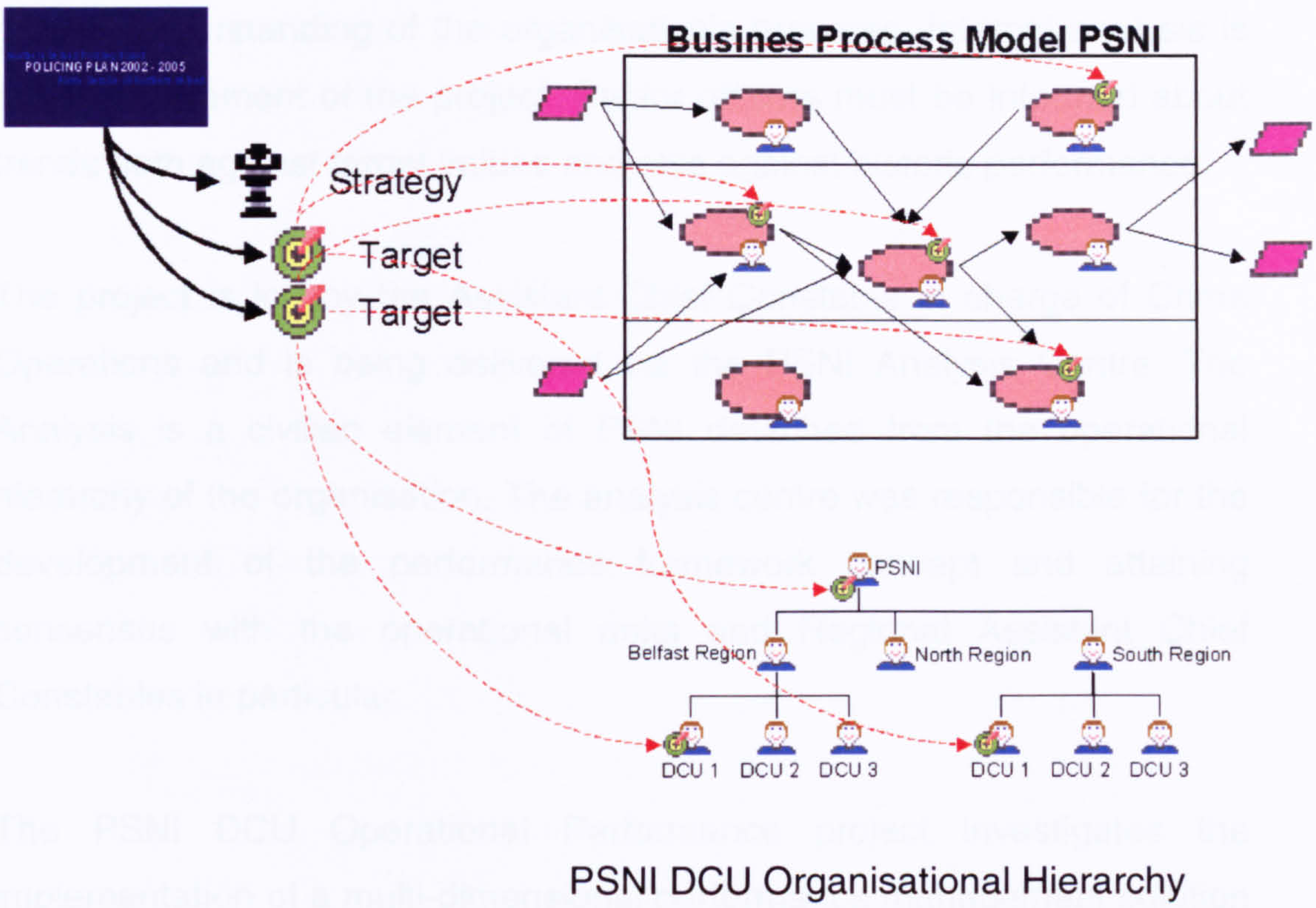


Figure 1.10: PSNI Policing Plan Performance Management Framework Relating to Process Landscape and Organisational Hierarchies

The performance management framework employed for operational units resembles almost exactly that of BAA. There is only a very slight difference in terminology. The terms “Objectives” as used by BAA is replaced by the “Overarching Aims” of the PSNI policing plan, “Goals” as used by BAA is replaced with “Targets”. The Policing Board is interested in reviewing performance from a variety of perspectives. First of all the performance of the individual DCUs is of concern in establishing the profile of localised crime and conditions. Secondly trends in particular crimes are of interest and the associated response plans of the operational units. Aggregated performance to Regional level is the concern of the Assistant Chief Constables responsible for delivering the Policing plans for these units.

Analysis by targets, strategies and overarching aims contributes to a greater understanding of the organisation's progress. Internal analysis is a key requirement of the project. Senior officers must be informed about trends both against target values and also against historic performance.

The project is led by the Assistant Chief Constable in charge of Crime Operations and is being delivered via the PSNI Analysis Centre. The Analysis is a civilian element of PSNI detached from the operational hierarchy of the organisation. The analysis centre was responsible for the development of the performance framework concept and attaining consensus with the operational units and Regional Assistant Chief Constables in particular.

The PSNI DCU Operational Performance project investigates the implementation of a multi-dimensional performance management solution based on a modelled software supported technique. This project and its implementation are described in greater detail in Chapter 4.

1.8.2 Operational Risk Management

In further response to the outcomes of the Patten Report, PSNI has embarked on a project to devolve responsibility for operational and corporate risk management to operational line units. This is in accordance also with improved Corporate Governance disciplines. Once again an objective of the project is to share information across the organisation and allow the proliferation of best practices. The project is being led by the Assistant Chief Constable in charge of Corporate Development and Change Management.

PSNI embarked on this project choosing a structured modelling method for the recording, management and reporting of risks. This approach was selected in order to share information, analyse risk and demonstrate risk status to a range of target audiences. The project included a development phase which provided a risk management concept. For this specific purpose Deloitte and Touche were engaged as principal consultants. This concept development phase resulted in the delivery of a paper based risk assessment and reporting framework. The practical implementation of a supported solution involved the use of software to model and manage the data within a defined object structure.

The delivery of the original solution resembled to a considerable extent the BAA MATRA risk project, however following implementation PSNI then altered the risk framework model. This particular case demonstrates the flexibility of the software modelling approach to accommodate change and in so doing maintain a robust framework for users and reduce the prospects of the concept falling into disrepute as a result of this change.

1.8.3 Uniform Ordering Process (Re-)Engineering

PSNI has recently engaged a company called Turner Virr to manage the supply and delivery of all uniform items. This includes day to day replacement items and also the equipping of new recruits. Turner Virr employs an order management system which requires uniform orders to be received electronically.

Turner Virr will now hold all stock on behalf of PSNI remotely in mainland UK. As such there are issues relating to delivery times, security access. On top of this PSNI, in line with the recommendations of the Patten report is in the process of devolving budgets to line business units e.g. District Command Units. PSNI has been required to re-engineer its uniform ordering, delivery and financial reconciliation processes in order to accommodate these changes. A project was initiated to complete this reengineering, specify the flow of activity for each scenario and communicate the change to all concerned parties.

This study includes an account of the implementation experience and the methods employed. PSNI chose to utilise software modelling on the basis of a process modelling framework to complete this exercise. The study considers the impact that this approach had on the themes emerging from the literature.

1.8.4 ICIS (Integrated Crime Information System) – Functionality Specification

PSNI utilise an in-house developed crime information database called ICIS (Integrated Crime Information System. This is a system which provides operational information relating to events, crimes, persons, addresses, assets e.g. stolen vehicles etc. It can provide details relating to criminal record, relationships, aliases etc. The mainland forces use a system called PNC (Police National Computer) which is similar in concept but more restricted in the range of functionality.

ICIS is developed as an Informix database product and is currently not integrate with PNC. PSNI employs two groups to maintain the product. One group is referred to as the ICIS team. They are responsible for being the interface between the business and the development of the product. They will engage with members f the operation to identify functionality enhancements, control user access and also liaise with other forces on issues such as integration. The second group is the ICIS Development team. Their role is to interpret the requirements provided by the ICIS team and develop product solutions. They comprise of software developers. The approach which has prevailed within PSNI has been to express requirements using a user specification document – a written description of preferred functionality.

This study includes a review of an exercise to utilise an alternative model based approach to requirements specification. This project is explained in greater detail in Chapter 4. The specific outcomes are discussed in Chapter 5 in relation to the emerging themes from the literature and the implementation experience.

1.9 Govan Initiative (Scottish Enterprise)

1.9.1 Performance Management

GI (Govan Initiative Ltd) is a local enterprise company and forms a part of the Scottish Enterprise network of companies. It s concerned with the regeneration of Govan, located in Glasgow on the South bank of the river Clyde. Govan as an area has struggled economically since the demise of the ship building industry. GI is concerned with attracting new forms of industry into the area and at the same time attempting to deliver services which better equip the people of Govan for accommodating new industries. This activity includes training schemes, re-skilling, education initiatives etc.

In order to facilitate its activities GI is given access to resources and also the opportunity to apply on a case by case basis for European funding grants. Transparency is a major requirement of GI. They must be able to demonstrate the impact of their activities in order to continue to be perceived as viable, productive and worthy of continued support.

In response GI publish an operational plan which forms the basis of their performance framework. This plan outlines the five central Goals of the organisation and relates them to strategies. Against the strategies targets are set and progress achieved towards these strategies is given by sets of indicators (115 in total).

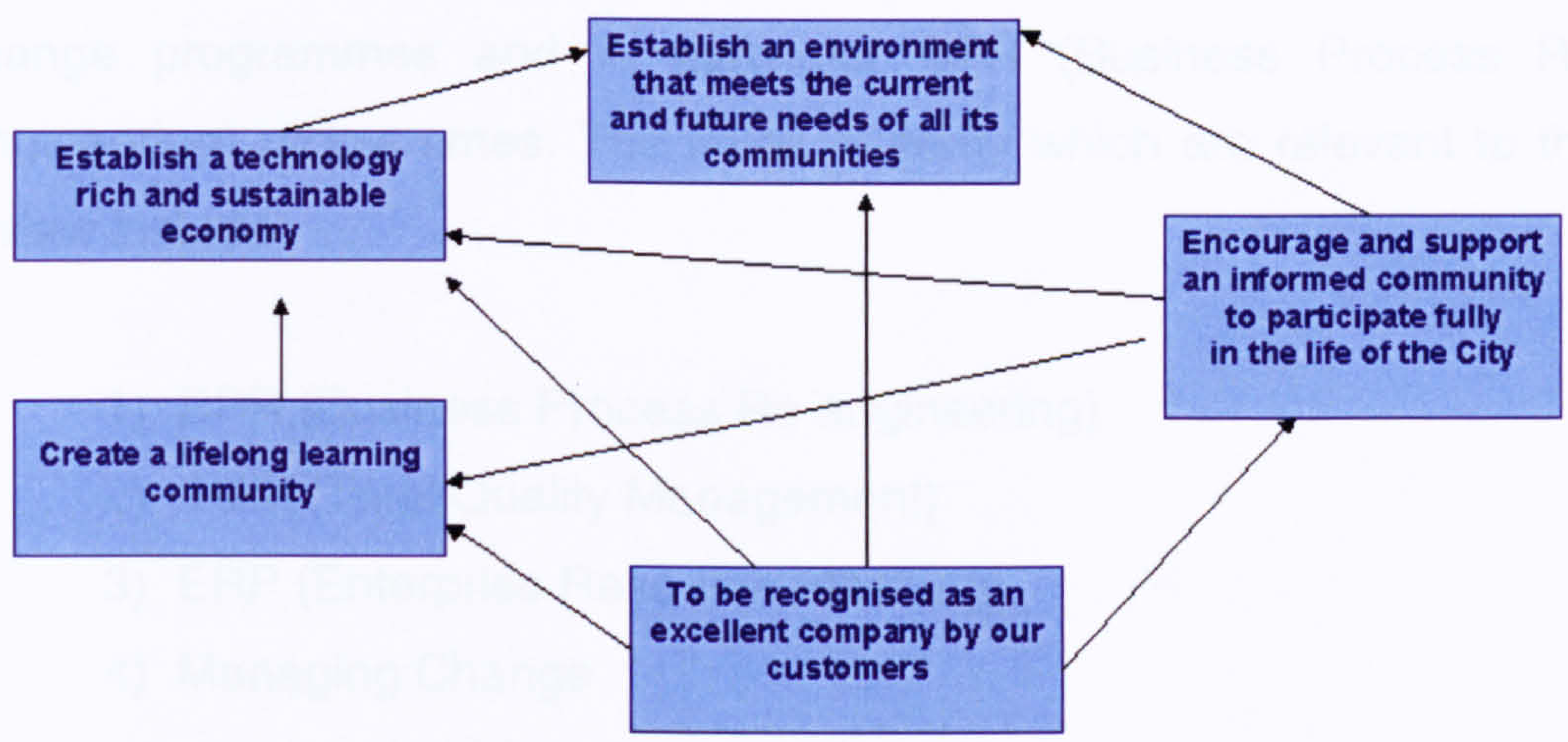


Figure 1.11 The Five Central Goals for Govan Initiative – Govan initiative Operational Plan

This performance framework model resembles to a great extent the published model of PSNI and also the OGSM model of BAA. The complexity of relationship between a small number of high level objectives and a significant number of performance indicators measured against a number of diverse and unrelated projects convinced GI to attempt a modelled approach to the recording and reporting of performance. The implementation and its outcomes are discussed in Chapters 4 and 5 respectively.

2. Chapter 2 - Literature Review Chapter

2.1 Introduction

The purpose of this chapter is to reflect on relevant literature to date concerned with the preparation for and implementation of IT led business change programmes and in particular BPR (Business Process Re-Engineering) programmes. The fields of study which are relevant to this review include;

1) BPR (Business Process Re-engineering)
2) TQM (Total Quality Management)
3) ERP (Enterprise Resource Planning)
4) Managing Change
   - Leadership (relating to change)
   - Resistance to Change

5) Performance Measurement and Management
6) Operational Risk Management

These areas require to be reviewed as they relate to both the implementation of business change programmes and also cover the subject matter of the change programmes examined within the empirical chapters of this study. The subject matter areas e.g. ERP, Performance Measurement, Risk Management provide a comparison of project type and an opportunity to identify variances of experience.

The major area of focus for this study is the review of methods employed to enable the successful implementation of business change programmes. The projects included within the study vary in nature, but all include a change to process that must be documented, communicated, devolved and embedded within the scope of an implementation phase. A review of the BPR literature forms the foundation of much of this chapter. On top of this a review is completed of relevant subjects related to implementation i.e. leadership (in relation to change), conflict and resistance to change, and stakeholder engagement.

As the subject matter of the implementation projects extends beyond BPR to Performance and Risk framework implementation, the literature review also covers relevant work in these areas.

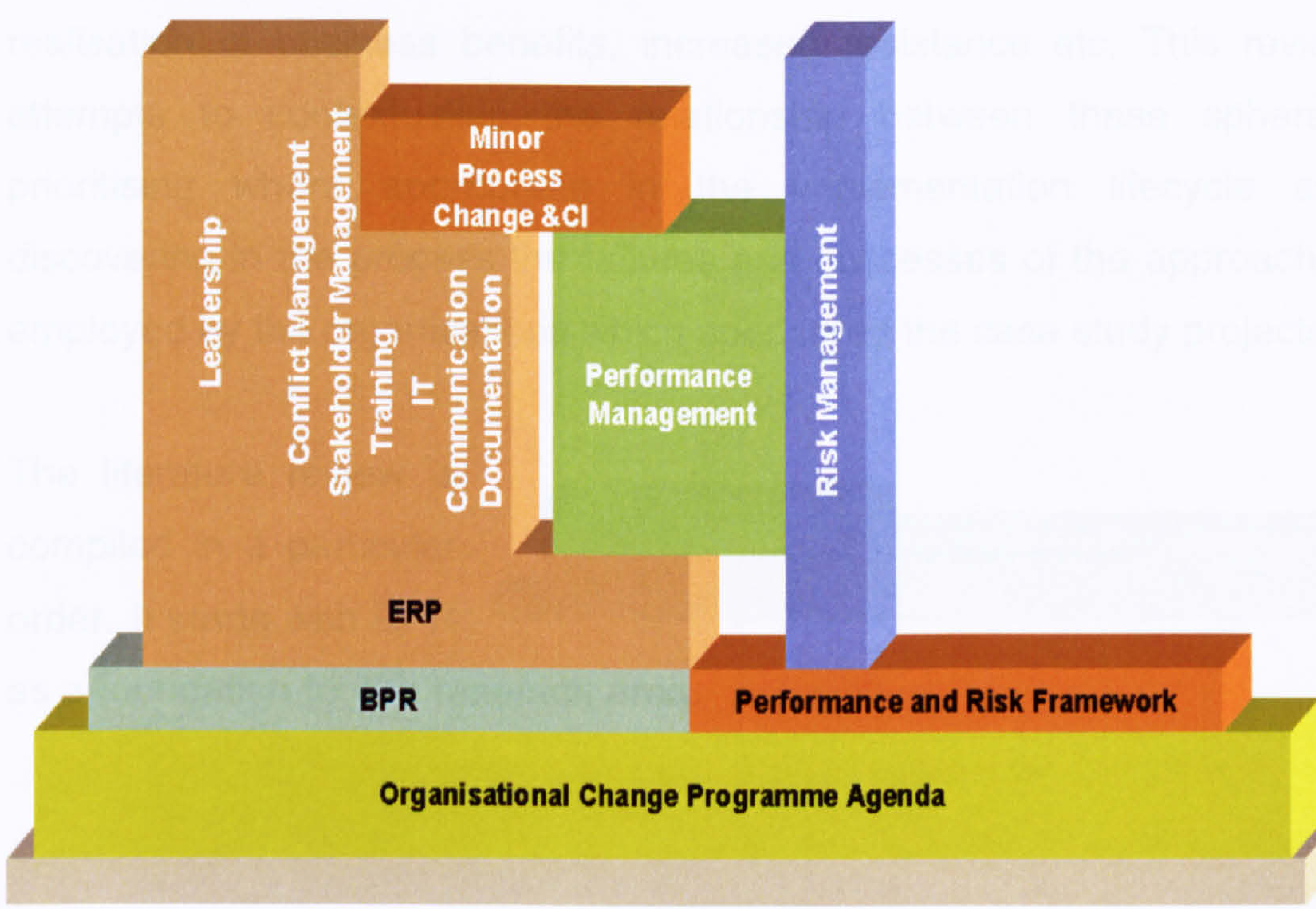


Figure 2.1: The Literature Framework

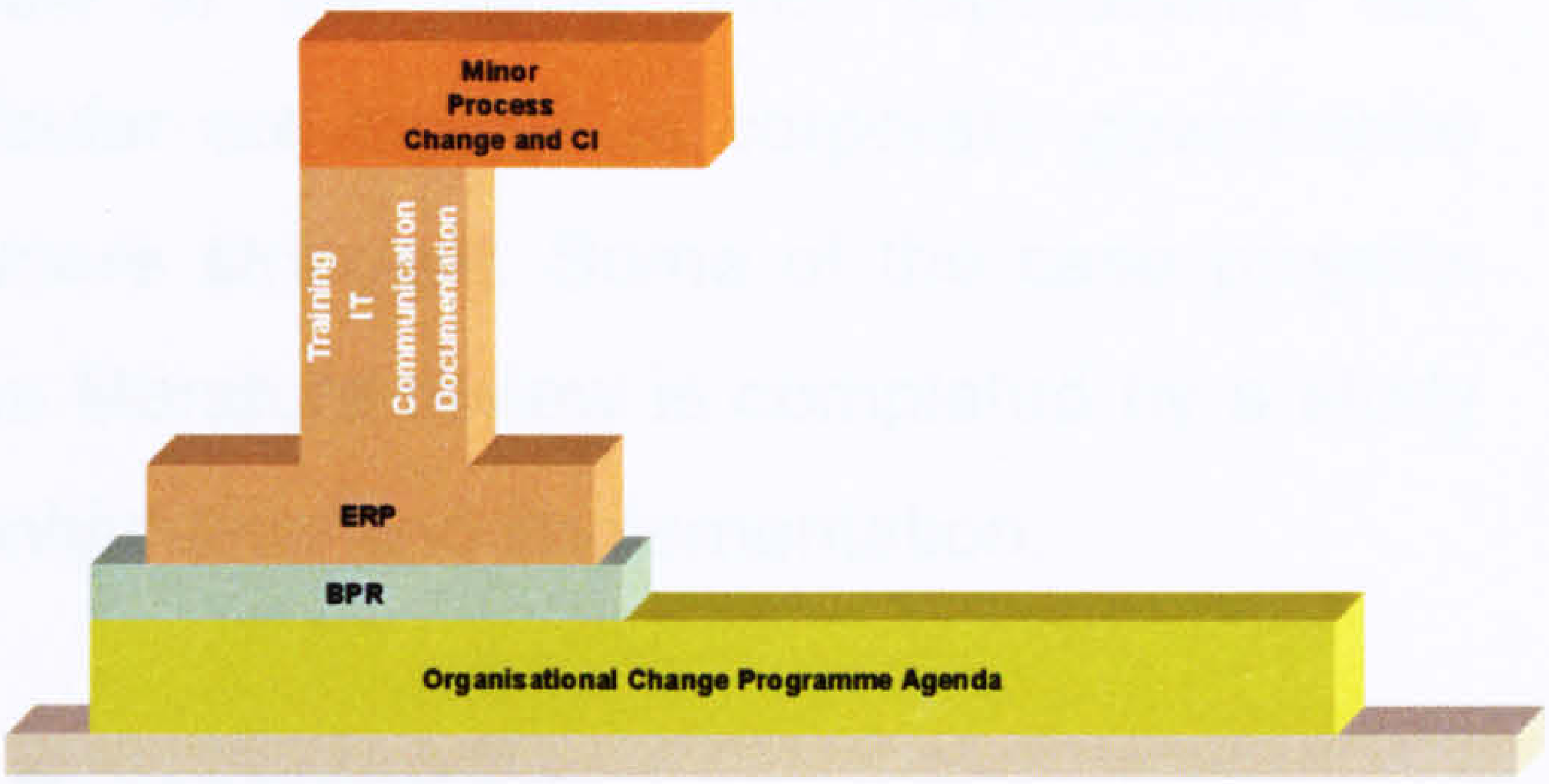
2.2 Background and Context

The extent of previous study completed in each of these areas is considerable and it would be neither practical nor relevant to attempt to comprehensively review all works completed. Instead the writer has chosen to review in particular those key texts appropriate to each sphere and in addition the most recent and most relevant pieces of study relating to practical implementation.

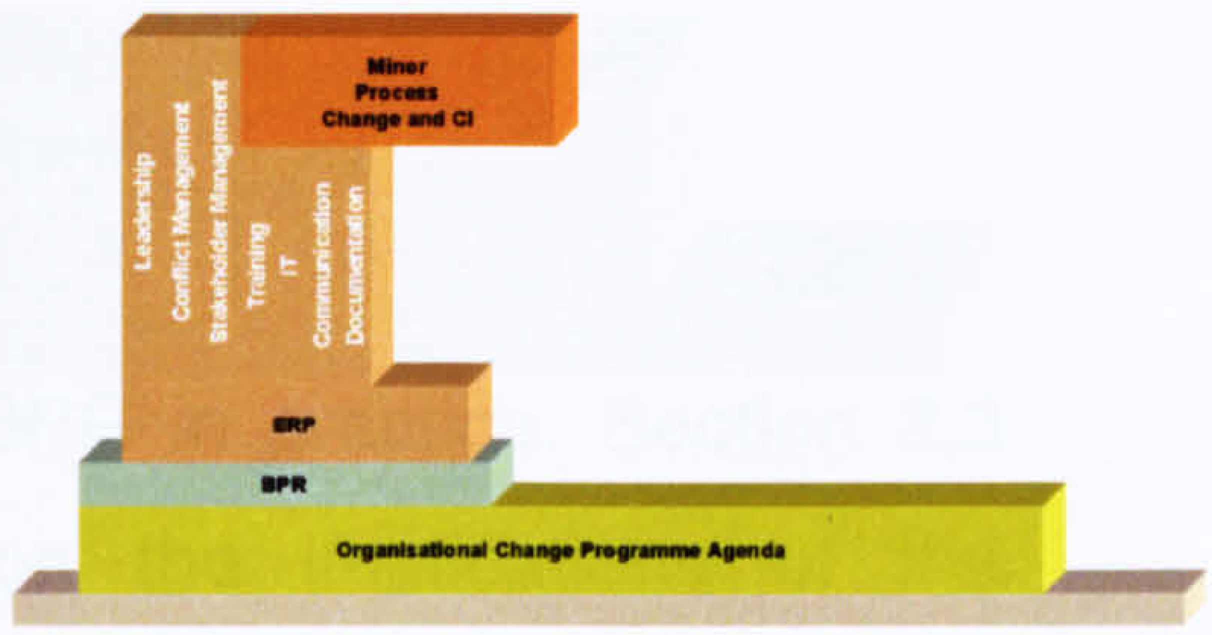
A key characteristic of reflections on implementation experiences that continually emerges from the literature is the importance of affording appropriate and very importantly co-ordinated treatment to each of the spheres listed above. Time and time again text and journal references are made to completion of BPR tasks in isolation of Change Management activity or without proper reconciliation with the IT functionality. Such incidents are often cited as reasons for implementation failure, non-realisation of business benefits, increased resistance etc. This review attempts to contextualise the relationship between these spheres, prioritising where appropriate in the implementation lifecycle and discovering in the process the failures and successes of the approaches employed by the organisations which sponsored the case study projects.

The literature review is compiled in a particular order. It starts with BPR as a foundation for the research area.

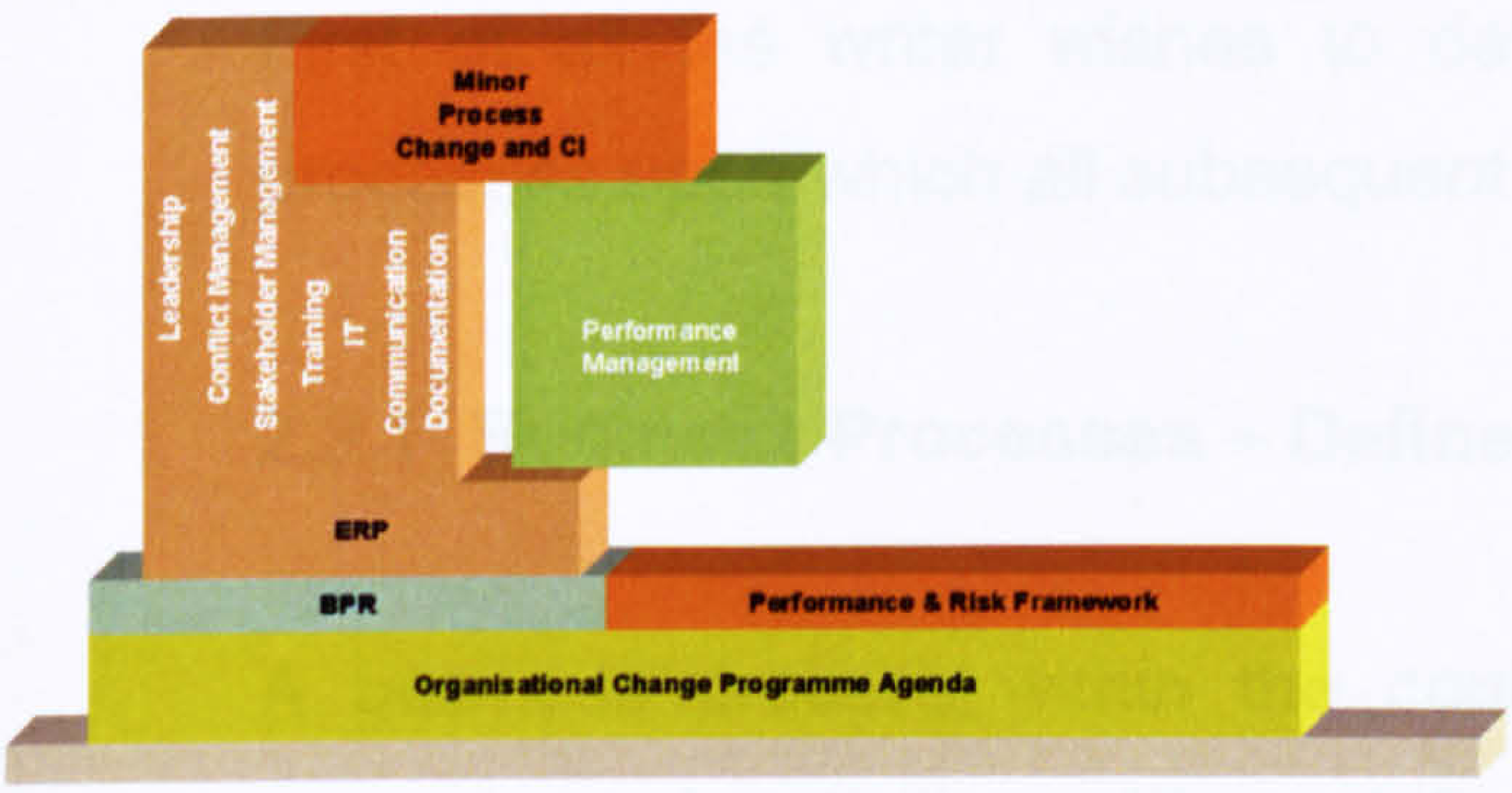
On top of this the relationship to ERP implementation is subsequently developed. One of the major case projects examined falls into the category of ERP implementation.



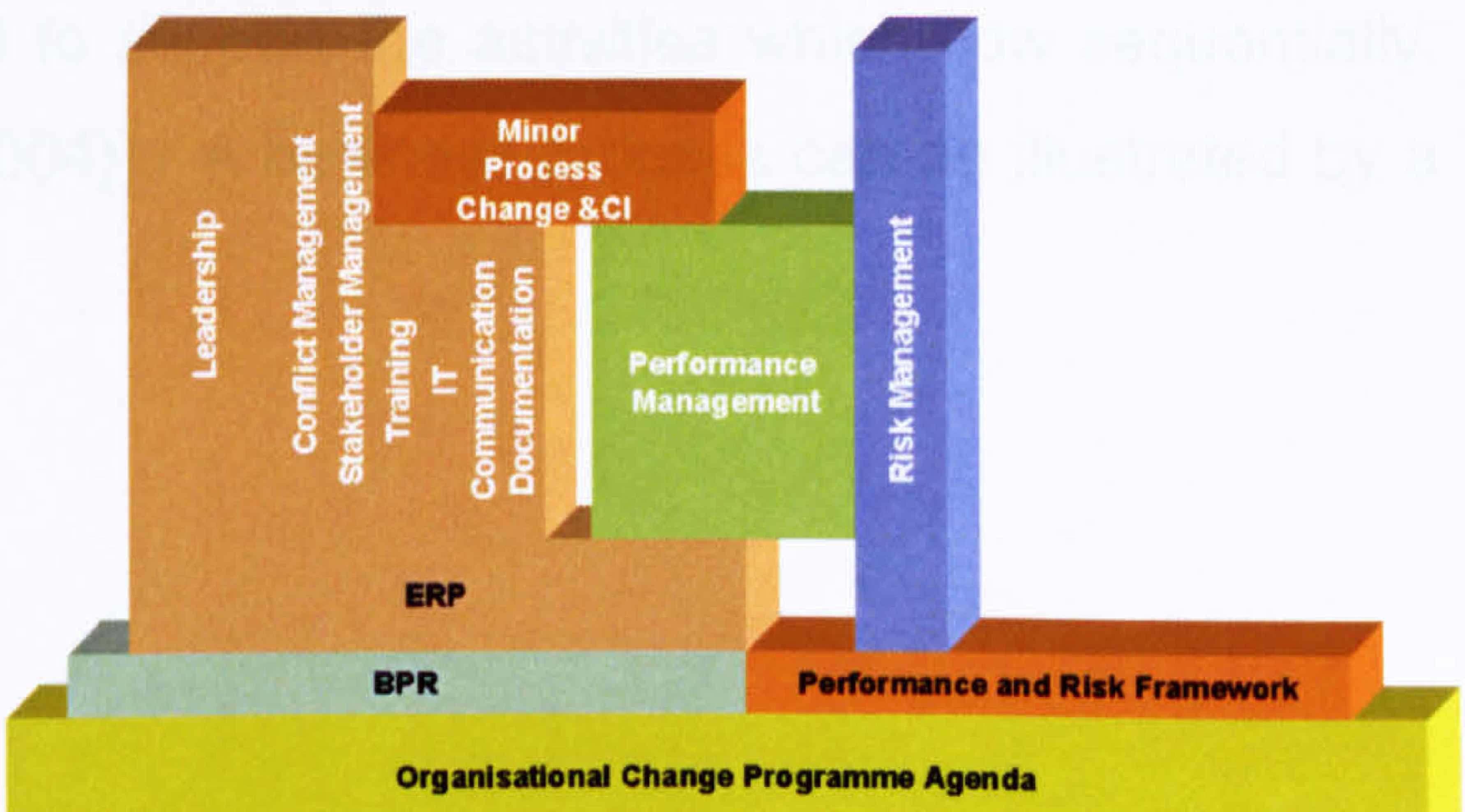
The relationship to IT and Change Management fields is subsequently covered including in particular the areas of leadership and conflict management.



There is a natural connection between ERP implementation and performance management. ERP projects by design are developed to improve business process performance. A number of the case projects focus on the implementation of business performance measurement solutions. Accordingly this area of literature is covered at this stage in the review.



As a balance to the Performance view many organisations now seek to demonstrate a systematic



incorporation of the Risk view at the same time. Operational risk management systems in particular are topical as corporate governance dictates in this area become more stringent. Some of the case projects reflect this trend and hence the literature review is completed by a study of literature relating to their identification and implementation.

2.3 BPR (Business Process Reengineering)

The literature relating to BPR is broad. Section 2.3 deals with a breadth of material starting with an introduction to BPR and working through a range of areas including; a reflection on criticisms, an assessment of BPR as

success or failure and a critical review of BPR in practice. Section 2.3 concludes with a summary reflecting upon the implications of the foregoing discussion for this particular study.

First of all the writer wishes to define an interpretation for business processes upon which all subsequent discussions can be referred.

2.3.1 Business Processes – Defined

A business process within the context of this study is defined as a sequence of activities with a defined start and end devised for the purpose of achieving a set of specific objectives. The purpose of the sequence of activities is to add value to the transformed resources which flow through the process and in so doing achieve the objectives. A business process comprises activities (or tasks), supporting resources (including assets) and the defined relationships between them i.e. how resources are arranged to support the activities which flow sequentially. (Van der Meer, R.B. (2004)). A business process can be illustrated by a layered approach of activities, supported by resources which in turn can be defined technically by an information layer.

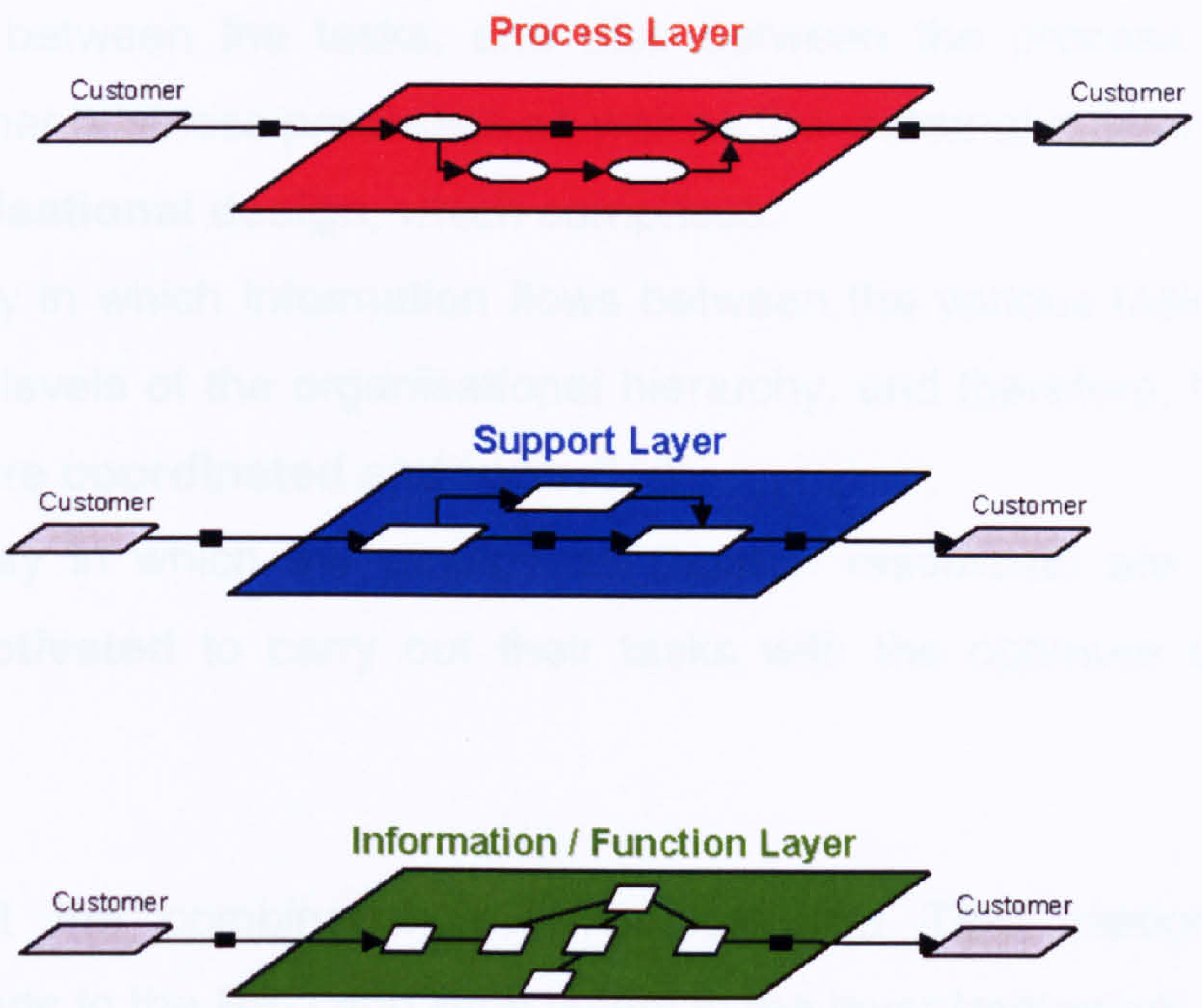


Figure 2.2: Layered Definition of Business Process Variables

The business process or "business value chain" as it may be referred to starts with an event, perhaps the action of a customer placing an order. This action engages the sequence of activities (Red Layer) which employ supporting resources (Blue Layer), perhaps human or technological. The functionality of the supporting resources e.g. an IT interface is defined by the data flow characteristics of the green layer. The green layer may well define the IT data classes being processed at each particular point in the sequence.

Van Der Meer (2004) identifies the key design features of a business process as:

1. **Task design**: the definition of specific tasks; and the allocation of specific 'transforming' resources to these tasks.
2. **Workflow design**: the determination of the flows of '(to-be) transformed' resources between the tasks; and the location of storage points between the tasks, and also between the process as whole and other business processes as well as the external environment.
3. **Organisational design**, which comprises:

- o the way in which information flows between the various tasks and the higher levels of the organisational hierarchy, and therefore, how these tasks are **coordinated** and controlled;
- o The way in which the employees (human resources) are controlled and **motivated** to carry out their tasks with the optimum amount of effort.

Note that the combination of Workflow and Task design roughly corresponds to the RED and Blue layers in the layer framework. Workflow design, as defined details the progressive impact of the activity sequence on the development of "work products" or "process results" and the transformation of resources.

If we adopt a definition of BPs of this kind, then BPR would correspond to radical change in Workflow design AND/OR Task design AND/OR Organisational design. Note that in the original Hammer & Champy (1990) approach, changes in Task and/or Workflow design were emphasised. Whereas the Davenport approach (and much of the practice of BPR) focuses on IT-related changes in Organisational design (that is, how information flows are organised and controlled).
The layered approach can be further developed to articulate comprehensively the specific relationships and schedule of process activities, resources, work products and data class specification as illustrated by the figure below.

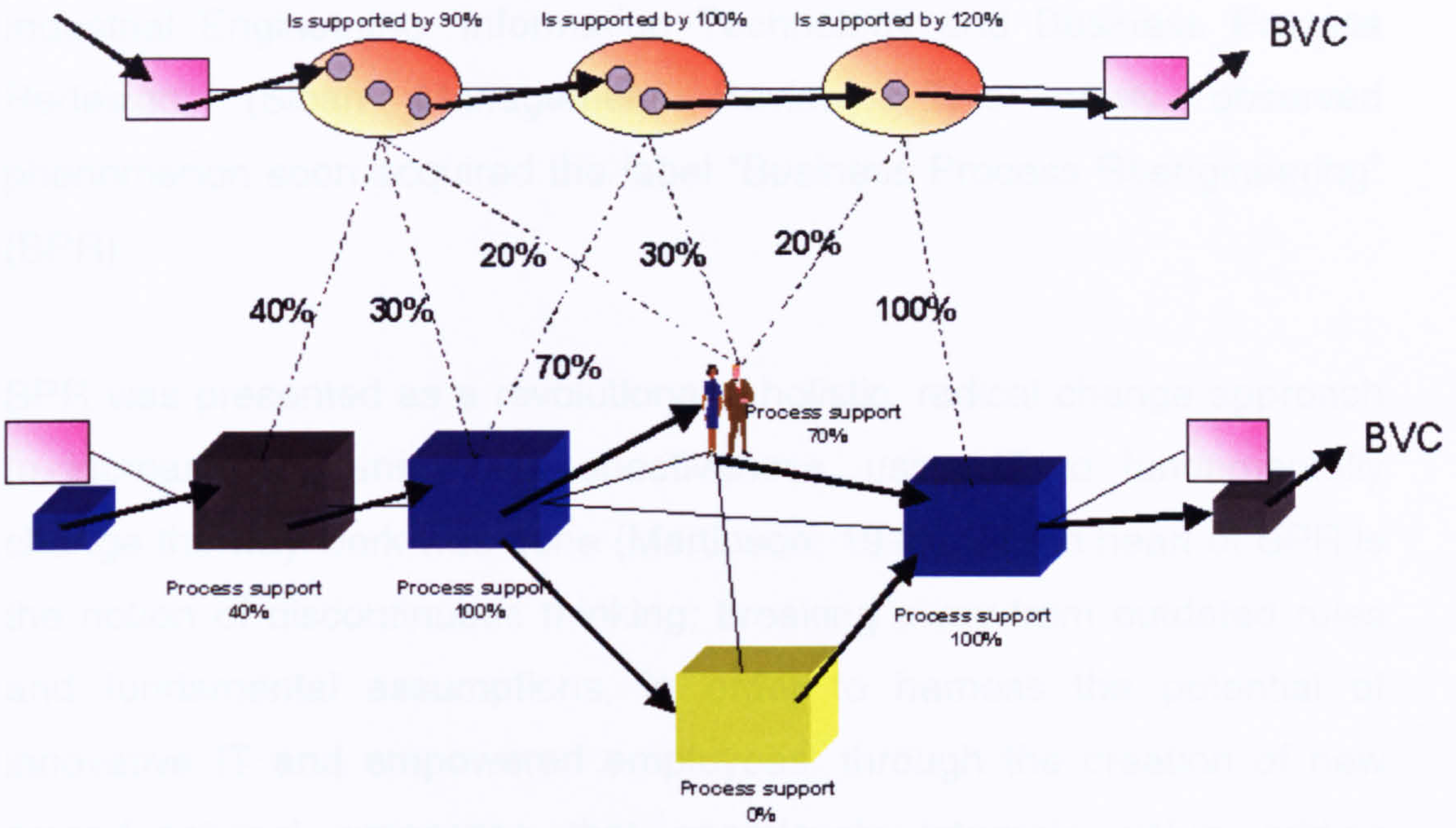


Figure 2.3 Schematic Representation of Relations Between the Sequence of Activities on the RED layer, the Corresponding Extent of Support by Resources on the BLUE layer and the Specification of the Data Exchanges between Resources on the GREEN layer

This definition provides the basis of reference for the consideration of business process discussion throughout this study.

2.3.2 BPR: An Introduction

A new order in management philosophy began to emerge in the mid 1980s. Certain major organisations, responding to the pressures of their environment, took radical action through a combination of inspiration, creative thinking and in-depth analysis of best practice in order to survive and grow (Hammer and Champy, 1993; Patching, 1994b). These accomplishments were noted and investigated by a number of consultancy companies notably CSC Index and Hammer and Co. (Patching, 1994b). The findings were disseminated in the summer of 1990 to an international audience by Hammer in his seminal article "Reengineering Work: Don't Automate, Obliterate" (Harvard Business

Review), and concurrently by Davenport and Short (1990) in "The New Industrial Engineering: Information Technology and Business Process Redesign" (Sloan Management Review). This newly observed phenomenon soon acquired the label "Business Process Reengineering" (BPR).

BPR was presented as a revolutionary, holistic, radical change approach to increasing organisational effectiveness, using IT to fundamentally change the way work was done (Martinson, 1995). At the heart of BPR is the notion of discontinuous thinking; breaking away from outdated rules and fundamental assumptions, in order to harness the potential of innovative IT and empowered employees, through the creation of new cross-functional processes that seamlessly integrate value adding activities designed to meet customer requirements effectively and efficiently (Hammer, 1990; Hammer and Champy, 1993). BPR captured the imagination of managers worldwide: "Large-scale companies with large-scale difficulties were receptive to large-scale change" (Martinsons, 1995) and soon became the buzzword of the 1990s. Technological possibilities, evolving market demands and adverse economic conditions, combined to make BPR a valuable addition to an organisation's business strategy (Martinsons and Hempel, 1998; Braganza and Myers, 1997), subject however to the bandwagon effect (Baskerville and Smithson, 1995). In practice, BPR became an umbrella term for a continuum of activities ranging from minor organisational tune-ups to complete restructuring of organisations (Gurton, 1995; Business Intelligence, 1994), and a convenient label to apply to any project, particularly those with a substantial IT component (Talwar, 1993). In the literature, it has been defined and conceptualised in many different and contradictory ways (Martinsons and Hempel, 1998); various terms abound relating to the management and improvement of processes including, business process redesign (Davenport and Short, 1990; Carr, 1993), core process redesign (Heygate, 1993; Hagel, 1993), reengineering (Hammer, 1990), process innovation (Davenport, 1993a) and business reengineering (Spurr et al, 1993).

The fundamental ideas of BPR as originally proposed represent good practice (Martinsons, 1995). Further, the experiences of many organisations documented in literature provide evidence that it is a vital and necessary tool for established organisations to address a crisis in business (Baskerville and Smithson, 1995), incorporate new models of operation consistent with the environment (Oliver, 1993), and navigate through unprecedented change (Mumford et al, 1996). Nevertheless, the success of BPR has remained largely theoretical with widespread disappointment in practice (Zaidford, 1998; Mandrish and Schaffer, 1996). The literature reflects little on the methods employed during implementation focuses most on the extent of process change attempted and the legacies created by the redesigned processes and supporting resource structure.

The question of why BPR failed to deliver its promise in practice is multi-faceted. (Mumford et al,1996). The fundamental rethinking proposed requires a paradigm shift, demanding radical change in every dimension of organisational life including: the way work is organised, human resource conceptualisation and management, internal and external relationships and interactions, structure, systems and infrastructure (Hammer, 1990). The simplicity and wisdom of its fundamental ideas tend to obscure the true enormity of the BPR challenge. In many cases, unreflective practice paved the path to failure (Martinsons and Revenaugh, 1997). To compound matters, when initially proposed, BPR lacked a strong theoretical foundation to support its ideas (Martinsons, 1995; Mumford et al, 1996). As with most technological change, it was based on observations by consultants of leading organisations using IT in innovative ways, rather than derived from theory (Peppard, 1996). Consequently, little guidance on how to manage this unconventional, radical change programme was provided to early practitioners. Further, given the innovative capabilities of IT and the critical role IT played in observed organisations, I.T. was often portrayed as either a key element or even the most important element in BPR (Baskerville and Smithson, 1995). The pre-eminence of IT is demonstrated by Tinaikar et al's (1995) study of BPR articles: 95.9% focused on technical issues. Although BPR profoundly rearranges the way people think, behave and work (Hammer and Stanton, 1995): employees' roles change from controlled to empowered, managers change from supervisors to coaches, and top managers change from scorekeepers to leaders (Paper, 1998), the human component was either completely ignored (Leonard, 1996; Wellins and Rick, 1995), viewed with a short-term perspective (Child et al, 1994), or at best underestimated (Wellins and Rick, 1995). The neglect of the human dimension is commonly singled out as one of the primary causes for BPR's well publicised 70% failure rate (Cafasso, 1993; Grint, 1994; Scott-Morgan, 1994).

2.3.2.1 BPR Defined

BPR has been defined as the application of techniques that will allow an organisation to reinvent itself. Hammer and Champy continue to stress the importance of engaging in BPR activity for America's largest corporations, "...for if they do not they will be eclipsed by the greater success of those companies that do...". Colin Coulson-Thomas is very quick to make the point that BPR for an organisation represents a step change not a series of incremental improvements and likens the experience of BPR to revolution, not evolution. Davenport agrees with Coulson-Thomas and also highlights the human and technological input factors, describing BPR as "A revolutionary new approach that uses IT and HRM (Human Resources Management) to dramatically improve business performance".

"...We must have the boldness to imagine taking 78 days out of an 80 day turnaround time, cutting 75% of overhead, and eliminating 80% of errors. These are not unrealistic goals. If managers have the vision, reengineering will provide the way...." (Hammer, 1990).

Fundamental to BPR is a change in mindset (Armistead and Rowlands,1996). By doing things differently (radical operational change) and doing different things (new strategies) (Martinsons, 1995), organisations can realise impressive benefits: effective employee utilisation, increased profitability, and most importantly, fundamentally improved, faster and more efficient customer service (Martinez, 1995). Empirical research suggests that some organisations have achieved 150% improvements in on-time delivery (Hammer, 1990) and reduced processing time from 25 days to just half a day (Butler Cox Foundation, 1991). The findings of another study of 15 reengineered organisations revealed that on average recorded improvements of 48% in cost, 60% in defects and 80% in time (Wilder, 1991).

BPR is about seeking dramatic rather than marginal improvements in organisational performance. Success in BPR is achievable if organisations are deliberate, and conscientiously understand what they are undertaking (Belmonte and Murray, 1993). Field research suggests that initiatives focusing on multiple measures of performance that are directly linked to strategic objectives, have the greatest potential to generate dramatic performance improvements (Hall et al, 1993; Grover et al, 1995; Kettinger and Teng, 1998).

The pioneering BPR text by Hammer and Champy (1993) Reengineering the Corporation: A Manifesto for Business Revolution in its very title stresses the radical "clean sheet" nature of BPR and formally offers a comprehensive definition - "The fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed". Hammer and Champy have taken the view here that business processes must be redesigned radically in order to achieve dramatic improvements with apparently little latitude being given to the prospects for varying the extent of change which may be perceived as being required. There is also a presumption that the implementation phase will be successfully facilitated. Coulson-Thomas agrees indirectly drawing a clear distinction between simplification and reengineering. Morris and Brandon take a more conservative position stating that "Reengineering is analysing and ***altering*** the basic work process of the business" rather than obliteration and starting over. Martin Parfett, National Computer Centre goes a little further directly questioning Hammer's presumption and promoting the concept of differing levels of BPR.

Parker adopts a significantly different approach to the "clean sheet", "start again" strategy of Hammer, - "the analysis and redesign of business and manufacturing processes to eliminate that which adds no value", focussing on wasteful process areas. See Dutta pp3. There is clear divergence of view as to what may constitute BPR. Hammer's oft quoted "don't automate, obliterate" article of 1990 which preceded his further collaborative doctrine with Champy leaves nothing to the imagination and does not entertain the prospect of using current practices as a starting point for improvement. If this is the purist view of BPR it would appear that over time there has been a growing willingness to extend the qualification of BPR to encompass continuous improvement and TQM.

Al-Mashari and Zairi (2002) offer a more modern perspective on the BPR area. They redefine BPR as a continuum of change initiatives with varying degrees of radicalness supported by IT means, at the heart of which is to deliver superior performance standards through establishing process sustainability.

2.3.2.2 Motivation for BPR

The various motivations for engaging in BPR by organisations are also discussed within the main texts. Keith suggests that the requirement to reengineer is a function of changing external or internal factors - "The problem appears to be ...developed systems of production that were remarkably successful in their time but are no longer suited to a changed world". The motivation therefore in the cases to which he refers is to revisit outdated processes which, once appropriate no longer meet the needs of the organisation due to the impact of changing internal or external factors. This is an interesting observation as the writer would suggest that organisations would always seek to employ optimised processes supported by technology which is commercially available and affordable and that truly optimised processes in an absolute sense has only been recently enabled by the availability of supporting technologies.

Having a clear motivation to entertain BPR in the first place is an important clarification for any organisation. It signals a realisation that radical action is required and that stakeholders are prepared to suffer the disruption associated with such an undertaking. BPR has come to be associated with frame-breaking change and not merely incremental improvements. Coulson -Thomas cites the early successes of Ford, GTE, Hallmark, Pacific Bell and Xerox were performance improvements (10x) were achieved, as being responsible for this perception of BPR becoming established. The drivers may be varied, some negative and some positive; survival, differentiation, competitive advantage, or a desire for early wins and quick fixes. Other results whether planned as strategic BPR objectives or simply desirable side effects of implementation are headcount and cost reduction.

Parfett explains that process simplification can come from quality driven initiatives such as TQM. This view is supported by the Deloitte & Touche explanation of the development of ERP. D&T explain that from the first model for manufacturing, MRP (Materials Requirements Planning) developed in the 1950's and 60's, the limited capacity of IT technology hindered the expanse of functionality. MRP ran only on mainframe computers, making it difficult to manage and maintain. During the 1970's and 80's and still focused on the manufacturing industry, MRP evolved into MRPII, Manufacturing Resources Planning.

The integration of financial systems enabled MRPII to be used as more of a closed-loop planning tool and subsequently with the development of client server technology this evolved further into ERP and included other essential resources, particularly human and capital. So, we are advised that ERP functionality is a development of TQM and accordingly falls into the incremental continuous improvement within an existing framework sphere rather than the "starting over" dictate of reengineering activity. Consider however an organisation which has chosen not to revisit or actively address process issues for some considerable time but has elected to take advantage of the extent of technological advancement which has been made in this area. This organisation may be viewed as taking radical steps albeit utilising process ideas which have been developed elsewhere over and extended period.

Therefore it can be claimed that BAA's implementation of ERP does constitute BPR albeit that the level of expectations of return on investment may be considerably less than in the classic and early cases often quoted as typifying true BPR successes such as Ford and IBM Credit. BAA has in fact exploited the growth in ERP implementation generally over the last 10 years. Packaged "off the shelf" vendor solutions are now available at a price which drastically reduces the extent of business benefit which must be attained in order to produce an attractive return on capital.

It could now be legitimately argued that BPR is no longer for the severe do or die cases but is appropriate to any organisation which foresees sufficient benefit being gained to justify the associated investment. It is the writer's view that the qualification for what constitutes a reengineered process should be the extent of change made to that process rather than the perceived requirement for it or for that matter the tangible gain or benefit which it delivers. The development which has taken place with respect to the likes of ERP vendor products such as Oracle (now incorporating Peoplesoft and JD Edwards, SAP, and BAAN (now owned by SSA Global) means that reengineered process may now be applied in a more cost effective and routine manner than was the case say 10 or 12 years ago.

From 1990 onwards many papers were written on the subject of BPR, illustrating confusion with regard to what the term represents. IBM identified BPR as "the term often used to describe the collection of techniques which are used to model and develop new business processes". Others have suggested that BPR "reflects a planned alignment between business processes and IT infrastructure as opposed to simple automation of current processes. - Grover et al 1993.

The term "business process re-design" was first coined during a research programme which started in 1984 at MIT and concluded with the publication of "The Corporation of the 1990's" in 1991 (Scott-Morton, 1991) Within this context BPR was classified as the third of five levels of "business restructuring" according to a classification of the emerging challenge of aligning IT and strategy (Venkatraman, 1991). The five levels were:

1) First Level: localised exploitation: concerns the exploitation of IT within a firm's functions. It usually involved the development of applications which improved the efficiency of operations.

2) Second Level: internal integration: represents the logical extension of the first level in the sense that the potential of IT was sought within activities that took place within the firm's processes, with potential impact both on efficiency and on effectiveness.

3) Third Level: business process re-design: consists of reengineering processes in order to exploit IT capabilities fully. This, unlike the first and second levels, reflects an active, planned and conscious effort to align the firm's processes and IT.

4) Fourth Level: business network re-design concerns the use of IT to re-design the nature of exchanges between firms that are part of the business network.

5) Fifth Level: business scope re-definition: this refers to the opportunities IT offers for re-thinking the firm's mission.

BPR was therefore defined precisely with no room for ambiguity - it was a specific strategy for using information technology. The link between IT and strategy was taken up by Hammer in his 1990 article "Reengineering work: don't automate, obliterate", in which he expounds the need for the radical reengineering of processes in order to exploit fully the potential offered by information technology: "It is time to stop paving the cow paths. Instead of embedding outdated processes in silicon and software, we should obliterate them and start over"

This article aroused considerable interest and debate about the idea of radical transformation, even obliteration of an organisation "blocked" by obsolete structures and non-"intelligent" automation. As previously referred to this interest led Hammer, together with Champy, to formulate the "BPR manifesto" in their key work *Reengineering the Corporation*, which sold almost two million copies in 15 different languages. The BPR which Hammer and Champy described has the status of a revolutionary innovation: BPR is "a reversal of the Industrial Revolution". Thus, the initial focusing on the role and strategic impact of information technologies, which served to qualify the idea of reengineering in the context of the problems of IT- induced change, was absorbed and, to some extent, incorporated within a markedly broader vision of BPR. The concept of BPR, as set out in the MIT project, was reconstructed: BPR as previously discussed represented the solution to the many problems that afflict organisations today. BPR is the radical transformation of a firm carried out through reengineering its processes. BPR offers a non-incremental approach to change, revolutionary and very different from the evolutionary perspective of continuous and gradual improvements. Reengineering processes entails changes which affect not only organisational structures but also operating mechanisms, management style, the characteristics of personnel and the culture. The structural elements of the organisation are not perceived as limits and current work methods, criteria and rules are all questioned:

- One characteristic which must be common to reengineered processes is that tasks are enlarged and enriched. There must be a transformation from “tortuous” processes, made up of a set of separate and simple tasks, to more “linear” processes made up of complex tasks. Responsibility and authority must be distributed along horizontal lines which match the flow of activity. Middle management's control and functions lose their meaning in a context where the main aim is to give responsibility to individuals, through designing organisational positions which unite operating and decision-making functions;
- Focusing on processes means that both performance measurement and control systems must be redesigned so as both to promote and to ensure that the systemic objectives are attained and, also, in order to overcome the tendency to seek partial optimisation at the level of the division, function or organisational position.
- Changes in the organisational structure and in control systems require both different attitudes and different competencies. In his radical and provocative way, Hammer stated that traditional firms expect their

employees to obey the rules, while firms that have re-engineered their processes require people who are able to make the rules for themselves. The role of a manager, too, is altered in an organisation where decision-making power has been redistributed downwards: the classical figure of the controller is substituted by that of the trainer. The fundamental ideas about the content and the process of organisational change which underlie BPR, which have been taken up and repeated in many of the books and articles that have developed Hammer and Champy's ideas (e.g. Hunt, 1996; Johansson *et al.*, 1993; Manganelli and Klein, 1994; Morris and Brandon, 1993), can be summed up as follows:

(1) The organisation is a collection of processes which can be reengineered "scientifically" and systematically.

(2) The nature of change is revolutionary and consists of:

• the passage from functional units to process teams;

• a move from simple tasks to multidimensional work;

• changes in power relations towards worker empowerment and change from a "bureaucratic" culture to one based on customer satisfaction;

• changes in managerial behaviour from supervisors to trainers;

(3) Planning for this change is top-down: reengineering must be directed, supported and led by the firm's top managers; furthermore, the pace of change cannot but be discontinuous, given the radical nature of the improvement objectives the firm is seeking to achieve.

2.3.2.3 The Relationship of IT and BPR – Driver, or Enabler?

IT is pivotal to BPR(Hammer, 1990: Hammer and Champy, 1993); it is perceived as a brilliant, energetic, capable ally on the pioneering journey from aspiration to creation (Fritz, 1994). IT's innovative and ubiquitous nature renders it an obvious mechanism for breaking the mould and for supporting new forms of relationships and ways of working (MacArthur et al, 1994; Coulson-Thomas, 1994a). BPR unleashes many of the potential benefits of IT (Teng et al, 1994; Martinsons, 1995) and represents a shift from IT's predominant focus on efficiency enhancements (automation) to that of a fundamental enabler in creating and maintaining flexible networks (Venkatraman, 1994). Accordingly Venkatraman (1991) proposes that the basics of BPR should be reassessed in light of the new capabilities offered by IT.

Bhatt (2001) found data that supports the hypothesis that network infrastructure affects the dimensions of BPR (process improvement thrust, and customer focus), but data integration was not found to be significantly affecting the relationship between network infrastructure and BPR dimensions.

The literature reflects significant debate concerning the relative contributions of IT, between IT as a "driver" and IT as an important support mechanism, "enabler" (Sillince and Harindranath, 1998). Hammer (1990) argues that BPR should be IT driven. Accordingly, his initial definition of reengineering specifically emphasised the centrality of IT: "use the power of modern information technology to radically redesign our business processes...." (Hammer, 1990). A similar emphasis was also noted in Venkatraman's (1991), publication entitled, "IT induced Business Reconfiguration". However, others argue there is a case for framing BPR in a wider "systems view" (Beer, 1975); for contemplating process redesign (Earl, 1992; Rai and Paper, 1994), for considering human issues and corporate culture (Baskerville and Smithson, 1995; Willcocks and Smith, 1995; Stoddard et al, 1996; Zaidfard, 1998), for handling the power dynamics (Willcocks and Smith, 1995) and for taking a broader view of both IT and business activity, and the relationship between them (Davenport and Short, 1990). The IT driven and IT supported (also referred to as enabled or competency driven) approaches differ considerably not only in the resources emphasised but also in their very nature (Booth and Philip, 1996). The IT driven approach is generally formal and adopts a rigid stance, with competition viewed as occurring on one particular front or issue (Booth and Philip, 1996). In contrast, the IT supported approach is represented by the development and use of skills, resources and advantages unique to and individual organisation, thus creating the possibility for a more varied and flexible approach to competition and radical change (Booth and Philip, 1996). The literature fails however to deal with the issues of effectively documenting the relationships between business processes and the corresponding prescribed IT functionality which will support them. Wells (2000) examined the impact of using internet technology for the purposes of assisting in the implementation phases of BPR projects. Wells found that the use of internet technology increased the chances of a successful BPR implementation.

The literature also reflects a reassessment of the emphasis of IT as a driver: in Hammers subsequent publication with Champy (1993), the reference to IT is omitted from the definition of BPR. Similarly, Venkatraman (1994) replaced the word “induced” with “enabled”. This de-emphasis, although subtle, is significant (Armistead and Rowlands, 1996). Subsequent writings led to a clearer message that BPR and IT are not synonymous (Warren, 1993; Klein, 1994). The consensus is that, IT is certainly an important factor in BPR (Baskerville and Smithson, 1995; Coghlan, 1998; Fiedler et al, 1995; Talwar, 1994), but IT alone cannot transform a human organisation (Baskerville and Smithson, 1995; Willcocks and Smith, 1995). Although an awareness of the enormous capabilities of IT should influence process redesign (Child et al, 1994; MacIntosh and Francis, 1997), IT should be viewed as just one critical resource, which must be integrated and used in combination with other resources (Clemons, 1991; Land, 1994). There is also an awareness that BPR does not have to involve IT (Fin Tech, 1992a; MacIntosh and Carrie, 1995). The business argument for BPR and the conceptual redesign of processes should be addressed before considering the potential of IT (Fin Tech 1992a; Child et al, 1994). The central argument for the IT supported approach is that, IT in itself does not give rise to sustained competitive advantage; advantage and value are derived from the process capabilities IT supports (Armistead and Rowlands, 1996), and the manner in which IT is used to do work better and differently (Altinkemer et al, 1998). Consequently, it is important that the IT strategy is significantly aligned with corporate strategy (Fiedler et al, 1995; Both and Philip, 1996; Coghlan, 1998). The primary lesson learned is, rather than drive corporate strategy, IT should be used to support the business argument for BPR. Kettinger and Teng's (1998) survey of consultancy firms' methods confirm, "unlike earlier reengineering efforts, the methods surveyed are becoming less IT driven".

Armistead and Rowlands, (1996) contend that to view IT as only an "enabler of new process architectures is to perhaps miss the potential implications which the process paradigm has for managing information".

Indeed it is the availability of the technological means, previously unavailable which has provided the platform upon which BPR activities are based. The Butler Cox Foundation defines BPR as "...a way of transforming the business, which frees it from the restrictions of the traditional approach by cutting across functional divisions. Information systems ...are the fundamental ingredient of redesigned business processes". Fundamental perhaps, however the relationship between the complexity of business process activity and the corresponding data flows is not addressed in terms of an appropriate method for specification and organisation design.

2.3.2.4 The BPR Revolution

The idea that reengineering offers an opportunity to radically transform the whole firm makes it very attractive and, as research has shown (e.g. Zairi and Sinclair, 1995), many projects have been carried out in the name of BPR. However, it is difficult to explain such success only in terms of the intrinsic qualities of the BPR vision of organisational innovation. BPR clearly seems to be a re-invention and a re-assembly of elements that had already been present, for some time, in management thinking; indeed it is not difficult to demonstrate the historical origins (Grint, 1994) of the "recipes" suggested by the supporters of reengineering. Some of this inheritance can be illustrated regarding points (1) and (2) in the preceding section:

(1) *The organisation is a collection of processes which can be "scientifically" and systematically re-engineered*. The importance of focusing managerial attention on inter-functional processes is a fundamental and distinguishing characteristic of TQM which sees the organisation as "a set of horizontal processes that begin with the supplier and end with the customer" (Spencer, 1994). Moreover, it should be recalled that, during the 1970s, IBM developed the business system planning methodology (IBM, 1975), which was based on the idea that a firm could be considered to be a set of processes which are interlinked with the various functional units.

(2) *The nature of the change is revolutionary and consists of*:

• *The passage from functional units to the process teams.* From a theoretical point of view, the process team represents the application of the classical organisation strategy of reducing uncertainty through the creation of self-contained tasks: "The next method for reducing the amount of information processed is to change from functional task design to one in which each group has all the resources it needs to perform its task" (Galbraith, 1977, p. 51). There is no lack of examples of this type of organisational "experimentation". Referring to the technical core of the firm, Grint (1994) cites the famous semi-autonomous groups in the Volvo plant at Kalmar; however, there are other more recent examples too, such as the Unità Tecnologiche Elementari (Elementary Technological Units) in Fiat (Bonazzi, 1993) or the Unité Elementaire du Travail in Renault or the Grupo de Trabajo in Seat. When studying the organisation of an Advertising Agency, Lawrence and Lorsch (quoted in Mintzberg, 1979, p. 127) offer an example of reengineering carried out in terms of "grouping by market" which is closely related to the process teams concept: "formation of the total creative department completely tears down the walls between art, copy, and television people. The new department will be broken into five groups. Each group will be responsible for art, television, and copy in their accounts".

• *A move from simple tasks to multidimensional work.* This does not suggest that multi-skilling is an innovation provoked by the BPR phenomenon. The benefits of multi-skilling have been promoted for decades; however the philosophy of multi-skilling task completion does inherently complement the ethos of process optimisation.

• *Changes in power relations towards workers' empowerment and a change from a bureaucratic culture to one based on customer satisfaction.* With regard to the problems inherent in behaviour that adheres too closely to formal rules and, also, the need for decentralisation, autonomy and empowerment, it should be remembered that as early as 1926, Mary Parker Follett was already saying that "the tendency today is to decentralise" and was hoping for the spread of the concept of horizontal authority, that is, of authority based on competence and experience and not on any formal position in the hierarchy (quoted in Eccles *et al.*, 1992, p. 5).

• *Changes in managerial behaviour: from supervisors to coaches.* Starting from some reflections by Elton Mayo, a whole school of organisational thought has developed around the theme of relationships between bosses and employees. For some time now (particularly, after McGregor had formulated his Theory-X and Theory-Y) consultants and trainers have been trying to convince managers that employees should not be forced, controlled, directed or threatened, but rather should be stimulated, listened to and involved – the paradigm "control-order-prescription" compared to the alternative paradigm "acknowledge-create-empower" (Evered and Selman, 1989) – even though the assumption that there is one best way in the style of leadership has been in dispute since 1969 when the theory of the life-cycle of leadership was put forward by Hersey and Blanchard (1969).

The clear lack of real novelty in BPR solutions has, however, been a constant feature of the various "guru theories" which have emerged and been developed since the early 1980s and whose popularity is fundamentally linked to some recurring themes such as (Huczynski, 1993):

• A simplistic representation of the world of work, based on the use of "magic words", on the hypothesis that human nature is infinitely malleable and on the assumption that the capabilities of managers/leaders are almost infinite.

• The attempt to satisfy the need of managers to maintain their self-confidence and to ensure that others will respect them by emphasising the importance of leadership in an organisation where there is no conflict of interests or, even more so, where it is considered to be irrational.

• The diffusion of solutions that presume to offer greater control over the work environment, which can be universally applied and which offer rapid and radical pay-offs.

With regard to this particular research project, the relation between BPR and the question of the universal nature of the solutions, the unitary perspective with which the organisation is interpreted and the malleability of human performance are of particular interest.

2.3.2.5 The universal nature of solutions

BPR contains what is really a "traditional" message. Accepting that hyper-competition, globalisation and increased sophistication of markets, technological innovations etc. impose requirements on the way in which firms are organised and managed to the extent that the "Fordist paradigm" of mass production, Taylor's principles regarding work organisation, the era of specialisation (Zeleny *et al.*, 1990), the metaphor of the machine as a model for organisation design are all in crisis, then the crisis of traditional organisational models can be overcome by designing organisational systems that are characterised by the following (Manzolini *et al.*, 1994, p. 12):

• dynamic efficiency, the result of focusing on specific competencies and on the chain of activities;

• lightness, the result of simplification and rationalisation of structures;

• co-operation, that is involvement, participation, group work, relationship orientation;

• autonomy, or rather entrepreneurship, decentralised decision making, self-organisation, individual freedom.

The alternative to the Fordist-Taylorist paradigm regarding the organisation of work is an organisation based on processes, one which is leaner and more flexible, where people are given more responsibility and are involved and autonomous.

2.3.2.6 The unitary perspective

The unitary perspective used to view an organisation assumes that both managers and workers have the same basic interests. From this perspective organisational change is a technical fact and is seen in an apolitical context. Indeed, only from this perspective can the revolutions which ensue, following the adoption of a BPR project, be automatically deemed to be "empowering" and enthusiastically embraced by people simply because they have been put forward by a skilful communicator or leader: empowerment is an inevitable consequence of reengineering processes (Hammer and Champy, 1993, p. 71) only in a world where power and autonomy appear as "entities" which the reengineers can attribute to individuals and not where they are the fruit of complex processes of negotiation and of "strategic games" played out between various actors, that is, between free subjects each one with his/her own rationality (Crozier and Friedberg, 1977). Only the unitary perspective seems able to resolve the contradiction between a reengineering process that reinforces both the status of the hierarchy (Willmott, 1995) (with the charismatic leader who guides and supports the initiative, the steering committee of top managers, the "process owner", the "reengineering czar"), and the result of the process which should be that of producing a less hierarchical organisation, based on empowerment of the personnel. The "personnel" in this context are those identified as being absolutely required in the post transformation environment.

2.3.2.7 The malleability of human performance

The idea that human performance may be pliable suggests that it is possible that it can be easily manipulated by the persuasive power and abilities of any manager. Accordingly, organisational interventions within BPR would seem to be simply an exercise in combining and eliminating activities wherein the people involved are conceived of as being "passive" actors, that is, elements that are, certainly, more intelligent than the cogs in the machine-organisation of Taylorist tradition but are nevertheless willing and able, to be adapted and inserted into the newly engineered processes. The central hypothesis here is that structural changes are by themselves able to produce suitable changes in the behaviour of human resources. These considerations could lead to the conclusion that the BPR revolution must be taken and interpreted for what it is - a product that is theoretically underdeveloped. As Costa and Nacamulli (1996) said, the main characteristic of the gurus who have, for some time now, been part of the business community, is that of creating “recipes for managerial excellence” and of preaching of distant mythical places where the formulae they propose will generate marvellous results. The BPR journey is one that leads towards a world where all organisational dilemmas vanish, where there is no longer a problem of balance between differentiation and integration and where any conflicts of interest have been eliminated.

2.3.2.8 BPR: Process Focus

The notion of a cross-functional, process orientated organisation is at the heart of BPR (Barua and Ravindram, 1996; Butler Cox Foundation, 1991; Hammer and Champy, 1993; Venkatraman, 1991). BPR requires taking a holistic and objective view of the core processes required to accomplish specific business aims, without the constraint of existing processes, structures and practices. It reintegrates tasks into processes, and eliminates those which fail to add value, thus replacing “artificial separations with natural togetherness” (Grey and Mitev, 1995; Martinsons, 1995). Further, it disintegrates traditional value chain boundaries of an organisation (Rockart and Short), 1989). IT is used innovatively to seamlessly integrate value-adding activities (Martinsons and Revenaugh, 1997), and to hook in with suppliers and customers (Sayer, 1998; Grey and Mitev, 1995) through extensive communication networks, accessible databases and enhanced human interface work stations (Coghlan, 1998). An implicit outcome of the core process focus is the outsourcing of non-core activities, for which the organisation neither has a critical strategic need nor special capabilities (Quinn and Hilmer, 1994) to suppliers dedicated to achieving world class standards. The driving forces for the core process focus are contemporary performance measures such as quality, service, cost and time (Martinsons and Revenaugh, 1997). BPR requires radical breakthrough ideas about process redesign. To meet the process challenge, every aspect of the organisation including supporting structures, systems, people and culture requires being rethought (Armistead and Rowlands, 1996).

The reengineered organisation will ideally evolve from a small set of value adding processes, rather than a command-and-control hierarchy (Martinsons, 1995).

2.3.2.9 BPR: Autonomous Teams

Hammer and Champy (1993) propose that autonomous teams are relevant in BPR because the empowered team-based nature is consistent with BPR guidelines such as flattening hierarchies, cross-functional process teams, increased bottom-up decision making and transforming managers into "coaches". Team orientated work structures have also been identified by Grover et al (1995) as an important intervention to initiate BPR change, and by Davenport (1993a) as an organisational and human resources enabler for BPR. Autonomous teams are self-managed, self-directed and empowered work groups (Janz et al, 1997). In reengineered organisations employees become nodes and empowered "knowledge contributors" (Grey and Mitev, 1995). Consequently, genuine empowerment and providing increased information access to lower organisational levels are necessary preconditions for successful BPR (Bowen and Lawler, 1992; Rai and Paper, 1994; Bashein et al, 1994; Martinsons and Hempel, 1998; Sayer 1998).
Equally, continuous team building is vital (Hammer and Stanton, 1996). Hammer and Stanton, (1996) identify 3 characteristics of teams in BPR:

caring an environment of honest and open communication that allows members to support or attack an idea without threatening the original proposer), *daring* (innovative, adventures and questioning) and *sharing* (united by common objectives). McHugh et al (1995) claim that unleashing imagination is the management issue of the 1990s and is particularly relevant for teams in BPR. Consequently, in BPR, employees require a fundamental change in mindset (Armistead and Rowlands, 1996).

Several complexities for practice are identified in BPR literature in relation to autonomous teams and empowerment. Firstly, the human resource implications of autonomous team-based structures require significant deviation from conventional personnel management practice (Kettinger and Teng, 1998; Armistead and Rowlands, 1996). To succeed, organisations must completely redesign the human resource architecture. BPR demands changes not only in job and skill requirements, but also in the way employees think, behave and interact, and the manner in which they are managed and measured (Hammer and Stanton, 1995). Further, managers must become leaders who motivate, coach, listen and inspire employees (Armistead and Rowlands, 1996). The segregation of managers and workers in reengineered organisations becomes blurred in terms of physical location, access to information and hierarchical divide. These changes are in contrast to the traditional roles and values sought of employees and managers (Armistead and Rowlands, 1996).

Further, Grey and Mitev (1995) point out a basic contradiction in BPR: BPR is top management imposed radical change, conceptualised in terms of increased profits which creates job insecurity at all levels of the hierarchy, in particular amongst middle managers and causes intensification of work (increased responsibility and output through diminished headcount), but at the same time, success rests on securing the support and commitment to the work force. The contradiction between the implications of, and requirements for, BPR, further highlights the complexity of the human resource challenge. However, in the early years of BPR, limited attention was drawn to the enormity of the human resource challenge and not surprisingly, little guidance was provided for practitioners. Inevitably in practice, this challenge was largely underestimated or ignored (Willocks and Smith, 1995); the terms autonomous and empowerment lost their essence (Grey and Mitev, 1995; Willmott, 1993a) and BPR acquired the label "the fad that forgot the people" (Davenport, 1995b).

A second complication relates to autonomous teams and the increased information interdependencies among the previously isolated decision units (Applegate, 1994; Davenport et al, 1992; Davenport and Stoddard, 1994). The assumption that IT alone leads to effective information flow is highly questionable (Baruna and Ravindran, 1996). According to Hoffman of Anderson Consulting,

"...while technology can open up the doors to information sharing, it can close them if not properly managed..."
(Schwartz, 1995)

Davenport et al (1992) also show that, IT far from acting as a catalyst for information sharing has had the opposite effect. The problem is compounded by shifts in the information management paradigm towards decentralised computer environments led by advances in distributed database and networking technologies (Diefenbacher, 1995; Barua and Ravindran, 1996).

Although IT can provide the infrastructure, the ultimate information sharing decisions rests on managers and users (Barua and Ravindran, 1996). The task issues for BPR teams include setting and achieving objectives, managing relational issues of how members work together, and managing meetings: solving problems, making decisions, and managing conflict (Coghlan, 1998). IT in itself is not sufficient for effective teamwork (Johansen et al, 1991); understandings of team dynamics, team processes and team management are equally critical (Coghlan, 1998). Barua and Ravindran (1996) and Wohl (1995) advocate the need for alternative facilitating mechanisms that go well beyond the capabilities of technology, for effective team activities such as information sharing and decision making. Although the critical shift to a collaborative, information sharing culture to complement the potential of IT is difficult to achieve (Seybold, 1994), literature provides several examples of organisations which have successfully met this challenge: Cigna Corporation Inc (Jarvenpaa and Stoddard, 1995) Integrated Systems Solution Corporation (Jarvenpaa and Ives, 1995); British Airways and Ford Motor Company (Pascale, 1994); 3M, Intel, Kao Corporation, Coming, Anderson Consulting and IKEA (Bartlett and Ghoshal, 1995). Nevertheless, in reality, most reengineered organisations have not quite grasped the human resource implications of team working and empowerment:

"...in most companies, many managers still believe that once the right technology is in place, the appropriate behaviour will inevitably follow."(Davenport, 1994b).

2.3.2.10 BPR Attendant Risk

BPR holds great promise of real benefits (Martinez, 1995; Stewart, 1993b), but undoubtedly takes an organisation on a risky journey with an unpredictable destination (Martinsons, 1995). The radical change proposed involves increased potential organisational risk, as high-risk approaches to organisation transformation are adopted (Dixon et al, 1994; Grint and Willocks, 1995). Two further interrelated risks to organisational transformation are identified by Clemons et al (1995):

political risk and functionality risk. Tushman and Romanelli (1985) suggest that competence destroying changes (such as BPR) are associated with increased organisational turbulence and conflict as the political subsystems react to one another and attempt to protect the status quo (political risk). Hammer and Stanton (1995) quote Galbraith: "Faced with the alternative between changing one's mind and proving it is unnecessary, just about everybody gets busy on the proof". If resistance to change is sufficient, it can hinder or even prevent appropriate design and implementation of BPR (Clemons et al, 1995). The more an organisation avoids competence destroying change, the smaller the political risk, but the more likely the organisation is to fall short of an optimal new strategy that adequately positions it for the future; thus increasing its lack of functionality (Clemons et al, 1995)

Further, IT-enabled BPR brings in the technology dimension and so adds further risk or failure to any major project (Stringer, 1992; Grint, 1994; Grint and Willocks, 1995). The extent of change generated by BPR precludes the use of parallel IT implementation strategies, and so forces organisations to take an increased risk associated with all-or-nothing IT/IS project implementation (Davenport, 1993a).

Over and above, the focus on process, team working and empowerment demand difficult cultural change (Grint and Willocks, 1995; Wellins and Rick, 1995).

Empowerment in itself can be threatening for managers who have previously withheld information, instructed and controlled, and for employees who were privy to limited information, been instructed and been controlled (Armistead and Rowlands, 1996). Culture can either enable or constrain BPR (Sayer, 1998).

Consequently, Martinsons and Hempel (1998) caution that organisations must weigh the expected rewards against the perceived risks, particularly those associated with the need to challenge and disturb existing norms and attitudes, before embarking on the BPR journey.

2.3.3 BPR: A Reflection on Criticisms

BPR has attracted substantial criticism in relation to its claims, content and approach. In addition, much of the criticisms have also been directed specifically at the original proponents, in particular Hammer (1990), and his co-authors Champy (Hammer and Champy, 1993) and Stanton (Hammer and Stanton, 1996), who have been singled out for the militarist and violent rhetoric espoused (Strassmann, 1994; Grint and Case, 1998) and rhetorical techniques employed as management gurus to engage managers into dramatic action (Jackson, 1996).

Berry et. al. (2001) identify three possible outcomes associated with the undertaking of BPR projects. First a BPR programme may fail in the short or long term either because it is improperly implemented or because there is no effective follow up. Second, a BPR programme may be deemed satisfactory in outcome yet still does not appear to significantly improve bottom line performance. Finally there is the BPR programme that is highly successful and significantly improves the bottom line performance. The writer's claim that in order to achieve the latter of these three outcomes, the scope of the project requires to be comprehensive. Failure to properly define the scope parameters of the undertaking significantly increase the risk of either project failure of the non-delivery of maximum benefit.

This section captures some of the main criticisms directed at the BPR concept, and where appropriate presents counter arguments offered in literature.

2.3.3.1 Rebottled Old Wine

The most common criticism is BPR's claim to radicalism and novelty are exaggerated (Harvey, 1994; Orgland, 1994; Strassmann, 1994; Whiting, 1994; Grint et al, 1995). Critics argue, BPR owes substantial debt to past business concepts and ideas such as Scientific Management (Whiting, 1994), Systems Thinking (Peppard, 1996), Organisation Development (Fiedler et al, 1995), Work Redesign (Fiedler et al, 1995), the Tavistock Institute's Socio-Technical Approach (Mumford, 1994; Buchanan, 1997), and TQM (Altinkemer et al, 1998). In defence, Drucker (Hammer and Champy, 1993) asserts that BPR is new. Earl (1994) contends that it is the integration of three core elements – IT, processes and transformation that distinguishes BPR. There is growing consensus that the novelty and value of BPR lies primarily in the conceptual consolidation of individual elements (Peppard and Rowlands, 1995; Davenport, 1993a; Grint, 1994) and focus on radical change and dramatic improvements (Fielder et al, 1995). Thus, BPR is much greater than the sum of its parts (Watkins et al, 1993; Orgland, 1994); its innovation lies in its denial of the incrementalist orthodoxy that has prevailed for 30 years and its strength in the novelty of its multiple linkages (Grint, 1994).

2.3.3.2 The Depoliticisation of Organisations

A third criticism is that BPR is presented as if office politics "do not, should not or will not exist in the reengineered organisation" (Grint and Willocks, 1995). However, Dalton (1959) and Jay (1967) contend that management is as much a political process as a rational one. Management is a political activity in terms of the politics of competing groups or the politics of personal ascendancy through the corporate ladder (Stewart, 1993). Further, Grint and Willocks (1995) note that IT as artefact in the BPR context has considerable political resonance. Not only is IT a visible sign of BPR being implemented, but IT can also be utilised and interpreted as a symbol of cultural change, investment and progress

(Grint and Willocks, 1995; Scarborough and Corbett, 1992). Yet, IT is seen by some BPR champions as being technological, impartial, rational, and apolitical; Johansson et al (1993) believe that with the ensuing change in management style, organisational politics can be cast aside. However, Grint and Willocks (1995) argue that even in Utopian BPR, it is unlikely that the organisation will emerge "depoliticised", rather as one where managerial life may have changed whilst remaining essentially political. Yet, BPR glosses over the depth of value placed upon power and politics, and do little to address the inevitable struggle that will ensue as a result of flattening structures and power realignment (Sayer, 1998).

2.3.3.3 Employee Emancipation

A fourth common criticism is that BPR takes a prescriptive and dictatorial approach to change; leaders dictate a new set of values, employees internalise these values and dissent is not permitted (Sayer, 1998). The violence invoked through the aggressive and confrontational language (Jones, 1994; Willmott, 1995) in the writings of Hammer and his co-authors (Strassmann, 1994; Grint and Case, 1998). Thus, "ostensibly employee-centered HRM and its incumbent notions are forced to sit precariously alongside an often callous and...., pathologically inhumane language of instrumental violence" (Grint and Case, 1998). The symbolic issues associated with the new partnership proposed between management and employees in BPR, cannot be solved by mechanistic means, they require sensitivity, understanding, negotiation and nurturing, not dictation (Sayer, 1998). Not surprisingly, BPR has in many cases resulted in vacuous meanings being offered by the one dimensional language of empowerment and autonomy (Grey and Mitev, 1995), and tightly circumscribed meaning and imagined possibility of employee emancipation (Willmott, 1993a). Harnessing employee creativity and contribution remains very much an abstraction yet to be realised.

2.3.3.4 Societal Connotations

Grey and Mitev (1995) draw attention to the larger scale societal consequences of BPR. They note that BPR has the potential to significantly increase unemployment in advanced industrial economies. The consequences are human poverty and misery, increased pressure on welfare budgets, increased crime levels and potential for right-wing extremism; all for the benefit of shareholders and those able to afford quality products and services. Given its high social and environmental costs, they question the value of BPR. Driven by capitalism, the emphasis on organisational efficiency and effectiveness for increased profits, returns, and quality, underpins much of management theory and practice – not just BPR. The social implications of capitalism are of grave importance and warrant serious consideration, but are outside the scope of this work.

2.3.3.5 BPR in practise: Early Enthusiasm

BPR began in North America in 1990 (Hammer 1990; Davenport and Short, 1990). So powerful was the message that BPR spread like a tidal wave during the early and mid 1990s (Fahey, 1998), not only throughout Europe (Mumford et al. 1996) but also as far as Africa (Remenyi and Cinnamonk, 1996), Asia (Sia and Neo, 1997; Martinsons and Hempel, 1998) and Australia (Sayer, 1998). Harsh economic conditions, technological possibilities, evolving market demands, inherent operational inefficiencies and threats posed by new entrants who had already adopted radically different modes of operation, combined to create a readiness for the concept and promise of BPR (MacIntosh and Francis, 1997). BPR rapidly gained wide spread acceptance (Patching, 1994a), largely due to the simplicity of its fundamental ideas (Talwar, 1993).

In the UK, a 1992 Cranfield University survey of 108 organisations indicated that 27% of respondents were involved in BPR (Preece and Edwards, 19930.
Subsequent surveys revealed increased levels of interest in the UK: 65% involved in or considering BPR (Skinner and Pearson, 1993); 77% engaged in BPR (Harvey, 1994). A survey of 497 North American organisations and 124 European organisation conducted by the CSC Index Inc in 1993 revealed that 69% and 75% respectively, of respondents had implemented BPR (CSC Index, 1994). In the US, a Deloitte and Touche survey of 534 Chief Information Officers reported that 85% were involved in BPR (Hayley et al, 1993).

The survey evidence points to the increasing importance and pervasiveness of BPR (Fiedler et al, 1995). It provided a new way to navigate through unprecedented change; both successful organisations with ambition, and those in crisis, embraced BPR (Klein, 1994b; Mumford et al, 1996). As the BPR tide rose, organisations began to rewrite their history (Davenport, 1995b); hardly an area of industry or commerce, and very few organisations has gone untouched (Mumford et al, 1996). BPR became the "buzzword of the decade" (Martinsons and Revenaugh, 1997) and "the management world's most fashionable fad" (Financial Times, 22 June 1993, in Grint and Case, 1998).

2.3.3.6 BPR: Misuse and Abuse

The picture of discontinuous change reflected in BPR theory was not underscored in practice (Grint et al, 1995; Altinkemer et al, 1998). The term has been "heavily overused, misused, and simply abused" (Hammer and Stanton, 1996).

BPR became an umbrella term for a continuum of activities ranging from minor organisational tune-ups to complete restructuring of organisations (Gurton, 1995; Business Intelligence, 1994), and a convenient label to apply to any project, particularly those with a substantial IT component (Talwat, 1993). A large number of organisations claiming to be doing BPR were actually involved in "process simplification", which generally leads to marginal, rather than dramatic productivity gains (Patching, 1994b).

Computerworld reported that only one in four businesses involved in BPR was tackling total, large-scale redesign (Cafasso, 1993). Forrester Research polled 50 businesses that claimed to be re-engineering which revealed that only 30% were engaged in "authentic" BPR (Carr and Johansson, 1995). In the UK, based on research in 168 organisations, Grint et al (1995) also concluded that in practice, high risk, radical approaches were not being undertaken.

Belmiro et al, 2002 challenged whether or not BPR practitioners were really addressing business processes. They identified BPR as carrying a stigma of being a major cause of job elimination. Their studies revealed the depth of involvement of BPR practitioners in what advocates claim are the fundamental ingredients of BPR – business processes. Some companies amongst those involved seemed to lose a BPR focus in favour of more urgent restructuring matters. Companies often lack a basic awareness of the business process concept, and that misconceptions about these issues can lead to unrealised expectations at various levels in the organisation.

Although BPR on the scale described by Hammer focusing on what organisations need to achieve in business terms, thereby encouraging the development of new ways of meeting specific business criteria, is more likely to give rise to dramatic successes. (Patching, 1994b); the high degree of uncertainty and risk involved unhinges the nerves of those attempting BPR so that they seek more conservative and instrumental approaches to change (Grint, 1994; Reynolds and Strassmann, 1994). However, the CSC Index survey (1994) highlighted one of the key distinguishing factors between "winners" and "losers" in BPR as being that winners aim high at the outset: organisations which had set ambitious reengineering targets had a significantly better record in attaining or exceeding their targets, whilst those with lower goals tended to miss even those lower goals. The implication is, when the essence of BPR is compromised, the risk of failure is increased.

2.3.4 BPR: Success or Failure?

The success of BPR has remained largely theoretical with widespread disappointment in practice (Zaidifard, 1998; Mandrish and Schafer, 1996). Altinkemer et al (1998) reflect that the only reasonable conclusion that can be drawn from numerous surveys on BPR is: "...the enormous popularity (of, and) significant satisfaction with the concept and significant dissatisfaction with implementation and results...". Although literature is sprinkled with examples of organisations whose foresight led to the emergence and formalisation of the BPR concept (Hammer and Champy, 1993), and notable success of numerous others spanning a variety of industries which had subsequently adopted BPR (Byrne, 1993), time has shown that for the vast majority, BPR has not been the miracle cure hoped for (Mandrish and Schaffer, 1996; Kettinger and Teng, 1998).

Paper and Rodger (2001) embarked on a case study within the Honeywell organisation to explore one organisation's experience with radical change. From interview data they were able to devise a list of ten lessons to help others transform successfully. Two lessons stand out above the rest. First, execution of a carefully developed change plan separates the high performaers from less successful BPR projects. Second, recognition that dealing with change is difficult and complicated is not enough. Top management require to make change management a top priority and communicate the change vision across the organisation.

The question of its failure is critical given the widely used, but unsubstantiated, 70% failure rate, commonly quoted in BPR literature (Caffaso, 1993; Grint, 1994; Scott-Morgan, 1994). There are several complications associated with evaluating BPR's true standing.

Firstly, although numerous surveys have been conducted there has been little consistency in methodology, in terms of length of questionnaire, nature of questions, terminology and focus of study. Not surprisingly, the results have been quire contrasting. An early survey of 350 executives revealed that nearly 85% who had implemented BPR were dissatisfied with the results (Caldwell, 1994). However the CSC Index (1994) survey identifies that 72% of North American respondents and 77% of European respondents reported meeting or exceeding most or all project goals. Further, Altinkemer et al (1998) observe that most surveys were carried out by consultancies as marketing tools, and thus question their objectivity: "Depending on the wording of the questionnaire, very different responses can be obtained". The focus of the questionnaire is centred on post-implementation results and significantly not on implementation techniques as is the case with the bulk of the literature considering the "failure" rate of BPR projects.

Secondly, BPR performance evaluation is inherently subjective, goals and targets set vary between organisations (Sockalingam and Doswell, Doswell, 1996b). The CSC Index (1994 study noted that certain goals were much tougher to achieve than others. Less than half of respondents aiming for increased market share achieved their goal. In contrast, the clear majority of respondents targeting cost reductions reported cuts that on average, nearly met their targets. Nearly three quarters aiming for cycle-time reductions and productivity increases achieved their goals, while approximately two-thirds anticipating revenue increases achieved on average half their targets. Additionally, what is deemed a "run-away" success in one organisation might well be categorised as "poor" in another (Sockalingam and Doswell, 1996b). Once again however the focus of the study is on the post implementation result rather than a review of the impact of the methods for implementation during the course of the project. There is also no reflection in the literature regarding the significance of the type of the organisation and its corresponding expectations or capacity for implementing change. The public sector vs. private sector comparison; commercial organisation vs. not for profit; even multi-national vs. small local enterprise receives no assessment with respect to influence on implementation success. An awareness of the scope, nature, ambition, methodology adopted and performance evaluation criteria is required to truly evaluate BPR performance on a large scale. However, Bashein et al (1994) and Davenport (1995a) note the absence of a systematic and comprehensive study on BPR outcomes. This does not extend to an assessment or even an identification for that matter of implementation phase outcomes.

Thirdly, as noted in Section 2.3.19, the majority of initiatives undertaken in the name of BPR are little more than incremental tinkering (Champy and Nohria, 1996). When the fundamental essence of BPR (ambitious, radical, holistic and fundamental change) is compromised in design and implementation, organisations cannot expect to reap the promised benefits of dramatic improvements. But, how many survey instruments are designed to evaluate the exact nature of respondent's initiatives? Given only a minority of initiatives in practice constitute authentic BPR (25%: Cafasso, 1993; 30%: Carr and Johansson, 1995), it is difficult to isolate BPR's success and failures from those caused by labelling every organisational change as BPR (Baskerville and Smithson, 1995).

Finally, Altinkemer et al (1998), note that BPR is generally not implemented exclusively on its own, but concurrently with other less radical change approaches such as TQM. Lee and Asllani (1997) concur that BPR and TQM coexist concurrently in many organisations. In practice, complications that can arise in integrating different change programmes and overcoming conflict between respective champions. Davenport (1993b) advocates either sequencing continuous change programmes after BPR, or alternatively creating a portfolio of processes and choosing different programmes for different processes. Davenport does therefore refer to an approach for implementation which seeks to accommodate the challenges presented however there is no detailing of a prescriptive framework for effectively documenting the BPR specification.

Lee and Asllani (1997) instead propose a systems approach for combining TQM and BPR, to harness the synergy from evolutionary and revolutionary process change. However, Altinkemer et al (1998) note that whilst some organisations have successfully achieved seamless integration, others do not perceive a need for integration or have achieved adhoc integration. Consequently, they argue that BPR should not be evaluated on its own, but as part of a "strategic change set" (Altinkemer et al, 1998). This adds further complications to the evaluation of BPR outcomes, in particular as the most common change programme to coexist with BPR, TQM, suffers from a similar disheartening success rate. Harari (1993) reports that only about 20% of TQM programmes in the US and Europe have achieved significant or even tangible improvements, whilst Rahul (1993) claims that "surveys show that two-thirds of American managers think that TQM has failed their companies". Over and above, many BPR initiatives involve substantial IT investment, but IT itself has been the subject of disappointed expectations (Renkema, 1998). Organisations estimate that about 20% of their IT spending is wasted, 30% to 40% does not contribute to business performance (Willocks and Lester, 1993) and approximately 70% does not give adequate returns on investment (Hochstrasser and Griffiths, 1990).

2.3.4.1 BPR: An Anatomy of Its Failure

The question of why BPR failed to deliver its promise in practice is multi-faceted (Mumford et al, 1996). This section attempts to draw together the primary causes as reflected in literature and identify areas which have not been addressed.

Practically all of the key literature highlights the complexity of the BPR experience and the significance of challenges facing those that undertake them. Hammer and Champy reflect on the statistic that 70 % of BPR projects are assessed as failing. Dutta and Manzoni identify three identifiable patterns of failure; those which have little impact, those which demonstrate improvement but which fail to sustain this improvement and those projects which although demonstrating performance improvement fail to sustain the pace of the early gains.

Truly successful implementation remains by nature “elusive” (Craig and Yetton, 1996). Reasons offered attribute responsibility primarily but not exclusively to employee’s resistance to change. This conclusion refers to an inappropriate treatment of the “softer issues” in BPR implementation but does not prescribe the implementation solution to be adopted or a recommendation of tools to mitigate the risks of failure. For a better appreciation of the prerequisites for successful implementation calls have been made for more field based case study work (Glasson, 1996, Stanton et.al., 1992, and Terez, 1993). Evidence will be referred to later to this end during a consideration of the relevant case studies.

Al-Mashari and Zairi (2001) identified a series of factors relevant to BPR implementation; factors for success and factors for failure. These are summarised on the opposing page.

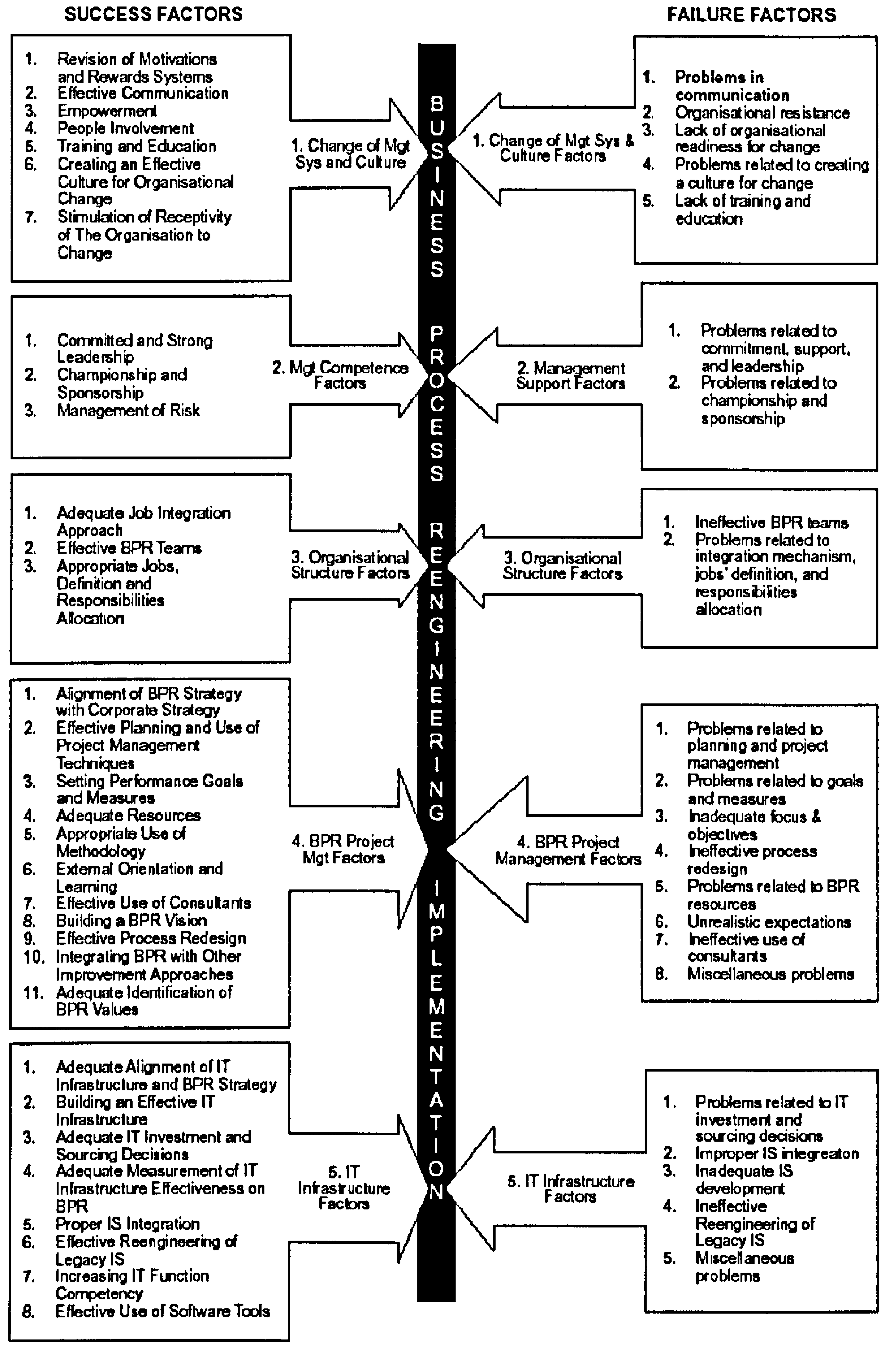


Figure 2.4: Success and Failure Factors for BPR Implementation – Al-Mashari and Zairi

The literature relevant to the implementation of BPR projects does reflect to a great extent agreement on the often problematic nature of BPR implementation. Little detail is provided as to the qualification and prescription of specific implementation methods however. There also exist gaps with respect to the role of supporting tools or concepts such as model development for the purposes of implementation rather than for the modelling of the post business change scenario. Models are referred to within the literature e.g. the importance of linking performance measures of processes directly to Objectives and Strategies within the organisation performance framework, however no advice is offered regarding the practical means by which this may be expected to be successfully accomplished. Comparative studies completed (Ascari et.al.,1995, Bashien et.al.,1994, and Hall et.al., 1993) bear evidence to their effects on BPR implementation. The failure of organisations to comprehensively document reengineered business processes and its contribution towards project failure has been cited. There is little evidence of a prescribed practical solution for managing process detailing and documentation during the transient implementation phase.

2.3.4.2 Absence of Theory

BPR, when first proposed, lacked a strong theoretical foundation to support its ideas (Martinsons, 1995; Mumford et al, 1996). It was based on observations by consultants, of leading organisations using IT in innovative ways, rather than derived from theory (Peppard, 1996). Consequently, little guidance on how to manage this unconventional, radical change programme was provided to early practitioners. Davenport, one of the pioneers, acknowledges: BPR "was a function more of management rhetoric than of management science" (Mumford et al, 1996).

Grint et al (1995) and Martinsons (1995) specifically identify the absence of a robust and comprehensive methodology. Although several commentators have proposed a variety of methodologies for BPR (Davenport and Short, 1990; Butler Cox Foundation, 1991; Kaplan and Murdock, 1991; Morris and Brandon, 1993; Dichter et al, 1993), Braganza and Myers's (1997) review of these methodologies revealed little consensus in relation to the way each step should be carried out and in the key sequence proposed. Their review also indicated "virtually no consensus on which are the key issues that are likely to lead to successful implementation" (Braganza and Myers, 1997). Earl and Khan (1994), Klein (1994a) and Willocks and Smith (1995) also note the lack of integratedness and immaturity on the methodological front. Additionally, some methodologies emphasised IT enabled information flow and processes (using systems analysis techniques), and inadvertently marginalised human, political and social processes and issues which are critical in any change management initiative (Clegg et al, 1994; Grint et al, 1995). Altinkemer et al (1998) argue that many of the early mistakes could have been avoided if the concept was further refined to include concepts from change management and organisational strategy.

2.3.4.3 Bandwagon Effect

The need for security in an uncertain and threatening environment created a tendency for organisations to jump on the BPR bandwagon (Cook, 1996; Mumford et al, 1996). In some cases BPR was spawned by a vague desire to see a general improvement in performance, but often only by a desire to "follow the crowd" (Mandrish and Schaffer, 1996). For top managers under pressure to show financial results, the fastest and easiest way was to reduce headcount. Headcount reduction gave BPR a "strategic rationale and a financial justification" (Davenport, 1995b). When embraced without a genuine strategic context, or a clear and compelling vision, the results can be disastrous (Monteleone, 1995); unreflective practice paved the path to BPR failure (Martinsons and Revenaugh, 1997).

2.3.4.4 Poor Conceptual Understanding

Altinkemer et al (1998) and Bashein et al (1994) attribute BPR's failure in practice to a poor grasp of the fundamental concept of BPR amongst practitioners. In a survey of practitioners and academicians concerning the significant differences between BPR and TQM, practitioners were noted to have identified only *two* major differences (length of project and level of change attempted) in comparison to academics' *ten* (Kreiter, 1996). Academicians also considered the importance of starting from a blank sheet, role of top managers in identifying changes, role of management in project management, pace of results during implementation, employee participation, employee morale, need for empowerment and importance of being able to identify when a certain process or division needs to be changed (Alinkemer et al, 1998). The lack of skilled practitioners with a thorough theoretical and methodological understanding resulted in poor implementations.

Fundamental to BPR is a wide scope of change that cuts across traditional boundaries to link up with customers and suppliers (Hall et al, 1994; Watts, 1993; Cypress, 1994; Champy, 1995) research has shown that BPR conceptualised in terms of growth and expansion rather than in terms of cost cutting and downsizing have a higher probability of success because it generates greater enthusiasm and less resistance (Bashein et al, 1994). Despite prescriptive advice to the contrary, Maull et al (1995) report that a commonly held belief amongst practitioners was that a narrow scope of change minimises risks. Consequently the focus was on short-term results (Martinsons and Revenaugh, 1997): cost cutting (Kettinger and Teng, 1998), headcount reduction (Manganelli and Raspa, 1995), and superficial change (Graham, 1995). When a process view is restrained to only the boundaries of a traditional functional area and has the primary objective of cutting costs, BPR is used to merely simplify and automate narrowly defined internal processes (Kettinger and Teng, 1998). In many cases BPR did not result in bottom-line improvements as the interdependencies between process were not effectively coordinated; dramatic results in individual processes were accompanied by and overall decline in organisational performance (Hall et al, 1994; Geisler, 1996; Drago and Geisler, 1997).

Poor understanding also resulted in the selection of wrong processes for reengineering. According to Keen (1996), administrative processes were often chosen because they better fit IT tools such as GroupWare. But, support process alone cannot deliver the performance improvement promised by BPR. Poor fundamental grasp of the concept led to poor planning and implementation. Hall et al (1994), identify the classic pitfall in BPR as, reengineering the status quo. The ultimate consequence was widespread disillusionment and criticism, with BPR being equated to "little more than downsizing" (Kettinger and Teng, 1998).

2.3.4.5 Paradigm Shifts and Vision Creation

A clear vision and strategy gives BPR momentum and direction (Armistead and Rowlands, 1996). Sillince and Harindranath (1998) note that the vision creation process "changes rapidly backwards and forwards between unfreezing and uncertainty (evidenced by problems, conflicts and questions) and refreezing and certainty (evidenced by solutions, resolutions and answers)". Today's society continues to indoctrinate values "orientated predominantly toward(s) controlling rather than...cultivating...natural curiosity and impulse to learn" (Senge, 1990b). When paradigm shifts and clean slate change are threatening (Clemons et al, 1995; King, 1996); fear and turf protection became the main drivers of behaviour (Leonard, 1996). Clemons et al (1995) further note that during BPR planning there is likely to be considerable disagreement, but the inherent tendency to avoid conflict and preserve existing skills and resources, creates an atmosphere whereby critical differences between existing and proposed strategies are either undetected or "undiscussable". In such environments, "how often are conventional wisdoms or assumptions explicitly identified and then systematically challenged?" (Cherry, 1994). New ideas that defy conventional wisdom are generally unpopular as they challenge the status quo, and threaten vested interest and power bases (Cherry, 1994; Eitorre, 1995). Political manoeuvring results in the tendency to "adopt incremental and limited change, even in the face of radical change in the business environment, and the need for radical change in strategy" (Clemons et al, 1995). Consequently, Champy (1995) attributes BPR's failure in practice to top management's inability to change their behaviour, display leadership and commitment, and act as role models to make their radical change a reality. These reasons for failure centre on an organisation's inability to match strategic objectives with delivery of operational solutions on the one hand and additionally the problematic practice of implementing appropriate solutions via an aligned organisational effort. There is no suggestion however regarding the practical implementation phase activities which may effectively remove these barriers and mitigate the risk of project failure.

2.3.4.6 Consultants

Instead of developing more exploratory, learning based approaches to develop capabilities, the reaction of many organisations to the daunting task of BPR is to transfer responsibility to consultants, without adequate direction and coordination (Willocks and Smith, 1995; Geisler, 1996; Mumford et al, 1996). Consultants did not have a history of managing radical change and so simply repackaged old techniques. It seemed like a win/win situation, top managers could claim they were reengineering whilst consultants could claim they had BPR methodologies and tools. However, BPR proved to be far more challenging; inadequate involvement of top management combined with inappropriate tools and inexperienced consultants led to failure (Mumford et al, 1996).

Although consultants have in part been blamed for the failure of BPR, some commentators argue in favour of the use of external change agents. Cook (1996) proposes that consultants "provide that essential impetus, whether in the form of a change model, their experience, or relentless pushing, without which, only marginal change can occur".

2.3.4.7 The Human Dimension

BPR profoundly rearranges the way people think, behave and work- employees have "the same social security number and inhabit the same bodies, but make no mistake about it: These are new people" (Hammer and Stanton, 1995). New people in new jobs also need to be motivated, managed and measured in new ways (Hammer and Stanton, 1995). Besides, BPR not only has the potential to create job losses as a result of new ways of working and improved efficiency (Grey and Mitev, 1995), but also to create a new world in which people have "careers rather than jobs" (Hammer and Stanton, 1995). Such fundamental change, compounded by the threat to security and stability, are bound to cause emotional trauma and resistance.

Although the success of BPR is dependent on the willingness of employees to embrace change with enthusiasm and implement it with care (Mumford et al, 1996; Martinsons and Hempel, 1998), yet, in practice, the human component was either completely ignored (Leonard, 1996; Wellins and Rick, 1995), viewed with a short-term perspective (Child et al, 1994), or at best underestimated (Wellins and Rick, 1995). The literature does not however prescribe an implementation methodology to mitigate the risks posed by the human dimension. There is no reflection on the relative impact of implementation tools and technical applications for the purposes of achieving more effective implementation results.

BPR failed to penetrate to the deepest levels of the organisation to remove barriers, relieve anxiety, design ways for employees to become "engaged and energised as individual agents of change" (Horney and Koonce, 1995) and nurture behavioural skills required to sustain change (Wellins and Rick, 1995). Instead, massive downsizing and reorganisation were followed by exhortations for surviving employees to do more, quicker and better (Martinsons and Revenaugh, 1997).

Empowering workers and getting managers to change is the anathema to the traditional views of managing and organisations (Sayer, 1998); in many reengineered organisations the culture remained one of command and control, and driven by fear, budgets, schedules and bureaucracy (Paper, 1998). An obsessively mechanistic focus in practice reduced individuals to merely cogs in the organisational machine (Fahey, 1998) and impeded the very organisational innovation that was necessary for long-term organisational health and success (Martinsons and Hempel, 1998). Academics were partly to be blamed: Tinaikar et al's (1995) study of BPR articles revealed that a notable majority of 95.5% focused on technical issues. Indeed the mismanagement and neglect of the human, political and social issues is well documented in literature as one of the major causes of BPR failure (Higginson and Waxler, 1994; Tinaikar et al, 1995; Smith and Willcocks, 1995; Oram and Wellins, 1995; Willcocks, 1996; Zaidifard, 1998).

The simplicity of BPR ideas and wisdom of its fundamental principles, compounded by the challenges of the business environment contributed towards BPR's swift rise to fame. Unfortunately, the plurality of practitioners failed to grasp the magnitude of the BPR challenge. Organisations that just flirted with BPR suffered the pains, without the gains (Cone, 1994); its high failure rate became a well-publicised issue. Due to lack of systematic studies and difficulties in defining and measuring failure, the true failure rate of BPR remains a mystery

(Davenport, 1995a). Regardless, its failure in practice is attributed in part to a lack of theoretical underpinning, but largely due to:

"...its lack of concern for people, its takeover by managers who wished to downsize and its unthinking and unsuccessful implementation" (Mumford et al, 1996)

2.3.5 BPR: A Critical Review

BPR is a complex set of relations between rhetoric, repackaged techniques, new techniques, managerial fashions and the newly perceived capabilities of IT (Coombs and Hull, 1995). The original intent was to increase organisational effectiveness through an IT-enabled, cross-functional process focus, to radically change the way work was performed (Martinsons and Revenaugh, 1997). But its swift rise to fame quickly led to misinterpretation. BPR became an icon for a broad web of ideas and an inadequately defined school of thought; it became difficult to separate authentic BPR form everything else it iconified (Baskerville and Smithson, 1995). Consequently, BPR has borne the brunt of a lot of bad press; it is commonly associated with inflated consultancy bills, and slash and burn corporate downsizing (Martinsons and Revenaugh, 1997).

The aim of this section is to review the theoretical development of the BPR concept and evaluate its potential future viability.

2.3.5.1 BPR: Maturation and Development

The infantile nature of BPR's initial theoretical underpinning is well documented in literature (Mumford et al, 1996; Martinsons and Revenaugh, 1997; MacIntosh and Francis, 1997). The magnitude of its euphoria with the initial success stories led to considerable empirical research with the cooperation of the early implementers. The initial focus was on basic issues central to BPR, such as methodology, critical success factors, barriers, risk factors and intervention strategies for successful implementation (Benjamin and Levinson, 1993; Hall et al, 1993; Business Intelligence, 1994; Caldwell, 1994; Carr and Johansson, 1995; Grint and Willocks, 1995). The widely differing findings and viewpoints, notwithstanding growing consensus, led to the conclusion that BPR was by no means a stable entity; the subject area was yet to mature (MacIntosh and Francis, 1997).

Subsequently, attention turned to other issues that continued to pose challenges in practice, such as strategic planning, IT, processes management and redesign, and what many commentators consider the key challenge in BPR: the people dimension. Since then, the theoretical framework underpinning BPR has developed considerably. Yet, the long-term benefits that were sought, in particular the creativity and dynamism of employees (Martinsons and Revenaugh, 1997), a collaborative, information sharing culture that complements the capabilities of IT (Barua and Ravindran, 1996; Wohl, 1995), and an openness to "constant change and productive chaos" (Fiedler et al, 1995), either never materialised or were limited.

Critical insights gained from previous work, specifically: *1) traditional theories and associated research method are less relevant* (Baskerville and Smithson, 1995); *2) BPR's , multi-disciplinary nature requires input from all management disciplines* (Armistead et al, 1995); *3) the interrelationships and interdependencies between process, IT, people and knowledge are of prime importance* (Martinsons and Revenaugh, 1997); *4) the need for anticipatory and strategic action regarding human resource issues* (Feeny and Willcocks, 1998), converged to influence subsequent research and fashion BPR's theoretical development. BPR's theoretical underpinning has broadened in scope since its seminal literature, and is now drawing on a breadth of thinking for guidelines. In particular, three prime areas of investigation have emerged: *1) Strategic and Holistic Business Process Management-* incorporating both human and IT systems (Guha and Grover, 1997; Kettinger and Teng, 1998; Paper, 1998; Armistead et al, 1999); *2) Information and Knowledge management-* incorporating a socio-technical approach (Barua and Ravindran, 1996; Coghlan, 1998, Fahey, 1998); 3) *Reframing Behaviour* – for nurturing trust and information sharing, and cultivating creativity and innovation (Cherry, 1994; Pascale, 1994; Sockalingam and Doswell, 1996a, 1997, 1999; Zaidifard, 1998). These areas of focus are of critical importance not just for the development and future viability of BPR, but for the success of any change programme in the Information Age. The literature referred to recognises the requirement to align the business process definition with the human, organisational and technical aspects of the delivery however there remains a gap in the area of how this is best done for the diverse range of business change projects and the varying nature of organisations undertaking them.

As the BPR concept matures and evolves, it is moving beyond the machine metaphor, and being undertaken in a more holistic and humane manner (Martinsons and Hempel, 1998). Kettinger and Teng (1998), propose "we are now well underway on our journey to understand BPR", whilst Altinkemer et al, (1998) go further in claiming that BPR has become a truly tested strategy for radical change. They note that its focus on radically changing strategically important cross functional processes and organisational structures capture the essence of numerous change management theories and methodologies (Altinkemer et al, 1998). It is expected that BPR will continue to evolve and develop, possibly incorporating new dimensions currently unexplored, enfolding from a deeper understanding.

2.3.5.2 BPR: Future Viability

Despite continuing research and theoretical development, for the populace, BPR has reached the derision stage of the "*discovery – euphoria – over-extension – derision – abandonment*" cycle (Altinkemer et al, 1998). Consequently, some commentators predict that BPR is a fad that is dying. Eitorre (1995) proposes that for organisations, which lack an understanding of, and commitment to, BPR, and are impatient for results – BPR is a fad. These organisations will move on to the next new concept and drift from one fad to another (Down, Director at Mercer Management Consulting; in Eitorre, 1995).

Other commentators, in particular Strassman (1995) strongly cautioned against radical change in the wake of BPR's swift rise to fame. Its well publicised high failure rate and the subsequent widespread disappointment tends to strengthen the argument against radical change, in favour of incremental and evolutionary change. Strassmann (1994, 1995) argues that evolutionary change delivers better and more permanent change as the relatively slow and deliberate nature of such process efforts are more in tune with the approach people normally use to cope with major change. Yet in retrospect, given the gross operating inefficiencies, organisational redundancies and work disconnections that BPR revealed in so many organisations, the need for BPR could hardly be questioned (Fahey, 1998). Further, Davenport (1995a) views the entire failure-rate issue as a red herring: it derives from an incorrect set of assumption about the business of process change, and distracts us from the true source of value. Accordingly, others argue that BPR is a vital and necessary tool for established organisations: to incorporate new modes of operation consistent with their environment (Oliver, 1993); to address a crisis in business (Baskerville and Smithson, 1995); to navigate through unprecedented change (Mumford et al, 1996); to transform and react to the new levels of performance that is required to get back into a competitive position quickly (MacIntosh and Francis, 1997; Martinsons and Revenaugh, 1997).

"continuous improvement is exactly the right idea if you are already the world leader in everything that you do...it is a terrible idea if you are lagging.... It is probably a disastrous idea if you are far behind" (industrialist quoted in Johansson et al, 1993).

The fact that many initiatives have failed is not at issue; any initiative that is poorly planned and/or executed is likely to fail (Mumford et al, 1996). Although organisations are becoming more cautious about adopting clean slate BPR, the need to re-examine and rejuvenate radical process innovation is as strong as ever (Martinsons and Revenaugh, 1997). If the argument that BPR offers a mechanism to react to the combined pressures of new IT, changing markets and increased competition is accepted, then BPR cannot be viewed as a passing fad, as "these changes in themselves are not fads" (MacIntosh and Francis, 1997). Accordingly, the radical response of BPR is therefore "not disproportionate – the nature of the competitive challenge demands it" (Mumford et al, 1996).

BPR will remain a dominant feature of the managerial landscape for sometime (MacIntosh and Francis, 1997; Kettinger and Teng, 1998); it may be "the only way, in the long run, to achieve rally ambitious goals" (Klein, 1994b). The need to aggressively challenge current ways of doing things, assimilate new technologies with ever increasing ability, and overhaul business processes prevails and will continue to prevail (Martinsons and Revenaugh, 1997; Kettinger and Teng, 1998). Martinsons and Revenaugh (1997) and, Kettinger and Teng (1998) report that many organisations have remained committed despite their initial failures, and are still reengineering. Ford has gone as far as replacing the position of CIO with that of a "Director of Reengineering" to better lead its BPR plans (Altinkemer et al, 1998)

The general consensus appears to be that BPR contains sound management ideas and that these will endure (Eitorre, 1995). BPR's greatest contribution is in provoking top managers "into searching for radically different ways of doing business and considering the unthinkable" (Armistead and Rowlands, 1996). MacIntosh and Francis (1997) propose that BPR may undergo a series of name changes in the foreseeable future, as consultancy firms attempt to differentiate their products and services, but the underlying principles (need for radical performance improvements, new ways of structuring and organising work and harnessing the potential of innovative IT) will remain largely unchanged.

Only time will tell if BPR can buck the downsizing trend, overcome the stigma of its sullied name and regain credibility amongst the populace of practitioners (Martinsons and Revenaugh, 1997). Despite some of its shortcomings, it would be tragic if BPR was either ignored, dismissed as a fad, or abandoned (MacIntosh and Francis, 1997; Martinsons and Revenaugh, 1997; Altinkemer, 1998).

2.3.5.3 The Revolution in Practice

But how have firms really interpreted the idea of reengineering? What emerges most clearly from the BPR literature is that the term BPR has in practice been used very broadly in order to identify classic interventions in organisation structures (such as the creation of inter-functional groups for innovation), design of new information systems, centralisation (or decentralisation) of support functions, and so on. The term BPR has proved to be an attractive banner under which it has been possible to initiate and legitimise even the most disparate projects for organisational change. If the real content of the series of interventions that have been studied and presented in the literature in the guise of BPR interventions is analysed, the conclusions will be the same. BPR it could be said is in fact the implementation of an MRPII system, the centralisation of staff functions, the creation of the figure of project manager, a plan for cultural change and so on. A European research project, COBRA *(Constraints and Opportunities in Business Restructuring – an Analysis)*, examined more than 100 cases of BPR and, in order to justify the enormous variety of projects which ostensibly fell into that category, even stated: "BPR can best be understood as an approach to management which helps people in the organisation to reassess the ways in which it meets its goals, especially by harnessing and applying its capabilities to activities which define, create and deliver value to customers" (Coulson-Thomas, 1995, p. 13). Interestingly, Davenport and Stoddard (1994) had earlier stated: The concept of business process redesign [...] is widely misunderstood and has been equated to downsizing, client/server computing, quality, activity-based costing, and several other management nostrums of the past several years. [...] As a result of this imprecision, many managers are pursuing reengineering because of its positive press, *without fully understanding what reengineering is.* Thus, in Davenport and Stoddard's opinion the concept of reengineering had not been fully understood and was being used in inappropriate ways.

Some authors have suggested that BPR should be interpreted as an "improvement philosophy" (Peppard and Rowland, 1995) which can appear in a variety of operational forms. This has opened the way for classifying different "approaches" to BPR, such as:

(1) Childe *et al.* (1994) identify seven approaches to process improvement activities which are graded according to the scale (incremental-radical) and the scope of the intervention.

(2) Edwards and Peppard (1994) distinguish business process redesign (reengineering one specific process within the firm) from business reengineering (the development of "business architecture"), which later requires in depth re-thinking and re-assessment of the firm's mission and of the processes required in order to fulfill it.

(3) Davidson (1993) highlights the differences between "micro reengineering" and "macro reengineering". Micro reengineering is characterised by focus on a single process and by a purpose which seeks to attain excellence in operating performance in, for example, productivity, speed, quality, accuracy and customer services. The prime

objective of macro reengineering, however, is to redefine the business through development of new competencies and services.

(4) Earl *et al.* (1995) developed a taxonomy of strategies for BPR:

• "engineering strategy", where the aim is to optimise flows of work, coordinate and schedule activities and interdependent tasks;

• "systems strategy", where analysis of the systems is central and the initiative is led by information systems experts;

• "bureaucratic strategy", where the approach is based on formal planning procedures and selection of innovation projects and where the idea that process capabilities are a key element at the level of business units is promoted;

• "ecological strategy", which reflects a "culturally holistic approach" to BPR where the focus is on designing new decision-making processes.

But what can be gleaned from all these attempts to classify BPR? Any project for change is, potentially, a BPR project and the adjective any should be underlined because any set of activities which are directed towards one objective can be re-interpreted as a process. It follows then that any intervention on a set of activities (the strategic planning process, the human resource development process) can be promoted as being BPR.

2.3.6 Summary and Implications for this Study

Clearly BPR is not a simple panacea but a complex and challenging change management philosophy. It demands fundamental change throughout the organisation and its effectiveness is dependent on thoroughly understanding the business and people in it – both employees and customers (Martinsons and Revenaugh, 1997). Certainly radical change involves increased potential organisational risk, albeit balanced by increased potential performance gains. Despite criticism, it is claimed that organisations that truly reengineer can achieve a quantum leap in business performance (Martinez, 1995).

BPR reflects a move to a new frame of reference for change, one based on the concept of radical change focused on holistic processes, rather than fragmentation and specialisation. A large number of organisations, recognising the pressure from increasingly competitive and global markets, were willing to invest a great deal of time and resource in BPR (Preece and Edwards, 1993; Hayley et al, 1993). The motivation was the promise of dramatic improvements in contemporary measures of performance. BPR rapidly gained widespread acceptance. But what started off as a good idea went astray due to a lack of theoretical underpinning, compounded by poor practice. However, over the last decade much has been uncovered and clarified, based on lessons learnt from practice and extensive academic research. This in turn has led to a deeper understanding, and a greater appreciation of BPR as a management philosophy. Although its name has been sullied, and consequently some argue that BPR is nothing more than another management fad on its way out, equally, a substantial number of others maintain that it is a valid and insightful approach to change demanded by the challenges posed by the contemporary business environment. As testimony, literature reveals that many organisations remain committed to BPR and are still reengineering. Consequently, further academic research and theoretical development is not only valid but also necessary.

The BPR philosophy is perhaps one mechanism by which established organisations can get back into the competitive ball game in a short space of time. BPR begins with a compelling and clear vision of the future desired state of the organisation, which is then translated into the identification and redesign of core business processes to link up with customers and suppliers. The central focus on processes requires the introduction of autonomous team orientated work designs and structures. IT is used innovatively to facilitate the radical change proposed. The outcomes are flattened hierarchies, a move away from the traditional command-and-control bureaucratic management style towards a collaborative and participative management style, new ways of working, changed roles and responsibilities for both managers and employees, increased dependence on communication and information sharing and in many cases a smaller workforce. These fundamental changes pose challenges for strategic management, human resource management and information management.

Fundamental to BPR is nurturing and harnessing creativity. Creative thinking is imperative at the strategic level, to challenge and breakaway from outdated wisdom and preconceived paradigms, and create a compelling, yet achievable vision, to strategically position the organisation for the future. Understandably, Kettinger and Teng (1998) argue that "BPR lives or dies in the executive suite". This challenging, complex and dynamic task requires that top managers work in teams, to draw on diverse viewpoints and expertise, and thus benefit from its collective wisdom. But this very feature of teams (diversity), predisposes it to conflict. Additionally, as noted by Clemons et al (1995) and King (1996), clean slate changes and paradigm shifts can be difficult for top managers to avoid conflict. Yet, conflict is what jump-starts the creative process; it is claimed to be the spark that can ignite valuable innovation (Pascale, 1994). Although the need for creativity in BPR planning is widely acknowledged (see Section 2.3.21.6) and the potential for conflict in top management teams can be recognised and managed to harness its creative potential.

Several commentators have identified teams as being relevant and critical in BPR. Teams that are creative can develop new and innovative ideas and thus add value to the organisation both during BPR and after. Hammer and Stanton (1995) go as far as identifying characteristics required of teams in BPR which include, an environment of honest and open communication that allows members to support or attack ideas without threatening the original proposer, being innovative, adventurous and questioning, whilst remaining united by common objectives. An inherent feature of BPR teams is diversity – individuals previously separated by functional divide and task specialisations are brought together in BPR. The potential for differences is obvious, and is the core motivation behind the formation of a multi-disciplined, multi-operational team structure, yet, Hammer and Stanton (1995) do not acknowledge the existence of conflict, nor address how conflict can be managed to harness its productive energy and generate the team characteristics described above. Modern organisations are politically complex, the degree to which may be dependant upon local or national social culture, current leadership, economic conditions etc. The literature does not challenge the frailties of the team determined self-implementation methodology of BPR projects. Team ownership of the development of the reengineered solution and also of the implementation is clearly established within the literature, however there is no reference made to a practical solution to managing the varying level of political conflicts which emerge during the process or the inclusion of elements which are sensitive to their identification.

Over and above, other researchers have identified that IT alone cannot ensure effective teamwork. There is recognition that team dynamics, team processes and team management are equally critical for effective decision making and information sharing. Accordingly, some have called for alternative facilitating mechanisms that go well beyond the capabilities of IT for effective team activities. Managing conflict has also been identified as one of the task issues for teams. Although there is recognition of the existence of conflict and the need to manage it, the question of "how" is not addressed. There is also little reference within the literature regarding the nature of the organisation: scale and focus for example and the impact or lack which these characteristics may have on implementation decisions.

Finally, as noted by Hammer and Stanton (1995), BPR not only profoundly rearranges the way people think, behave and work, but also creates a new environment whereby people have careers instead of jobs. Such profound change is bound to be threatening and can create conflict between organisational objectives and individual objectives, in particular as BPR is commonly associated with massive redundancies. The neglect and mismanagement of the human dimension in BPR is recognised as a major cause of failure in practice.

The risks to project implementation presented by changed roles and responsibilities, compounded by the move away from jobs to careers require new approaches for employee motivation, emancipation and development. The significance of developing and prescribing a framework(s) for the mitigation of such risks during the implementation phase is not adequately addressed in the literature.

This study aims to fill the gap identified in BPR literature concerning the management of change programme implementation and specifically the impacts of the methods employed for documentation and communication.

2.4 TQM – The link between BPR and ERP

TQM can be interpreted as a management philosophy which is characterized by certain principles, practices and techniques (Dean and Bowen, 1994; Grant *et al.*, 1994; Hackman and Wageman, 1995). Whereas, in the case of BPR, the same conclusions cannot be drawn given:

(1) the mix of more or less innovative concepts that are its essence;

(2) the way in which rhetoric prevails over quality and theoretical consistency in proposals put forward by reengineers;

(3) the potpourri of organizational interventions which are, in practice, labelled as being BPR. This provokes the inclusion of Eccles *et al.*'s appeal to try to go beyond the hype so as to avoid constant discussion

of new practices for the new era which "may lead us both to misunderstand the past and to ignore what is really important in organizations" (Eccles *et al.*, 1992, p. 4).

The definition of business process usually adopted (for an overview see Harrison, 1995), that is, of a structured set of activities designed to produce a specific output for a specific customer or market (Davenport, 1993, p. 5) is, essentially, a reformulation of the classic concept of "workflow", which is understood to be the set of sequences of activities which represent the functioning of an organization (Khandwalla, 1977, p. 447). The reason why the term "process" instead of "workflow" tends to be used is generally explained by the fact that the focus of attention ought to be shifted from economic efficiency (usually associated with workflow) to organizational effectiveness and to focus on output and on the customer. However, the substance remains the same.

In order to study the concept in greater depth and to clarify it, some authors have set themselves the problem of identifying fundamental typologies of processes. For example, Earl and Khan (1994) have outlined the following categories: network processes (which go beyond the boundaries of the firm and involve both customers and suppliers), management processes (through which resources are planned, managed and controlled), core processes (vital for the firm's functioning and which directly affect the external customer) and support processes (which have internal customers and which are, effectively, the back-office of the core processes). It could be argued that conceptually reconstructing a firm by means of its management, operating and support processes is the same as the traditional breakdown of the system-organization into its fundamental sub-systems. The only difference lies in the substitution of the concept of system. Here it is useful to recall that the idea of a transformation process is central to the concept of system (Checkland and Scholes, 1990) and is also fundamental when describing the specific class of systems created by humans – the class of human activity systems. Checkland (1981, pp. 109-21) distinguishes human activity systems from other classes of systems with which human beings interact as follows:

• *natural systems*, whose origins lie in the origins of the universe and which are as they are as a result of the forces and processes that characterize the universe itself;

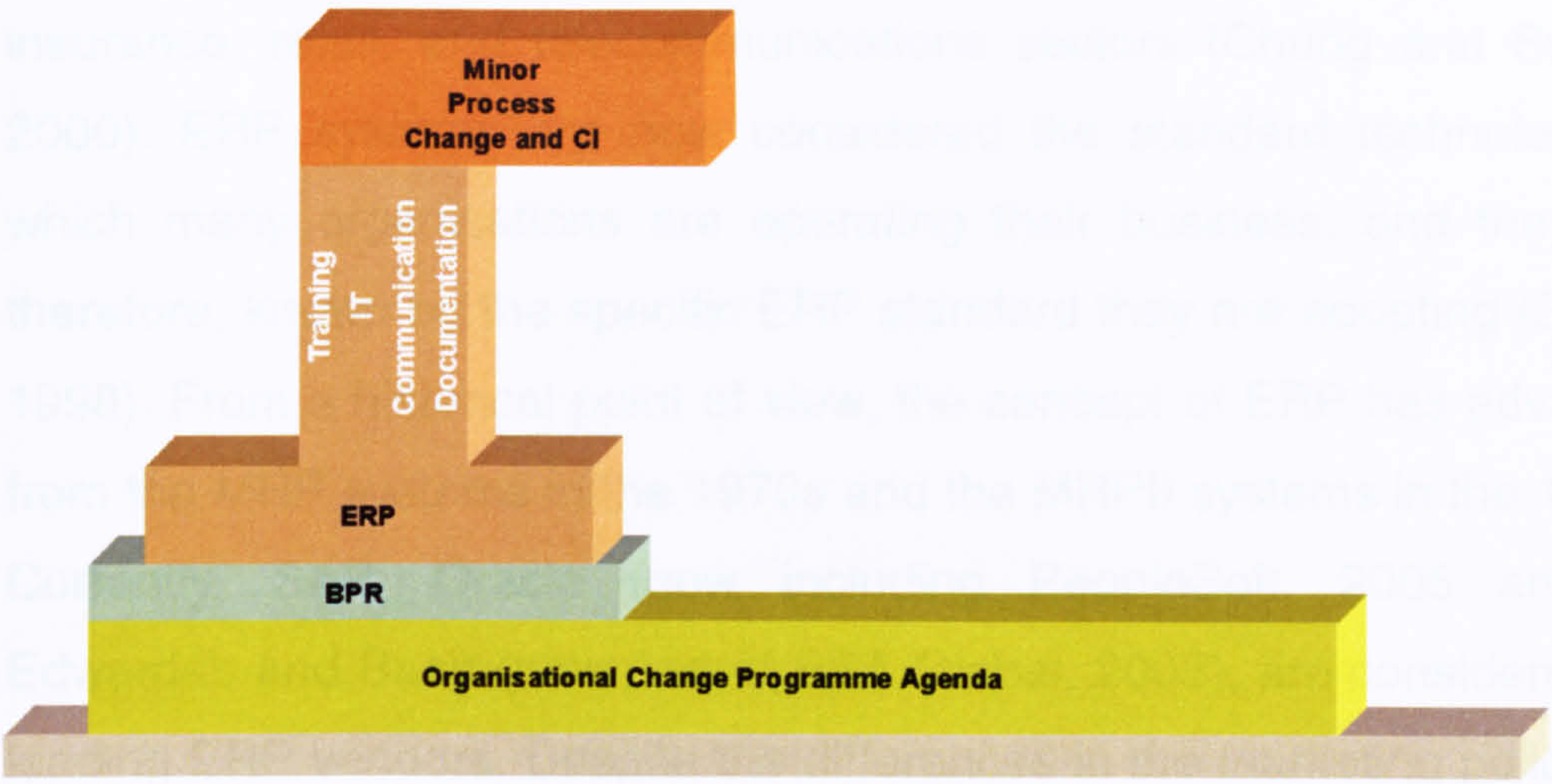
• *designed physical systems* which are physical artefacts designed for a specific end;

• *designed abstract systems* which are the conscious and ordered product of the human mind – these are, in themselves, abstract even if they have been incorporated in some type of physical artefact;

• *human activity systems* which are "less tangible systems than natural and designed systems. Nevertheless, there are clearly observable in the world innumerable sets of human activities more or less consciously ordered in wholes as a result of some underlying purpose or mission" (Checkland, 1981, p. 111).

What then is a business process if not a conceptual model used to represent human activity systems (Maull *et al.*, 1995)? However, in the world of (re)engineers business processes would seem to belong to the class of designed physical systems and not to that of human activity systems given the assumption that a natural isomorphism exists between the sequence of operations predicted in a flowchart and situated action (Suchman, 1983) which constitutes the reality of cooperative work. Bringing the concept of business process back into notion of system and, in particular, the fact of recognizing that it is none other than a conceptual model which seeks to describe a specific class of systems – human activity systems – has important consequences for the problem of analysing processes and for methodologies for intervention. When analysing processes it is important to recognize that such analysis must be based on an ongoing dialogue with the actors involved in the process and on a, necessarily, "multi-perspective" representation (Kawalek, 1991), in so far as both the various dimensions of the activity system (the logical structure of the process, interactions between roles, the objects manipulated within the process) must be included and, in a parallel cultural study, the elements necessary for analysing the "social system" and "political system" must be identified (Checkland and Scholes, 1990, p. 44). As regards the problem of intervention, given that the processes are conceptual models of business sub-systems, it is clear that the problem of redesigning them is, as Leavitt (1965) demonstrated almost 40 years ago, no different from the more general problem of organizational change It seems clear that (re)designing a process poses a socio-technical problem, and it is well-nigh impossible to understand where the real difference lies between BPR and the approach to the analysis and design of production processes developed at the Tavistock Institute, if not in the fact that the (re)engineers seem to have ignored the ethical problems posed by the search for a delicate equilibrium between productivity and satisfaction, between technical and economic questions and social questions.

2.5 ERP (Enterprise resource Planning)



Enterprise resource planning (ERP) systems can be regarded as one of the most innovative developments in information technology (IT) of the 1990s and early 2000s. ERP platforms provide the technological solution to integrated TQM. ERP systems provide the front end information systems and relational database infrastructure to enable the integration of all back office information management systems. With the growing interest of many organisations in moving from functional to process-based IT infrastructure, ERP systems have become one of today's most widespread IT solutions. According to Heald and Kelly (1998), it was projected that, in 2004, organisations' total spending on ERP applications would reach \$72.63 billion. What have motivated organisations to implement ERP systems are their integration and standardisation capabilities, flexible client/ server architecture, and their abilities to drive effective business reengineering and management of core and support processes (ComputerWorld, 1998).

2.5.1 ERP Origins

While ERP systems have traditionally been used by capital-intensive industries, such as manufacturing, construction, aerospace, and defence, they have recently been implemented in the finance, education, insurance, retail, and telecommunications sectors (Chung and Snyder, 2000). ERP systems are now considered the standard technology on which many organisations are operating their business, and they are, therefore, known by the specific ERP standard they are adopting (Sweat, 1998). From a historical point of view, the concept of ERP has advanced from the MRP systems in the 1970s and the MRPII systems in the 1980s. Currently, SAP, Oracle (now including PeopleSoft, 2005 and JD Edwards), and Baan (now part of SSA Global, 2005), are considered the leading ERP vendors. Despite the differences in the marketing policies of their vendors, these packages have similar offerings and shortcomings, and they still adopt the MRPII's model for the manufacturing planning components of their system products (Gray and Landvater, 1989). Overall, ERP systems are beneficial in providing support for all variations of best business practices, in enabling the implementation of these practices with a view towards enhancing productivity, and in empowering the customer to modify the implemented business processes to suit their needs (Rao, 2000).

2.5.2 ERP - an enabler of BPR

Total quality management (TQM) and business process re-engineering (BPR) movements are believed to be among the contributing factors to the heightened attention to the employment of IT in key business functions (Soliman, 1998). Several researchers point to the linkages between ERP and BPR, where the former is considered a driving technology of BPR. ERP systems are seen to be effective in tying the business functional units with the various organisational information systems and their associated databases, which in the end can support the strategic aims of modern organisations (Soliman and Youssef, 1998).

2.5.3 Standardisation of Processes

One of the major challenges in ERP adoption is flexibility assurance. Organisations will always need to integrate newly-acquired business functionalities into its data processing systems with the minimum time possible (Gupta, 2000). The flexibility of ERP systems refers to the extent to which an ERP system may be dynamically reconfigurable to define new business models and processes (Stedman, 1999). However, one of the major drivers of implementing ERP systems is their competence of being designed based on best practices and their ability to standardise business processes and systems (Cooke and Peterson, 1998; Keller and Teufel, 1998; Rick, 1997). Organisations view ERP-enabled standardisation as a vital means to integrate dispersed organisational systems, provide a seamless access to information organisation-wide, and make informed decisions on strategic and daily business matters (Osterle et al., 2000). However, standardisation in ERP context is without shortcomings. Several researchers point to the fact that standardisation might be achieved at the cost of flexibility (Bancroft et al., 1998; Keller and Teufel, 1998; Pawlowski et al., 1999; Scapens, 1998; Vercoulen and Wegberg, 1999), which is another important business requirement for organisations to accommodate emerging changes in business processes and IT systems (Osterle et al., 2000). However, it is at the ERP package selection phase that a balance between standardisation and flexibility should be considered, based on a careful determination of industrial and organisational demands (Keller and Teufel, 1998). Attention to other important factors is also important to ensure a balanced implementation approach.

2.5.4 Getting Fit for Enterprise Resource Planning

The adoption of ERP system in an organisation requires intense efforts, focusing on both technological and business themes of implementation. Critical to the success of these efforts is the adequate organisational preparedness for embarking on ERP. The following list developed by Rao

(2000) describes the major factors that have to be considered in the preparation stage of ERP implementation:

* Infrastructure resources planning -- making sure that adequate infrastructure is planned for in a way that it becomes reliably available well in time (both for the pre-implementation and the post--implementation stages).
* Local area network - ensuring network support for any ERP or other applications.
* Servers - deploying adequate server/ network, even during the training/ modelling phase.
* PCs - introducing new PCs with latest configuration that would be quite adequate for most ERPs.
* Training facilities - establishing adequate training center to work as competency center.
* Human resources planning - focusing on building a teamwork environment where team size spans across the entire organisation.
* Education about ERP - ERP education should be carried out across the organisation about ERP success and failure practices.
* Commitment to release the right people -- ERP is recognised as a difficult but necessary project, and the best people must work full-time on the project.
* Top management's commitment - top management must have a change mindset through learning at all levels.
* Commitment to implement "vanilla version" - ensuring minimal customisation and quick implementation.
* Ability and willingness to consider an ongoing site as a Greenfield site.
* Reasonably well working manual systems - carrying out audit exercise to find the current status and corresponding corrective actions.
* Strategic decision on centralised versus decentralised implementation.

Gupta (2000) finds that the keys to successful implementation of ERP are related to securing top management commitment, forming cross-functional task forces to link project management with business units, carrying out an assessment exercise of hardware requirements, making deployment in a step-by-step introduction rather than all at once, starting early planning on user training and support, streamlining decision making to move implementation quickly, and being patient as ERP implementation takes time. Cissna (1998) finds that factors relating to top management support, assignment of best people to implementation teams, and strong involvement of people from the field are important in reducing the resistance to changes involved in ERP implementation.

2.5.5 Resistance to ERP Change

Gupta (2000) illustrates several common problems associated with ERP implementation. Among these is the resistance to change, when, for example, some employees become reluctant to learn new techniques or accept new responsibilities. Another problem is related to unplanned cost associated with new requirements emerging after the freezing stage. A third problem is poor training of end-users, who, when the system is up and running, do not know how to use it and maintain it continually. This is an interesting point as it relates to the effectiveness of the implementation effort pre Go-Live. The literature does not refer to solutions for mitigation; methods employed to eliminate sources of confusion etc.

Future research in this area may focus on conducting more series of case studies and empirical studies on ERP deployment with regards to **specific** stages of implementation. It would be interesting to investigate, through a critical factor approach, how organisations have gone through the ERP implementation. Other themes of study can be ERP's influence on IT and human resources infrastructure, strategic alignment, knowledge management and organisational learning, outsourcing and application service provider and competitive advantage.

A number of researchers highlight several ERP issues related to the technical side of implementation. One of these issues is related to the increasing use of the Internet, which has raised the biggest challenge facing ERP suppliers. This challenge relates mainly to the need of addressing the global access issues and deployment of information systems that would accommodate to intra-organisation and extra-organisation needs effectively. Moreover, ERP systems need to stimulate these technologies to provide complete (best business practices), usable (highly productive) and adaptable (easily installed and maintained) application systems (Rao, 2000).

Chan (1999) proposes an evaluation framework for the different IT architectural choices for ERP systems based on identifying the requirements of eight components relating to: network infrastructure, server operating systems (OS)/platform, database, data ownership, client OS/workstations, Web enablement, prerequisite user skills, and IT capacity. The framework is proposed as a theoretical framework. The method by which the evaluation can practically be completed remains unclear including the level of granularity and the specification of supporting tools.

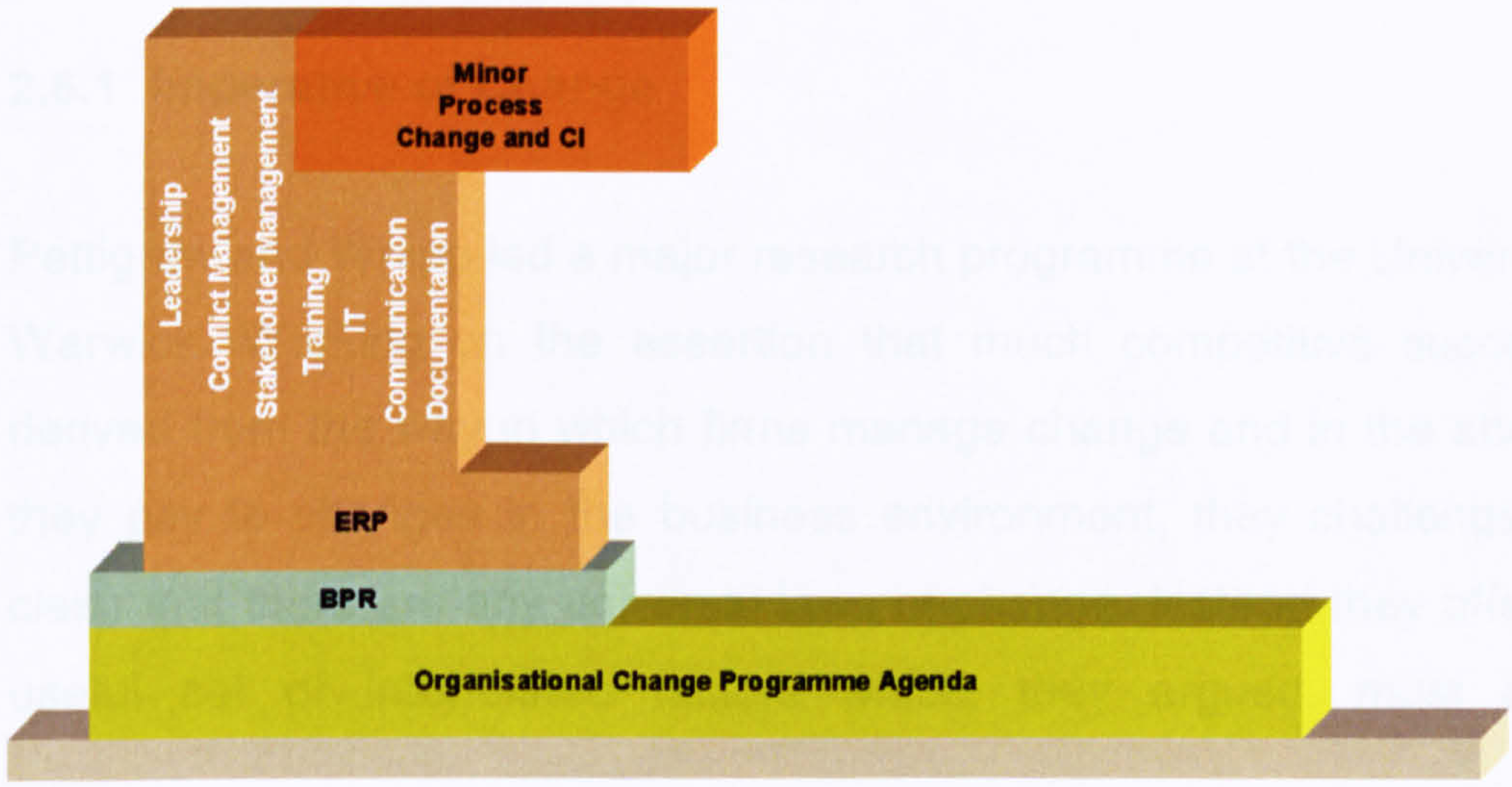
2.5.6 A Case for Modelling the ERP Environment

In addressing the problem that many organisations face when attempting to keep up with the new versions of their already implemented ERP system, Pu Ng and Chan (1999) develop an economic model of ERP life-cycle cost to assist in determining the best time to select an upgrade and the best time to complete its implementation. Umar and Missier (1999) illustrate a knowledge-based decision workbench tool to reduce the time and effort spent on integration and migration tasks in ERP implementation. This workbench helps the user to define appropriate strategies, decide architectural configurations, and select a software package and plan for the implementation project.

2.5.7 The Re-usable Model for Incremental Development

Seethamraju (1999) suggests that future ERP systems will be developed based on components rather than modules and will be designed for incremental migration rather than massive reengineering. He also predicts that the focus will be on managing dynamic rather than static configuration, which, in turn, requires managing multiple sourcing and partnership relationships. Sato et al. (1999) put forward several areas for future research, including integrating ERP and other systems on the Internet, modelling the effects and outcomes of various customising changes in ERP, developing an ERP-oriented approach to process modelling, and the application of ERP systems in home business domains. Gable et al. (1997) suggest researching whether ERP implementation requirements should be specified in the same way as for designing and developing a custom system.

2.6 Managing Change



Change *is* difficult

"There is nothing so difficult to execute, nor more dubious of success, nor dangerous to administer than to introduce a new order of things;
For he who introduces it has all those who profit from the old order as enemies, and he has only lukewarm allies in all those who might profit from the new."

Machiavelli

The implementation of an Enterprise Resource Programme for an organisation such as BAA represents major change in terms of technology, processes and human behaviour. Considerable research has been completed in the field of managing change. Many studies have sought to identify factors responsible for successful change in organisations. Others have challenged the conclusion that there are universal laws of change. In this section a particular focus is made on the literature relating to the emergence and management of resistance and conflict in the face of technological change implementation.

2.6.1 Imperative of Change

Pettigrew and Whipp led a major research programme at the University of Warwick. Working on the assertion that much competitive success is derived from the way in which firms manage change and in the attention they pay to changes in the business environment, they challenged the claim that there are any universal laws of change. Instead they offered a useful set of interrelated factors which, they argued, must all be considered and managed during periods of change. The five central factors are shown below:

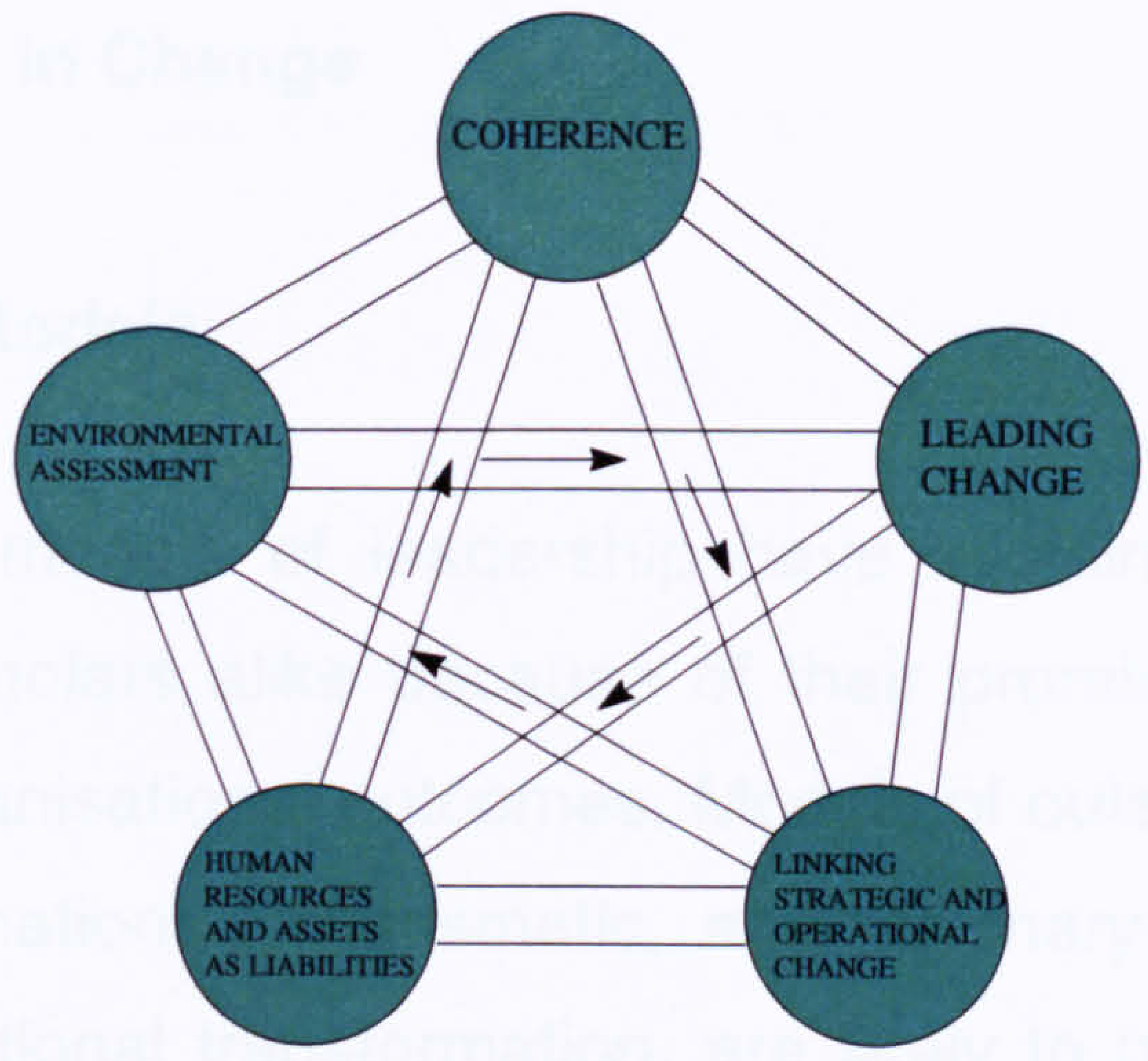


Figure 2.5: Managing Change for Competitive Success: The Five Central Factors – Pettigrew an Whipp

Pettigrew concludes that there is an observable difference in the way that higher performing firms manage change from their lesser performing counterparts and that success is dependent upon an adequate treatment of each of the five factors. Pettigrew further concludes from his research that it is insufficient for companies to regard the creation of knowledge and judgments of their external competitive world as simply a technique exercise. Rather the need is for organisations to become open learning systems. In other words the assessment of the competitive environment does not remain the preserve of a single function or the sole responsibility of one senior manager. Instead strategy creation is seen as emerging from the way a company at various levels, acquires, interprets and processes information about its environment. Porter (1987) emphasises the need to understand the process of creativity which takes place in a company in order to understand the strategies they choose. If successful strategy formulation depends upon a comprehensive and broad understanding of the competitive environment then effective Leaders of change must not only ensure that the environment is understood but also that the organisation can learn and is able to act on such analysis over time.

2.6.2 Leadership in Change

2.6.2.1 Change Models

Change oriented models of leadership have sustained the interest of managers and scholars alike because of their promise of extraordinary individual and organisational outcomes. Models of outstanding leadership such as transformational, charismatic, and visionary leadership, which focus on organisational transformation, are likely to become even more important to organisations because of the breathtaking changes foreseen in the business and political environment. These include workforces with a greater degree of demographic diversity, technological change, and increased international competition which will place new demands on the leaders of tomorrow (House, 1995). The importance of leadership to the change management process is underscored by the fact that change, by definition, requires creating a new system and then institutionalising the new approaches (Kotter, 1995). The literature establishes this concept well however the practical challenges associated with how to complete this activity successfully are not addressed.

The key role leaders play in the change process has been noted by change theorists, yet there is no conclusive research that focuses on this relationship between leadership and change (Almaraz, 1994). Recent theoretical research has attempted to integrate change as a contextual variable influencing transformational leadership (Pawar and Eastman, 1997). Such research focuses on determining when organisations will be more receptive to transformational leadership and the match between receptivity level and the actual transformational leadership process. However, Pawar and Eastman (1997) do not address the issue of the capabilities of transformational leaders required to carry out the pertinent change process.

2.6.2.2 Types of change: incremental, radical, continuous

Tushman and Romanelli's (1985) punctuated equilibrium model of change emphasises the discontinuous nature of change. Long periods of small incremental change are interrupted by brief periods of discontinuous, radical change. These occasional dramatic revolutions or punctuations overcome organisational inertia, which alters the organisation frame. The deep structure, or metacontext, persists and limits change during stages of equilibrium (Roach and Bednar, 1997). The metacontext, which Gersick (1991) refers to as the "design of the playing field and rules of the game" (Gersick, 1991, p. 16) changes during metamorphosis. Advocates of the punctuated equilibrium model (Miller and Friesen, 1980) support the view that organisations are both inertial and adaptable as they evolve through stages of convergence in which only incremental change takes place, and reorientation, during which fundamental change occurs. Nadler and Tushman (1989) discuss the skills managers need to navigate the turmoil of metamorphosis.

Gersick (1994) expanded her earlier work on change in project groups (Gersick, 1988, 1989) to the organisational level of analysis. She concluded that two distinct mechanisms, temporal pacing and event pacing, were used to modulate the speed and course of organisation change. She suggests that temporal pacing is well suited to non-routine situations as it offers the possibility for punctuated change at milestone transition points. It also serves as a check against escalating commitment (Staw, 1981). The key is to match the organisation's pacing to the rate of change in its particular environment. In contrast, event-based pacing is shown to be well suited to fostering incremental change. The focus is on specific events that signal when actions should be initiated or corrections made. Its focus is on keeping on a given track and is motivated by the desire to achieve specific outcomes.

Sastry (1997) also found that time-based pacing, rather than responding to events in the external environment, is beneficial in turbulent environments. In calm environments, managers can use external pacing, where change is triggered by environmental shifts. Sastry (1997), using the punctuated organisational change model, studied why organisations may fail following reorientation. He concluded that organisations need time to reap the benefits of earlier reorganisation - time free of further restructuring. He proposes a trial period during which change is suspended. Sastry (1997) uses the example of a transformational leader, Jack Welch of General Electric, as evidence that this trial period works in real-world organisations. Without an explicit trial period of "soft initiatives," Welch suggests, GE would not have realised the performance gains in the 1990s set in motion by the major changes in GE's businesses and management structure implemented in the 1980s (Sastry, 1997).

An article by Brown and Eisenhardt (1997) argues that, although the punctuated equilibrium model has academic interest, it is not representative of the experience of many firms. They drew theoretical insights about the structure and processes that characterise firms that compete by changing continuously. Their study of multiple-product innovation in the computer industry focuses on an industry characterised by an extraordinary rate of change. Brown and Eisenhardt (1997) argue that organisational survival depends on the firm's ability to engage in rapid and continuous change, in contrast to the rare, episodic phenomenon described by the punctuated equilibrium model.

2.6.2.3 Enacting Change

Ford and Ford (1994) use models of logic to provide different understandings of the change process. They argue that our understanding of organisation change will vary depending on the logic that is deployed. The logic of dialectics emphasises conflict or struggle as the basis for change. The conflict between the forces for and against change is two opposing actions that "work at each other" until one dominates and the resulting outcome is a synthesis that is distinct but contains elements of the forces for and against change. This model assumes that dissatisfaction with the status quo is necessary before change can occur. In contrast, the logic of trialectics proposes that change occurs through attraction. Changes do not result from "pushes" or pressure to move away from the present situation, but instead result from being "pulled" toward or attracted to different possibilities. In addition to developing these models of logic, change researchers have sought to describe other aspects involved in implementing successful change. Brown and Eisenhardt (1997) identified three key characteristics of successful managers in continuously changing organisations. Successful managers provided clear responsibility and priorities with extensive communication and freedom to improvise. The limited structure provides framework without which there are too many degrees of freedom. Yet, these fundamentals provide a firm backdrop against which individual members can be creative.

A second characteristic of successful managers is exploration of the future by experimenting with a wide variety of low-cost probes. They argue that low-cost probes enhance learning about future possibilities. This learning opportunity is critical because, while the future is uncertain, it is possible to learn something about it. Learning makes it easier for leaders to anticipate and even create the future (Brown and Eisenhardt, 1997).

Third, effective managers link current projects to the future with predictable (time-paced rather than event-paced) intervals and choreographed transition procedures. Familiar routines are created by predictable timing and by transition procedures that link the present to the future. They use the term "links in time" to portray explicit organisational practices that address past, present and future time horizons and the transitions between them. Rhythms are created that enable people to pace their work and synchronise their energies with one another, creating a focussed flow of attention that enhances performance. Consistent with Gersick (1991), performance is further enhanced if the rhythm created by the transition process becomes synchronised with the rhythm of change in the environment.

2.6.2.4 Theory of Change Oriented Leadership

Given the change literature's emphasis on the importance of the leader in enacting change, attention is turned to a discussion of a leadership theory that is intimately tied to change: transformational leadership.

One of the most comprehensive leadership theories of organisational transformation is the theory of transformational and transactional leadership. Burns (1978) developed the initial ideas on transformational and transactional leadership in the political context and Bass (1985) further refined them and introduced them into the organisational context. Transactional leadership develops from the exchange process between leaders and subordinates wherein the leader provides rewards in exchange for subordinates' performance. Transformational leadership behaviours go beyond transactional leadership and motivate followers to identify with the leader's vision and sacrifice their self-interest for that of the group or the organisation (Bass, 1985). Bass' (1985) conceptualisation of transformational leadership includes charisma or idealised influence (followers trust in and emotionally identify with the leader), intellectual stimulation (followers are encouraged to question their own ways of doing things) and individualised consideration (assignments are delegated to followers providing them with learning opportunities). Descriptive research by Tichy and Devanna (1990) shows that transformational leaders engage in a process, which includes a sequence of phases: recognising the need for change, creating a new vision, and then institutionalising the change.

A review of the literature on change oriented or outstanding leadership, which also includes charismatic and visionary leadership (House, 1995), indicates that the "majority of the approaches share the common perspective that by articulating a vision, fostering the acceptance of group goals, and providing individualised support, effective leaders change the basic values, beliefs, and attitudes of followers so that they are willing to perform beyond the minimum levels specified by the organisation" (Podsakoff *et al.,* 1996, p. 260).

Most of the research on the transformational and charismatic leadership paradigms has focussed on its relationship to individual and organisational outcomes such as job satisfaction and performance (both subjective and objective). These studies have been conducted in a variety of settings using lab, field, and archival data and a variety of samples that include private and public sector organisations, students, military leaders, presidents, and different national cultures (Bass, 1990; House *et al.,* 1991; Pillai *et al.,* in press; Podsakoff *et al.,* 1996). According to Bass (1995), charisma, attention to individualised development, and the ability and willingness to provide intellectual stimulation are critical to leaders whose firms are faced with demands for renewal and change.

2.6.2.5 Links Between Transformational Leadership and Change Management

As the above descriptions of the change and transformational leadership literatures illustrate, there is a need to integrate these perspectives to gain a greater understanding of how to effectively enact change. The leadership and change literatures both show that certain transformational leadership qualities are uniquely appropriate for leading certain types of change. For example, research in the leadership area supports the idea that transformational leadership is better for non-routine situations (Bass, 1985). Furthermore, Pawar and Eastman (1997) propose that organisations will be more receptive to transformational leadership when adaptation (as opposed to efficiency) is the goal. In the change literature, the definition of event-based pacing (i.e. centered on maintaining status quo and achieving specific goals (Gersick, 1994)) may be a better fit with transactional leadership that emphasises clarification of goals, follower compliance through incentives and rewards, with a focus on task completion (Bass, 1995). In order to further this argument, there follows a description of areas of convergence between the two literatures that point to the appropriateness of transformational leadership in enacting change.

Transformational, charismatic, and visionary leaders can successfully change the status quo in their organisations by displaying the appropriate behaviours at the appropriate stage in the transformation process. When there is a realisation that the old ways no longer work, such leaders may undertake the task of developing an appealing vision of the future. A good vision provides both a strategic and a motivational focus. It provides a clear statement of the purpose of the organisation and is, at the same time, a source of inspiration and commitment. Consistent with Ford and Ford (1994), this view holds that leaders create change by providing a vision that is attractive to followers rather than creating dissatisfaction with the status quo. There is yet no consensus in the transformational leadership literature concerning whether a crisis or dissatisfaction with the status quo is necessary for transformational leadership to occur. Leaders may not need to create dissatisfaction with the present, but instead may provide a vision of a possible future that is attractive and engaging (Kouzes and Posner, 1988).

Even without dissatisfaction or crisis, both literatures suggest it is critical that the leader be a change champion who can assemble and motivate a group with enough power to lead the change effort (Kotter, 1995). The change literature also suggests that a leader's ability to effectively use inducements and interventions that get people to change is only effective if people have an active need that the change can satisfy.

As described in the change literature, in order to pull or attract followers to different change possibilities (see Ford and Ford, 1994), the leader must craft an appealing vision that takes into consideration the underlying needs and values of the key stakeholders. Once this vision is developed, the leader must implement the change. This could be done through intellectual stimulation, whereby the leader sets challenging goals for the employees and motivates them to rethink old ways of doing business. The leader frames the change by appealing to follower needs for achievement and growth that induces the follower to find the change attractive. The process may also be facilitated if the leader shows individualised consideration where he or she provides support, coaching and guidance to the employees. Coaching and guiding behaviours are particularly important in large-scale transformation and in the development of self-managing work teams. A number of modern corporations are adopting the team approach to structuring the organisation, which in itself is a major transformation of the culture.

A transformational leader would be a good facilitator of this process by promoting the creation of a culture that encourages team-decision making and behavioural control (Manz and Sims, 1990). Individualised consideration would also play a role in neutralising the inevitable resistance that is bound to accompany the transformational process. The leader must work at getting large numbers of people in the organisation involved in the transformation process. Otherwise, it is likely to be greeted with cynicism and strong resistance from key constituents, which is a sure-fire route to failure. This idea that the transformational leader creates a culture which embraces change is consistent with the change literature research by Brown and Eisenhardt (1997). Their description of the three key characteristics of successful managers in continuously changing organisations proposes that the successful leader creates a system (i.e. an organisational culture) that is neither too rigid (over-controlling the change process) nor too chaotic (so the change process falls apart).

Throughout the transformation process, the leader should set high performance expectations and reward behaviours that are directed toward fulfillment of the vision. It is also important that the leader models the behaviours that are required to institutionalise the change and sets the standards for the rest of the organisation to emulate. As Kotter (1995) argues, change sticks only when it becomes "the way we do things around here", when it seeps into the bloodstream of the corporate body. This is similar to Sastry's (1997) conclusion that enforcing a waiting period after every significant change in strategic orientation is necessary to maintain competence. The transformational leader can play a critical role in communicating how the changes have led to better performance and ensuring that the next generation of top management personifies the new approach (Kotter, 1995).

2.6.3 Resistance to Change

This section of the literature review presents resistance to change as represented in the literature. The theoretical background on resistance to change provides a context for the study. Four aspects of resistance to change are presented: (1) resistance to change vs. resistance to beneficial change, (2) the framework of resistance to change, (3) the timing of technology adoption, and (4) the timing of resistance. Each of these aspects is elaborated below.

2.6.3.1 Resistance to Change vs. Resistance to Beneficial Change

Whether one sees change as a battle that must be won, or as a learning and growing experience, depends only on one's perspective. Typically, resistance to change is viewed as the enemy, which must be overcome at all costs in order for the change to be successful (Waddell and Sohal 1998). Tied in closely with the view that resistance is bad is the notion that innovation is always good. Rogers refers to this as the "pro-innovation bias" – the implication that an innovation should be accepted without modification and quickly adopted by all members of a social system (Rogers 1995). "This viewpoint regards any resistance as a merely irrational reaction to innovation, or simply something to be ignored as unimportant". (Herling 1996, p. 49). Waddell and Sohal (1998) examined the literature and discovered that this negative view of resistance has no theoretical support. In fact, a number of researchers have found that much value can be gained from resistance to change (Albanese 1973; Bauer 1995; Kanter 1985; Klein 1973; Mabin et al. 2001; O'Connor 1993b; Rogers 1995; Zander 1973).

Resistance to change has many advantageous aspects. For example, it is "better than apathy, it avoids group-think, it provides alternative ideas for consideration, and a wider set of people involved in the evaluation of alternatives may overcome the problem that many managers have of failing to consider or evaluate properly enough alternatives" (Mabin et al. 2001, p. 170). Bauer (1995) says that resistance is an alarm signal warning that more evaluation of the possible consequences of the innovation adoption needs to take place. However, if resistance is used randomly or irresponsibly, it can have a significant negative effect on views about the change (O'Connor 1993b). There are times when resistance to change may be good. As Maurer (1996a) points out, "resistance keeps us from attaching ourselves to every boneheaded idea that comes along." Resistance to change is a protective function. It provides a way to say 'no' to a change and allows individuals to express different views about it. It encourages a search for alternative solutions and promotes additional thought regarding the proposed change (Waddell and Sohal 1998). Resistance "plays a crucial role in drawing attention to aspects of change that may be inappropriate, not well thought through, or perhaps plain wrong" (Waddell and Sohal 1998, p. 545).

Sometimes the proposed change is not the right one for the social system and is a threat for all involved; resistance is quite appropriate here (Kanter 1985). It is also important to "learn how to differentiate between change which may pose real threat and change which is resisted simply because it is new and feels alien" (Klein 1973, p. 433). Even Freud emphasised that "resistances were a necessary and even desirable aspect of the therapy. He pointed out that without resistance patients might be overwhelmed by the interventions of the therapist, with the result that inadequate defences against catastrophe would be overthrown before more adaptive ways of coping with inner and outer stimuli had been erected" (Klein 1973, p. 425). "It is important, therefore, for those seeking change to consider the costs of ignoring, overriding, or dismissing as irrational those who emerge as their opponents. To ignore that which is being defended may mean that the planned change itself is flawed; it may also mean that the process of change becomes transformed into a conflict situation in which forces struggle in opposition and in which energies become increasingly devoted to winning rather than to solving the original problem" (Klein 1973, p. 432).

Similar to the thought that resistance to change should be viewed as a good thing, lack of resistance to change can often be bad. Apathy should be regarded as an indication that there is a problem with the existing system or the method of introduction of the proposed change (Albanese 1973). Resistance contributes energy to the change process and the lack of resistance can indicate that implementing the change will be very difficult (Waddell and Sohal 1998).

Finally, it is possible for change to be a bad thing for the system. "It is a fallacy to consider change itself to be inherently good. Change can only be evaluated by its consequences, and these cannot be known with any certainty until the change effort has been completed and sufficient time has passed" (Hultman 1979, p. 53). It is impossible to predict whether the change will achieve the goals it sets out to and what unintended consequences may occur in the process.

2.6.3.2 Framework of Resistance to Change

People have a natural resistance to change, but not everyone reacts in a similar fashion, or for similar reasons. The amount of the resistance also varies between people. These discrepancies may be the root of the technology implementation problem. Certain trends can be identified however. It can be suggested that there is a relationship between the level of resistance and the maturity of the implementation.

The figure below attempts to plot this relationship identifying a diminishing appetite for the implementation as uncertainty emerges followed by a gradual acceptance (generally) of the change and a realisation through time of exactly what the change constitutes and the extent of impact that this will have on them.

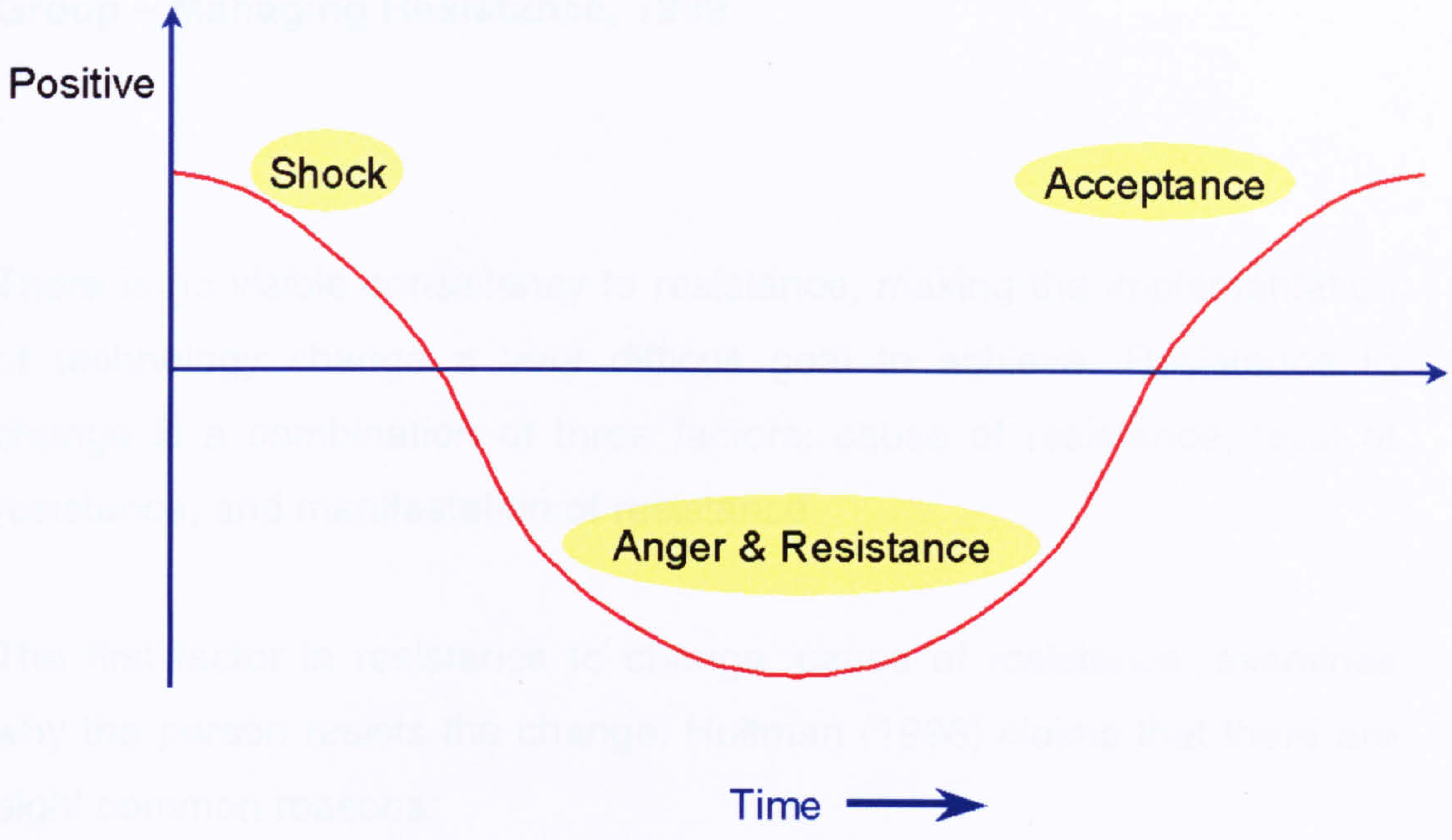


Figure 2.6: Behavioural Reaction to Change, Deloitte Consulting Group - Managing Resistance, 1999.

Viewed another way this transition of emotion can be explained as a function of the information flow available to the individual during the implementation process.

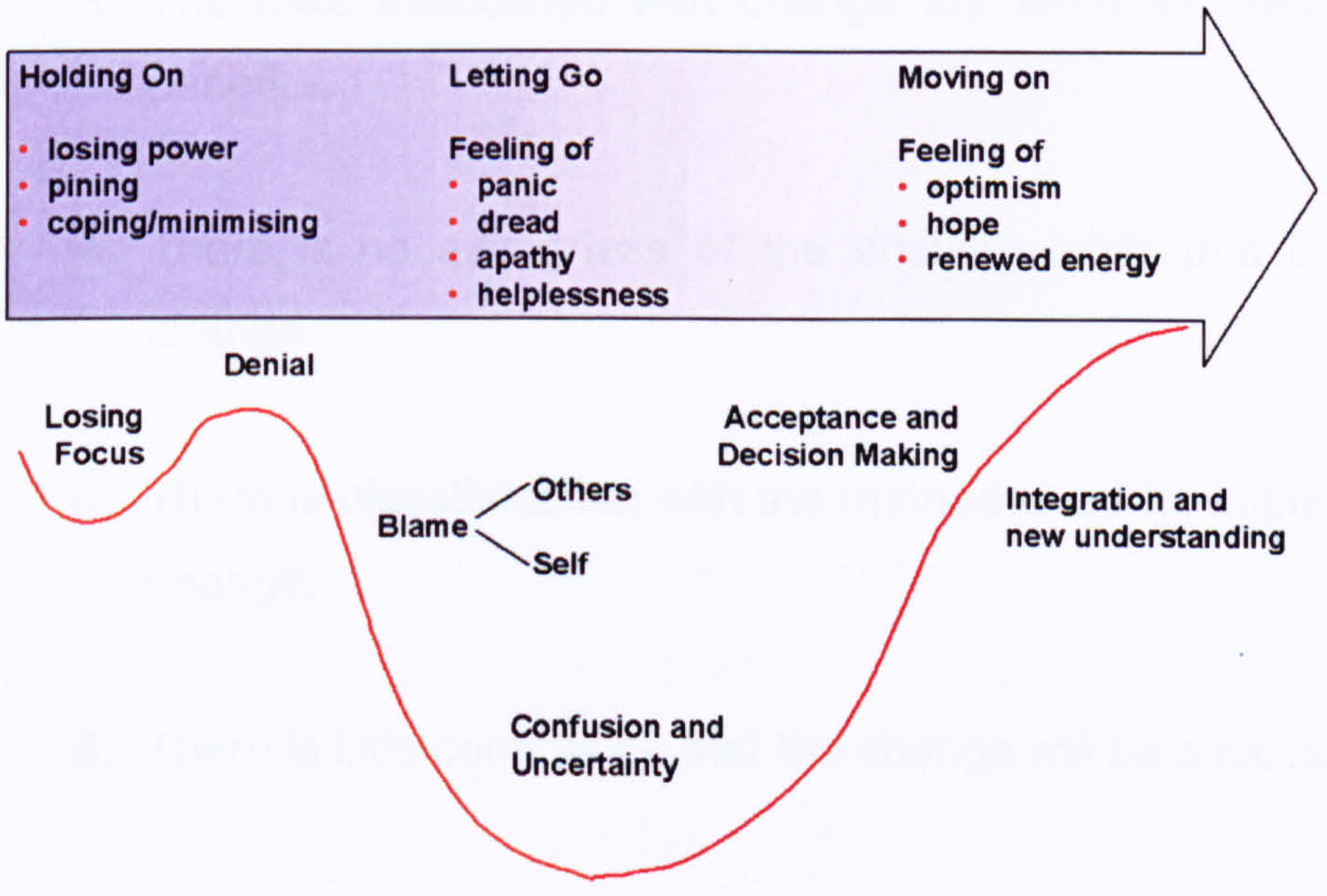


Figure 2.7: Behavioural Reaction to Change, Deloitte Consulting Group – Managing Resistance, 1999

There is no visible consistency to resistance, making the implementation of technology change a very difficult goal to achieve. Resistance to change is a combination of three factors: cause of resistance, level of resistance, and manifestation of resistance.

The first factor in resistance to change, cause of resistance, examines why the person resists the change. Hultman (1998) claims that there are eight common reasons:

1. There is no incentive for change to occur. The person is content with the status quo.

2. The change is a threat to the status quo, is viewed as harmful, and protection is sought.

3. The risks associated with change are seen as greater than the benefits.

4. There is no awareness of the ensuing crisis that is driving the change.

5. There is dissatisfaction with the method used for implementing the change.

6. There is little confidence that the change will be successful.

7. The change is not consistent with values and beliefs.

8. There are doubts about the honesty and openness of the leadership responsible for the change.

The second factor in resistance to change, level of resistance, measures how much resistance is present. It is measured subjectively and exists along a continuum from no resistance to extreme resistance (Hultman 1998).

The third factor in resistance to change, manifestation of resistance, identifies what behaviours the person exhibits to show their resistance. These manifestations reveal themselves in different ways. They may be active displays of resistance, such as sabotaging or arguing, or they can be passive, like procrastinating or withholding information (Hultman 1998), sometimes referred to as malicious compliance. They can also be exhibited in physiological ways like an increase in blood pressure, or in a specific emotion like fear (Maurer 2001).

2.6.3.3 Timing of Technology Adoption

In order to discuss resistance to change properly, it is helpful to understand how individuals distribute themselves throughout the change diffusion process timeline. This is a timeline illustrating when individuals or groups adopt a change, with respect to the establishment of the change.

The most widely recognised model of the diffusion process is Rogers' diffusion of innovations model (Rogers 1995). Diffusion is defined as "the process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers 1995, p. 5) and innovation is defined as "an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers

1995, p. 11). Rogers' model categorises potential adopters of an innovation into five groups, based on innovativeness – the time at which an individual adopts an innovation.

Innovators represent the first 2.5% of adopters within a social system. Innovators are adventurous individuals willing to accept the uncertainty surrounding an innovation at the time of adoption. Early adopters represent the next 13.5% of individuals in the system adopting the innovation. Early adopters are respected individuals within the system that are generally thought to be role models for the group. This category includes a majority of the opinion leaders in the social system (those whose opinions are sought by others considering the adoption). The next 34% of adopters are known as the early majority and are sometimes described as the deliberators. Their decision process is longer than for the innovators or the early adopters, but they are very willing to adopt new innovations once they have learned enough to make the decision. The late majority (34%), on the other hand, adopt because of economic necessity or pressure from others within their social system. They are generally very sceptical about the innovation and wait until most of the uncertainty surrounding the innovation has vanished. The last group to adopt an innovation are the laggards, which represent the final 16% of adopters in the system. They tend to be suspicious of all aspects surrounding the change and are usually individuals at the perimeter of the system. They need to know that all of the uncertainty has been removed from the innovation. It is important for them to know that the innovation will definitely succeed.

2.6.3.4 Timing of Resistance

It is important to note that some resistance is initial resistance to using a technology and some resistance is delayed. Initial resistance means that an individual does not wish to begin using the technology. This was discussed in the above section regarding the timing of adoption. Delayed resistance means that an individual begins using the technology and decides at a later time to stop or significantly reduce their usage.

2.6.4 The Attitude-Behaviour Connection

To continue the discussion of change management theory as it relates to this research, this section presents the connection between attitudes and behaviour as represented in the literature. Many of the variables related to resistance to the implementation of innovation are attitudinal in nature. The connection between attitudes and behaviours provides the link needed to contextualise an individual's attitudes explain their intentions, and in future research to anticipate their behaviour. The predominant theories relating attitudes and behaviour are the Theory of Reasoned Action and the Theory of Planned Behaviour. A discussion of each theory is presented below.

2.6.5 The Theory of Reasoned Action

It is commonly believed that a person's attitudes about an object or action are related to the person's behaviour with respect to that object or action. Fishbein and Ajzen proposed the theory of reasoned action to support this idea. In this theory, beliefs about an object lead to an attitude about it. Attitudes are defined as "the predisposition to evaluate or respond to a person, a situation, or an event in a certain way, favourable or unfavourable" (Melvin 1979). Attitudes are likely to be unconscious, whereas beliefs, though defined essentially the same, are more likely to be verbalised. Beliefs are gathered from many sources, including past experiences and what other people may have said about the object. The attitudes that are formed, in turn, lead to behavioural intentions regarding the object, such as intentions to use it or avoid it. These behavioural intentions affect the actual behaviour of the person toward the object. The behaviour of the person has a feedback loop returning to the person's beliefs. If there is a positive behavioural experience, the belief is reinforced in a positive manner, and if there is a negative behavioural experience, the belief is reinforced in a negative manner.

Much empirical research has been performed using this theory with mixed success. A review of available research (109 investigations) was completed by Ajzen & Fishbein (1977). Their findings indicate that when the attitudes measured closely corresponded with the behaviours measured, the correlation between the attitude and the behaviour was quite high. In other words, when the researchers were careful to use appropriate measures of attitude, a person's attitude could be used to predict their behavioural intentions, and consequently, their behaviour. Based on this theory, an appropriate measure of attitude must correspond to the behaviour of interest in terms of Target, Action, Context, and Time to be completely accurate for prediction purposes. Target and Action were found to be the most important elements that needed to be matched between the attitude and the behaviour of interest (Ajzen and Fishbein 1977). For example, if the behaviour of interest is the use of computers, the Target is computers and the Action is use of computers. The attitude measurements need to be related to computers (Target), and more specifically, to the use of computers (Action) for prediction of behaviour to be possible. A general attitude cannot be used to predict a specific behaviour (Ajzen 1991).

2.6.5.1 The Theory of Planned Behaviour

The theory of planned behaviour is an extension of the theory of reasoned action (Ajzen 1991). The attitude and belief portions were first combined, and then split into three new categories: attitude toward the behaviour, subjective norm, and perceived behavioural control.

The attitude toward the behaviour now consists specifically of attitudes formed based on the individual's evaluation of the behaviour. Subjective norms are those attitudes resulting from perceived social pressure from family, friends, and other important persons. Perceived behavioural control reflects the person's confidence that they are capable of performing the behaviour of interest. All of these aspects influence the person's intention to perform the behaviour. This intention, combined with the person's perceived ability to perform the behaviour, will result in the behaviour of interest. Based on a review of 16 research studies using the theory of planned behaviour, it was concluded that "Attitudes toward the behaviour, subjective norms with respect to the behaviour, and perceived control over the behaviour are usually found to predict behavioural intentions with a high degree of accuracy. In turn, these intentions in combination with perceived behavioural control can account for a considerable proportion of variance in behaviour". (Ajzen 1991, p. 206).

As stated in the previous section, a general attitude cannot be used to predict a specific behaviour, but it can be used to predict aggregate behaviours (Ajzen 1991). A single example of behaviour is influenced by many factors unique to the occasion being observed. By aggregating behaviours over different situations and times, the influences tend to cancel each other out, making the general attitudes much better predictors of behaviour. "Many studies performed in recent years have demonstrated the workings of the aggregation principle by showing that general attitudes and personality traits do in fact predict behavioural aggregates much better than they predict specific behaviours" (Ajzen 1991, p. 180-1). The Theory of Planned Behaviour is used as a theoretical basis for this research. This theory is an extension of the Theory of Reasoned Action and is therefore more comprehensive and more appropriate as a foundation for this research. The Theory of Planned Behaviour provides the link needed in this research to use an individual's attitudes to forecast their behavioural intentions, and in future research, to ultimately predict their behaviour.

2.6.5.2 Implications for this study

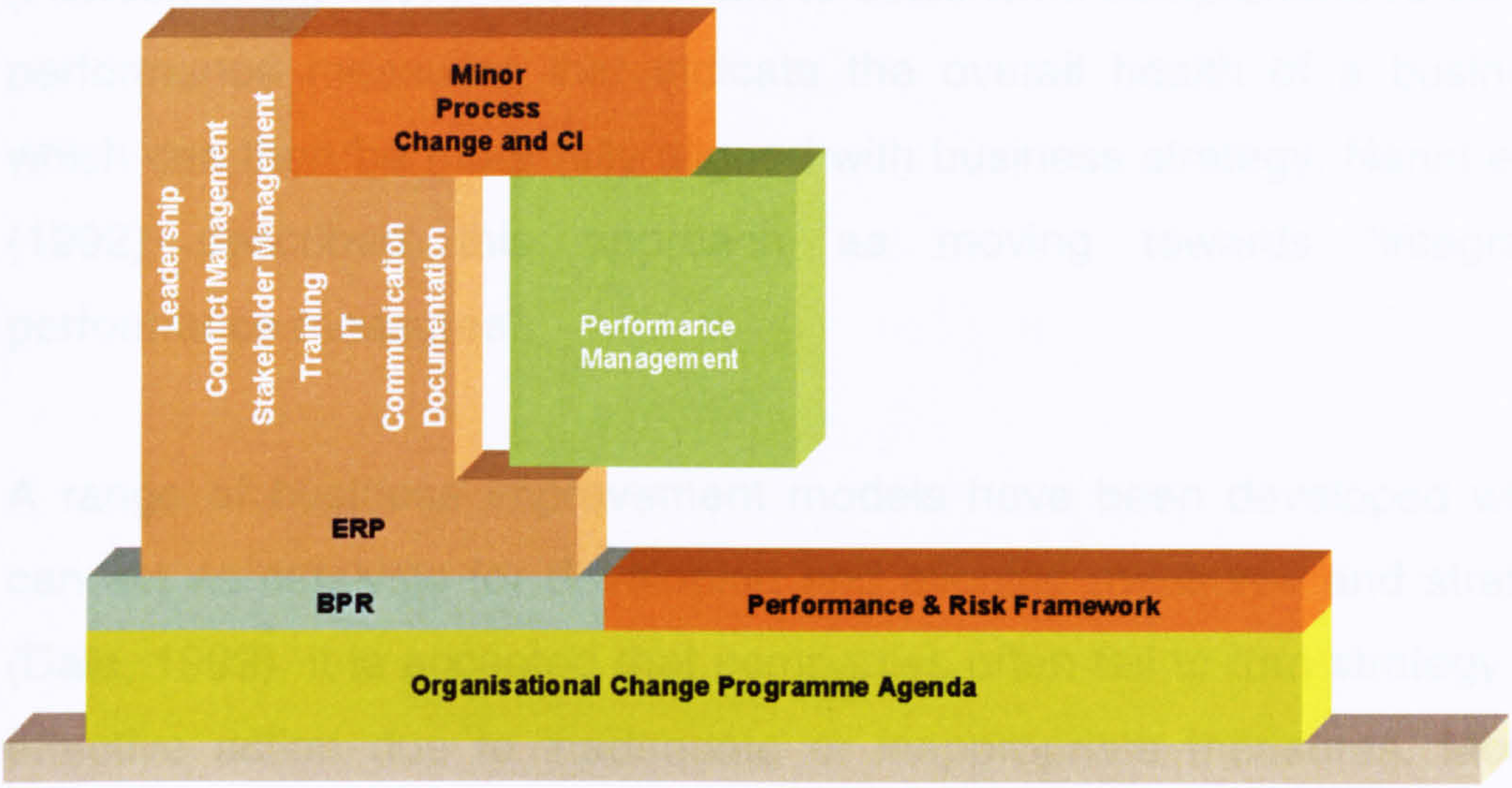
This chapter discussed resistance to change as represented in the literature. The chapter also included discussion of the connection between attitudes and behaviours of an individual as represented in the literature.

The literature contributes to this study by establishing context for the behavioural characteristics encountered during the case study implementation projects. Reference within the empirical chapters to the resistance symptoms encountered during the case projects which emerged are validated by the findings in the literature. The literature recognises the forms of resistance to change which emerge and also recognises the impact that resistance can have, both positive and negative on the implementation of change.

Marjanovic, O. (2000) identified resistance to change as remaining the biggest obstacle yet to successful BPR implementation. His investigations into the soft side of BPR (i.e. human aspects) and the use of IT during implementation, in particular Group Support Systems, GSS, demonstrated that IT can support change and reduce resistance.

However, the literature does not extend beyond this to include the impact which the change implementation methodologies can have on resistance itself and how these may be used knowingly or unknowingly to influence the level and type of resistance which can be expected. This is a key gap as the findings of this study reflect the impact which varying implementation methods have on the resulting levels of resistance and post implementation compliance.

2.7 Performance Measurement



2.7.1 Introduction

Since the late 1980s performance measurement has become very topical with ever-increasing interest in the subject. The increasing interest has been driven by the increased rate of change in the business environment in both the private and public sectors. Bourne et al. (2000) state that this rapid change has led to "general dissatisfaction with traditional backward looking performance measurement systems, identifying their shortcomings and arguing for change". Holloway, J. A. claims there is little empirical evidence about the impact of measurement on performance. Alher defines performance as a managerial process, showing how managers use metrics during the strategic process. Holloway proposes investigations into neglected aspects of organisational performance measurement, reflecting the concerns of managers and illustrating the potential for theoretical developments to have an impact on practice.

Businesses today require better information across a wider scope than that of the traditional, and often linear, financial measures, to achieve understanding of the factors that create the foundations of future success (Fawcett et al., 1997). It is important to establish a comprehensive view of performance measures that indicate the overall health of a business, which can then be more fully aligned with business strategy. Nanni et al. (1992) described this approach as moving towards "integrated performance measures".

A range of business improvement models have been developed which can act as catalysts for developing and aligning measures and strategy (Dale, 1999). It is accepted that companies often fail to turn strategy into effective action due to inadequate or inappropriate measures. Models such as the balanced scorecard (Kaplan and Norton, 1996) and the business excellence model (EFQM, 2001) are seen as tools to enable the alignment of measures and strategy in a dynamic manner. These models can be used to monitor and control the characteristics essential to the future success of the organisation and are able to look forward, rather than relying entirely on traditional measures that are historical in nature.

An aim of this study is to explore the alignment between performance measures and business strategy. Moreover, the study will probe the role of business improvement models as a key catalyst in this alignment process. First, the links between performance measurement and business strategy are discussed. Second, the alignment process is examined. Third, there is a discussion on the enabling role of business improvement models in the alignment process.

2.7.2 Performance measurement and business strategy

Marshall et al. (1999) describe performance measurement as "... the development of indicators and collection of data to describe, report on and analyse performance". Neely et al. (1995) see performance measurement as the process of quantifying action, and more specifically define it as "the process of quantifying the efficiency and effectiveness of action". They define a performance measure as "a metric used to quantify the efficiency and/or effectiveness of an action". While these definitions are representative of a considerable body of knowledge, they fail to develop performance measurement as a complex and dynamic phenomenon that can be used to interact with business strategy (Neely et al., 1994). Traditional accounting systems allocated overheads on the basis of direct labour, which up to the 1960s was a reasonable method, direct labour being a significant proportion of the cost of goods sold (over 50 per cent). Technological advancement in the 1980s brought substantial introductions of automation and computer controlled processing, reducing the proportion of direct labour in the cost of goods sold to a much lower level (less than 10 per cent). The traditional method of accounting, therefore, can lead to misleading information and, ultimately, wrong decisions. Better and more accurate ways of determining product costs had to be found, leading to the need for wider measurement. Bourne et al. (2000) describe such traditional performance measures as being criticised for "encouraging short-termism, lacking strategic focus, encouraging local optimism and not being externally focussed".

Neely (1999) explains why there has been such an increase in interest in a more strategic perspective to performance measurement systems since the late 1980s. He expresses the view that there are seven main reasons for performance measurement being necessary in the current business environment. He claims that the main reasons for performance measurement being so critical today are: the changing nature of work; increasing competition; specific improvement initiatives; national and international quality awards; changing organisational roles; changing external demands; and the power of information technology. Thus, as pointed out by Dangayach and Deshmukh (2001), performance must have a strategic input to these issues. Increasing competition and globalisation of markets has led organisations to strive to differentiate themselves from their competitors.

Markets are driven more by value than cost, forcing organisations to consider quality, customer service, response and other such attributes. This change of focus has generated the need for performance measures to facilitate the control of these attributes (Bourne et al., 2000). Another driver for increased performance measures due to competition derives from the fact that organisations must continually increase efficiency in competitive markets. To achieve this many have downsized, usually by removing a layer of middle management and empowering employees to make decisions (Alvesson and Willmott, 1996). This requires senior management to communicate the organisation's strategy and direction across a wider base; one way of doing this is by using appropriate performance measures. How this is achieved practically is another matter and one not addressed in detail by the performance management literature. The requirement to communicate must be translated into tangible product in order to effect a successful implementation of performance management frameworks. The prescription of effective methods is not a priority of the literature. Also lacking is the debate concerning comparison of methods employed to embed performance management frameworks.

The introduction of national and international quality awards such as the Baldrige Award and the European Foundation of Quality Management (EFQM) has driven organisations to carry out internal audit exercises. To do an audit an organisation needs to be able to measure and record a wide range of attributes, demanding the development of sophisticated performance measurement systems. Furthermore, the models used to drive the award process (e.g. business excellence model, Baldrige model) have strategic elements, which emphasise the need for development of supporting performance measures. Gunasekeran et al. (1996) see these business improvement models as helping to develop closer links between performance measurement and strategy.

The main function of performance measurement in a strategic context, as claimed by Letza (1996), is to provide the means of control to achieve the objectives required, to fulfil the company's mission/strategy statement. This view is supported by Neely et al. (1994) who view performance measurement as a key part of strategic control". Fawcett et al. (1997) and Neely et al. (1994) develop this argument by stating the need for performance measurement to exercise this control through:

* helping managers to identify good performance;
* setting targets;
* demonstrating success or failure.

In summary, there are compelling reasons why performance measurement must become more strategic in outlook. Models and mechanisms must be developed to address the need for appropriate supporting performance measures for business strategy in rapidly changing business environments. These must of course be effectively implemented and continually supported by appropriate tools and educated personnel, otherwise the implementation will not be sustained for any reasonable period.

It is insufficient to state the need for closer links between performance measurement and business strategy: the process of alignment must be addressed. Neely et al. (1994) argue that one of the key factors of alignment is that of "consistency of both decision making and action".

This consistency can only exist, in times of rapid change, if the performance measures and strategic process are dynamically linked as suggested by Franklin (1996). Long lead times between decision making and strategic formation will result in outdated information and subsequently misguided action (Bourne et al., 2000). Neely et al.'s research indicates that those who achieve this consistency compete on quality as opposed to those who compete on price, who lack this consistency.

To achieve this consistency, and hence alignment, there must be a broader and more holistic approach to devising and using performance measures, if they are to be meaningful in a dynamic and complex situation (Bourne et al., 2000). Dixon et al. (1990) developed a "Performance measurement questionnaire" which attempted to audit whether a firm's performance measures aligned with its strategy. This approach went beyond traditional accounting measures and ratios; however, it is indicative rather than prescriptive of a wider approach to performance measures.

Some of the literature differentiates between two types of measures, financial and non-financial measures. Financial measures are required by legislation and have been in existence for many years, so all businesses use some form of financial measurement system. The development of non-financial measures is relatively new, with increasing interest in their use as a strategic tool. Kaplan and Norton (1996) state that "... an organisation's measurement system affects the behaviour of people inside and outside the organisation." Hence measures must reflect the strategies and capabilities of the organisation and not just the financial results. Dangayach and Deshmukh (2001) support this argument by inferring that softer measures such as attitudes and teamworking will lead to improved financial results.

Letza (1996) draws attention to the fact that financial and accounting measures are an "... inadequate and insensitive tool for decision-making" in regard to alignment with business strategy. The standard financial measures have been developed for regulatory and financial reporting which itself has evolved from the need for reporting on the stewardship of money entrusted to management. Therefore, these measures focus on reporting what has happened in the past and do not address strategy in any way. Letza (1996) also claims that attention to comprehensive measurement "... guards against sub-- optimisation by forcing senior managers to consider all the important operational measures". Typically, many managers tend to concentrate on the results that will get them immediate reward, thus sacrificing long-term health of the business for short-term gain, so the range of measures must be structured to provide a clear view of the causes of the results and the drivers of future performance. Kaplan and Norton (1996) and Morrow (1997) recommend the balanced scorecard model as a multivariate approach that takes an internal and external view. There is no consideration however given to the diverse nature of organisations and the relevance of a modelled approach to performance management for different types of organisation. It has been suggested that the fashion for balanced integrated performance measurement systems has led to managers focusing on improving the accuracy of the measures used rather than managing the business. Johnston and Fitzgerald, 2000, provide evidence of a "good enough" approach to performance measures leading to innovation and improved results by using measurement as a facilitator not the raison d'etre. One might hypothesise that what may work well in the public sector may not work so well in the private sector. A model appropriate for a large multi-national may be too cumbersome and unwieldy for a smaller local organisation. The literature omits to address such considerations.

In addition to the need for a wider range of measures to achieve alignment, the balanced scorecard model (Kaplan and Norton, 1992,

1996) suggests that a "balanced" set of measures in four categories, namely customer satisfaction, learning and growth, internal business processes and financial, should be adopted. This "balance" is paralleled in the work of Dixon et al. (1980) and reflects the interdependencies between many of the measures in times of dynamic change (Nanni et al., 1992).

Light (1998) in supporting a wider range of performance measures to achieve alignment with strategy states that intangibles such as "management performance, quality of strategy, customer satisfaction and employee retention" must be addressed. He argues, along with Dangayach and Deshmukh (2001), that measurement, monitoring and control of these aspects helps to "pinpoint problems, improve processes and achieve company goals".

The literature suggests that if alignment between performance measures and business strategy is to be meaningful and effective, then there must be "consistency of both decision making and action". This consistency, and hence alignment, can only be achieved in rapidly changing and complex environments by developing a more comprehensive range of performance measures. These measures must include dimensions such as financial, non-financial, tangible, intangible, balanced, mechanistic and organic. The concept of arranging them within an integrated business strategy model appears established by the literature, however the question of the complexity which this presents and the impact this has on the sustainability of manually managed reporting procedures is not examined. Correspondingly the literature offers no prescription or guidance relating to the use or requirement to use software supported modelling techniques as the practical means to facilitate the exercise. The literature presents a compelling case for the requirement for a complex and comprehensive framework model but does not extend to dealing with the practical considerations of how to implement a solution sustainably.

It has been claimed that performance measurement systems do not produce the expected results. Andersen and Henriksen, 2004 address a possible mismatch between the application areas pursued and the design of the resulting system. Andersen and Henriksen suspect that such systems end up as hybrid solutions trying to compromise between different possible usages of such measurements. They outline a number of various pursued when implementing such a system.

The contribution of business improvement models Dixon et al. (1990), Neely et al. (1994), Bourne et al. (2000) and Dangayach and Deshmukh (2001) have all stressed the need for appropriate measurement systems to support the suggested wider range of performance measures and hence, alignment. Devising appropriate measuring systems causes difficulty for many organisations (Giunipero and Brewer, 1993). Chenhall (1997) states that organisations implementing change must have an appropriate measuring framework to measure effect. Various structures for comprehensive measurement systems have been tried including Dixon et al.'s (1990) "Performance measurement questionnaire". However, the advent of the quality movement has resulted in a number of business improvement models and methodologies which have business dynamics, performance measurement and its alignment with business strategy, as key constructs (Dale, 1999). Thus, these models can make a contribution to the alignment issue by acting as part of an implementation framework for performance measures and at the same time ensuring consistency (Neely et al., 1994) - "consistency of both decision making and action". The challenge is exaggerated however by the expanding compliance framework to which organisations are subject: quality models, project models, risk management models, performance models, governance models etc. all impose documentable workload on the organisation regarding the demonstration of compliance. Many of these models in themselves provide the basis of performance measurement criteria. The literature does not reflect the challenge to the realistic sustainability of the resultant performance management model.

Two exemplars of performance compliance models are the business excellence model (EFQM, 2001) and the balanced scorecard (Kaplan and Norton (1992, 1996). The business excellence model and the process of self-assessment utilises a range of performance measures. These include financial, non-financial, perceptive, non-- perceptive, lead and lag measures. The use of "enablers" and "results" measures and criteria within the model enables the lead and lag measures to reflect the dynamics of business strategy. The process of self-assessment against the model's criteria can be synchronised with the strategic planning process in organisations to ensure maximum alignment (Ghobadian and Woo, 1996). However, if the model is used simply as a static auditing tool, then the inherent performance measurement framework will be used for operational reporting rather than creating a dynamic interplay with business strategy (McAdam and O'Neill, 1999; Johannsen, 1996).

The second business improvement exemplar is the balanced scorecard (Kaplan and Norton, 1992,1996). This model is applied by the management team to clarify and codify high-level strategy into business objectives. Within the model, performance measures and targets can then be applied and aligned with the objectives. Business improvement initiatives are then applied to achieve the objectives and targets. Thus, the scorecard assists in aligning performance measures and business strategy. There are four key quadrants in the model representing a "balanced" view of performance measures, namely financial, internal business processes, customer focus and learning and growth. Roest (1997) documents essential rules for developing and implementing successful scorecards, which include the use of lead and lag performance measures. For example, traditional financial accounting measures will be lag measures as they reflect past performance. Lead measures could be the number of new skills developed under the learning and growth quadrant, thus predicting the ability of the organisation to fulfil tasks in the future (McAdam and O'Neill, 1999). Thus, the model can contribute to the dynamic alignment issue. The scorecard can also aid the effective deployment of strategy and aligned performance measures through teams at lower levels developing scorecards consistent with the strategic scorecard. Thus, consistency of deployment, identified by Neely et al. (1994) as a key issue in alignment, can be preserved. Hoverstadt, 2004, advcocates the use of systemic organisational models to performance measurement and management. Hoverstadt argues that systems modelling provides a coherent platform for improving the role of performance measurement linked to resource bargaining and monitoring systems. Such an approach Hoverstadt claims can help to avoid the common failures incurred with performance measurement and management.

In summary, business improvement models and methodologies can contribute to the issue of aligning performance measures with business strategy, based on the premise of a wide range of performance measures being used, as discussed above. However, as suggested by Neely (1999), the areas where existing research is scarce are in the implementation of models which incorporate performance measurement systems, and strategy and the ongoing management of them.

Performance Measurement Frameworks: Characteristics

It has been widely reported that there has been a revolution in performance measurement in the last 20 years. The enormous interest in measurement has manifested itself in practitionaer conferences and publications as well as in academic research (Neely, 1998). Research indicates that organisations using balanced performance measurement systems as the basis for management perform better than those that do not (Lingle and Schiemann, 1996). For this benefit to be realised, it is necessary for organisations to implement an effective performance measurement system that "enables informed decisions to be made and actions to be taken because it quantifies the efficiency and effectiveness of past actions through acquisition, collation, sorting, analysis, interpretation and dissemination of appropriate data" (Neely 1998). This definition is important as it indicates that a performance measurement system has a number of constituent parts:

1) Individual measures that quantify the efficiency and effectiveness of actions.
2) A set of measures that combine to assess the performance of an organisation as a whole.
3) A supporting infrastructure that enables data to be acquired, collated, sorted, analysed, interpreted and disseminated.

2.7.3 Performance Measurement and the Impact on Service Quality

Black Briggs and Keogh (2000), argue that while organisations have made some headway in improving the range of performance information they have available, and in their use of such information, significant problems remain.

These problems include those of;

- conceptual mis-development

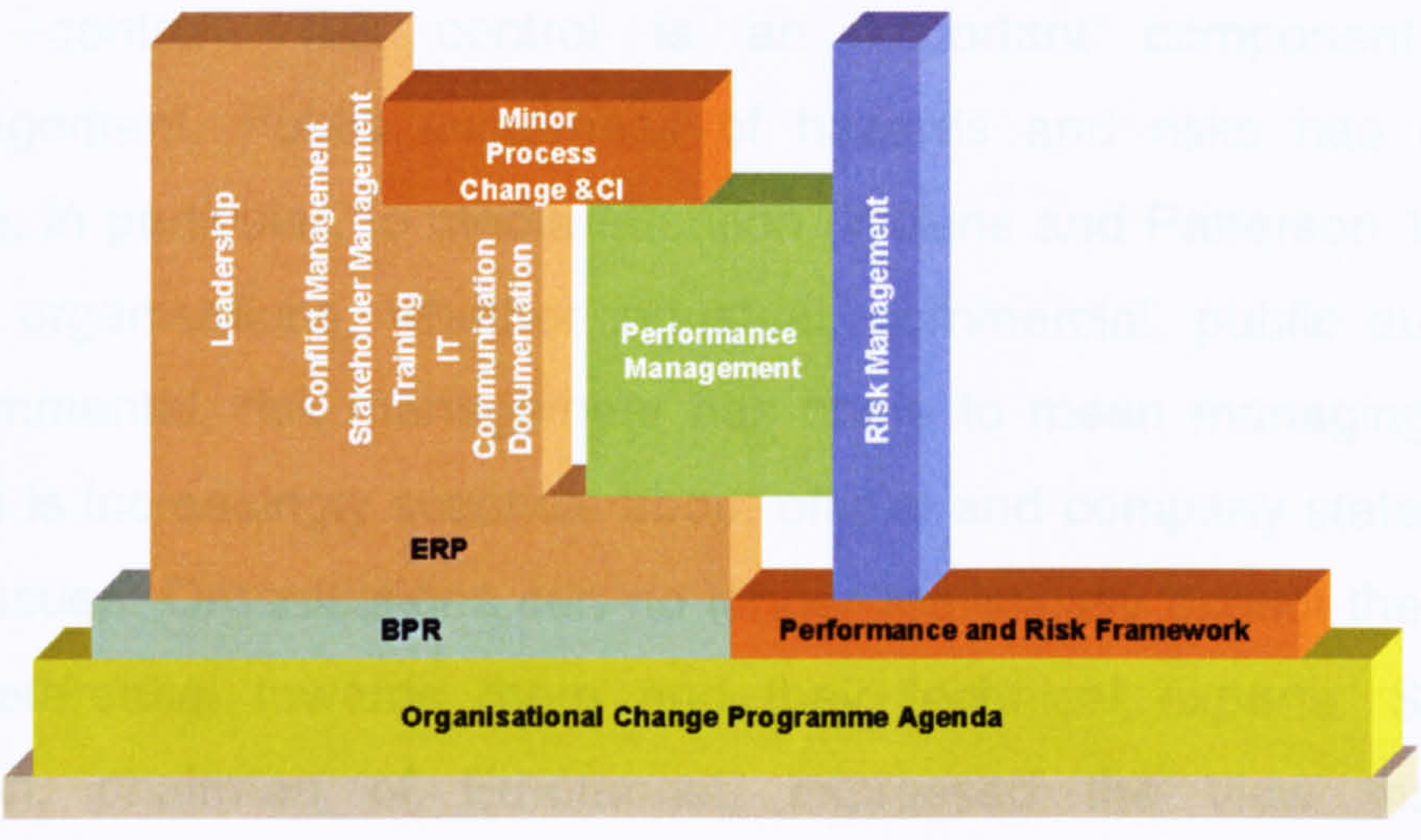
- limitations in recognising the needs of different stakeholders for such information
- data shortage difficulties, and
- both technical and analytical under-development of practice.

The changing environment has also been shown to influence the profile of performance measurement and management. One of the key case studies within this dissertation relates to performance management within UK airports. Humphreys and Francis have examined the consequences for performance measurement from the changing ownership patterns of airports. Their examination cites pressures for change from sources including commercialisation, regulation, rapid passenger growth and technical innovation. With respect to performance management within police forces, Collier has examined the accountability of policing through performance indicators. He concludes that there has been a lack of agreement about the purposes of policing; shifting priorities in relation to what the police do; and a continually changing environment of performance measurement.

The UK government is committed to more effective public service delivery through "performance management". Private sector models are being adopted with this aim. Fitzgerald, Lamb and Shah, 2004 examine a public sector implementation within the Inland Revenue concluding that there is evidence of conflict between the objectives of the organisation itself (Inland Revenue) and the target audiences (Central Government).

Bond (2002) established a role for performance measurement in continuous improvement. The study indicated that the process life cycle has four stages. A newly designed process commonly suffers from a variety of teething problems during the initial post-commissioning phase. Once these have been eradicated achieving smooth product flow becomes important in accordance with Just in Time philosophy. A stable process may be improved by applying a continuous improvement programme. A dramatic step change in performance may be achieved by radical re-engineering.

2.8 Operational Risk Management



Operational risk management, or to be more precise the implementation of operational risk management solutions is an area for which the writer discovered a dearth of reviewable material. Unlike financial risk management, operational risk is an area often neglected by industry. This situation has noticeably changed in the last few years. Significantly the worldwide political climate has been responsible for the shift in attitude towards operational risk. High profile and operationally costly events such as 9/11, the Madrid train bombings, Lockerbie, Clapham and Paddington train disasters and even the Tsunami have increased the concerns of stakeholders in the management culture prevailing towards what would have been considered unlikely. The preparation of contingency and disaster recovery plans have only in the last few years become routinely recognised terms in organisations. The "Risk Register" whether departmental, project or programme etc. are only now maturing within organisations as standard and business as usual methods of managing and demonstrating the management of operational risks.

2.8.1 Meanings of "Risk Management"

The term "risk management" has multiple meanings and this may lead to confusion. Although "Risk management" may be used synonymously with "Risk control", risk control is an important component of risk management. Public awareness of hazards and risks has increased owing, in particular, to media attention (Wilkins and Patterson 1990). For large organisations, whether industrial, commercial, public authority or governmental, risk management has come to mean managing a public which is increasingly sceptical about official and company statements on risk issues. Organisations can no longer realistically expect the public to be deferential towards them and their technical experts. Sir Alistair Morton, chairman of Eurotunnel, expressed the view that "many organisations my have to rethink their "contract" with the public on matters of risk. There is no point in wishing you had thought about emergency planning when you are surrounded by 600 angry, frustrated and possibly frightened customers whose cars have gone to Calais following an evacuation" (Morton, A, 1995).

The Royal Society Report (1992) uses the term "Risk Management" to denote regulatory measures (both in public policy and corporate practice) intended to shape who can take what risks and how. Risk-benefit analysis is often used to identify an acceptable balance between overall risks and overall benefits of a proposed course of action and expenditure of resources. According to Chicken (1994), "the decision maker with comprehensive responsibility for determining the acceptability of a project will require detailed information about the acceptability of the technical, economic, and socio-political aspects of the project". Chicken is advocating that risk decisions are made at a high level, possibly excluding those parties to whom the risk will impact. Pettigrew (1994) noted political processes operated essentially at the micro level i.e. a small group of people engaged in influencing and making a particular decision. Such people may make erroneous assumptions regarding the risk and how it is likely to impact on those directly affected. This position and his advocacy of the inclusion of the spectrum of interested parties are consistent with the concept of devolving responsibility for the management of risk assessment and management. This is a feature of two of the cases studied within this project. The literature however focuses specifically on the conceptual case for risk management and for the inclusion of affected parties; however there is no reflection on the methods for implementation. There is also no focus within the literature relating to the transparency of risk data to the wider community as a required feature of effective risk management. Significant discussion referred to above centres on the selection of appropriate parties to complete the tasks, however a failing of many risk management exercises remains that the data developed remains with the originator or a small group of related roles and is not systematically shared with others. The writer regards this as a significant feature of effective risk solution implementation and accordingly its absence in the literature as a significant gap.

2.8.2 Risk Assessment

Risk assessment is the general term used to describe the process organisations undertake to gauge the most likely outcomes of a set of events, situations or options. Cognition, perception, motivation and attitude interplay with decision-making and prioritizing actions across the spectrum of individual interests, needs and concerns (Glendon and McKenna 1995). Although a major hazards rationale is often necessary, it is important to recognise that risk assessments carried out by technical risk analysts often fail to include due allowance for other equally important factors. Toft (1996) and Toft and Reynolds (1994, 1997), quoting examples such as Three Mile Island, argue that a purely rationalistic approach to hazard identification cannot identify all pertinent routs to causes of disasters, which are theoretically infinite in number. Allied to this caveat is the failure in risk assessment to recognise the relevance of the individual heuristic risk assessments, among those subject to risk, those engaged in risk decisions, or those used by individual experts. The HSE Discussion Document on risk (HSE 1995a) defines assessed risks as those determined by experts whereas apparently, non-experts are capable only of "perceiving risks". Similarly Chicken (1996) defines "objective risks" as those determined by experts, whereas "subjective risks" are those determined by non-experts. This is an interesting observation and impacts on the cases studied. The PSNI risk management project employs a concept which devolves responsibility to the subjective community of non-expert business managers. The BAA MATRA project centralises the management risk with teams of specialists or experts.

2.8.3 Approaches to risk assessment

Two broad approaches to risk assessment have arisen – the heuristic and scientific. Although an heuristic or "rule of thumb" approach may include some form of quantification, generally it is qualitative and subjective, relying on individuals' collective judgement. The scientific approach however employs quantitative modelling and generally requires formal training in the mathematics used (Chicken 1996). This is more appropriate for financial risk assessment carried out as a central role. It is not conducive to the concept of devolving to line roles.

The subjectivity of the heuristic approach does not necessarily simplify the challenge. Indeed it is this characteristic which has been identified as complicating and moreover confusing the exercise. The recursive nature of terms such as "hazard" and "risk" and terms such as "assessment", "analysis", "estimation", and "evaluation" in everyday speech creates ground for ambiguity and confusion, especially in risk communication (Glendon and McKenna 1995). This hints toward the requirement for a tightly defined, robustly implementation and well articulated risk management framework; trained staff working to a consistent method within an aligned organisation. Attempts have been made (Royal Society 1992; HSE 1995) to produce standard definitions for risk but the problem of recursive language remains. The evidence points toward the requirement for a clearly and consistently articulated and embedded procedure for risk assessment within the organisation. The literature does not however extend to articulate this directly or review the contrasting methods of implementation and the tools appropriate.

2.9 Chapter Summary and Identification of Gaps in the Literature

Chapter 2 has reviewed the literature relevant to a study of implementation of business change projects including business processes, performance management and operational risk management. The change management sphere has been reviewed, particularly the areas of Leadership and Resistance Management as appropriate to change implementation. The purpose of this review was to examine the existing sources for information relating to issues arising during implementation and the effects of differing methodologies. The reviewed also hoped to establish whether or not implementation methods were prescribed to vary between organisations of different type i.e. commercial vs not for profit, public sector vs. private, large vs small etc. In particular this study aims to explore the impact of supporting tools such as software modelling techniques as opposed to traditional manually documented methods of project implementation.

Throughout the literature there is a reflection on the reasons for implementation failure and a prescription of the success factors required for ultimate and sustainable successful implementation. The requirement to communicate comprehensively to concerned parties for example a sufficient level of process/process support relationship and the requirement to adequately train users in the supporting applications in addition to embedding a comprehensive knowledge of the end to end process is established repeatedly. Likewise within the performance management literature there is considerable reference toward the fundamental need to demonstrate linkage between performance management frameworks and strategy. This identification and recognition of conceptual requirements is not accompanied by a specification or prescription of appropriate method or critique of employable tools. The practitioner has now at his/her disposal access to technological solutions and no reference as to the appropriateness of them to the implications for business change programme implementation. Similarly much reference is made to the requirements for "alignment" through the performance framework and across the organisation. This is a strong and important characteristic of best practice performance management frameworks, however the practitioner would benefit from an account of methods employed, booth successful and unsuccessful to educate their attempts to implement successfully.

The risk management literature refers to requirements of robust risk frameworks, the inclusion of a broad spectrum of stakeholders etc. However a solution to the challenge of co-ordinating the information mass resulting from this concept is not offered. The sustainability question for compliance of a complex governance framework such as risk is raised again with no practical suggestions made to answer it. The literature specifies a requirement for comprehensive inclusion both of human resources and data but fails to specify how this can be practically delivered in a way which ensures the framework will not be quickly abandoned, lose credibility and achieve the objectives. The risk literature also highlights the importance of data being shared with others but again does not review the impacts of methods or tools for the purpose. This argument is relevant to the fields of BPR implementation and also performance management implementation.

Generally the literature provides considerable evidence relating to problems associated with programme implementation and clearly identifies the criteria required for sustainable success as concepts. This does not extend to a prescribed method, analysis of tools or a qualification of approach for organisations of different type. These gaps in the literature provide the basis of the research questions which the nine cases examined seek to answer. The focus of the empirical work centres on the implementation methods employed and their impact on the sustainability of the implemented solution. The research also allows for the assessment across cases for the purposes of comparing organisations of similar and dissimilar type.

3. Chapter 3 - Methodology

3.1 Introduction

Chapter 1 noted the general aim of the thesis as a case study exercise in exploring the impacts of selection of implementation methods and tools on the eventual outcomes and contribution to success or failure. The primary purpose of this chapter is to discuss the methodological framework within which the study was undertaken. Chapter 3 explains the methodological underpinnings of the research, and presents explanation and arguments supporting choices made regarding the methodological framework and specific research techniques employed for data collection and analysis.

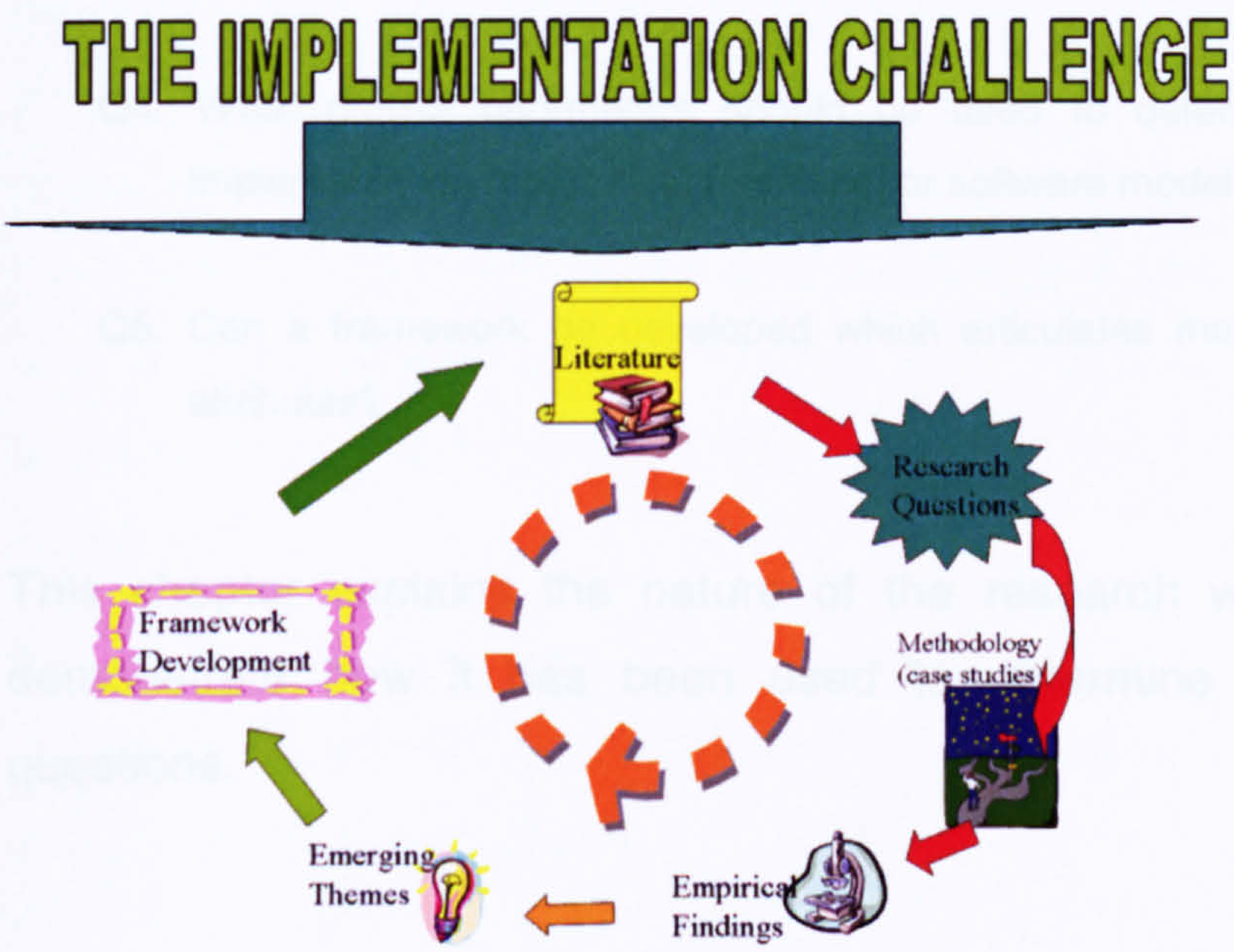


Figure 3.0.1 The Research Activity Cycle

3.2 The Research Questions

At the outset of the study the writer developed a series of questions which the research seeks to answer. These are repeated below:

Q1. To what extent are the reasons for implementation failure provided by the literature related to the implementation methodology?

Q2. To what extent if any would these reasons or risks of failure have been influenced by use of structured modelling techniques and software support?

Q3. To what extent does the nature of the organisation e.g. public/private sector, large, small etc. influence either the selection of the implementation methodology or influence the prospects of successful implementation?

Q4. What project parameters should be used to determine the selection of implementation method i.e. traditional or software modelled?

Q5. Can a framework be developed which articulates mandatory change model attributes?

This chapter explains the nature of the research work undertaken to demonstrate how it has been used to determine answers to these questions.

3.3 Research Methodology

Research methodology is described as the procedural framework (Remenyi and Williams, 1995) on which research is based and against which claims for knowledge are evaluated (Frankkfort-Nachmias and Nachmias, 1992). The aim is to:

> **"... to help ... understand, in the broadest possible terms, not the products of scientific inquiry but the process itself..." (Kaplan, 1964, p23)**

Methodology plays a critical role in the quest for knowledge and has a secure place in scientific literature (Kaplan, 1964). The case for research methodology cannot be considered in abstract; its choice and adequacy embodies a variety of assumptions regarding the nature of the knowledge and the methods through which that knowledge can be obtained, as well as a set of root assumptions of the phenomena to be investigated (Morgan and Smircich, 1980). Methodological naivety can lead to the misuse of precise measures on materials for which they are not suited (Merton, 1973). Usher (1997) notes that research now demands not only an evaluation of outcomes, but a reflexive analysis of the research process and of the place of the researcher within that process. However Kaplan (1964) cautions, pressing methodological norms too far can inhibit bold and imaginative ideas. Further, research has to be opportunistic because what one discovers may not be what one sets out to do (Whyte, 1984).

Consequently, although research methodology provides important guidelines (Remenyi and Williams, 1995), it should not be used as a straight jacket (Quinn, 1988).

3.3.1 Research Philosophy

A research philosophy underlines the way in which the data on the phenomenon investigated is collected and analysed, and is seen to determine the epistemology guiding a study. Epistemology belongs to the philosophical discourse where it is understood as the way in which claims to knowledge are justified; it is a commitment to a particular way of understanding the world and acting within it through research (Usher, 1997).

Easterby-Smith et al (1993), report the long standing debate in the social sciences regarding the most appropriate philosophical stance for the derivation of methods; of which 'positivism' and 'phenomenology' are the two extremes. Positivism the social sciences is attributed to Comte who coined the term "positive philosophy", of which positivism is an abbreviation (Hughes, 1980). Positivism which emphasises the use of methods associated with the natural sciences (Gill and Johnson, 1991) has developed into a distinctive paradigm over the last century and a half (Easterby-Smith et al, 1993). Its fundamental concept is that the social world exists externally, and as such its properties should be measured through objective measure (Easterby-Smith, et al, 1993). Positivism is associated with quantitative data collection methods. In contrast, phenomenology stems from the view that the world and reality are not objective and exterior, but that they are socially constructed and given meaning by people, (Husserl, 1946). This new paradigm has risen during the last half of the century largely as a reaction to positivism. Easterby-Smith et al (1993), report several variations associated closely with phenomenology including: interpretive sociology (Habermans, 1970), naturalistic inquiry (Lincoln and Guba, 1986), social constructionism (Berger and Luckman, 1966), qualitative methodology (Taylor and Bodgam, 1984) and 'new paradigm' inquiry (Reason and Rowan, 1981). Phenomenology is associated with qualitative methods and focuses on how things appear to people and how people experience the work (Gill and Johnson, 1991).

Guba and Lincoln (1994) argue that paradigm issues are crucial: "...no inquirer ... ought to go about the business of inquiry without begin clear about just what paradigm informs and guides his or her approach...". Although distinction between both paradigms is clear at the philosophical level (Burrell and Morgan, 1979), when it comes to the issues of quantitative or qualitative methods, and to that of research design, the distinction breaks down (Bulmer, 1988; Punch, 1986).

Kuhn (1970) argues that:

"The pull towards a single methodological perspective, with its clearly defined tools, needs to be resisted because this single perspective designed for research in *normal science*, overlooks the anomalous quality of human experience. The difficulty for human science arises not from the need to change from one paradigm to another but the need to resist settling down to any single paradigm."

A growing number of researchers have recognised the potential value in the triangulation of methods (Burawoy, 1979; Denzin, 1970; Fielding and Fielding, 1986). Denzin (1978) broadly describes triangulation as "the combination of methodologies in the study of the same phenomenon". This belief in the "methodological pluralism" is sometimes referred to as "post-positivism" (Giddens, 1978; Hirschheim, 1992). The assertion is that there is no one correct method of science, rather the correct method is contingent upon nature of the study. The fundamental strategy is "to attach a research problem with an arsenal of methods that have non-overlapping weaknesses in addition to their complementary strengths" (Brewer and Hunter, 1989). The objective is to improve the accuracy of judgement by collecting different kinds of data bearing on the same phenomenon whilst capturing a more complete, holistic and contextual portrayal of the unit under study (Jick, 1979). However, Whyte (184), reports that few researchers have made ambitious attempts in triangulation.

3.4 BPR and Organisational Research

BPR literature provides testimony to the infancy of its research methodology. This is not surprising as BPR's two connected and more established fields of study: organisational studies and IS (Information Systems), still look towards other disciplines such as sociology and psychology for guidance (Easterby-Smith et al, 1993; Hirschheim, 1992).

Not surprisingly, the paradigm debate persists in both IS and organisational studies. Visala (1991) observes that the theoretical position in IS research is one of fragmentation and un-coordination. A similar position is also noted in its cognate discipline, organisational studies (Reid, 1992). Both fields are divided into various schools of thought and communication between schools has been described mainly as based on aggressive refutations of each other's theories (Olaisen, 1991).

It is reported that the positivist paradigm has a monopolistic grip in organisational and IS research (Van Maanen, 1979; Galliers and Land, 1987; Orlikowski and Baroudi, 1991; Avision 1997). Orlikowski and Baroudi (1991), note that 96.8% of research published in leading American IS journals follow the positivist tradition. They claim that the dominance of positivism in IS research provides only a partial view and consequently has implications for the understanding of IS, theory building and IS practice. Mintzberg (1979) shares a similar view in relation to organisational studies:

"... The field of organisation theory, I believe paid dearly for the obsession with rigor in the choice of methodology. Too many results have been significant only in the statistical sense of the work..." (p583)

Some theorists like Willmott (1993b), view sociological paradigms as an inherently repressive force that "denies the very possibility of analysis that is much more sensitive to the ambiguous and contradictory nature of social reality than is allowed by its own one-dimensional vision "bind(s) ... people to their own ideas" and "create(s) docile bodies who do not question". Patton (1990) takes the paradigm argument a step further by rejecting methodological orthodoxy in favour of methodological appropriateness as the primary criterion for judging methodological quality. According to Patton (1990), quality should be judged on whether, "one has made sensible methods decisions given the purpose of the inquiry, the questions being investigated, and the resources available". Guba and Lincoln (1994) note that a resolution of paradigm differences is critical for the emergence of a new paradigm that is more informed and sophisticated than any existing one. However,

"... All too often, methodologies are discussed as if they were scientific religion – each one labelling itself as the one true faith..." (Martin, 1993, p42)

Galliers (1995) and Ngwenyama (1991), note that the choice of qualitative or quantitative methodology is explicitly linked to the paradigm debate, whilst Morrow and Brown (1994) advocate the integration of both qualitative and quantitative approaches in the same research design. They argue that:

"... nothing about qualitative research, regardless of the form it takes, necessarily precludes the use of quantitative representations ... Ethnographers and historians can and do count things ..." (Morrow and Brown, 1994, p207)

Equally, the use of quantitative data need not imply the acceptance of a positivist paradigm (Mingers, 1997). Both qualitative and quantitative methods have their place in organisational research (Downey and Ireland, 1979) and are not mutually exclusive (Van Maanen, 1979). Crompton and Jones (1984) contend that in reality it is very difficult to study organisations without using both methods.

3.5 Underlying Research Philosophy

Referring to the research questions developed earlier relating to change programme implementation, the writer has employed a case study approach. The cases study approach was chosen in order that appropriate documentary evidence may be collated which would lead to the answering of the questions. The case projects were selected carefully in direct response to the research questions.

The rationale for case study selection relative to the research questions was as follows:

Q1. To what extent are the reasons for implementation failure provided by the literature related to the implementation methodology?

The cases selected employed differing implementation methodologies including manually documented methods and software modelling. Within the manually documented projects included, significant differences in implementation approach existed and therefore a critical examination of implementation methodology relative to implementation failure would be enabled. The range of nine distinct projects provides an appropriate volume of evidence for the study undertaken within a fixed timescale.

To answer this question evidence emerging from selective projects is used to consider the impact of the selected implementation method.

Comparisons are made between projects to identify whether or not the evidence can be attributed to implementation methods as distinct from organisation type etc. The evidence referred to includes qualitative material in the form of project records such post implementation review, project risk records, documentation, and system outputs.

Q2. To what extent if any would these reasons or risks of failure have been influenced by use of structured modelling techniques and software support?

Within the range of case studies the diversity of approaches employed between manual and software supported implementation allows for comparison of impact. Specifically this includes the opportunity to examine the impact of structured modelling techniques on the emergence (or not) of implementation issues and project risks. As an extension of this it allows for the examination of a software supported solution in particular and its effect relative to the complexity of the project challenge.

Q3. To what extent does the nature of the organisation e.g. public/private sector, large, small etc. influence either the selection of the implementation methodology or influence the prospects of successful implementation?

In order to qualify the boundaries of a potential framework for implementation parameters, the cases selected included a diversity which provided evidence from various types of organisation. The questions of whether or not the sector of the organisation i.e. public or private was significant or the scale of the organisation, large or small was important require to be accounted for. Accordingly the case projects were selected to enable appropriate comparison between projects employing different implementation methodologies of same and differing sectors and also of similar and differing size. The portfolio of projects selected enables the direct comparison of public/private sector with public/private sector and manually documented/software modelled with manually documented/software modelled.

Q4. What project parameters should be used to determine the selection of implementation method i.e. traditional or software modelled?

As business process change projects can be diverse in their scale, technical complexity, criticality, targetted audience etc., the question arises regarding the universal appropriateness or otherwise of a prescribed implementation methodology. A resultant framework must be sensitive to not only the type of organisation as enquired by the previous question but also of the project type. What may be appropriate for one undertaking within an organisation may not be appropriate for another within the same organisation. This question requires the inclusion within the portfolio of project cases with varying levels of scale and complexity etc. The projects selected have been so on the basis that they would provide appropriate evidence to answer this question. This question is answered by an examination of the project data management challenge. Each project provides evidences of the impact of the technical challenges independent of the organisational culture and therefore this evidence is considered.

Q5. What are the critical measures of successful business change implementation?

The literature refers to successful implementation of business change in terms of achievement of pre-defined business process improvement targets. There is little or no reference to measures associated with the success or efficiencies associated with the implementation activities undertaken themselves. This question recognises a distinction between the implementation tasks associated with the delivery of a technical solution and the re-organisation of the supporting resource base and ultimate long term impact of the BPR or change project on operational or functional performance. Project implementation as a series of activities in its own right must be assessable as successful or unsuccessful in isolation and distinct from the results of applying new processes. The case projects are examined with a view to highlighting the emerging issues from a diverse range of projects and in doing so, identify a set of measures which refer to the success or otherwise of the selected methodology.

Q6. Can a framework be developed which articulates mandatory change model attributes?

As with Q5., the nine cases examined provide the breadth and volume of evidence required within the timescale of this study to draw conclusions relating to the appropriateness of prescribing a framework for implementation approach. The evidence compiled within the empirical chapters 4 and 5 provide the basis for a debate relating to appropriateness of differing approaches.

It can be reported that this study was conducted within the phenomenological paradigm using both qualitative and to a very limited extent, quantitative data. The choice of the phenomenological paradigm was dictated by its appropriateness both to the overall nature of the inquiry and that of each individual phase, taking into account the sources of data available. The phenomenological paradigm adopted in this study broadly subscribes to the interpretive approach proposed by Burrell and Morgan (1979).

3.6 Research Aims and Underlying Epistemology

This study focused on organisational process management in BAA Scotland, PSNI and also Scottish Enterprise. BAA Scotland was selected because it provided an intriguing opportunity and challenge, as little was known of implementing IT led change of this scale within this particular organisation. The implementation approach adopted here represented classical traditional examples, typical of most organisations. The paper based approach to documentation, process communication and issues handling represented an ideal opportunity to examine the many implementation issues arising from such organisations.

The PSNI cases were selected for three significant reasons. Its innovative use of modelling techniques applied to the traditionally manual, paper based activities of documenting and implementing business processes, performance measurement and risk management solutions represented an opportunity to make comparison on the basis of implementation method. PSNI is also public sector with an engrained political perception. Not only does it attempt to serve a uniquely opposed community but it is itself the subject of continued political examination. Scottish Enterprise was also selected as it represented a cultural variation to the other much larger and bureaucratic organisations. The inclusion of a business change study within Govan Initiative introduces the opportunity to introduce an examination of a small/medium but very high profile organisation. The inclusion of cases from the three organisations allows the study to extend beyond the methods of implementation employed but also informs regarding the impact of the organisational type and culture prevailing.

3.7 Research Aim and Nature of Study

At the start of this study, BPR's high failure rate had received much publicity and was well documented. Thus, the motivation for this research arose out of a desire to try and understand why, despite plausible theoretical principles; BPR is and continues to remain problematic in practice. More specifically the writer wished to establish to what extent the methods associated with the implementation phase contributed to or mitigated the risks of failure. In addition the areas of performance measurement/management and risk assessment/management have assumed increased status in recent years. An increased focus on corporate accountability and investor activity has led to legislative changes demanding transparency of reporting and response. Throughout the course of this research the writer has engaged and examined the impact of different methods of implementation practice in these areas with differing effect. The comparison of implementation techniques contributes significantly to the determination/prescription of a framework for business process change methodology.

BAA Scotland presented the initial opportunity for case examination. The AOS and ERP project implementations studied represented the first significant examples of Business Change Programme activity within BAA. As such, the cases proved significant subjects. The issues arising would not be attributable to prior experiences, good or bad. Little was known at the outset of the peculiarities of implementation confined to the BAA organisation. It effectively operates something of a monopoly, hence the reasons for the regulation of much of its business. This posed something of a risk in that the themes emerging may be concluded as being associated with an organisation within the private sector of such unique standing. The inclusion of case examination from PSNI mitigates this risk somewhat. PSNI and BAA bear striking similarity in many significant areas which allow a comparison of approach and subsequent success appropriate. PSNI does of course hold a monopoly (technically) on the enforcement of law and order within the province of Northern Ireland. It is also regulated to a great extent by the Policing Board of Northern Ireland and the Police Ombudsman. The inclusion of Scottish Enterprise broadens the scope of the applicability test and confirms the generic nature of the conclusions which may be drawn for both large and small, private and public sector organisations.

The only certainties at the outset were that: 1) the study would be conducted on the basis of qualifying case examination i.e. those business change programmes which presented the possibility of analysis of implementation and against which comparisons could be drawn, 2) that subsequent phases would be led by preliminary findings i.e. the initial focus was a general consideration of implementation method and decision making. The analysis of the impact of specific tools and modelling techniques emerged during the course of the study. This is in accordance with Adams and Schvaneveldt (1991), who advocate that the inherent flexibility is a vital feature of exploratory research which allows the focus to be initially broad but become progressively narrower as the research progresses.

The motivation was to retain an open mind in understanding the forces that influenced methods in practice, without being enslaved by existing literature. Exploratory studies are a valuable means of discovery: to find out "what is happening; to seek new insights; to ask questions and to assess phenomena in new light" (Robson, 1993). Good research, according to Remenyi and Williams (1995), often owes as much to intuition and inspiration as to logic and reason.

3.8 The Expected Research Output

When this study commenced in September 2000, the field of BPR was no longer in its infancy but appeared to still lack a strong and reliable theoretical underpinning particularly that based on empirical research. Accordingly, the ultimate output aimed for at the outset was contribution to knowledge; to enrich the theoretical underpinnings and understanding of BPR, advance the development of BPR as an academic discipline and enhance its practice to allow for an improved likelihood of success. The basis of this development would be the advocating of structured techniques supported by a comprehensive software tool. To this end, the study has explored and identified new potential critical success factors for BPR and developed a body of theoretical knowledge to underpin the empirically refined framework proposed. It is hoped that the framework will aid practitioners and also feed further research. This has extended to cover the areas of business performance measurement solutions implementation and also risk management solutions implementation. The justification for a modelled approach to mitigate conflict in particular, more accurately determine functional requirements and enable effective management in BPR, performance and risk generally, are presented and discussed in Chapters 5 and 6. The prescribed use of this technique is qualified in Chapter 6 as appropriate against set project criteria.

As a direct outcome of these actions, this study has contributed to the practice of BPR at BAA Scotland and Police Service of Northern Ireland, and significantly shifted the culture towards robust and disciplined performance and risk management within the same organisations and Scottish Enterprise additionally.

3.9 The Role of the Writer

The writer started this study while employed by BAA in the role of Change Implementation Manager. The prospect of implementing two major business change programmes (AOS and ERP) over a period of 18 months necessitated the appointment of a resource to represent Glasgow Airport specifically and also lead other members of the Scottish Airports Group implementation team. The Scottish Airports Group of companies with BAA comprises Aberdeen, Edinburgh and Glasgow. The writer was seconded to this role in March 2000. The job title at the time was Programme Implementation Manager.

The post was responsible for developing the local business case for each project. This included preparation of cost/benefit plans. The writer was also responsible for management of all corporate communications relating to the implementations. The writer was required to report to and be a member of the local and central Project Boards for the implementations and organise and facilitate all project related workshops: Organisation Design, Training Needs Analysis, Process Communications Sessions, and 3rd Party Stakeholder Sessions etc. The writer was also responsible for the assessment of progress and for signing off the readiness to Go-Live and Gateway documentation for the ERP project jointly with the Operations Director, Managing Director (Glasgow Airport) and Programme Director (Group). At the outset of this challenge and given that this undertaking presented the first significant business process change programme for BAA, the writer embarked on this study with the objective of researching the failure reasons of BPR change projects. Given the specific role of implementation manager the study was selected to focus on the contributions to failure of employed implementation methods.

This phase of research uncovered considerable material relating to the use of intellectual frameworks for documentation, however there was very little reference discovered relating to the application of supporting applications for the modelling of frameworks.

Following the implementation and a period of embedding management activity the writer left BAA and took up a post with Pulinco uk ltd as a business process (re-)engineering consultant. Pulinco is a Swiss based organisation which at the time was seeking to establish a presence in the UK market. The role of the writer was to engage with client organisations, prescribe business process change solutions and project manage the subsequent implementations.

Significantly the change of role allowed the writer to extend the research base to include project case studies of business change programmes employing a documentation framework supported by software applications. The solutions development methodology employed by Pulinco incorporates a modelling framework supported by a software tool TopEase® XBench, developed and owned by Pulinco. An important point to note is that the specific software solutions applied during the course of implementation were developed for each and every project individually. The TopEase® XBench application formed the model tool basis for all outcomes, however all output results were prepared specifically according to the requirements of the client project teams. This generally involved a client engagement which generated the conceptual specification of model structure and output generation. During subsequent business change projects with BAA (now as a client of the writer), PSNI and Govan Initiative, the writer witnessed the impact of the application of a modelling tool for the documentation, cascade and specification of business process relationships. Impacts also emerged relating to leadership alignment, communication, quality and consistency of implementation results. On the basis of this the study has developed to review the specific effects of modelling, supported by software on implementation projects in comparison to the manual, paper based methods of organisation design and process documentation employed during the original case projects at BAA (AOS and Enterprise).

3.10 Bias

The writer is required to consider the issue of bias with respect to the completion of the examination of the project data. This refers the bias that the writer brings to the data collection through being party to the projects as a consultant and secondly, the bias that may result from how the data collection exercises were managed.

3.10.1 Bias Related to Data Collection

As regards the collection of data the potential for the writer's possible bias to influence data selection has been extremely limited. The data sources employed throughout the consideration of these projects include only those developed by the client organisations during the normal course of the project implementations. They include for example the post project review results developed as a consequence of a pre-defined review activity, independent of this particular piece of research. Further examples relate to the business cases developed to support the capital expenditure programmes, the auditable outputs of the projects in terms of report generation and the documented frameworks for compliance which a number of projects were required to comply with.

The role of the writer as consultant included implementation activities also defined in complete isolation to the research project objectives and is concerned only as a project implementation resource. No clinical research activities were conducted by the writer for the purposes of delivering results other than those which were predefined as implementation requirements. No interventionist activities were designed with a view to delivering data results to serve the purposes of the research project. The writer adopted a purely case study approach to data collection.

3.10.2 Bias Related to Data Collection Exercises

As essentially explained within the previous section the data employed within this project study emerged naturally during the course of project implementation and all sources were generated inconsequentially of the research project. The data sources employed conformed to pre-defined deliverables from the normal project implementation phases and as such can be qualified as being free from the bias of the writer either in terms of his role as researcher, or implementation consultant. As the exercises which were responsible for delivering the data sets formed a normal part of the implementation programme, again no effective bias can be demonstrated relating to the writer's role as implementation consultant.

3.11 Sources of data

The study utilises several sources from which analysis is made and conclusions are drawn. All of the data is provided by the projects detailed. The AOS and ERP implementations at BAA are assessed on the basis of Post Project Review and Embedding data. The risks and issues data which emerged through the course of implementation is referred to. This includes assessment against original objectives, assessment of risks and issues outcomes and assessment against the implementation team feedback sessions. The data from the software modelled projects emerges from the software itself in the form of documented outputs. Reference is also made to the project implementation schedules relating to duration of implementation and also to the risks and issues emerging from these. The cases themselves and the emerging themes are described and identified respectively within chapter 4. The outcomes from the project implementation cases are discussed further in Chapter 5, this time in greater and more specific detail against the emerging themes detailed previously.

3.12 Identification of Gaps in the Literature

As explained the writer embarked on this study seeking answers to research questions relating to the identification and contributory effect of implementation activity and methods on the success or otherwise of business programme change projects. Despite the abundance of literature relating to BPR and the many articles relating to the failure of implemented solutions to deliver the extent of benefit initially targetted at project outset, there is little reflection within the literature on the contributory effect of the selected implementation methods and more specifically of the supporting tools employed. Given the perspective of the writer as Implementation Manager, this presented an appropriate field of study. The literature failed to identify the significance of an implementation assessment and distinctions for selected implementation methods between projects on the basis of for example technical complexity, organisational type, cultural or quality demand considerations. There was an absence of relationship between the methods of implementation employed and the associated impacts on results.

The case study approach therefore, exploiting the opportunities of examining projects employing contrasting implementation methodologies and supporting techniques and also projects within different industry sectors; private and public, presents a suitable platform for research.

3.13 Case Approach

The writer therefore approached the case studies with a specific focus on assessing the impact of the selected method of implementation. The analysis of the projects focuses on the results experienced during the course of implementation rather than an extended analysis of post implementation benefits measurement. The value of the study is as much in identifying the methods which contribute to the efficiency and quality of implementation itself rather than in an assessment of the achievement of the long term objectives of the business change programme. Throughout the description of the cases reference is made to methods employed and issues and results arising. On a number of occasions risks emerged to the implementation projects as a result of the decisions taken and the methods employed. These are identified throughout the course of the project descriptions. The aim is to highlight the impact of selected methods and expose the contribution which they make to the determination of success or otherwise of the implementation. These are highlighted as learning points and from these a series of emerging themes is identified throughout Chapter 4, categorised within the terms **Change, Quality** and **Efficiency.**

The cases are presented from the perspective of the writer's involvement as an implementation consultant – internal for BAA with respect to the AOS and ERP projects and external with respect to all other case projects examined. In all cases the writer presents the cases from inception through to practical completion of all implementation phases. Each implementation is presented generally according to the chronological order of the activities. The reader's attention is drawn to the emergence of issues which ultimately lead towards the classification of recurring themes.

The question of action research methodology is raised as the project cases were undertaken following the establishment of the research questions and the prior identification of research parameters. It is the writer's view however that action research is not an appropriate reference for the research conducted as no direct intervention was consciously made to establish results on the basis of implementation methods. The case approach remains appropriate as had the research been undertaken retrospectively, the same procedure and basis for case examination would be employed i.e. the emerging sources of documentable implementation evidence.

3.14 Framework Development

From a consideration of the emerging themes, the writer contextualises the evidence of the case studies and prescribes a framework for implementation which extends to identifying the suitability of supporting applications.

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4. Chapter 4 – Case Project Implementation

Chapter 1 of this thesis introduced the projects, the organisations which undertook them and the relevant stakeholders involved. This Chapter documents the detail of the implementation approach, the implications for the organisations and the impact of implementation.

Following a review of the literature, detailed in Chapter 2, and an explanation of the research methodology in Chapter 3, the outcomes of the projects and a discussion of the issues emerging from the implementations are detailed in Chapters 4 and 5.

This presentation of the projects and an examination of the empirical findings are made now in this chapter (4). Chapter 4 presents the projects according to the client organisation. Section 4.1 deals with the four BAA projects examined: AOS, Enterprise, OGSM Performance Management and MATRA Operational Risk Management. Section 4.2 deals with the four PSNI projects examined: Performance Management; Operational Risk Management; Uniform Ordering Process and IT functionality specification. Section 4.3 deals with the single project examined within the Govan Initiative organisation: Performance Management.

Following the presentation of the projects section 4.4 identifies the emerging themes and creates a classification for them for further scrutiny in chapter 5.

Given the scale of the BAA projects particular detail is provided in relation to the **AOS** and **ERP** (Enterprise) projects. A review of the implementation relating to the BAA performance framework **OGSM** (Objectives, Goals, Strategies and Measures) follows. The implementation of BAA **MATRA risk** solution completes the section relating to the BAA plc organisation.

The very high profile PSNI **performance** and **risk** projects are then detailed to extend the treatment to consider public sector experience. This examination includes an account of a process redesign project relating to uniform ordering. Finally the private sector experience is described with a review of the Govan Initiative (Scottish Enterprise) performance management project.

This study compares two implementation approaches: A traditional paper based method of specifying business change, against a software supported object based and structured modelling approach.

Some of the projects examined were undertaken employing the traditional approach and others with the aid of software modelling. The following table identifies this.

APPROACH	BAA								
	AOS	ERP	OGSM Perf.	MATRA Risk	Perf.	Risk	Unif Proc.	IT Funct. Spec.	Performance
Traditional (paper based)									
Modelled (software)									

Table 4.1: Case Projects Sorted According to Implementation Approach

4.1 BAA - Change Programmes Implemented

4.1.1 BAA – The Objectives

For the purposes of establishing context, it is important to understand the nature of the BAA organisation, its objectives and the factors that influence its selection of suitable solutions. Glasgow Airport limited forms a part of the BAA organisation. It is one of the seven UK airports owned and operated by the BAA group of companies. An overview of the Glasgow Airport operation provides a reasonable description of the BAA airport companies.

4.1.2 Glasgow Airport Limited

The BAA organisation is separated into distinct business units with Glasgow Airport Limited forming one such business unit. The business is supported by functions led by central strategy teams, both at group and Scottish level with dotted line responsibilities to the business units in a matrix structure.

These support functions are:

Property
Retail
Finance
    IT
    Development
Health & Safety
Corporate Affairs
Strategy/Planning/Environment
Human Resources

The organisational structure which provides perspective to the relationship between Glasgow Airport, the other Scottish locations, the functional departments and the Scottish Airports Limited (SAL) Group company is illustrated below.

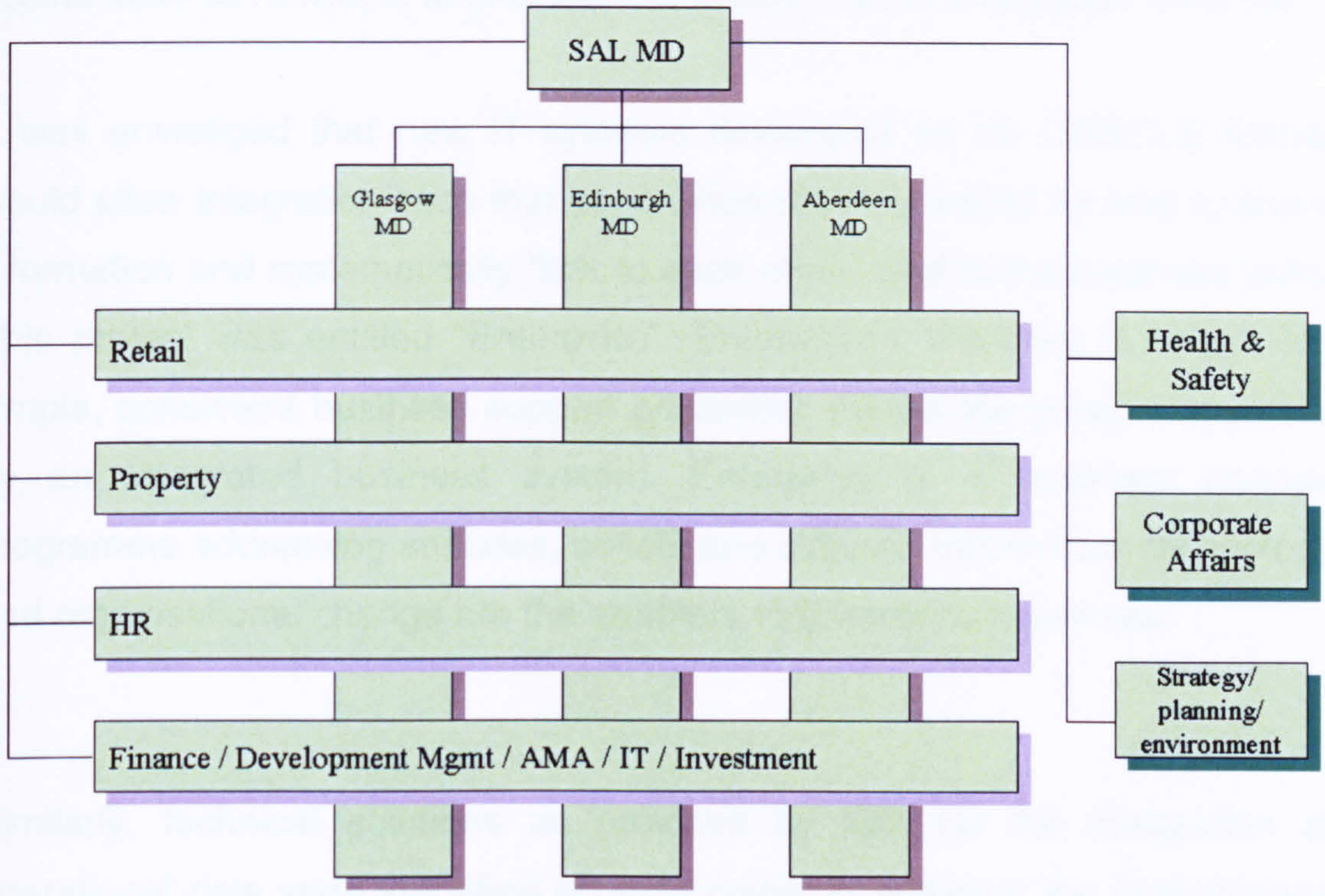


Figure 4.1: Organisational Structure of Scottish Airports Limited Operational Business Units and Functional Departments – BAA

Historically these supporting functions have operated as "silos" with no direct connection between their respective processes, systems, databases etc. There are also no direct links between these support functions and the operational business units i.e. the airports. An array of separate stand alone IT systems are in use with specific functional roles. Reorganisation of the support functions in a manner that allows integration of the respective processes has been identified as being critical to the continued success of the organisation.

In addition there was also recognition of the requirement to exploit the availability of technology solutions to increase the productivity of operational assets such as runways, aircraft stands, check-in desks, baggage belts etc.

It was envisaged that new IT systems developed on an ORACLE format would allow integration such that back office systems would be able to share information and systematically "talk to each other" and to the business units. This project was entitled "Enterprise". Enterprise's objective is to provide simple, consistent business support processes across the group, supported by an integrated business system. Enterprise is a business change programme addressing attitudes, beliefs and culture. Information technology and organisational change are the enablers to Enterprise's success.

Similarly, technical solutions as provided by IBM for the integration of operational data were identified as appropriate to enhance the performance of the operational asset base. This project was entitled AOS (Airport Operational Systems).

Both projects focussed on the delivery of new business processes. The over-riding concept which prevailed was that process follows strategy (to optimise productivity), and structure follows process. By focussing on processes, it is intended that Enterprise and AOS will challenge non value adding roles as well as the 'silo' approach to work and resolving issues. By doing this, internal customer support processes will be improved and in turn contribute towards meeting - or exceeding - the expectations of BAA's external customers.

4.1.2.1 The Airport Organisational Structure (Pre-implementation)

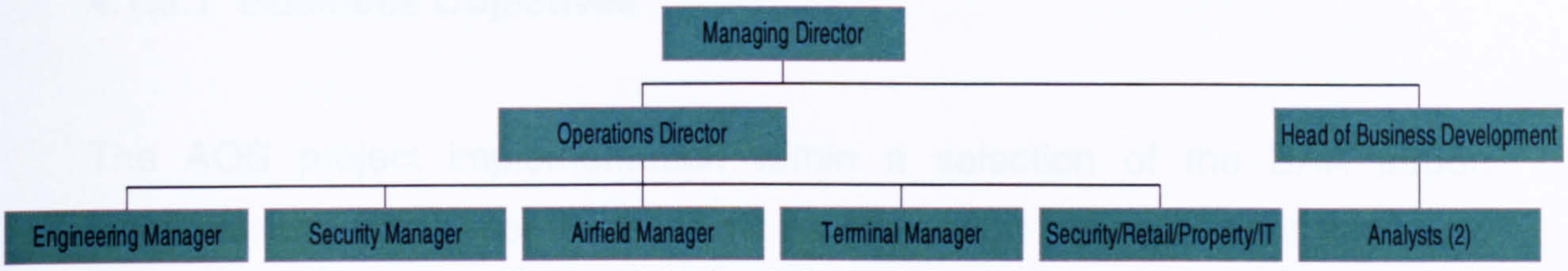


Figure 4.2: Glasgow Airport Limited Operational Department Structure – BAA AOS Programme

The structure of the organisation can be described as typically hierarchical and one based upon operational and functional relationships. This structure has prevailed within the organisation for several years and relies almost entirely on the cascade of objectives and policy from top to bottom through the operational silos.

Glasgow Airport is structured in a manner consistent with all other BAA UK airports impacted by AOS, Enterprise and established business performance and risk management methods.

There are a number of core operational departments; Airfield Operations, Terminal Management, Security and Engineering. In addition there are some smaller semi-operational resources such as retail and commercial property. Each department is responsible for repairing and managing revenue and capital expenditure budgets within a corporate framework of approval protocols.

Glasgow Airport Limited as an organisation has a staff complement of approximately 500 a turnover of approximately £70M and a net profit of approximately £20M.

4.1.3 AOS – Airport Operational Systems Integration

4.1.3.1 Business Objectives

The AOS project implementation within a selection of the BAA airport locations was completed over an 18 month period between April 2000 and November 2001. The implementation of the project at Glasgow followed that of Stansted and Edinburgh airports. The duration of the Glasgow implementation phase was 3 months; August 2001 to November 2001.

The main business objectives for this project in Glasgow were to:

- Deliver quality flight data and information to all airport users including passengers, meeters & greeters, airport and airline staff, and handling agents;
- Encourage information exchange between business partners;
- Optimise the use of landside and airside resources;
- Provide a solid foundation of timely, validated flight data;
- Provide a vehicle for business change;
- Facilitate the improvement of the business process for Operational tasks;
- Improve service to airport customers;
- Reduce the risk to the business by way of increased reliability;
- Establish a standard set of AOS products for implementation across BAA;
- Derive technology benefits with the implementation of common systems across BAA;
- Provide a technologically stable system;
- Develop an interface between the IVR (Interactive Voice Recognition) system and AOMIS (Airport Operational Management Information System);

- Implement a new FIDS (Flight Information Display Screens);
- Implement a new SIS (Screen Information System);
- Develop a system which assists an effective commercial provision for third parties.

4.1.3.2 Summary Project Recommendations

In November 1997 the BAA Airports Committee approved a strategy to implement a commercial, product-based Airport Operational System (AOS) in BAA. It was agreed that a recognised systems integration company should be contracted to deliver a product solution to the airports. IBM won the tender process and successfully delivered AOS to Stansted Airport during 1999.

The overall group programme was co-ordinated at BAA Group level with local Project Board and Project Managers being responsible for implementation at each site. The writer undertook the role of Programme Implementation Manager for Glasgow Airport.

AOS was a business-driven project involving change of the core operational business process. The project incorporated the new computer system as a tool to facilitate business improvement. The implementation approach was based on fully understanding the existing processes and ensuring close integration between the new product's functionality and any new processes that were to be defined.

4.1.3.3 Project Dependencies

The main AOS database was reliant on the provision of quality flight data from a number of sources including NATS (National Air Traffic Services), SITA (Societe Internationale Telecommunication Aeronotique), ACL, plus British Airways and other airlines/Handling Agents. Successful completion was dependent on the willingness of the business and wider airport community to accept and manage change in Airport Operations.

4.1.3.4 Preliminary Project Context

The AOS scope concerned those airport functions directly associated with the monitoring and processing of aircraft movements and passengers. This also involved the planning and allocation of the airport's associated resources. The original scope is outlined in the diagram below.

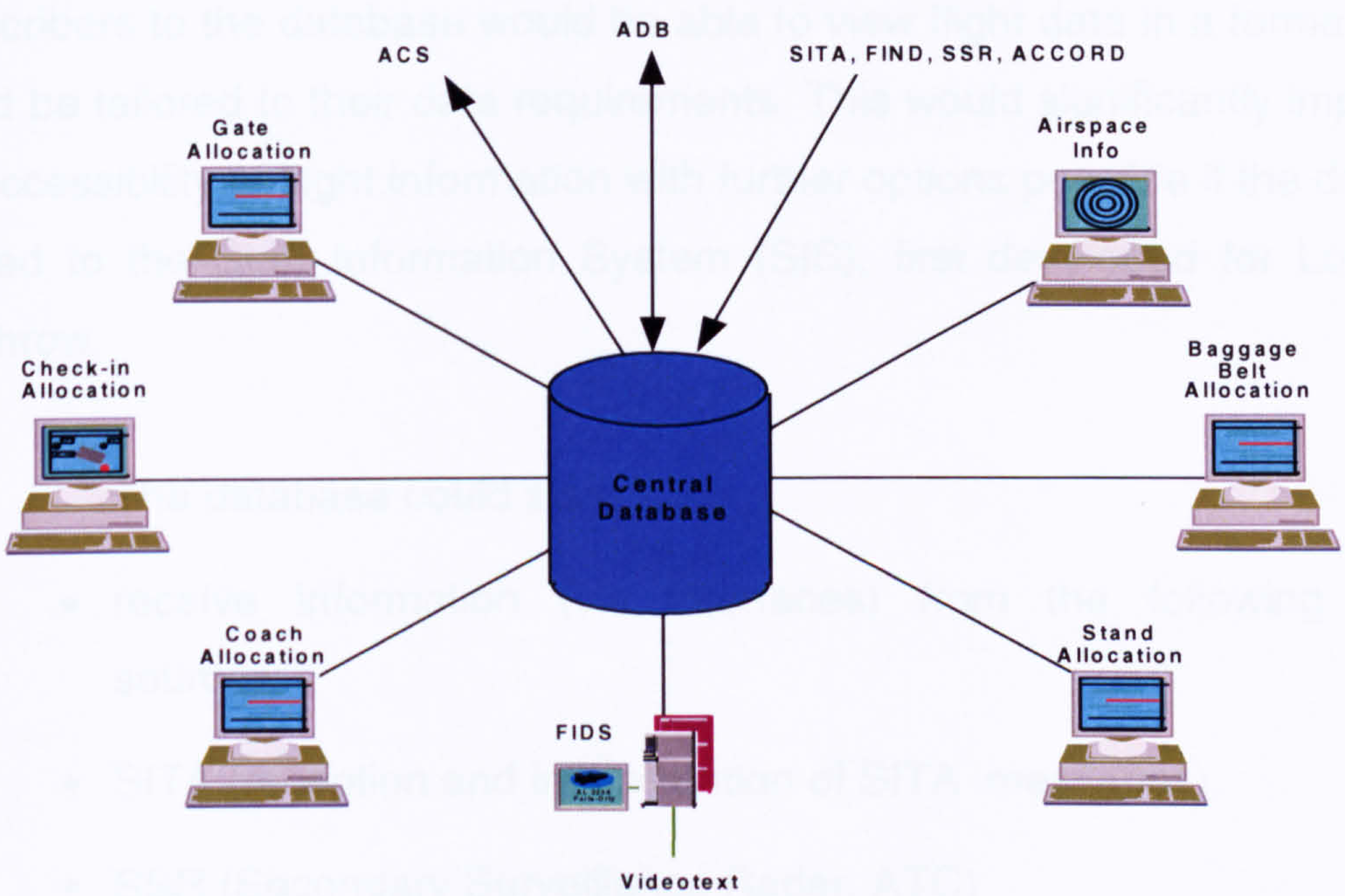


Figure 4.3: AOS Functionality

A core central database stored flight details from the time a movement was scheduled until after it had been completed. In order to do this the database maintained records associated with:

- aircraft flight movements;
- aircraft ground movements;
- passengers, cargo, mail and baggage;
- flight schedules;
- airport resources, their allocation and status;
- aircraft status;
- aircraft and airport reference data.

The database served as the basic "building block" of information for Airport Operations and, given its importance, was appropriately resilient.

Subscribers to the database would be able to view flight data in a format that would be tailored to their data requirements. This would significantly improve the accessibility of flight information with further options possible if the data is passed to the Staff Information System (SIS), first developed for London Heathrow.

The database could also:

- receive information (via interfaces) from the following data sources:

* SITA (reception and interpretation of SITA messages),
* SSR (Secondary Surveillance Radar, ATC)
* ACCORD (Schedule information from Airport Co-ordination Limited),

- provide information to, and receive information from, the following applications and interfaces;

* ADB (BAA Airports Database - aircraft and airports reference database),
* Aircraft Stand Allocation,

- distribute information to the following subscriber applications / systems;

* ACS-FAS (Airport Computing Suite – BAA invoicing information),
* Teletext services.

Future development options included:

- Interface with BA's FIGARO system,
- Other Business Partners' in-house systems (e.g. Handling Agents'),
- Check-In Desk Allocation,
- Gate Allocation,
- Coach Allocation,
- Baggage Belt Allocation (as a function of FIDS).

After a functional review, the scope for the AOS implementation at Glasgow was defined and is as shown below.

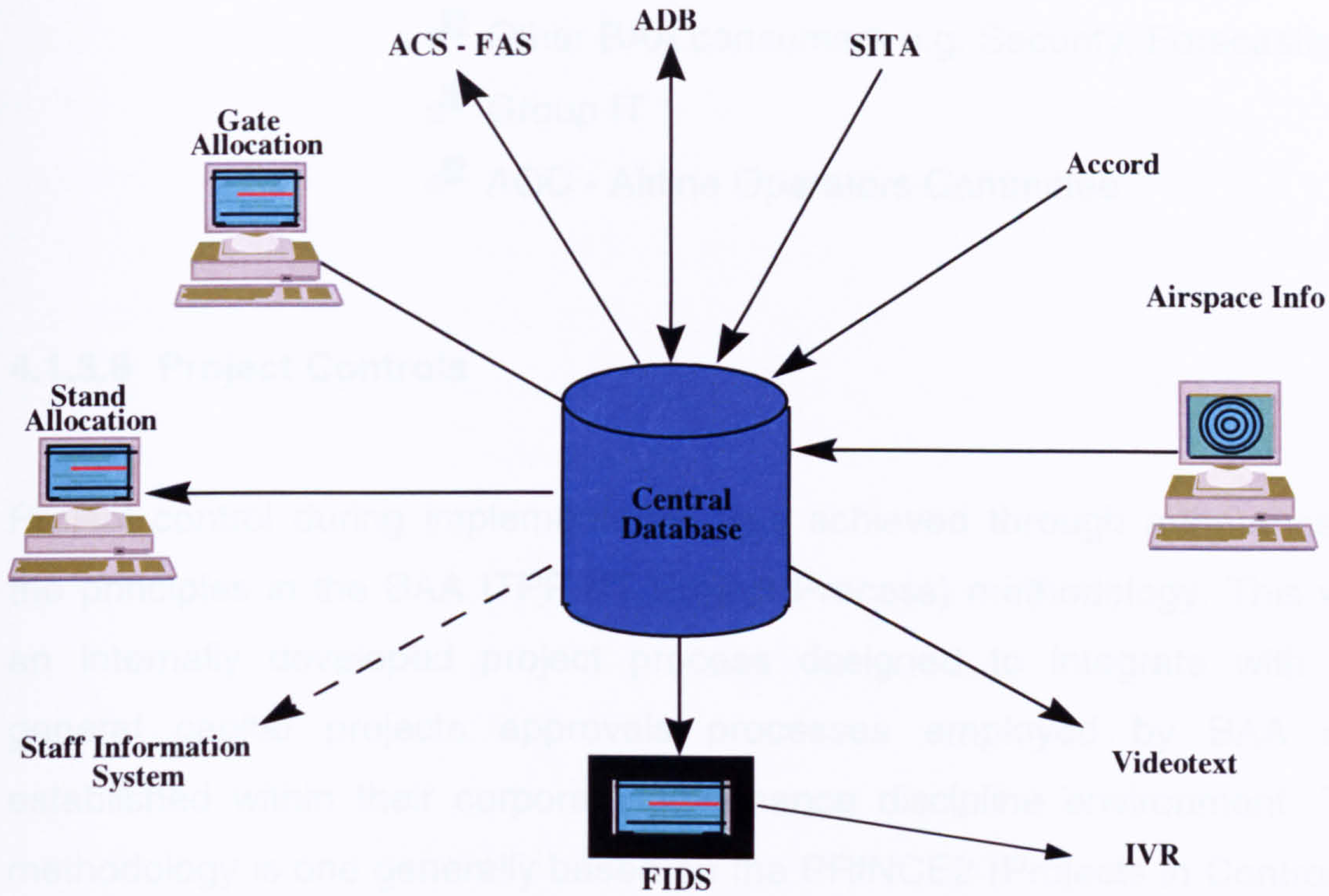


Figure 4.4: Refined AOS project functionality schematic

4.1.3.5 Stakeholders

The stakeholders identified with an interest in this project are listed below. This offers some perspective of the breadth of organisations impacted by the process changes.

- Passengers / Meeters & Greeters
- Airlines
- Handling Agents & other airport based organisations
- NATS / CAA
- Airfield and Terminal Operations
- Control Authorities (Police, HMI etc)
- Retailers / Concessionaires
- Finance
- Audit

- Other BAA consumers e.g. Security, Forecasting
- Group IT
- AOC - Airline Operators Committee

4.1.3.6 Project Controls

Project control during implementation was achieved through adherence to the principles in the BAA ITPP (IT Project Process) methodology. This was an internally developed project process designed to integrate with the general capital projects approvals processes employed by BAA and established within their corporate governance discipline environment. The methodology is one generally based on the PRINCE2 (Projects in Controlled Environments) Methodology.

4.1.3.7 System Controls

The recording and presentation of flight data is time and business-critical. Maintaining this service to the business necessitates a high availability solution taking advantage of resilient hardware, software and the new network infrastructure.

The automation of data input is intended to make the data available as soon as possible. Achieving this requires powerful parsing software to handle the volume of incoming data and to ensure its validity. An example of how this would contribute is through the consideration of turn around times. The capacity of an airport to cater for ATMs (Air Traffic Movements) is determined by a number of factors, one of the significant ones being the time for an aircraft to arrive on a stand, be serviced, load new passengers and then taxi for departure. The servicing of an aircraft requires the attention of several third parties: cleaners, baggage handlers, passenger services, fuellers, caterers, buses and possibly control authorities such as HM Customs and Immigration or Special Branch. AOS will provide the capacity for these parties to know exactly which stand the incoming aircraft has been scheduled to reside twenty minutes before it has arrived. This means that by the time the aircraft arrives on stand the servicing community will be in attendance. Quicker turnarounds mean more turnarounds and subsequently increased capacity for the same asset base.

Business processes had to be established to monitor the quality of incoming data from all its sources and to encourage improvements from suppliers.

4.1.3.8 Budgetary Constraints

The AOS budget that covers the system development and core team costs is held centrally and was, upon implementation levied as a lease charge from group IT. The total developmental and central infrastructure costs plan for all locations was defined as £16M approx. In addition to this Glasgow Airport developed a local cost plan for implementation (provision of local hardware and infrastructure) which was owned by the local Project Board and managed by the Project Manager. This local budget was approximately £450,000.

4.1.3.9 Time Restrictions

Cut-over to live operation was planned for 30 November 2001 at Glasgow Airport. The implementation phase locally was completed in three months.

4.1.3.10 Technology Considerations

Individual NT PC workstations built to a BAA standard and monitored using the Tivoli System Management System. The GLAL (Glasgow Airport Limited) network infrastructure would prove to be an important factor of the detailed design. Capacity and resilience were recognised as more than sufficient for requirements but access to more remote locations would have an impact on the expectations of users and the business.

Realisation of the full benefits of AOS was dependent on increasing the automation of data input to the system. This had been thoroughly tested at Stansted but had to be repeated at Glasgow to allow for local conditions and practices. The successful engagement of 3rd parties and the interfacing of their systems would also determine the success of the project.

4.1.3.11 Precondition

IBM was the prime contractor. They were contracted to deliver an integrated suite of business applications together with the appropriate hardware environment, levels of training and ongoing support to ensure successful implementation and continued operation. They were also responsible for producing guidance on process and activity flows. This information was provided as paper based documentation. Following this, each location, Glasgow included continued to produce process related information in the same manner e.g. all activity flows were prepared in consultation with stakeholders using 2-dimensional “process mapping” applications i.e. Microsoft VISIO®. This material was shared with all relevant third party business partners during communication workshops. It is important to note at this point that no visual or practical demonstration of the processes or the infrastructure was provided either to the third parties or the internal operational management team of Glasgow Airport. Assessments of requirements and “how it would really work” were based on verbal and written descriptions from the central IT and IBM teams. Relating this to the earlier definition of business processes in Chapter 2, we find that the implementation project was not in fact process led, but was resource led i.e. the business processes were developed as a response to the supporting resources which were pre-defined, pre-developed and prior procured. In other words the RE-Engineering of operational business processes was defined first of all by the GREEN layer i.e. data flows, then subsequently by the BLUE layer i.e. IT applications and organisational resources and finally by the documentation of the process activities themselves; the RED layer.

4.1.3.12 Recommended Delivery Option

The 1997 Concept Study that was commissioned to research the issue of operational systems integration considered various options for delivery:

- enhancing existing systems - limited in their scope for growth or as flexible tools to facilitate business change;
- custom-built - long development time and high cost if maintenance
- off the shelf - requires flexibility in the product and in the business processes and assumes maturity of product and provider with a minimum of customisation.

Given the timescales involved and the intention for AOS to serve as the basis for future Operations applications it was agreed that a commercial, off-the-shelf package would be implemented.

4.1.3.13 Proposed Technology Infrastructure

The BAA IT Group established a standard of IBM RS6000 Unix servers for the data storage and handling of operational flight data. The particular models installed were the basis for a server-based hardware environment that fits into the developing IT infrastructure for Scotland. This provided the foundations for:

- a data centre approach to IT management;
- a mix of servers suitable for the capacity requirements for AOS in Glasgow and the rest of Scotland;
- associated NT Servers (as appropriate) for high demand applications such as resource allocation.

4.1.3.14 Impact and Risk Assessment

Glasgow Airport's local management team developed a vision of what improved flight information and communication can provide for the airport. Managing that expectation, therefore, is an important issue to ensure the basics are understood and established. Maintenance of quality must be assured before additional decision-based applications can be considered.

The most visible impact of AOS at Glasgow Airport Limited (GLAL) is the new Airport Operational Management Information System (AOMIS) and Airport Resources Information System (ARIS) systems. The new systems provided better Stand planning facilities and better communications across the Business Unit. This is counteracted by the natural resistance to change and the willingness of business partners to support AOS, both during the implementation programme and once fully operational.

Areas of business risk included:

- the failure to maintain an effective business relationship with the supplier (IBM);

- the failure of the business to adapt business processes to an established product set.

The specific project risks included:

- limited scope for improvement of business processes;
- increased maintenance costs to support out of date systems;
- decreasing levels of customer service;
- increased pressure on terminal and airfield resources;
- information bottlenecks still reliant on telephone communication;
- continued reliance and use of ACS - FIS;
- non realisation of a common set of IT products;
- non rationalisation of IT support arrangements;

4.1.3.15 Identifying the benefits of AOS

AOS was designed to manage flight and airport asset information more effectively by integrating the various sources of data, improving its quality and the speed with which it is delivered. A business case was developed in order to validate the capital spend at Glasgow Airport. This was developed following a workshop. The workshop was attended by the implementation team, including the heads of operational departments, the Location Implementation Manager (the writer) and the AOS Process Implementation Manager for Scotland. The workshop was sponsored by the Project Board Chairman i.e. Operations Director, Glasgow Airport Limited. The following benefits were identified during the business case development workshop.

- AOS will improve utilisation of assets and resources:

⇒ defer capital expenditure (e.g. interest saving on deferring a £20M check-in expansion = £2M pa).

- AOS will enable the journey of the passenger through the airport to be better planned and controlled
  ⇒ that will provide passengers with a better experience of the airport and provide opportunities to target passengers commercially?

- Automation of manual tasks (e.g. stand planning and check-in allocation) will generate resource efficiency gains
  ⇒ this may result in staff undertaking higher value tasks
  ⇒ this may result in cost savings (further work required to quantify)
  ⇒ any savings achieved may have to be measured against the 'do nothing' position and would be realised incrementally by not having to recruit staff as the business grows.

- AOS may be the catalyst for creating a call-centre where up to 8 functions may be grouped in a single location.
  ⇒ this generates staff savings, space savings and communications benefits.

The prospective benefits to Business Partners and 3rd Parties delivered by the implementation were outlined as follows:

- Retailers:
  - provide flight information to enable caterers and shops to target services to suit specific flights.
  - advertising on FIDS can be targeted to specific flights.
  - provide taxis and car hire companies with better quality flight information to enable them to provide an improved service.

- Airlines & handling agents
    - provide improved quality of flight information.
    - may allow them to have single point input of all their flight information.

- Control Authorities
    - better quality flight information will enable them to improve management of resources for flights.
    - their may be specific benefits to Special Branch for profiling target flights.

- The following generic companies may benefit from having a source of real time accurate flight information:
    - Aircraft fuellers
    - Aircraft cleaners
    - Hotels
    - Tourist Board
    - Travel Agents
    - Taxis
    - Chauffeur companies
    - Off-airport car parks
    - Cargo/freight trucking companies
    - Local radio (currently telephone the ADM daily)
    - Rail & bus companies
    - Football stadiums
    - Special events (SECC)
    - Oil companies (for onward travel information)
    - Other airports

Technology Benefits

- Consolidating servers in one location may lead to a reduction in local support costs (to be identified by SAL IT)

The business case (and the financial plan) was developed on this fixed snapshot view of how the processes would be implemented, and the likely roles being filled according to the early plan.

- AOS will enable better understanding of asset utilisation and may ultimately facilitate improved management of pax flows through the airport building.
  - ⇒ This will result in improved utilisation of our assets (e.g. improved stand utilisation, departure lounge and gate allocation) and improved customer experience.
  - ⇒ This will result in deferred capital expenditure and less management time spent in dealing with customer complaints.

- AOS will reduce "leg work" for the ADM and better quality information will mean less likelihood of errors.
  - ⇒ This will enable the ADM to proactively manage airport operation which in turn may improve customer experience.
  - ⇒ This will result in less management time spent in dealing with customer complaints.

- AOS will reduce manual inputting for Airfield Operations Department and less phone calls will enable them to focus on airfield safety
  - ⇒ This may result in less likelihood of incidents occurring and consequently reduce the cost (to BAA and its business partners) of investigating incidents.
  - ⇒ In the long term this will lead to a reduction in insurance costs to BAA and its business partners.

- AOS may be the catalyst for creating an airport operations control centre where all BAA and perhaps business partner operations are consolidated.
  - ⇒ This would facilitate a reallocation of operational tasks to improve productivity of operational staff (both BAA and business partners).
  - ⇒ This may reduce office space requirements.

- AOS provides better information to ramp handling agents and other ramp contractors which will enable them to better plan their activities
  - ⇒ This will result in a reduction in vehicle movements on the apron that in turn will reduce likelihood of apron incidents.
  - ⇒ This will improve business partner productivity and reduce their operating costs.

- AOS reduces manual inputting of information by Customer Services staff and will deliver better quality information
  - ⇒ This will enable a better service to be delivered to customers (prompt attention and more accurate information about flights).
  - ⇒ This will result in less management time spent in dealing with customer complaints.

- AOS provides better quality and more timely data to Finance which in turn will enable Finance to speed up invoicing
  - ⇒ This will result in an improved cash flow position.

- A number of tasks currently undertaken by separate departments will ultimately be undertaken within a single Operational Control Centre.
  - Stand allocation is undertaken by Airfield Operations on nightshift.
  - Check-in allocation is undertaken by the ADM (Airport Duty Manager) on nightshift.

- Bus allocation is undertaken by the ASU (Airport Services Unit) Supervisor with very poor quality information.
- The Airlines and Airfield Operations undertake gate management/allocation.

- Operational control centre - will ultimately undertake multi-functional tasks including:
    - stand planning
    - check-in allocation
    - bus allocation
    - Gate management/allocation
    - PBX
    - Reclaim belt allocation
    - CEM monitoring (Security Access System
    - BMS monitoring (Building Management System)
    - Fire alarm monitoring

⇒ Once stand allocation was undertaken by the control centre, the number of staff required in airfield operations could be reduced by 5No (£110k). This saving was realised by not recruiting additional staff as the airport grew.

⇒ Other benefits were accrued from efficiency gains as the ADM (Airport Duty Manager) was released to do better quality tasks.

- The Operational Control Centre will be staffed by: ADM, TDO (Terminal Duty Officer), Fire SO (Station Officer), SD Eng (Shift Duty Engineer), Airfield Operations Controller, Control Centre and Call Centre staff.

4.1.3.16 Learning Points from Previous Implementations

Edinburgh Airport had preceded Glasgow Airport in the implementation of the AOS systems and process changes. Observations from the post implementation review which were relevant to the Glasgow Airport project included;

- The Information Desk staff (19) that previously carried out customer services and PBX duties were redeployed to the Edinburgh Airport Operational Control Centre earlier in the year (2001). The Tourist Board was contracted to man an Information Desk that provides both airport information and tourist information to customers. This generated a saving of £50K pa.

- The new Operational Control Centre function was not yet fully effective as it did not have the tools or quality of information that was anticipated to be delivered by AOS. This makes resource planning particularly difficult. It was estimated that this was costing Edinburgh Airport Limited £100K pa in additional overtime costs. Additionally the customer service benefits of AOS were not being delivered. This was due to confusion and subsequent dispute between stakeholders surrounding responsibility for the inputting of flight information.

- Further savings may be achieved by consolidating call-centre, stand planning and check-in allocation in one location. The modules of AOS had been implemented as discreet processes. On reflection this was viewed as an avoidable weakness of the implementation approach. Greater efficiencies could have been obtained by adopting a bigger picture view of the entire operational process model.

- Notes:
    - It is essential that all SAL (Scottish Airports Limited) airports jointly understand and sign-off the configuration of AOS and not rely on

the implementation of a collection of individual processes as discreet elements.

- The AOS report writing/generation function needs to be confirmed. This had not been clearly understood from the supplier documentation.
- The real benefits of stand planner will only be achieved if it is linked to pushback despatch systems otherwise Airfield Ops will have to continue manually inputting times of aircraft off stand. A full assessment of this area had not completed as there was a lack of clarity surrounding the workload related to these activities.
- The real benefits of check-in allocation will only be realised when Terminal Duty Manager receives actual load factor information.

4.1.3.17 3rd Party Responsibilities

AOS enabled a number of changes to the role played by third parties at each airport. With AOS there is the potential to transfer responsibility for entering and validating information on flights to third parties such as the airlines or their handling agents on their behalf. Much of the information would then be used for public display and charging.

Previously this role had been played by BAA operational departments on a real time basis with information gathered by various manual means. Transferring this role to third parties was key to the success of AOS and a change which was vital if the benefits of AOS were to be fully realised. As such the strategy which ensured third parties bought into the principle of AOS, the role which they would play, and the commercial arrangements to be agreed were paramount.

The ***communications*** strategy developed for the AOS project discussed the proposed strategy for communicating AOS to third parties in particular.

The strategy employed was fourfold:

Stage 1 - Identification of stakeholders

Planning sessions were held at each of the 3 Scottish locations which have identified key stakeholders for AOS.

Stage 2 - High level buy - in

High level buy-in was essential at an early stage to allow local discussions to take place. The approach taken to ensure high level buy-in was as follows

- Letters sent from MD/SAL (Managing Director/Scottish Airports Limited) which describe the AOS product and invited third parties to attend meeting, and to have individual briefings.
- A visit to Stansted where AOS is already implemented was planned which allowed third parties to see AOS in operation. Both BAA and third parties users of AOS were included in the visit. A key element of the day was the time with third parties who had all bought into AOS.

Stage 3 - Local level briefings

- Local briefings at each phase II airport with third party station managers to discuss AOS in more detail, the role of third parties, commercial arrangements and names of super users and those requiring training.

Stage 4 - Active involvement with process definition

- The active involvement of third parties in process definition and validation
- The requirement for third parties to sign-off AOS processes.

At each of these stages it was important to provide a common approach so that appropriate messages were given. It was also important to fully understand the third parties specific roles, the change this would mean from the current process, background to their operation at the airport, likely benefits to the third party (e.g. reduction in manual communications with BAA operations and access to a better level of information) and any impact on the conditions of use/licenses for their operation at each airport. Briefings were also arranged with local management, Finance Director/SAL and MD/SAL regularly to ensure the appropriate message was given.

Stakeholder Analysis/ Risk Analysis

As discussed above the buy-in of third parties is essential to the success of AOS and the ability to redefine operational processes and to achieve the benefits which AOS potentially enables. It is also important to recognise that AOS will generate additional work and responsibilities for third parties. The objective however is that this will be limited if the reliability of the automatic interfaces can be proven.

If third parties objected to AOS the system would still be implemented. The benefits and effectiveness of AOS however would not be fully realised. The risk therefore was not a programme risk but a business/system effectiveness risk.

The key stakeholders were those identified with a role in system data entry such as flight numbers, aircraft registration etc. and until high level buy-in was secured the business/system effectiveness risk is HIGH.

Following the visit to Stansted a third party risk register was prepared in order to fully analyse the risk for individual third parties. This was further expanded when process definition reached a developed stage and third party roles became defined.

Summary

In summary the key elements and proposed timescales for ensuring third party buy-in to AOS were conveyed in the following table.

Stage	Description	Target date	Target/likely risk status	Additional notes
1	Identification of stakeholder	1 Dec 99	HIGH	Completed
2	High level buy-in	24 Dec 99	HIGH	Letter sent from MD/SAL
	3rd party visit to STN	24 Jan 00	Medium	Risk register prepared on individual third parties
3	Local level briefings	1 March 00	Medium	May be possible to reduce to low

				depending on outcome of specific consultation
4	Involvement with process definition	28 March 00 TBC	Medium/Low	Low status dependant on outcome of sessions
5	Sign-off of AOS processes	1 June 00 TBC	Low	3rd parties to accept new role at this stage

Table 4.2: 3rd Party engagement activity schedule – BAA AOS project

The success of the communications strategy was identified as critical to the success of the project, particularly the communications related to 3rd party stakeholders. The operational sustainability of the AOS platform relied upon 3rd parties contributing routinely to the activity schedule of the processes. The activity flowcharts developed during the process definition workshops recorded the step by step procedures and systems application specification. These flowchart documents proved a major communication mechanism and formed the basis for the 3rd parties' interpretation and perception of the new processes prior to systems training.

4.1.3.18 AOS Project Approach

The project was undertaken within strict timescales and followed a very well defined project management methodology. Strict procedures and protocols were in place in relation to stakeholder sign off, capital allocation and change control.

The local management team was required to establish a local project board. This was chaired by the Operations Director and included the heads of all operational departments. The terms of reference of the project board were as follows:

- The Project Implementation Board is responsible for identifying local roles and responsibilities. The Project Implementation Board reports to the AOS Phase II Steering Group and acts as the first filter for any change requests.

- To identify opportunities for process, commercial and technology benefits from AOS and ensure these benefits are ultimately delivered.

- To fully involve business partners in the implementation of AOS and ensure they are given the opportunity to benefit from the AOS product.

- To deliver AOS into Glasgow Airport within the agreed Phase II programme, whilst maintaining business continuity.

- Deliver AOS into Glasgow Airport within the approved Cost Plan.

The end position of the project was much more easily identifiable at the outset even though no structured model was prepared. Activity flow information was provided in graphical form, developed within an environment which included all stakeholders, and the technical architecture was well developed as a standard, generic reference model in advance of the engagement of the local implementation team or third party business partners. This element of the implementation approach, particularly the collaborative preparation of the business process flow information and its communication to stakeholders, is consistent with the recommendations contained in the literature regarding the comprehensive education of system users in the completion of tasks and in the understanding of the end to end process.

No Change Management activities or resources were prescribed for this project despite the extensive behavioural and process changes which would result. On the contrary the project was presented as a necessity to maintain a competitive market position. BAA ensured engagement of third parties by imposing contractual relationships for the rental of AOS related IT infrastructure. The investment in AOS was designed to benefit all stakeholders and therefore considerable onus was placed on third parties to make a contribution to their implementation in terms of revenue funding on an annual basis and also in terms of the routine population of required operational data. The stark reality of non-engagement was also made clear during the "consultation" phase of this project.

Legacy systems would be withdrawn so basically if third parties refused to engage in a commercial relationship they would have no access to flight information and would find it practically impossible to maintain the required standards of performance to which they are contractually bound. This formed a compelling argument but also presented an example of starkly clear and unambiguous communications regarding the "To-Be" business process environment.

The approach was highly effective, and commercially very efficient. The key points are drawn out in Chapter 5's review of the project outcomes. It is important at this stage to note the difference from the more "softly, softly" approach of the Enterprise programme. This approach enabled change by appealing to the very core sensitivities of the stakeholders. For internal operational staff it was about "saving jobs" by increasing efficiencies and for third parties it was about safeguarding their business, improving the service they were able to provide to customers and being more efficient in the process.

The project disciplines were strict, the project governance structure firmly established, they included limited local flexibility and allowed limited scope or tolerance for variation from documented processes. The Risks and Issues process was clearly set out and managed within the confines of the project process. The project documentation, from process specification through to data models was clearly established. There was little capacity for flexibility within this particular change model.

Generally the approach was must stricter than that applied to the Enterprise ERP implementation. The role of the organisation was much more dominant in its behaviour and patriarchal in the specification of "how it was going to be". The point is worth repeating however that the approach towards specification of re-engineered business processes was very much "bottom-up" i.e. GREEN layer – BLUE layer – RED layer. The definition of new ways of working was anything but a clean sheet exercise but a response to a strict definition of IT hardware configuration and software application functionality.

The issues from the project referred to above all share the common feature of emerging from a poor understanding by the combined stakeholder community of the business processes in detail. Few issues emerged relating to the operation of IT applications or the technical performance of the supporting hardware.

The challenge however which the approach does not efficiently address is that of **sustainability** and **quality** control. Immediately following implementation the business operated with new business processes, adequately supported by a manually documented specification of supporting resources. The specification included references to roles and tasks. As the business asset base develops and as staff turnover occurs, variations at each operational location will impact upon the specification and variances will occur in contrast to the specified model. The absence of a sustainable central model as a control source of process support documentation prevents the organisation from maintaining a sustainable monitor on how the new processes are being supported and operated.

4.1.4 "Enterprise" Business Processes

Enterprise is the BAA generic project term for the ERP (Enterprise Resource Planning) implementation. The integration of back office business processes is structured around three business process areas:

PDB – Plan and Develop the Business
AMA – Acquire and Maintain Assets
RDMP – Resource Develop and Motivate People

4.1.4.1 PDB - Plan and Develop the Business

This process area employs a full life cycle approach to strategic business planning. Risk and investment modelling is used to determine revenue, capital investment and funding decisions. In addition, it includes flexing and scenario building capabilities to yield a comprehensive understanding of the impact of changes and new budgetary proposals on the overall asset development and maintenance programme. A forward looking approach to business planning and capital investment is an ongoing activity, enabled by the availability of relevant, consistent information in a timely manner, thereby avoiding large amounts of re-work within the planning cycle.

The PDB processes are supported by users employing a number of tools interfacing with the same ORACLE database. The modules are designed to facilitate the requirements for data handling for activities related to business planning, capital investment, revenue budget management and reporting. The diagram below illustrates the arrangement and main connectivity relations between the modules.

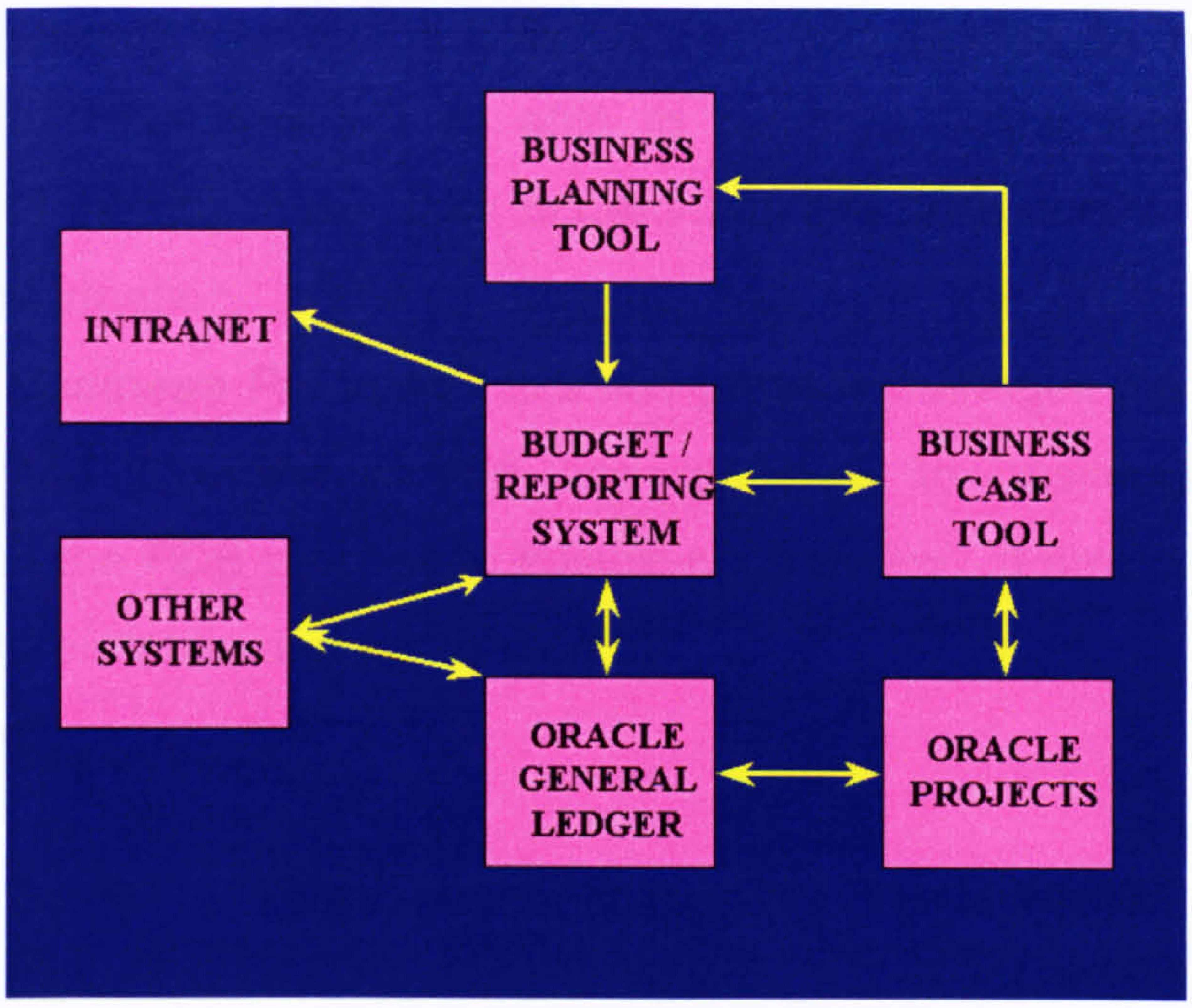


Figure 4.5: PDB Modules and their connectivity relations

PDB comprises the following sub-processes:

- ***Business Planning*** - this is where each level of the business sets its goals, derives a strategy through which the goals will be achieved, evaluates options for delivering the strategy and finally develops the preferred options into a Business Plan. Work on business planning will lead to the creation of one single business plan at the UK Airports level.
- ***Generate Guidelines*** - this refers to the production of a set of guidelines for business planning. Guidelines will be used to provide advice to the airports business, at all levels, and will be integral to the development of group wide strategies. Parameters will be set to ensure that business plans meet statutory and regulatory requirements, and will detail opportunities and threats to the business. Managers must use this information to make sound commercial decisions, in areas where it is necessary to consider regulatory, statutory and economic issues.
- ***Manage Review and Report Performance*** - this involves the reporting of actual performance (both financial and non-financial) and projections

based on trend information. By having open access to performance information, managers will be able to compare actual versus planned results and thereby make quick decisions based on accurate, current and concise information.

- ***Manage Business Planning*** - this sub process manages the whole PDB process and provides support and guidance to business managers throughout the PDB process to ensure consistency. It provides guidance on the interpretation and application of

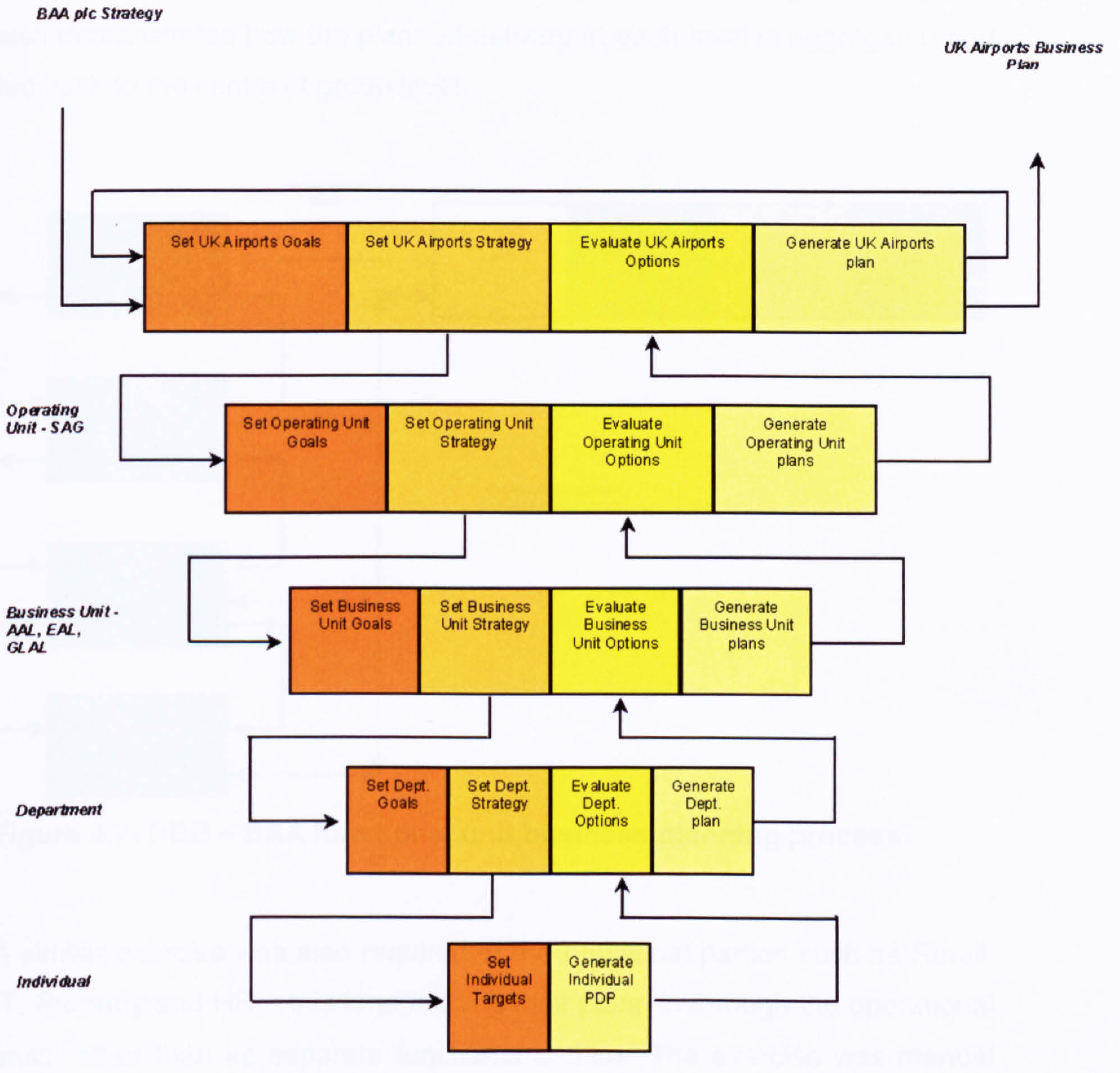


Figure 4.6: PDB – BAA business planning process – BAA Enterprise Programme Communications

guidelines, provides assumptions to ensure consistency between plans, sets timescales for completing plans and reviews and ensures they are met, ensures long term company objectives and strategic plans are set, ensures medium and short term business plans are aligned to strategic goals, monitors the effectiveness of the PDB process through KPI's. The diagram above illustrates the cascading nature of objectives and targets setting and also demonstrates how the planned delivery at each level is aggregated and fed back to the centre at group level.

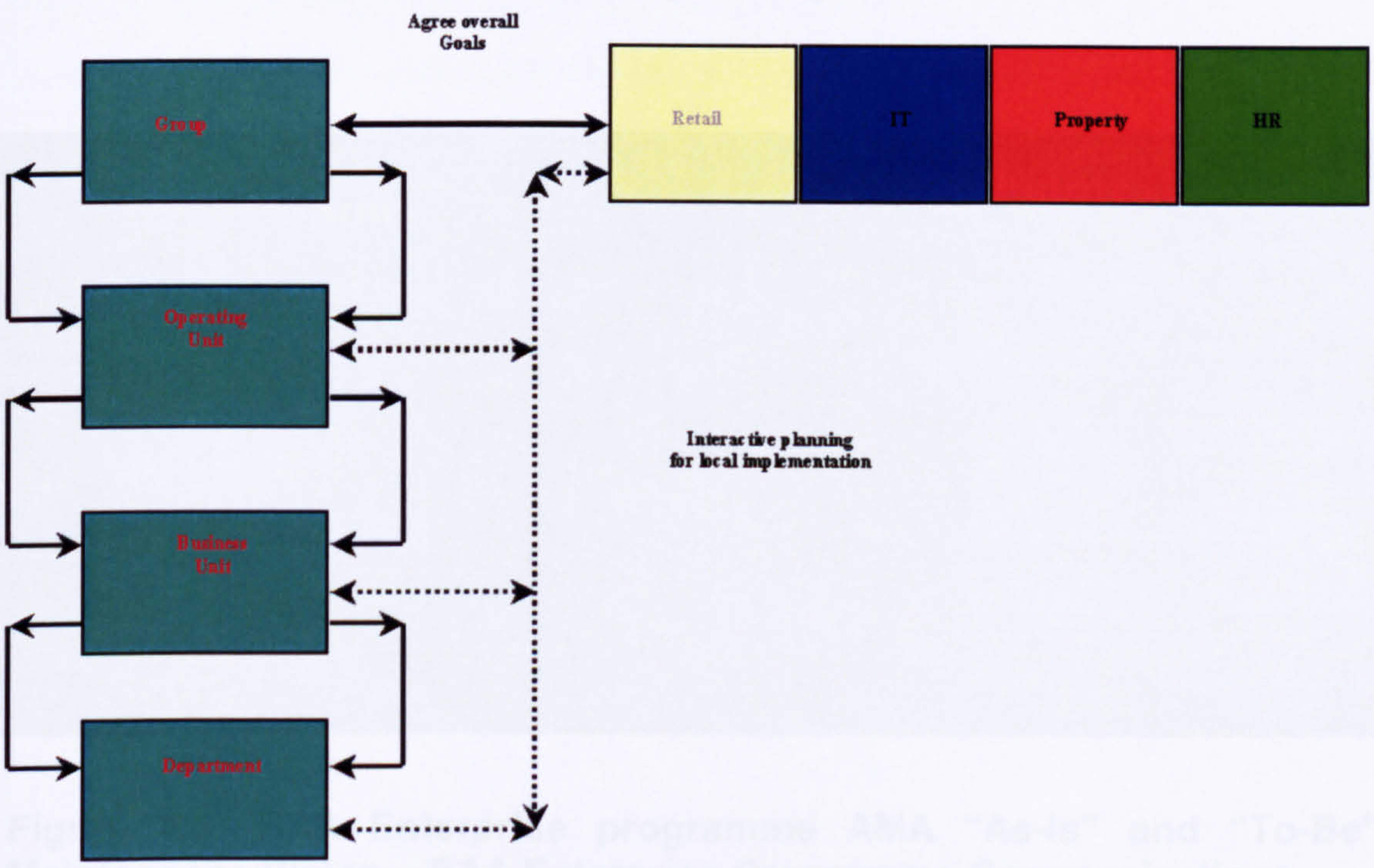


Figure 4.7: PDB – BAA functional unit business planning process

A similar exercise was also required of the functional parties such as Retail, IT, Property and HR – this time feeding their plans in through the operational units rather than as separate functional entities. The exercise was manual and required the consolidation of business plans conforming to often inconsistent templates.

4.1.4.2 AMA - Acquire and Maintain Assets

BAA as an organisation is an asset focused organisation. The maintenance and development of that asset enables its continued capacity for completing business. As a result BAA invests heavily in the procurement internally and externally in Engineering services and maintenance products. It is important that this is achieved as effectively as possible.

The following illustration describes the desired change in focus targeted by the Enterprise programme for the Engineering maintenance function.

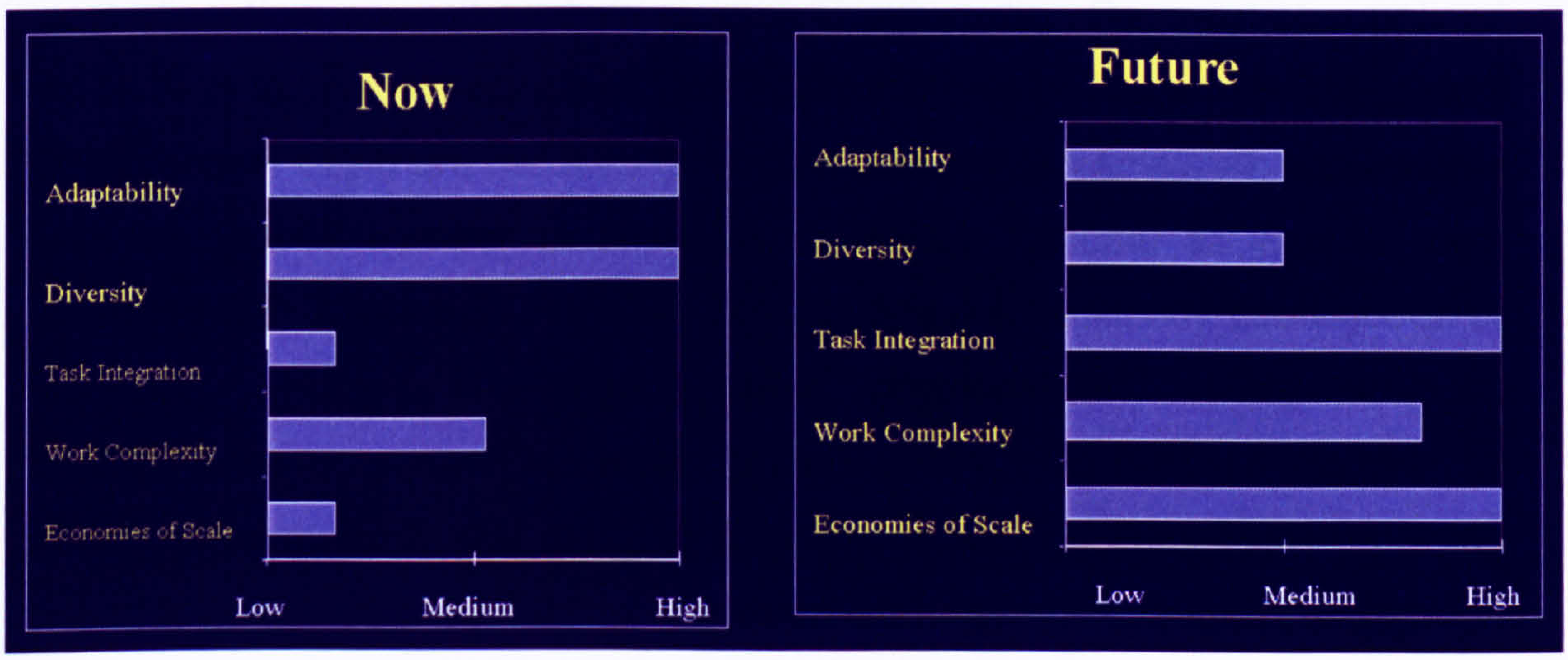


Figure 4.8: BAA Enterprise programme AMA "As-Is" and "To-Be" Maintenance Vision – BAA Enterprise Programme Communications

A shift in priority is visible, escaping the high level of flexibility historically provided albeit expensively and a move towards integration and achievement of economies of scale. The designed process area referred to as AMA (Acquire and Maintain Assets) sought to achieve these aims. A greater emphasis was paid toward the prioritisation of tasks on the basis of.

This whole process area links in very closely with the PDB (Plan & Develop the Business) process mentioned above. By applying, for example, the new projects sub process, assets would be developed in line with business needs identified by the PDB process and the business case would be monitored throughout the life cycle of the project. The new maintenance process provided zero based budgeting plans with the objective of meeting planned capacity requirements within the economic life of assets.

This process had three sub processes which were:

Procurement - an integrated cross-functional process that delivers the required goods and services in a timely manner to users in the line. The process starts with a request for goods or services and, following internal cost allocation, commitment accounting is automatic. Payment of suppliers' invoices is accomplished without the traditional invoice "paper chase". Costs in the supply chain are reduced through a strategy of framework agreements with a reduced number of suppliers, exploiting national as well as local relationships. Agreements enable users to acquire frequently used goods or services, whether for major capital developments, minor projects, maintenance or general revenue purchasing and this process satisfies all routine requirements and many emergency situations. Requirements falling outside of agreements, having low value and risk, can be handled through procurement cards.

There is no doubt that the processes that BAA now employ are fundamentally and radically different to what prevailed before. BAA now operates a variety of front-end user applications served from an integrated database (Oracle®) which validates data transactions and serves to eliminate sources of error, duplication of data handling and the proliferation of a multitude of stand-alone information systems. However after studying the literature on BPR it is not immediately apparent that BAA has successfully engineered out all of the inefficiencies associated with the old ways of working or for that matter has learned from the experiences of others. The classic case of Ford Motor Company employing reengineered Accounts Payable processes brings this to light. "Accounts payable clerks no longer match purchase order with invoice with receiving document, primarily because the new process eliminates the invoice entirely." Hammer and Champy go on to explain the efficiency of the new accounts payable process. The system adopted by Ford simply seeks to reconcile an electronic purchase order with an electronic receipt, automatically authorising payment.

The system employed by BAA still involves the manual matching of the invoice with both a relevant purchase order and proof of receipt, albeit the latter two being made available electronically. This method completely misses the basic concept of the Ford efficiency gain i.e. payment authorisation being performed by the receiving body and not by accounts payable. The reasons for this omission may be complex and may well include sociological and political influences.

- ***Facilities*** - this sub process enabled an optimum balance between planned and reactive maintenance activities to minimise fault incidences at the most economic level. Efficiency is improved through rationalisation of maintenance resource pools into Facilities Management Support Centres managed at airport level.

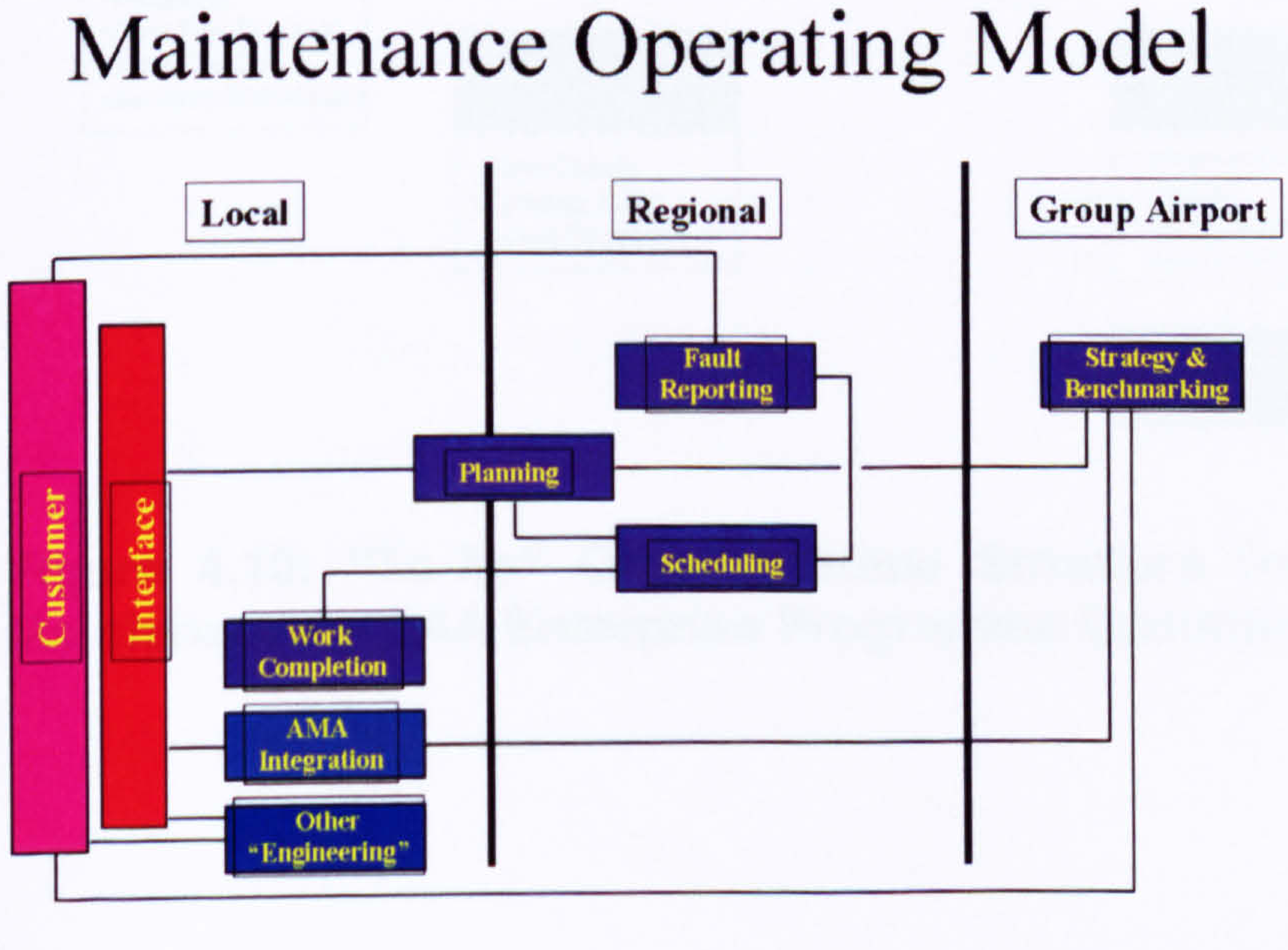


Figure 4.9: BAA ERP Implementation Communications – AMA Maintenance Operating Model

The above figure illustrates the new responsibility profiles of the local and central engineering resources within BAA. The objective is to allow technicians to use their time more effectively as a result of improved planning and procurement processes. Fault reporting owned by one central area assists with itemised billing for all maintenance services provided.

Organisationally the Engineering Departments, their required skill sets and their role changed significantly. Structurally this is reflected by new positions and reporting lines.

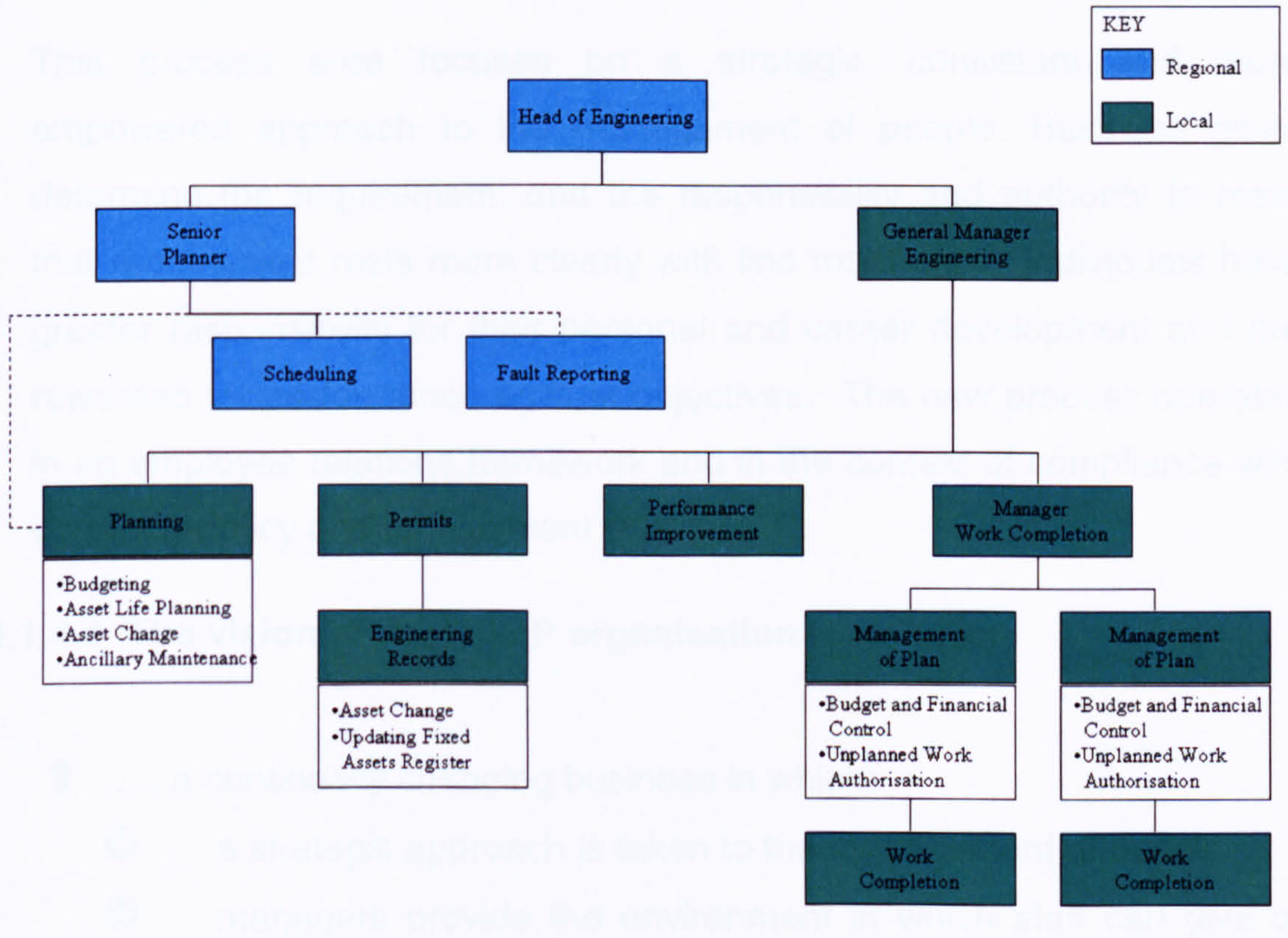


Figure 4.10: "To-Be" Organisational Structure for AMA Engineering Maintenance – BAA Enterprise Programme Communications

- ***Projects*** - There is a single process for projects (regardless of size), supported substantially by the new procurement processes and accompanying integrated systems. In this new environment, all revenue and capital expenditure against a project is identified at source and tracked through commitment accounting to assets in the course of construction and finally, to fixed assets on completion. Different users having different business perspectives are able to view and analyse data in multiple ways to match their particular business needs. For example, project managers and financial analysts can each have their own views of the same information without having to request it from each other or rely on interpretations based on inconsistent assumptions.

4.1.4.3 RDMP - Resource, Develop and Motivate People

This process area focuses on a strategic, consistent and more empowered approach to the management of people. Business goals determine the requirement, and the responsibility and authority to meet that requirement rests more clearly with line managers. Individuals have greater responsibility for their personal and career development and are rewarded for performance against objectives. The new process operates in an employee relations framework and in the context of compliance with company policy and employment law.

4.1.4.4 The vision of the RDMP organisation is to have:

- ......a continually changing business in which:
  - a strategic approach is taken to the management of people
  - managers provide the environment in which staff can give of their best
  - individuals take responsibility for and make some of the decisions on their own career and its development

- the HR Function provides leadership
  - •in people management strategies
  - •organisation design
  - •managing change

- ....underpinned by values which:
  - respect and value the individual;
  - support people through continuous change;
  - recognise and reward development, achievement and contribution;
  - acknowledge that achieving business objectives is essential

4.1.4.5 Changing the face of HR

The intended effect was to change the HR function to one described as follows:

•a high quality strategic business partner

- enable the business to achieve its business results by:
  - operating quality people management processes
  - managing accurate information to make quality decisions
  - to get the best out of its investment in people

- transferring capability to line managers to manage and develop their people well

- become experts in organisation development and change

4.1.4.6 RDMP Broken Down

The RDMP process area is made up of four sub processes:

- ***Organisational Design and Development*** - this covers the management and the application of organisational design and development with the RDMP process. It provides the overall model within which people management processes are carried out. It anticipates and responds to business strategies drawn up to meet the expectations of both external and internal stakeholders, and aligns the organisation to deliver business results. Its output is an agile organisation able to move quickly to meet changing business needs. This sub process is applicable at all levels of the business, from intra-departmental reviews to reorganisations which involve working across functional and organisational boundaries (e.g. with business partners).

- ***Resourcing*** - the objectives of this sub process are to provide the organisation with the ability to plan and predict resourcing strategies to meet the future demands of the business, to clearly demonstrate the need for every role within the organisation thereby enabling a systematic review of existing resources against business criteria, and to utilise a competency based matching process which clearly indicates roles in terms of

competency and skills and requires individuals to actively participate in the selection process.

- ***Learning and Development*** - the objectives here are to provide a mechanism whereby individuals can take greater responsibility for their own career and personal development, thereby ensuring that the organisation has the right competencies, both generic and technical, and skills to meet the future demands of the business. Activities within this sub process are

  - identify the L&D needs for the organisation to ensure achievement of business plans and objectives,
  - identify the L&D needs of the individual and set out an action plan,
  - identify specific L&D programmes required by the organisation and establishing priorities and methods of delivering the learning outputs,
  - develop and deliver L&D programmes,
  - receive the learning experience,
  - identify the future roles required for the business in terms of competence/attitude/behaviour and
  - ensure the development of people to meet those requirements through the development of a succession plan.

- ***Reward and Recognition*** - the objectives of this sub process are to provide effective management of reward and recognition. The process tracks from designing the reward strategy to performance management, through to the action of payroll. Some activities comprised in the process will ensure that individuals and teams are rewarded fairly for their contribution to meeting business objectives, managers are clear about their level of discretion over distribution of rewards, all reward mechanisms are motivational, reward systems are simple to administer and deliver accurately and on time and reward systems are sufficiently flexible to make them sustainable.

The RDMP operating model is displayed below and conveys the specialist policy role of the AoE (Areas of Expertise) and also the role of contracted service providers. This marks a significant change from the previous ways of working whereby far more local autonomy was practised with regard to the specification and execution of HR processes and activities.

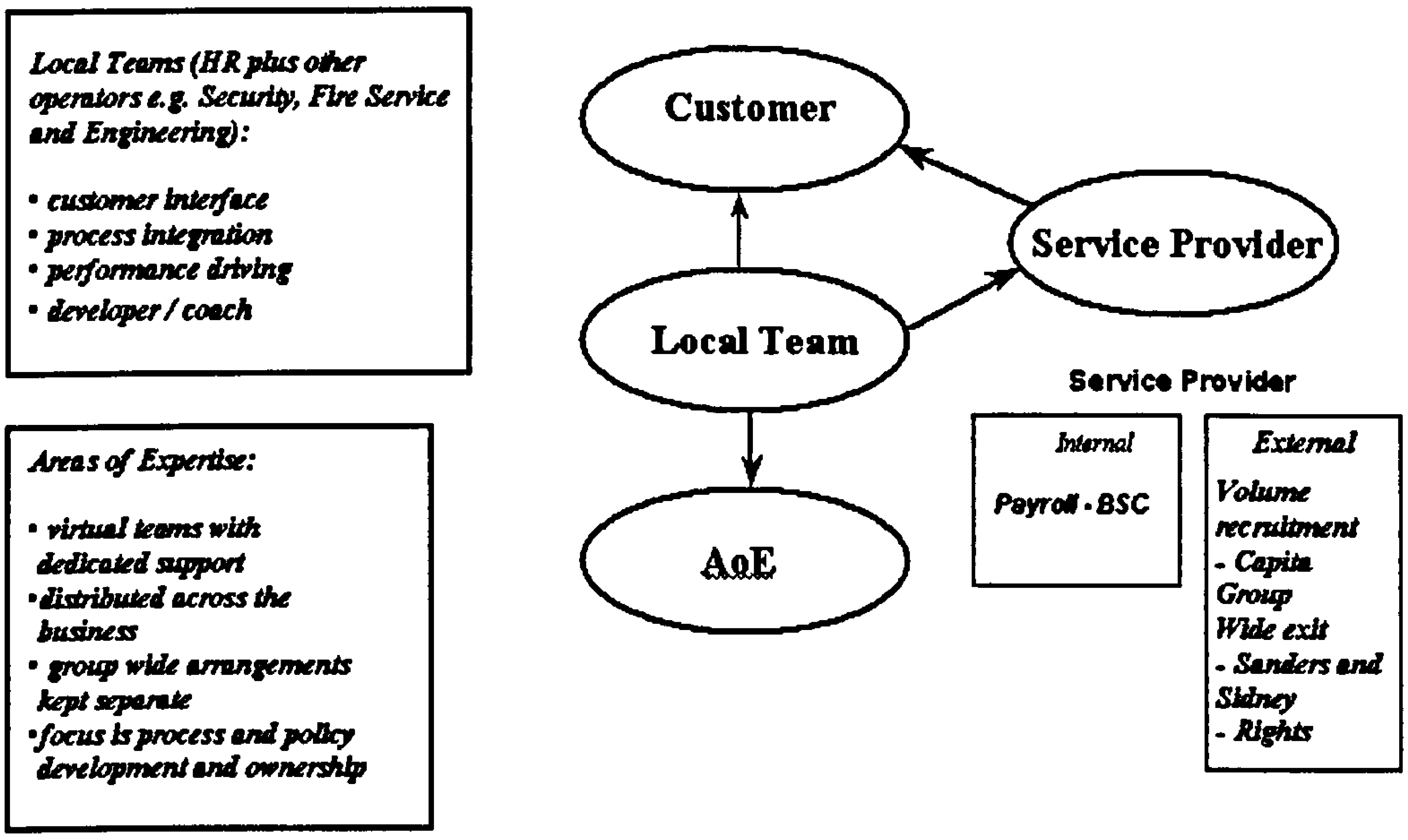


Figure 4.11: BAA ERP Project – RDMP Operating Model

The "End Picture" for the organisation subject to RDMP processes illustrates the controlling strands of the process view on the operational parts of the organisation. This is illustrated below.

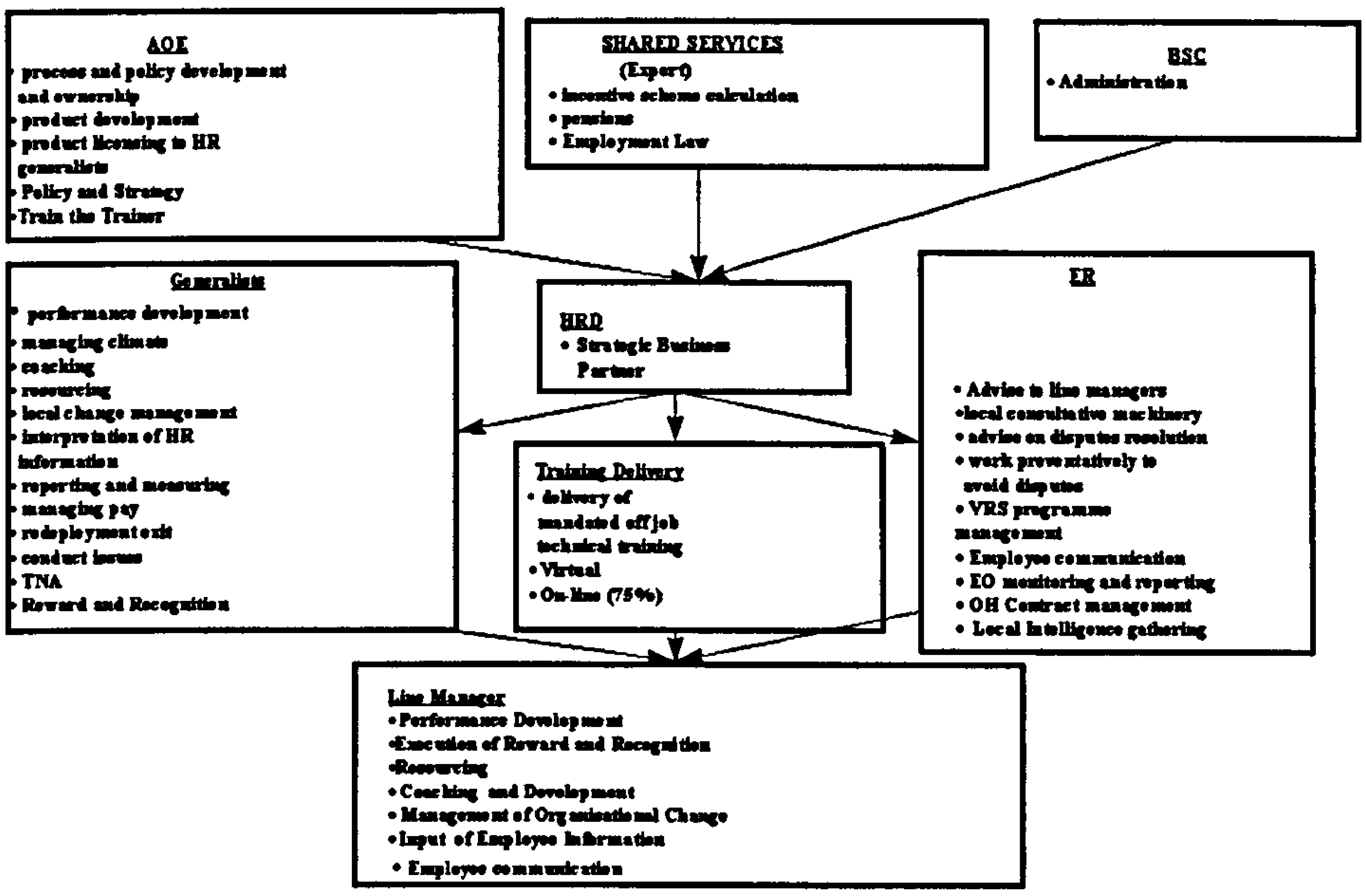


Figure 4.12: RDMP Functional and Operational Line Management Delivery Structure – BAA RDMP Communications – BAA

The operational or functional line manager is now subject to controlled policy, methods, sources of reference and even service providers on all matters relating to resourcing, development and reward and remuneration. This "process view" is intended to systematically ensure consistency is applied across the organisation on all HR related matters.

Enterprise introduces two new organisational concepts into the business. These are "Support Centres" and "Areas of Expertise". Support centres (e.g. Finance Business Support Centre) deliver services of a transactional nature or provide routine assistance. Areas of expertise focus on the provision of advice, identifying best practice and determine implementation strategies and the setting up of infrastructure.

The scope of Enterprise is currently limited to the UK Airport Operating Companies (including Corporate Office).

The following have been identified by the main BAA plc Board as the four key principles to Enterprise's success:

- customer focus - support processes deliver services to internal customers at appropriate performance levels to enable delivery of service excellence to the ultimate customers;

- devolution - devolution of some activities to the line (e.g. business planning, resourcing and routine purchasing) leading to user empowerment and autonomy within consistent frameworks of business practice;

- scalability - processes are applicable to all airports regardless of size;

- integration - self contained monitoring and control, high quality of management information enabled by integrated systems.

4.1.4.7 The Enterprise (ERP) Implementation Team Structure

The implementation team structure for the Enterprise project was much more complex than that for the AOS project. At the peak of project implementation activity there would be 600 staff working on this project across the BAA operation. The membership of this team varied from functional specialists responsible for the development and specification of business processes, location specific process implementation managers, location implementation managers, external technical and change implementation consultants and IT service providers. The core of the implementation team and its structure is illustrated below. This conveys the consistent approach adopted across all airport locations.

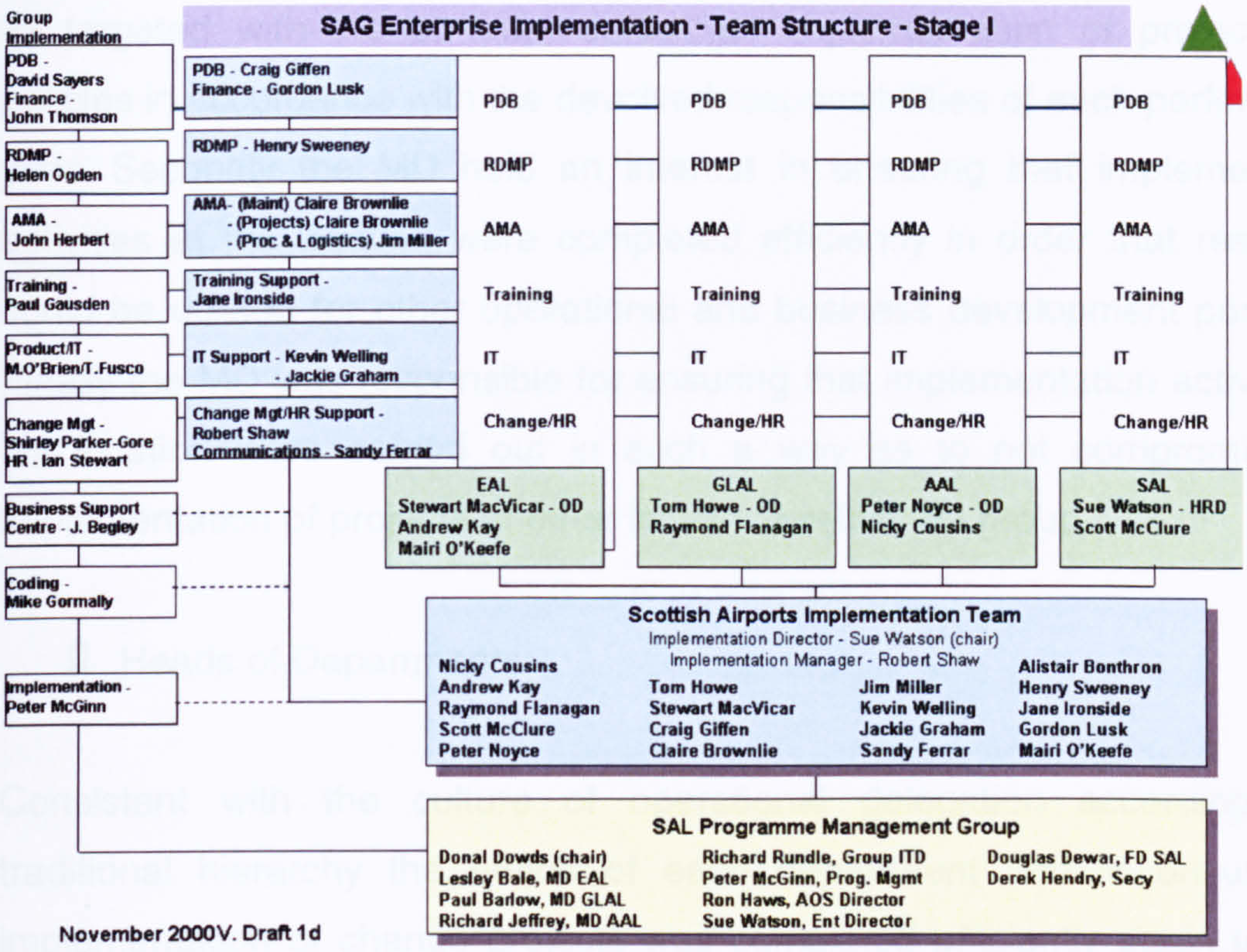


Figure 4.13: Scottish Airports Group Enterprise Implementation Team Structure – BAA Enterprise Programme

4.1.4.8 Introduction of the Stakeholders

It would be safe to say that all staff and business partners hold a stake in one or more of the projects described within this thesis. There are certain parties however who hold key implementation responsibilities and will expect to realise business benefits from the implementation on behalf of their organisations.

- Airport Managing Director

The Glasgow Airport Limited Managing Director at the time of the implementation (Paul Barlow) had a significant interest in ensuring the successful implementation of projects at Glasgow Airport. The MD is first of all targeted with the on-time, on-budget implementation of projects and policies in accordance with the devolved responsibilities of each performance year. Secondly the MD held an interest in ensuring that implementation activities at his location were completed efficiently in order that resources could be utilised for other operational and business development purposes. Finally the MD was responsible for ensuring that implementation activities at his location were carried out in such a way as to not compromise the implementation of projects at other locations within the group.

- Heads of Departments

Consistent with the culture of operational delegation according to a traditional hierarchy the heads of each department had to ensure that implementation of change projects was completed efficiently again to meet personal targets cascaded by superiors, make best use of operational resources and also to ensure that the activities of their departments do not compromise the implementation of others. The key Heads of Department at Glasgow Airport limited were:

- Head of Business Development
- Operations Director
- Airfield Operations Manager
- Terminal Manager
- Engineering Manager
- Security Manager

- Functional Heads/Board Members

Although with no direct line relationship with the operational departments at Glasgow Airport, the functional heads and Board members did hold a significant stake in the implementation of projects at a local level.

- Finance Director
- Engineering Director
- HR Director
- Retail Director
- Property Director
- Head of Business Development

The holders of these positions had a special interest in the implementation, particularly as the project focussed on functional business processes and policy implementation. The organisation was on the threshold of implementing defined processes to ensure consistency across the business units. The functional heads therefore were identified as the champions of business process.

Specific implementation roles included;

- LIM (Location Implementation Manager – the writer)
- PIM (Process Implementation Managers – PDB, RDMP and AMA)
- DIM (Departmental Implementation Manager)
- Change Manager

LIM (Location Implementation Manager)

The LIM was responsible for planning, resourcing, and communication and verification activities at each airport location. The LIM reported directly to the Operations Director who sponsored the project and headed up the local team effort. The LIM was effectively the airport project manager for the implementation.

PIM (Process Implementation Manager)

The PIM was a process resource located at each airport, one for each location. The PIM role for PDB (Plan and Develop the Business) processes was also the Head of Business Performance at Glasgow Airport. The PIM was responsible for the cascade of all process related communications to the local team and also the verification of Organisational Design and Training activity associated with the roll-out of the PDB processes.

DIM (Department Implementation Manager)

The DIM was the departmental representative for the Enterprise programme, typically the head of the department. Their role was to support the requirements of the implementation project by ensuring that they committed appropriate resources to the tasks and contribute to the development of the Organisational Design work of the airport i.e. jobs to roles and names to jobs.

Change Manager

Each location was served by a Change Manager. The role holder was responsible for providing change management tools and exercises relating to the local implementation programme. The Change Manager was an internal appointment, trained by the professional services organisation employed as a partner by BAA, namely Deloitte and Touche. The change activities scheduled covered the extent of the six strands of change management detailed later in this Chapter.

Following on from this of course, performance and risk to a lesser extent become commentaries as much on business processes rather than necessarily operational business units alone such as locations as was previously the case. The attention of functional representatives to business performance metrics is heightened as the focus of target setting is extended to include process and supporting systems activity.

4.1.4.9 The Management of the ERP Change in BAA

In contrast to the approach adopted within the AOS implementation project, considerable focus was applied together with considerable resource on activities related to **"Change"**. The argument for the commitment of substantial resource in this area was made by making reference to the high rate of failure of Business Change Programmes and most importantly the reasons identified for this failure rate. The case is made that Change Management activity can mitigate the effects of these reasons. Deloitte and Touche were engaged to provide expertise and a framework for the managing of change. The activities are sorted into the "Six Strands of Change".

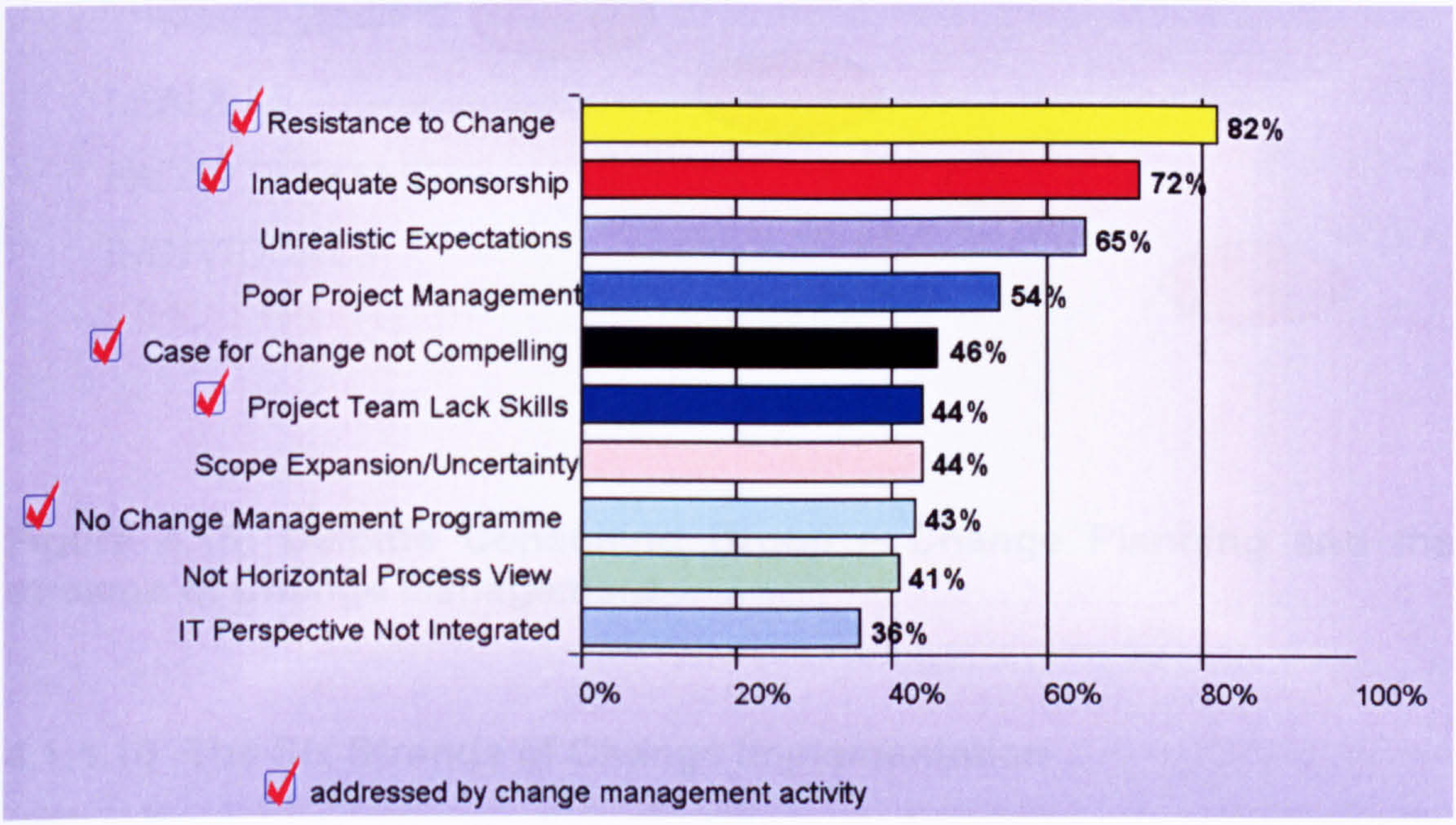


Figure 4.14: Barriers to Change - Deloitte Consulting Group Survey

The framework for Change Management was developed by Deloitte and Touche. This framework for managing change issues was cascaded to the BAA implementation team and a network of resources included within the project structure. The framework covered a broad scope. The following schematic model demonstrates the relationships between these change strands and the groups of stakeholders involved in the planning f the implementation.

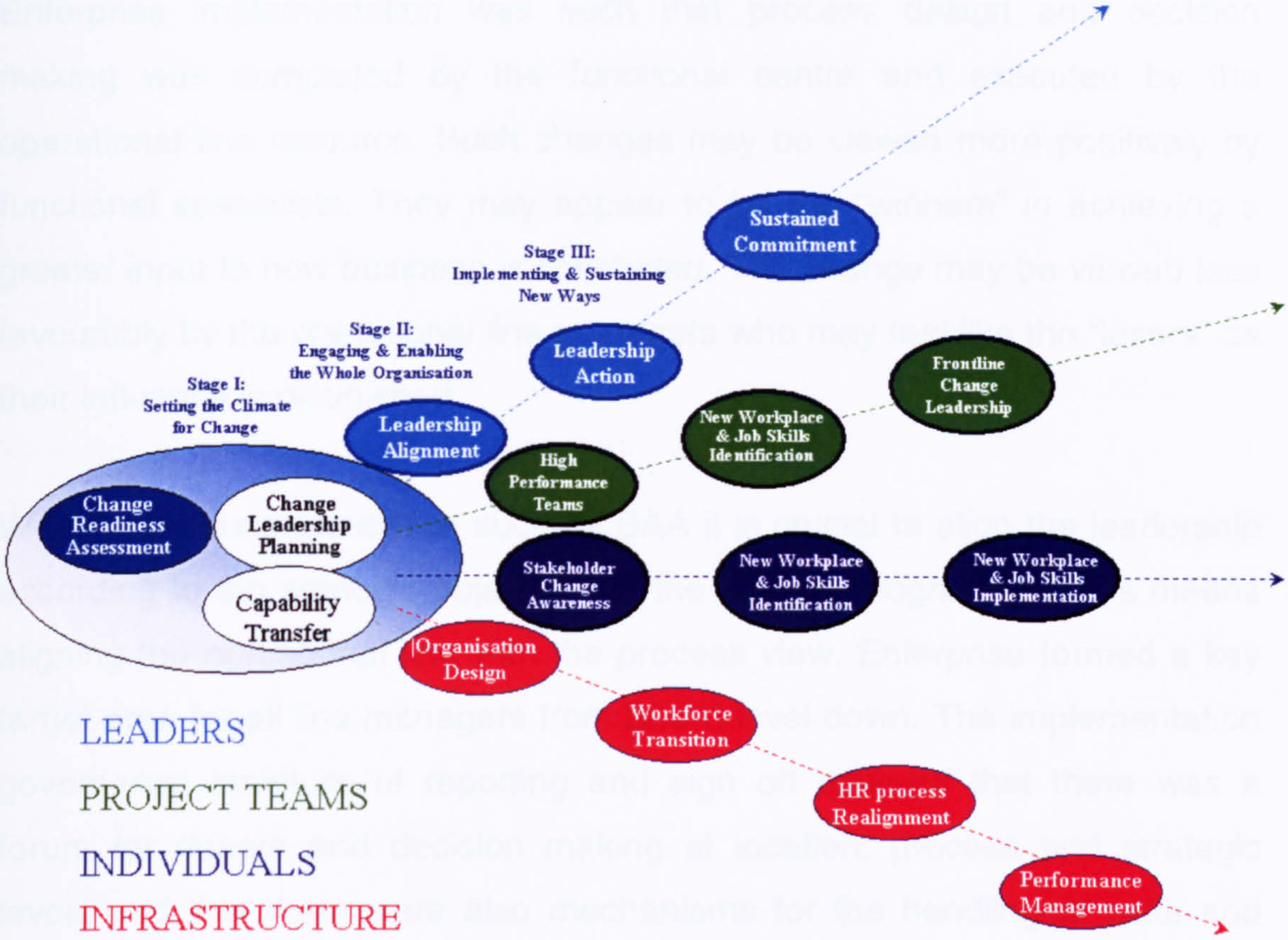


Figure 4.15: Deloitte Consulting Group – Change Planning and the streams of Change Management

4.1.4.10 The Six Strands of Change Implementation

The change implementation strategy prescribed by BAA`s external consultancy partner (Deloitte) focussed on the treatment of six key strands.

4.1.4.10.1 Leadership Alignment

BAA as an organisation has been known to be like many FTSE organisations of its type, highly political. This culture can often provide obstacles to the efficient implementation of new business processes. The nature of the Enterprise implementation was such that process design and decision making was completed by the functional centre and executed by the operational line resource. Such changes may be viewed more positively by functional specialists. They may appear to be the "winners" in achieving a greater input to how business is concluded. The change may be viewed less favourably by the operational line managers who may feel like the "losers" as their influence is diminished.

Within a matrix organisation such as BAA it is crucial to align the leadership according to the strategic objectives of the change programme. This means aligning the operational line with the process view. Enterprise formed a key target area for all line managers from Board level down. The implementation governance structure of reporting and sign off ensured that there was a forum for debate and decision making at location, process and strategic levels and that there were also mechanisms for the handling of risks and issues.

The personal performance framework for managers was drafted to include targets specific to the implementation of Enterprise processes. This performance framework included a financial incentive as bonus payments were tied directly to performance results. This very simple measure proved effective as a motivator and is discussed in greater detail during the reflections in Chapter 5.

Considerable resource was also invested in a very detailed governance structure which established responsibilities across the entire management organisation. The structure pictured above reflects responsibilities for reporting at local and regional levels by operational teams and also local and central levels by process and functional teams.

4.1.4.10.2 Communication

The implementation of business process change and the associated impact on organisational resources and supporting tools imposes a requirement for the establishment of a responsive and creative **communications** mechanism. The resistance to change which naturally occurs in established organisations sensitive to the motivations of efficiency driven process projects can be influenced by a well managed communications policy. Accordingly such a mechanism must be designed and resourced. Significant investments in this area were made by BAA in order that implementation activities were understood by the considerable proportion of the staff organisation involved and also as a method with which to manage resistance.

All communication material was centrally prepared and issued formally. Documentation of process related literature was prepared manually. No location based communications strategy was developed in contrast to the AOS project. Also in contrast to the AOS project, the Enterprise project did not prepare graphical activity based process documentation for the purposes of user notification.

4.1.4.10.3 Organisation Design and Development

The changes in processes and behaviours driven by Enterprise require to be embedded by a change in organisational structure and infrastructure. This in turn must be supported by consistent HR policies regarding performance measures and rewards. An appropriate treatment of Organisation Design is essential for the successful implementation of business change programmes. Further it is clear that the methods and tools employed to record and design this organisation resource base to support the process view can have a significant impact on the likelihood of the design being implemented consistently and successfully. The following diagram illustrates the approach taken to organisation design within the Enterprise project at BAA. The writer was responsible for developing this approach in association with other implementation team resources including Process Implementation Managers from across the BAA group. The approach relied entirely on the manual documentation of plans and results and the processing of the documentation through the Gateway sign off framework of the project governance structure which is explained in more detail within section 4.1.4.12.

The process for Organisation Design, unlike that of the AOS project was led very much from an examination of the process flows i.e. a top down approach in layer terms rather than the bottom up approach based on IT functionality. This approach was engaged as it was believed that this was consistent with the process led ethos which the organisation was trying to embed and the one upon which continuous improvement efforts would continue to be based. The approach reflects the layered approach in that it sequentially examines the requirements of changes to process, then individuals, through to the impact on organisational structure and then finally the IT Changes necessary.

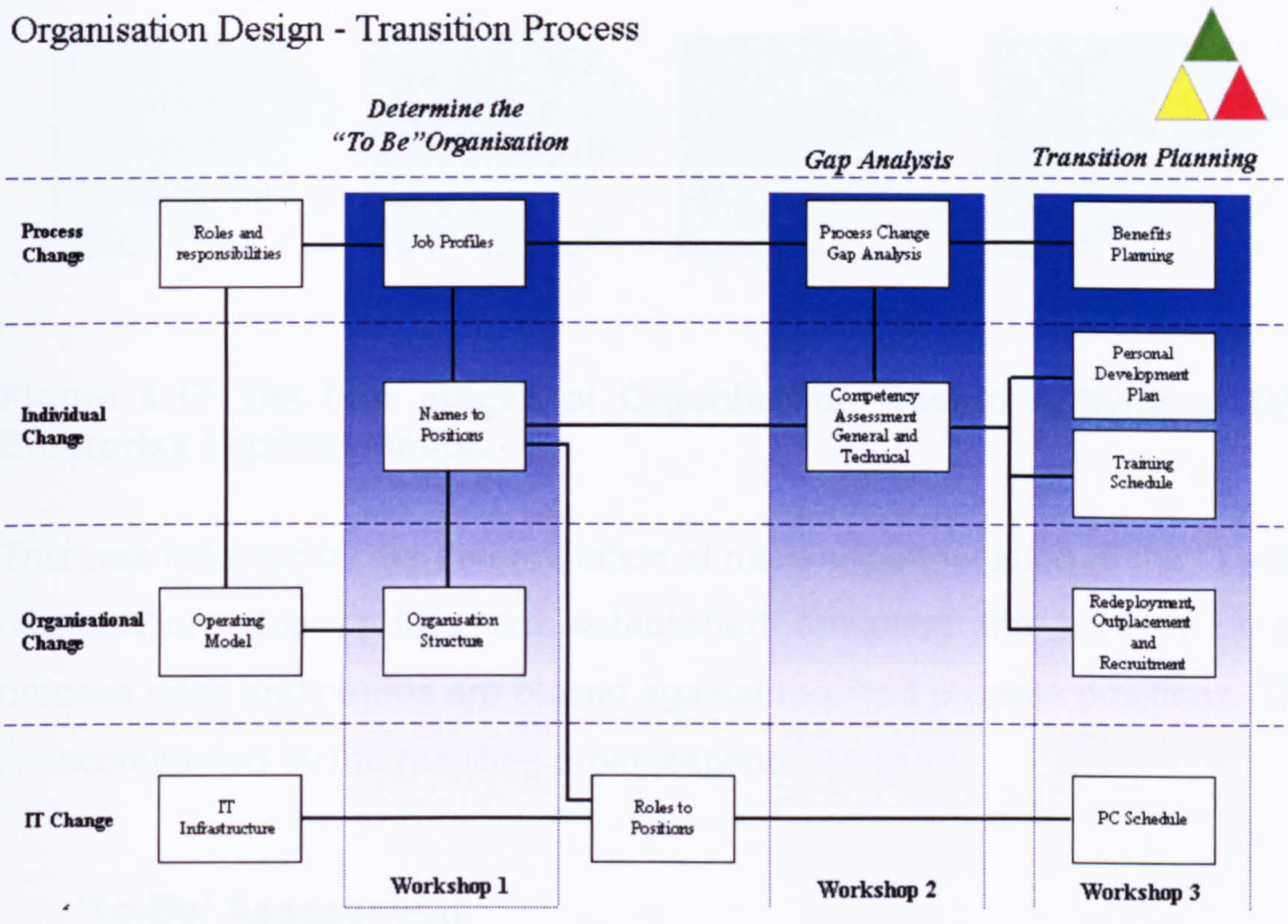


Figure 4.16: BAA Enterprise Organisation Design Planning

The design and implementation of the "Organisation Design" work within Enterprise adopted a 4 stage process commencing with the establishment of process roles within an organisational framework and a specification of the required supporting IT infrastructure and software functionality. These stages were as shown tin the figure below.

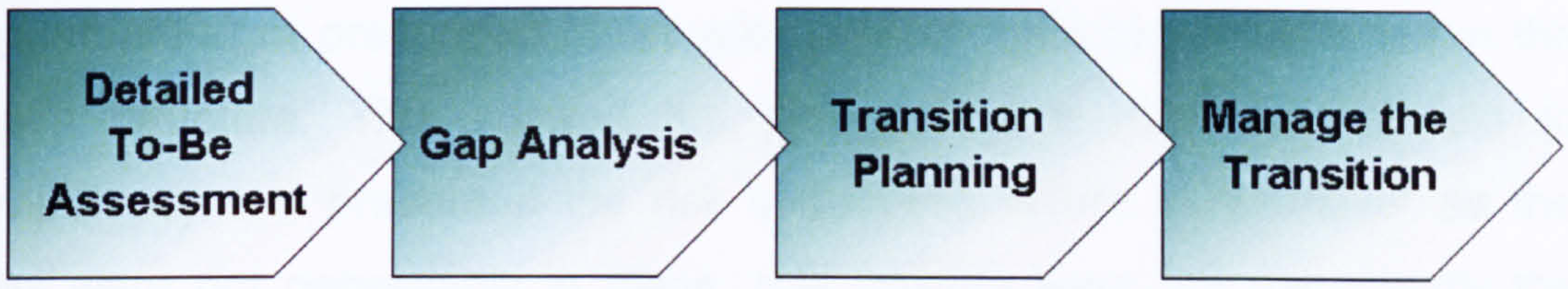


Figure 4.17 The four stages of Organisation Design Activity – BAA Enterprise Implementation

This was followed by the determination at each airport location of the "To-Be" organisation. Job profiles are established reflecting the content of the process roles and names are placed against required process positions. This is accompanied by the resulting organisational structure.

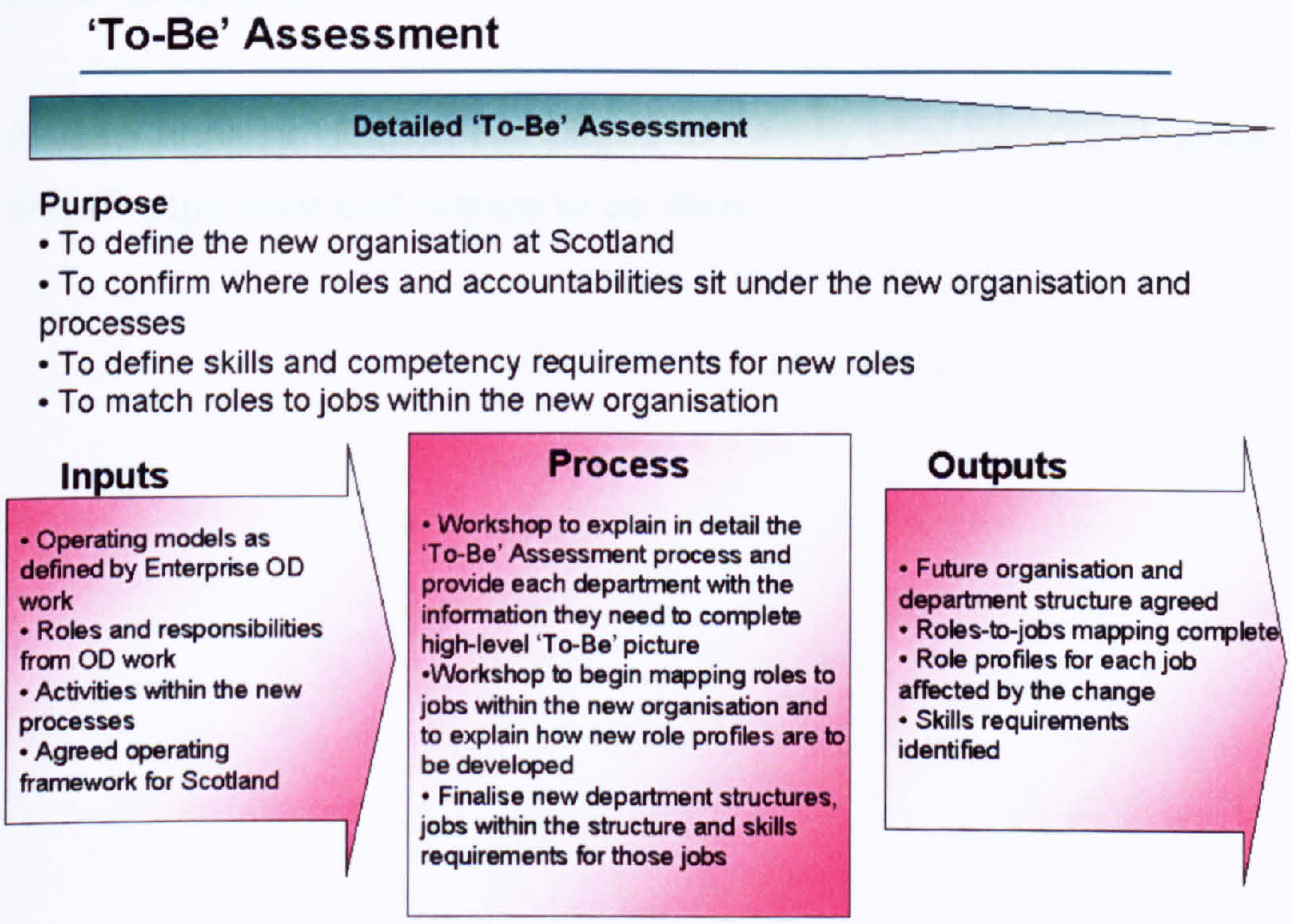


Figure 4.18: BAA Enterprise Implementation – "As-Is" OD Activity Specification

It is important to note that all design work is paper based and no consistency is guaranteed or prescribed in the allocation of roles to positions within the airport structure. This allowed the prospect of a mismatch of role to competency and presented the risk of process failure at "Go-Live" as the skills were not necessarily in place, role holders were not necessarily the optimum resource to complete the required task. The relationship between process activities and supporting resources was not absolutely defined by this method and much of the organisation design work was interpreted by the locations in a manner that accommodated the designer's operational and inexperienced preferences. This Organisation Design approach and the method of documenting the outcomes did not deliver absolute detail. Nor did it comprehensively reflect the relationships of one process (and subsequently the role holders) and another. The specifics of this observation are included within Chapter 5.

A "Gap Analysis" is then completed to identify what personnel, skills, training and IT gaps exist and require to be filled.

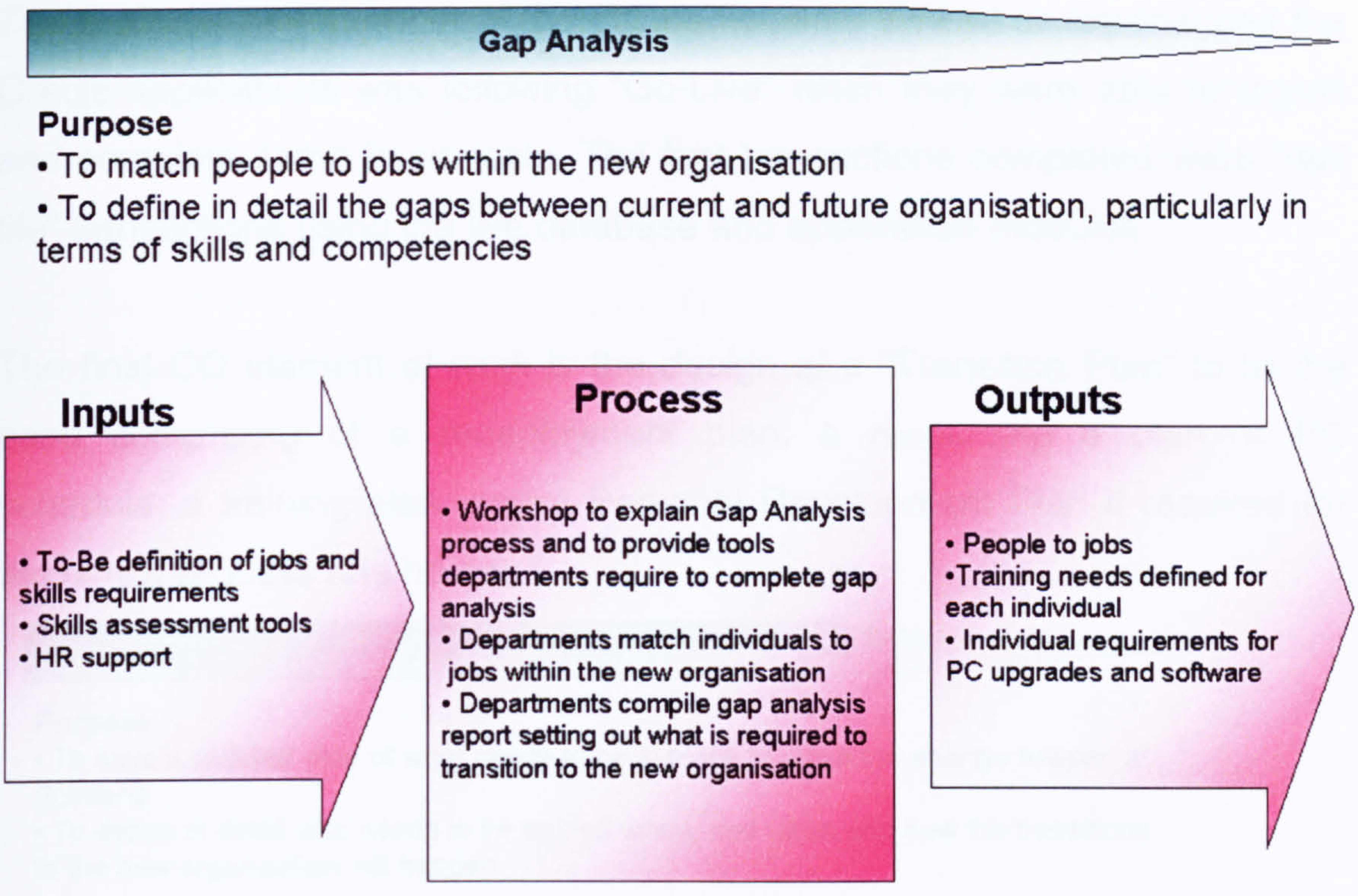


Figure 4.19: BAA Enterprise Implementation – "GAP Analysis" OD Activity Specification

This activity included some highly contentious "matching" of skills to roles and effectively forms the change aspect that provides the source of most personnel resistance. The activity is completed largely by the operational line management organisation and presents the opportunity for the line to specify the support layer of the process activities. Given the advance nature of this Gap Analysis activity in the implementation timetable it can be argued that the line team are not best qualified to complete this task. They may, in the absence of process experience be inclined to base their decisions on territorial ownership. At the time of completion, the "Gap Analysis" was based only upon a described view of how the process would operate and no experience of the complexity or simplicity of the technological solution.

The first time any member of the OD participants viewed or experienced the Oracle applications was following "Go-Live" when they were able to log-on and complete some basis tests. The first transactions completed were "real life" transactions using the live database and application modules.

The final OD element of work is the design of a "Transition Plan" to fill the gaps comprising of a redeployment plan, a resourcing a plan, a PC schedule, a training plan, and a Personal Development Plan if required for each new process role holder.

Figure 4.20: BAA Enterprise Implementation – "Transition Plan" OD Activity Specification

Once again the Transition Planning phase of the project is completed by line managers based upon a cursory introduction to each process. Training schedules, development plans, IT schedules, organisational structures and perhaps most significantly in terms of assessing success, benefits realisation plans are based upon a "best guess" of how the process is to be supported. No prior experience of the processes in action is available to the line managers in their assessment of requirements.

Managing the transition is the final phase of implementation. It is notable that the transition plan is owned by the Operations Director at each location i.e. the line. This excludes the process experts and allows the line total control over the implementation of process support resources based on a less than comprehensive understanding of the processes themselves.

There is no direct modelled connection between this plan, the plan of other locations and the central process team. This means that the local plan is not immediately sensitive to changes made within other plans or changes made to core process functionality. The project management governance structure would have to accommodate this by continual reviewing of plans against each other. The risk of confusion and misinformation was subsequently high.

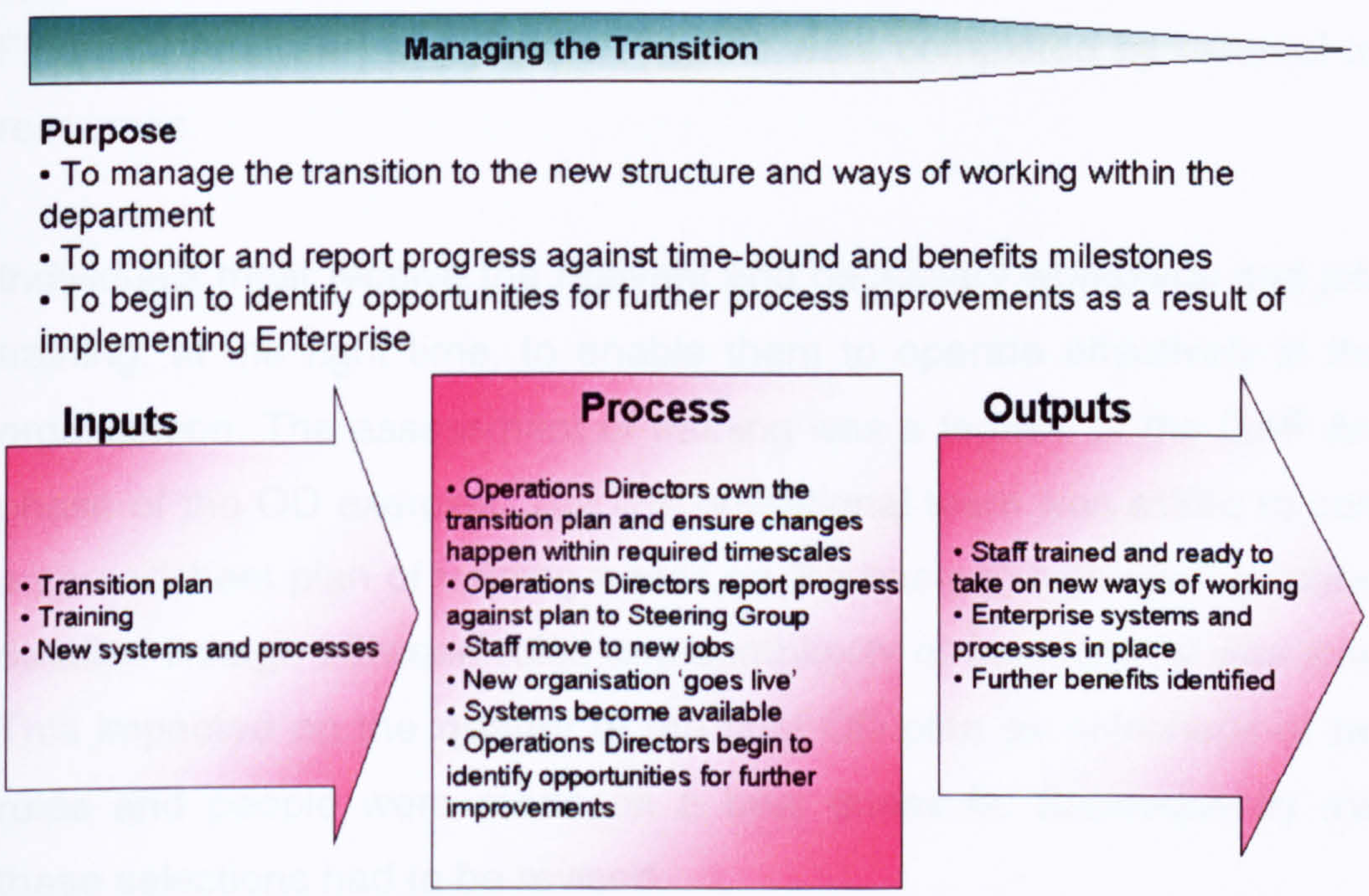


Figure 4.21: BAA Enterprise Implementation – "Managing the Transition" OD Activity Specification

The method of representing OD in paper form has significant implications for the implementation experience. The "To-Be" documentation is required to paint the picture of how each local unit will support the Enterprise processes. This includes name to posts, roles to names, position hierarchies, organisational hierarchies, addresses. This documentation formed the entire reference source for the development of the information system electronic hierarchy for managerial authority and workflow transaction completion. Risks of errors, quality gaps, lack of change control, and lack of sensitivity to change are accordingly high.

4.1.4.10.4 New Workplace and Job skills

Training was prescribed according to the output of the OD work. Each process role qualified for systems and process training. This work was scheduled and completed by a variety of resources and techniques. A considerable amount of training was completed using a "train the trainer" approach. The more complex Oracle modules such as OFA (Oracle Financial Analyser) and Oracle Projects were completed by external training resources.

Individuals must receive the relevant and necessary workplace and job skills training, at the right time, to enable them to operate effectively in the new organisation. The assessment of training was a feature of the GAP Analysis phase of the OD exercise. The line operational team was asked to complete a spreadsheet plan of training needs on the basis of high-level guidance. No detailed linkage between roles and complexity of functionality was available. This impacted on the **quality** of the final OD plan as selections of tasks to roles and people were made on a best guess fit. Subsequently many of these selections had to be revised.

The training plan is a manually prepared document, prepared in isolation and with no direct link to those of other locations. The training plan is based in individuals filling roles within a specific reporting hierarchy. The Position Hierarchy and the Organisation Hierarchy are key to the establishment of the

ORACLE® applications workflow hierarchy. Changes made to this plan must be exhaustively considered for implications to the network of authority relations. This was sometimes not always done. This risk to flawless implementation is exposed in greater detail in Chapter 5.

4.1.4.10.5 Front-line change leadership

Being able to adapt and respond to changing requirements is vital to the success of a large scale business transformation. Ongoing monitoring of progress and timely feedback should enable the change programme to be adapted as the programme progresses and allow for support to be focused where it is most needed. Accordingly a very comprehensive network of project resource was committed to the project covering process, location, IT and Areas of Expertise.

4.1.4.10.6 High Performance Enterprise Project Teams

The organisation was being transformed to a process driven culture. This represents a significant change for the organisation in its philosophy of task completion. This change demonstrates that the organisation has recognised that continuous improvement and the exploitation of resources must be identified from the examination of activity flow and not from the traditional examination of organisational elements and structure. Accordingly the source of continuous improvement will be the continued redefinition of supporting process resources in response only to a prior redefinition of data flow activities. Each process area; PDB, AMA and RDMP is required to be equipped to systematically measure, reflect upon and prescribe improvements to process on a continuous basis. This required the establishment of high performance teams to baseline performance, monitor performance and constantly maintain the standards and support mechanisms to achieve the objectives and drive the benefits of the processes from the organisation. These teams were initiated to assist with the implementation of new processes, validate the implementation by base-lining performance and reporting on the quality of implementation and seeking to further refine the processes on an ongoing basis.

The validation of implementation included reference to the benefits outlined within the business case. This reference base is only worthwhile of course on the premise that the original business case assumptions were in fact challenging, accurately established in the first place and also still valid. Chapter 5 refers further to the assessment and validation of business benefits against the original business case as an exercise.

4.1.4.11 Infrastructure and Information Technology

Critical to the successful support of new business processes is the provision and correct operation of infrastructure and information technology. The use of market established Oracle software modules and the compelling commercial reasons for their selection influenced significantly the required infrastructure requirements at the outset to the greatest extent.

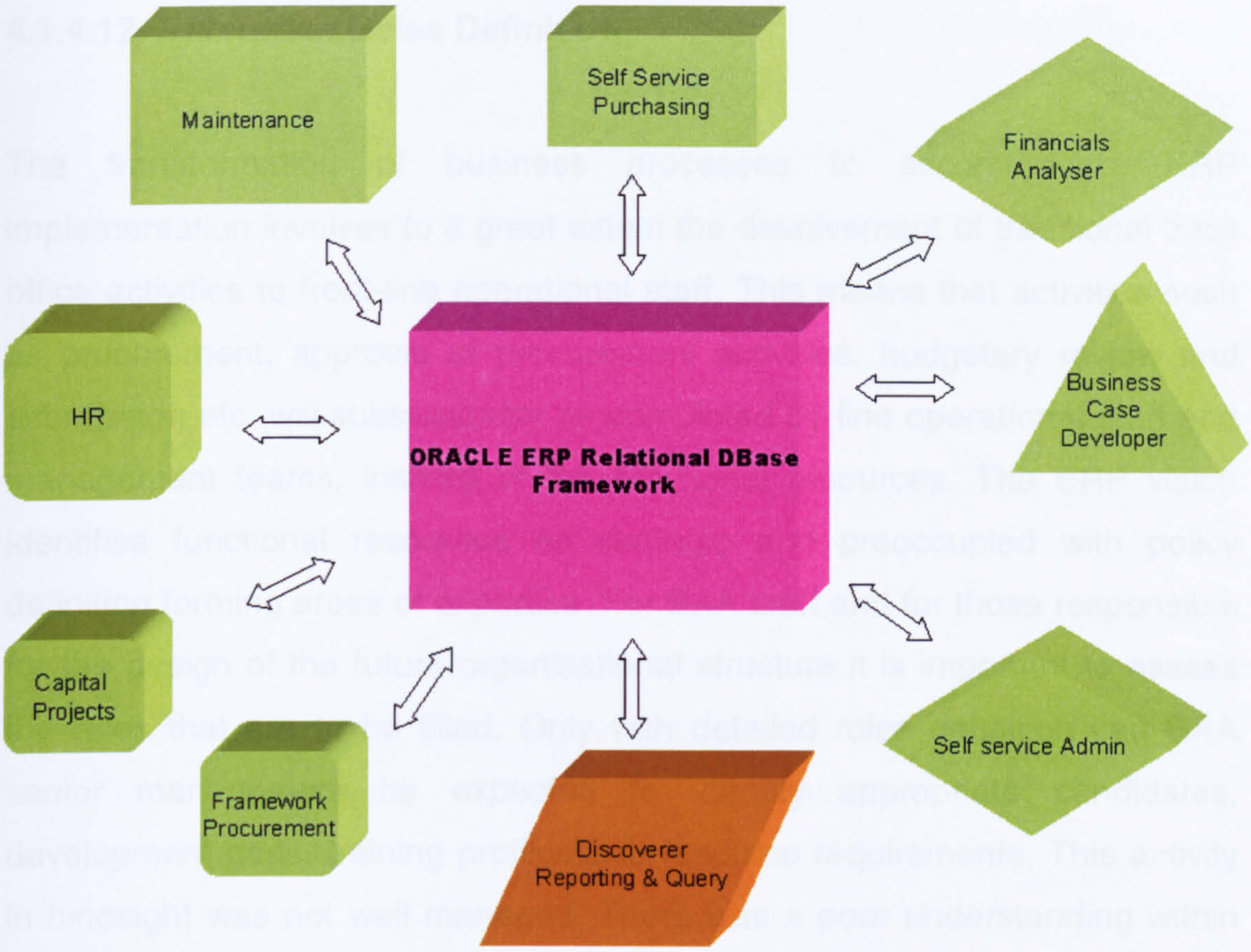


Figure 4.22 Selected ORACLE® Modules Implemented During BAA ERP Project

The project retained an ongoing activity of reviewing the performance of the IT provision as issues arose relating to the competency of users and the capacity of the BAA network to support original estimates. Lessons were also learned during implementation relating to the misconception of the extent of usage of specialist report writing modules (Oracle Discoverer). Gaps in perceived functionality emerged during implementation as the impact of adopting the "vanilla" version of the applications became apparent. On several occasions these gaps caused confusion with training audiences whose perception of the new processes, based on prior documentary description differed from the hands on experience. This required flexibility of response from the users to adapt quickly.

4.1.4.12 Enterprise Roles Definition

The transformation of business processes to accommodate ERP implementation involves to a great extent the devolvement of traditional back office activities to front-line operational staff. This means that activities such as procurement, approval of procurement activities, budgetary review and submission etc. will subsequently be completed by line operational staff and management teams, instead of the functional resources. The ERP vision identifies functional resources as strategic and preoccupied with policy definition forming areas of expertise. For BAA staff and for those responsible for the design of the future organisational structure it is important to assess the roles that are to be filled. Only with detailed roles definition can BAA senior management be expected to identify appropriate candidates, development gaps, training profiles and resource requirements. This activity in hindsight was not well managed. There was a poor understanding within the organisation of the relationship between process activities and supporting resources. The poor understanding originated from an inadequate awareness of the process activity. Assumptions were made regarding the appropriateness or otherwise of existing resources to complete tasks. These assumptions were made in the absence of sufficiently detailed process information.

The Enterprise implementation programme sought to provide guidance to the local management teams during the Organisation Design phase by rolling out Enterprise Role Profiles. Each role profile identified a set of responsibilities to be completed by and Enterprise role holder e.g. "Line Manager" or "Business Performance Manager". These profiles are typed documents listing in high-level terms only the responsibilities of each role with respect to Enterprise processes. An example of a role profile is shown below. No further assistance is given to the line management in the determination of their future organisation design and therefore a potential weakness is introduced to the implementation strategy as stakeholders must interpret on the basis of only a cursory knowledge of new processes. The result can be a defensive approach being taken which maximises the quality of the resources reserved for process support and one that threatens the realisation of maximum benefit.

Process	**Role**	**Principal Accountability**
PDB	**Line Manager**	Agrees business objectives with the Business Unit team
		Inputs into business plan at a departmental level
		Reviews and interprets performance and take remedial action when required
		Uses the basic business planning model to look at business planning scenarios
		Balances profit, safety, security and environment in decision making

Process	**Role**	**Principal Accountability**
RDMP	**Line Manager**	Focuses on people development targets alongside financial and operational targets
		Takes a commercially focused approach to resourcing assessing both work and resourcing alternatives prior to choosing recruitment
		Ensures all direct reports have understood targets, are performance managed, recognised and rewarded accordingly
		Ensures all direct reports receive training/support to enable them to carry out their work
		Ensures all direct reports are developed in the interests of the business and for their development
		Supports and advises on how RDMP

		processes can enable people to own their personal development
		Devises and implements an L&D plan to support their business plan
		Follows up L&D with individuals to ensure evaluation of L&D activity and transfer of learning into their day to day activities
		Evaluates department L&D plans and give assessment of valued added to L&D co-ordinator
		Is responsible for leading and implementing organisational change in their area
		Records changes to individuals personal and employment status on the HR IT systems

Process	**Role**	**Principal Accountability**
AMA Supply Chain	**Line Manager (with Financial Authority)**	Identifies a need to procure goods, works or services
		Contacts the BSC for advice including how to procure goods/works/services, help in identifying the correct item on the system, help in identifying the correct supplier on the system any general inquiries and advice
		Interrogates the system to see whether the requirement can be fulfilled directly with a supplier (including BAA stores) i.e. that the item is covered by an agreement negotiated by the Supply Chain AoE
		Uses Route 1 for agreements in place
		Uses Route 2 for purchase cards
		Uses Route 3 for simple purchases under 5k with no agreement currently in place (link into BSC)
		Uses Route 4 for complex strategic purchases over 5k with no agreement in place (link into Supply Chain Account Management AoE)
		Creates draft purchase requisition and submits

		for financial approval where individual's financial authority is insufficient
		Receipts the goods, works and services on the system when the supplier has fulfilled the requirement
		Interrogates system to check status of order
		If works/services are not performed to standard attempts to resolve the issue with the supplier
		Helps Business Support Centre with any discrepancies that may arise when matching invoices

Table 4.3: BAA Enterprise Process Role Profiles, Source: BAA ERP Implementation Programme

Little detail is provided within the role profile of the expected volume or complexity of data handling expected by the generic "line manager" as described by the profile above.

4.1.4.13 Programme Governance, Gateways and Sign-off Protocols

Prior to being able to make the full on-line transition to new processes, each airport location was required to demonstrate implementation would stand up to scrutiny. This was achieved by the application of an Enterprise Governance framework of check-sheet completion and sign-off.

This formed a complex and time consuming and occasionally politically contentious paper exercise. Each "sign off" stage was very high profile, following an ascending hierarchy of authority. Considerable pressure was applied to ensure that Gateways were passed according to the group project programme. The political focus was not so much on getting the readiness condition correct as much as declaring a state of readiness. This culture was counterproductive as managers interested in challenging the condition of their organisation were dissuaded from doing so in case their reluctance to sign off demonstrated "failure" in implementing according to the set timescales.

4.1.4.13.1 Purpose of the 'Go Live' Readiness Assessment

Implementing Enterprise constitutes a major change in the way that BAA conducts its business. Consequently, there is a need to provide assurance to management that all the necessary preparations have been made, so that the Enterprise Executive can formally approve the decision to 'go live' at a particular location and date.

The process for reaching the 'go live' decision was required to meet the requirements of internal audit and demonstrate that 'due diligence' had been practised. On reflection it is perhaps inappropriate therefore that the assessment is completed by the line operation and the implementation team itself. An "external" party to the implementation team e.g. internal audit would be well placed to consider the state of readiness. There are arguments to support this view including:

1) Internal audit would not be influenced by pressure to declare any particular state of readiness
2) Internal Audit would be able to build up a group-wide view of implementation and therefore assess one location against another on identical basis.

4.1.4.13.2 Principles of Readiness Assessment

As each location approached the date for making the transition to new ways of working, supported by new systems, the status of the programme was reviewed against a set of key 'readiness criteria' at particular dates (readiness checkpoints). Responsible parties were required to sign off the status at those dates. The criteria used in the readiness checks addressed all three aspects of Enterprise - people, process and technology; all were required to be at a compatible state of readiness and alignment to achieve a successful transition.

A governance framework and tools (check-sheets) were provided by the central project team to facilitate the process for reaching the 'go live' decision at locations and providing the desired level of management visibility; it is closely related to the 'Acceptance Plan' for a location.

It is notable that no audit activity took place and that the declaration of readiness to Go-Live was the responsibility and at the discretion of the location. This is at variance with the AOS project in which the Technology providers had a major input in determining the state of readiness validation for going live.

4.1.4.13.3 Acceptance Plan

An 'Acceptance Plan' for a location, (e.g. see BAA/GAL/ACC/OO1), defines three Acceptance Phases and associated Approval Gateways:

Acceptance Phase A: Pre-Auto Conversion
Gateway A: Approval to 'Start Automatic Live Data Conversion'

Acceptance Phase B: Auto Conversion/Cut-over -
Gateway B: Approval to 'Operate New Processes & New Systems' (i.e. 'go live')

Acceptance Phase C: Close Out -
Gateway C: Approval to 'Hand-Over the Programme'

Much of the information and sign offs were common to both the Acceptance Plan and 'Go Live' readiness assessments. The difference is mainly one of purpose: the Acceptance Plan focuses on achieving sign off for *acceptance by the location* that certain criteria have been met satisfactorily, whereas the readiness checks focus on *status* of certain criteria for overall programme management purposes.

4.1.4.13.4 Assessing Readiness to 'Go Live'

General

The state of readiness of a location to 'go live' was assessed against a number of key readiness criteria.

Readiness for 'go live' checks (readiness checkpoints) are used to indicate the status of the programme, from a location perspective and help maintain progress towards the achievement of the acceptance criteria and associated sign offs. Readiness check-sheets were used to record the status of criteria at key dates leading up to the 'go live' event. The principle is largely one of **self-assessment** at each level of responsibility with peer and next "tier" in the programme reporting lines reviewing and agreeing (or challenging) the assessment and signing the check-sheet.

The completion of check-sheets with appropriate signatures were intended to provide **documentary evidence** that due diligence was being applied throughout the transition from the current situation to live operation with new processes and systems.

4.1.4.13.5 Check-sheets

There were check-sheets for the following:

Location

Department

Process

Technology

The four check-sheets cover the key criteria in each of the three areas impacted by Enterprise - Process, People (organisation) and Technology. If these criteria are all satisfied, confidence in going live with Enterprise ***should*** be high.

Regardless of the contentious decision to allow locational self assessment, this sign off protocol was deemed sufficient for:

1) Programme Management and the Enterprise Executive to have visibility of the evidence of readiness for 'go live'
2) Internal Audit to ensure that there is an approved 'due diligence' process for deciding to 'go live'

4.1.4.13.6 Key Dates

The key dates within the programme plan for acceptance and operational implementation are set out below. These dates determined the timings preparation for all acceptance and gateway sign off activity.

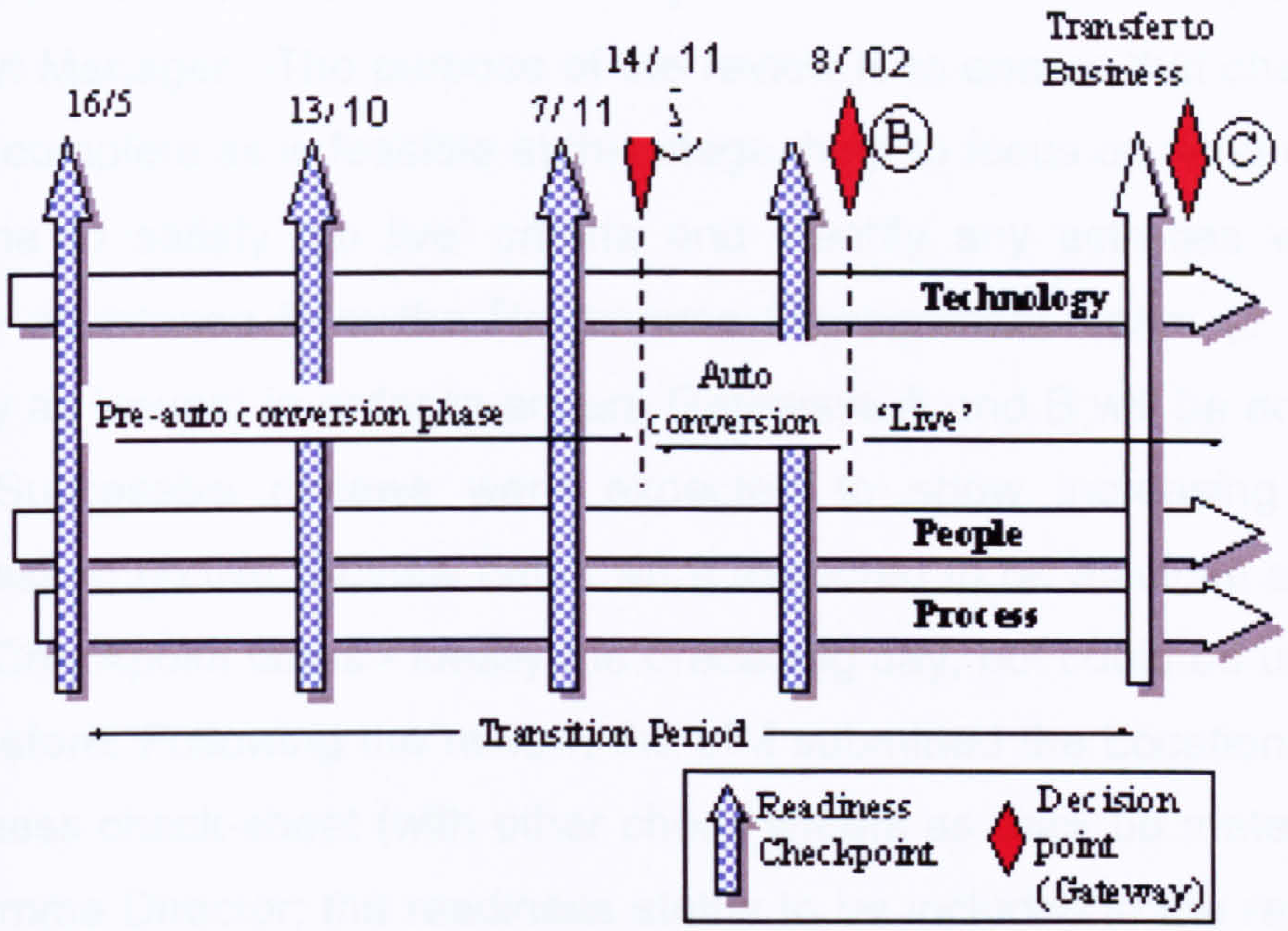


Figure 4.23: BAA Enterprise Programme – Key Dates

- ✓ 16 May 2000 Readiness for 'go live' Checkpoint 1
- ✓ 13 October 2000 Readiness for 'go live' Checkpoint 2
- ✓ 7 November 2000 Readiness for 'go live' Checkpoint 3
- ✓ 14 November 2000 'Gateway' A - Start automatic live data conversion
- ✓ 20 December 2000 Readiness for 'go live' Checkpoint 4
- ✓ 08 Feb 2001 'Gateway' B - Start live operation with new processes and systems
- ✓ Oct/Nov 2001 'Gateway' C - Approval to hand over the programme (i.e. dissolution of Gatwick and Corporate implementation teams; full responsibility for operating with new processes, delivering benefits etc taken on by the locations).

4.1.4.14 Readiness Reviews

The check-sheets were reviewed by the LIM with their Implementation Support Manager. The purpose of the review is to ensure that check-sheets are as complete as is feasible at this stage, help to focus on what remains to be done to satisfy 'go live' criteria and identify any activities which may require assistance from the Programme Management Team (if not raised already as issues) in order to ensure Gateways A and B will be achieved on time. Successive reviews were expected to show increasing levels of readiness to go live. Review dates were expected to be as close as possible to the Checkpoint dates - ideally the preceding day, but could be up to seven days before. Following the review, the LIM submitted the Location 'Go Live' Readiness check-sheet (with other check-sheets as back up material) to the Programme Director; the readiness status to be included in the report to the Enterprise Executive.

It was recognised that at this check-point date, many of the key criteria may not have been achieved (although some may well have been); the emphasis was on determining whether the location and process implementations were on track to achieve the key criteria by the necessary dates for 'go live'. Again the conflict faced the location whether or not to risk the fallout of failing to report on-track implementation performance for the sake of "getting it right".

4.1.5 AOS and Enterprise Implementation - Referring to the Literature

For the BAA UK Airports business BPR in the form of the implementation of an Oracle Enterprise Resource Planning programme has meant the provision of a centralised source of information integrating the previously disparate and silo structured strategic functions of the business; finance, procurement, HR, engineering (maintenance), projects. The process reengineering activity completed by BAA has been radical and subscribes certainly to the definitions offered by Hammer and Champy and Butler Cox referred to in Chapter 2. The same can be said of the AOS project, which fundamentally introduced new ways of completing operationally critical activities supported by an entirely new IT platform and requiring a new personnel skill set and roles profile. The ***implementation approach*** however which facilitated the AOS project focused on the establishment of IT-related changes in organisational design endorsed by Davenport rather than the radical change in Workflow and/or task design followed by supporting resource promoted in the original Hammer and Champy approach.

The implementation of ERP and AOS represent a significant investment for BAA, not just in capital investment terms. The Enterprise ERP project represented BAA's first "big leap" and time will tell whether BAA continues to pursue a strategy of steady and continuing improvements or choose instead to attempt again a BPR exercise some years from now, allowing for the embedding of new processes and systems efficiently, free from the constantly unsettling activity of continuous implementation. Coulson-Thomas argues that in a dynamic marketplace this may not be enough to maintain original objectives with respect to revenue growth, cost control, market share etc. Conversely Maier points out that the most committed incremental improver may fall foul of those employing more radical and innovative step changes.

From the BAA perspective the implementation of ERP processes does not exactly constitute a "start over "scenario, particularly from a technological perspective. The application of tailored solutions, previously developed and commercially widely available as "stock answers" to business integration requirements such as Oracle SSP or SAP R/3 does establish a starting point and a "step for a hint" as regards the development of appropriate process designs. There has however been a significant requirement to lead the organisation through all of the activities outlined above. The learning curve and the cultural changes to be negotiated have meant that the Enterprise programme could not simply be quickly installed and switched on. In order to realise the full Go-Live benefits and also establish a perception of the future as being one different to the past, the programme did concentrate on following a structured change management approach methodically.

Compare this to the very different approach adopted towards the implementation of the AOS solution. A conscious decision was made not to promote this exercise as a major change programme as the organisation feared an adverse reaction form the heavily unionised elements of the business, particularly the Airfield Operations and Terminal Operations members of staff. The business case for AOS is based heavily on the ability of the airports to accommodate growth whilst at the same time limiting the staff complement required to cope with it. AOS posed very much a threat to those with an interest in maximising the influence of the Airfield and Terminal Operations faculties. Another factor that determined the approach to be employed in the roll out of AOS was the governance structure employed. The AOS implementation team was effectively an IT project team. No Change Management expertise or professional HR consultancy work was applied to this programme. As a result the project was presented and communicated as an IT upgrade and subsequently and highly significantly received by those affected parties as an IT upgrade. This approach proved extremely successful and IR issues that may have emerged from the attempted implementation of a second major business change programme failed to materialise. On the contrary, the business change programme that was presented as such and actually posed less of a threat in job terms to the operational members of staff, Enterprise, was perceived with suspicion, fear and resistance.

Certainly BAA's desire to integrate functional processes has been progressed as a result of the technological capability becoming a practical option. There is no evidence to suggest that had the supporting technology been available ten years ago, affordably, that BAA would have chosen not to attempt integration.

The writer would argue that traditionally organisations have sought naturally to maximise the efficiencies of their organisations through the employment of practical processes and that the fairly recent availability of technology has enabled organisations to continue with this ethos, albeit with more radical opportunities and results achievable. It is the extent and scale of process improvement which is now enabled through technology that has created the BPR phenomenon. There has been over the past ten or so years an information systems capability explosion which has initially pulled organisations through an opportunity vacuum. Latterly however as organisations come to adopt IT culturally as a means of achieving greater benefits and many for the first time feel comfortable using technology across the business, we have seen them take the lead in determining the future development of IT supported process solutions.

The question of what is motivating the organisation is an interesting one when applied to BAA. This particular organisation has traditionally occupied the role of safe haven within the FTSE 100. Over recent years business performance may be broadly related to the throughput of passenger numbers and the associated impact on retail income, aircraft and passenger charges. Generally BAA may be described as an assets company, achieving a good return on capital employed in airport related assets and facilities. Over recent years business performance and shareholder returns have been predictably "safe", reflected by a steady share price. The notable exception to this condition is the 1999 withdrawal of intra-EU duty free trading rights. However, even with the effects of this commercial setback, growing passenger numbers and a favourable outlook for the future have enabled the company to retain its robust stock market status.

Within the Hammer and Champy definition, "Reengineering should be brought in when there is a need for heavy blasting" and not for companies that wish to make up a 10% shortfall in revenue or similarly a 10% reduction in costs. Davenport takes this idea further with the comment that "radical changes to processes can only be achieved when the leaders of an organisation believe and can demonstrate that current modes of operation are a threat to the survival o the company" In the case of BAA there were no such claims but a recognition that the integration of support function processes and data would provide more accurate information and also lead to some efficiency gains.

Does the implementation of ERP within BAA UK Airports business constitute BPR then? According to Hammer's definition, no, because the radical and fundamental requirement is not there, but according to the opinion of Martin Parfett, Why Not? Process simplification is seen as a less drastic option appropriate to those organisations that do not require extreme measures. BAA appears to fall between these two stools. BAA's processes have been radically reengineered. The implementation of the Oracle® front-end applications and database has ensured this. At the same time there is also no question that the implementation of fully integrated ERP systems does not form an absolute requirement to sustain business performance. This then suggests if we accept the views of Hammer et al that BAA may have embarked upon a major business process transformation exercise when something far less radical would have been not simply sufficient but more appropriate. Parfett advocates the process simplification option as being appropriate for many organisations where significant improvement may be achieved but where the extreme scenario ("must start over for the very sake of business survival") does not apply.

4.1.6 BAA Performance Measurement (OGSM)

Following the arrival of a new Chief Executive in 2001, BAA sought to roll out a new performance management framework called OGSM – Objectives, Goals, Strategies and Measures. The background to the philosophy behind the framework is outlined in Chapter 1. This Chapter describes the application of a software modelling approach to the implementation.

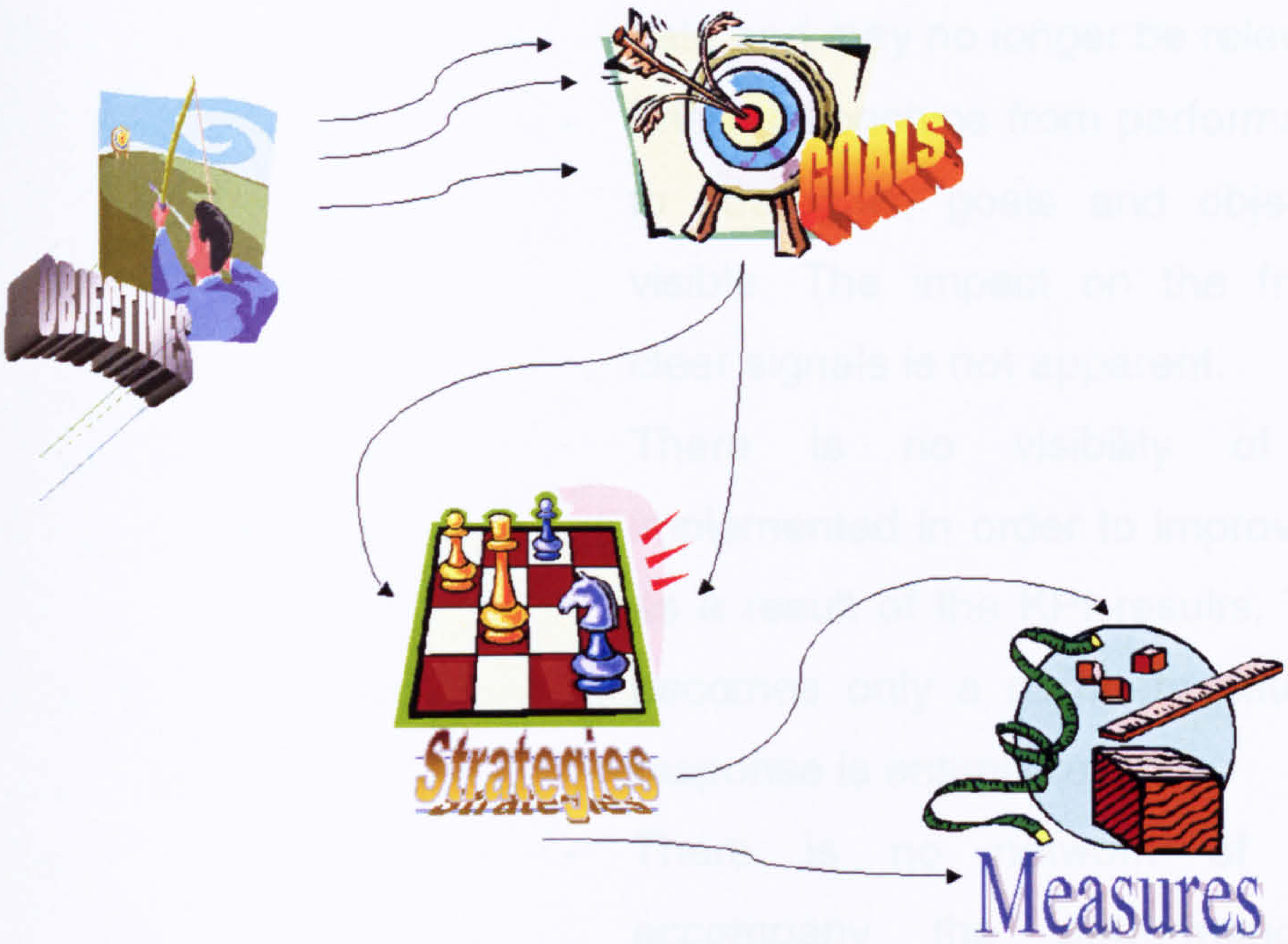


Figure 4.24: BAA OGSM The connectivity of Objectives, Goals, Strategies, Measure

Glasgow Airport commissioned a pilot project to explore the merits of utilising software to model the OGSM framework as it applied to the airport. The OGSM model was established as a paperwork exercise which required all departments to record performance against performance indicators. These departmental performance reports were then compiled and aggregated at Airport level. The contribution of Glasgow Airport was aggregated once again at regional level, i.e. Scottish Airport Group level and then once again at UK airports level. This exercise, although robust in terms of comprehensiveness, failed to meet the optimum requirements of the organisation as a responsive mechanism for performance measurement.

Contributing factors to this failure are:

- the time taken to complete the recording and aggregation is so long (7-8 weeks) that by the time reports are available, the data is out of date and may no longer be relevant.
- The relationships from performance indicators to strategies, goals and objectives are not visible. The impact on the framework from clear signals is not apparent.
- There is no visibility of the actions implemented in order to improve performance as a result of the KPI results. The framework becomes only a numbers database and the response is entirely reactive.
- There is no network of ownership to accompany the performance framework results. Clear accountability cannot be conveyed efficiently with the paper based system.

In a short space of time (two or three reporting periods) the failings of the reporting process become culturally accepted. The profile of the framework is negatively impacted and the culture within the organisations is such that the performance framework is not seen as a driver for future activities, but only as a disjointed reporting mechanism.

The requirement of the organisation is for a dynamic, responsive solution which delivers stakeholder information appropriate to a variety of organisational units. The system must be easily maintained and reflect all relationships. BAA decided to employ software to satisfy the requirement. The software selected was TopEase® XBench by Pulinco Ltd. This is a java written Enterprise Modelling application. It is client or client server based and uses a traditional Windows style front-end. Report outputs are delivered by java script files and can be customised readily with java code. The software models on the basis of identifiable objects and their respective relationships. Data can then be added to the model as object attributes. Objects are represented within the software by identifiable icons e.g.

Objectives

Goals

Strategies

Organisational Elements

The BAA OGSM pilot model was structured and populated with data according to object relations. The "objects" identified within the OGSM model are:

Objectives
Goals
Strategies
Measurements
Airports
Departments
Heads of Department
Staff Members
Owners of Actions

Associated with the objects within the framework are a series of attributes. These were defined as follows:

Performance data
Performance Data Dates

Performance Target Values

Performance Target Value Dates

Actions

Action Date

Action Costs

Action States

The software model was developed during a two day consultation exercise between the writer as consultant and the client. The software model reflected the hierarchical model of the organisation and also across this, the relationships of the OGSM framework i.e. the eight overall objectives and the specific goals and strategies to which these are mapped in the concept.

First of all the high level objectives of the organisation were modelled as represented within the OGSM performance model.

- Objective
  - Airlines
    - 1. Airlines - Improve Commercial and Operational Relationships with Airline Partners
  - Network Performance
    - 2. Network Performance - Efficiently meet the demands of the network
  - Resources
    - 3. Resources - Ensure efficient use of airport resources
  - Stakeholders
    - 4. Stakeholders - Maintain a safe operating environment
    - 5. Stakeholders - Maintain a secure operating environment
    - 6. Stakeholders - Maintain contract with the community "license to operate"
  - Traveller
    - 7. Traveller - Increase Traveller Participation
    - 8. Traveller - Optimise the Quality of Service to the Traveller

Figure 4.25: BAA OGSM Software Model Objectives Structure

Secondly, from the paper plan, the relationship from Objectives to Strategies and Goals is created.

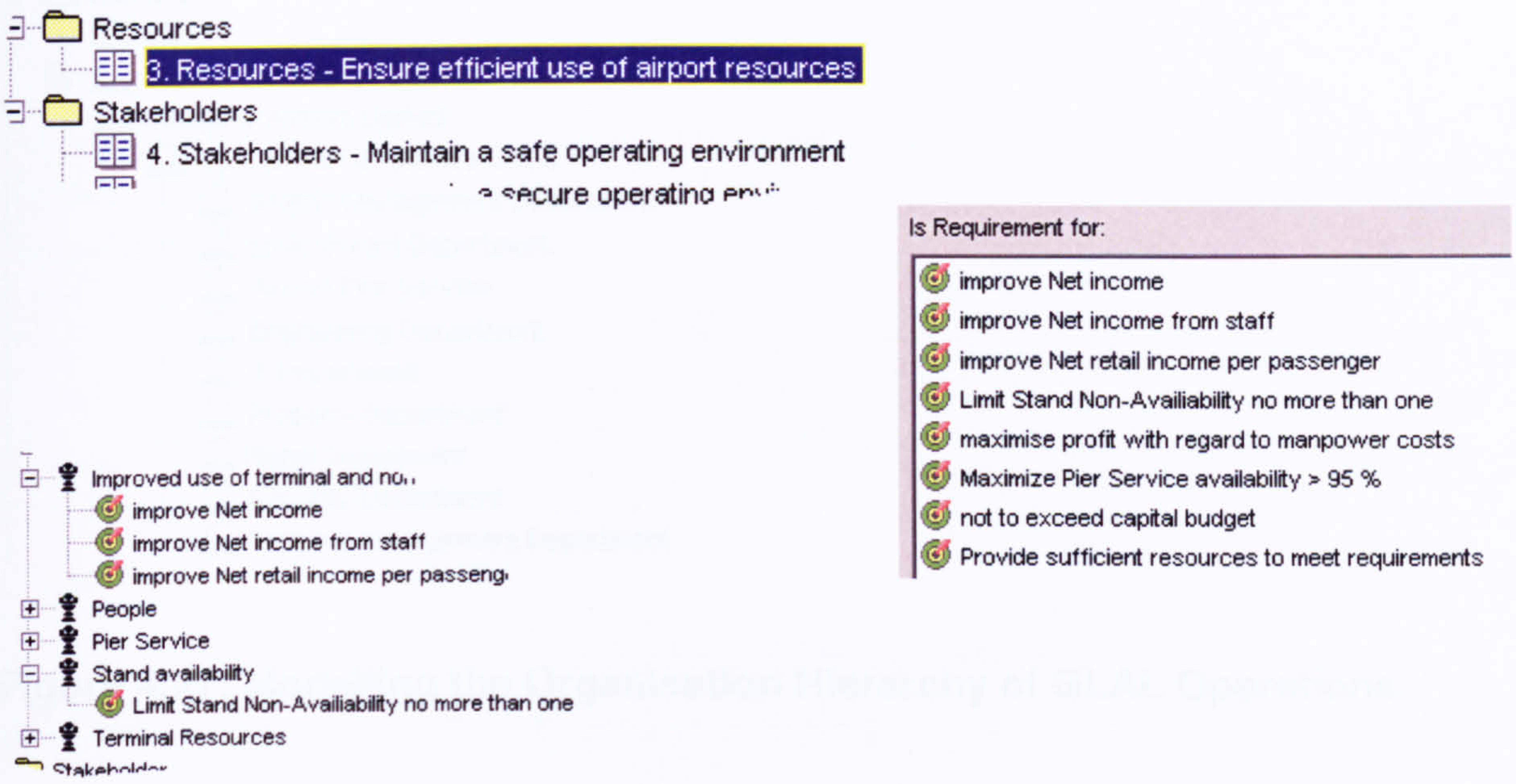


Figure 4.26: BAA OGSM Software Model - Objectives – Goals – Strategies Structure Definition

The third stage in the structure of the model is to represent the organisational elements. These are the objects against which data will be entered and performance will be measured. In this particular model this means the departments. The departments were organised within a hierarchical structure in order to allow the correct aggregation of performance data through the reporting set.

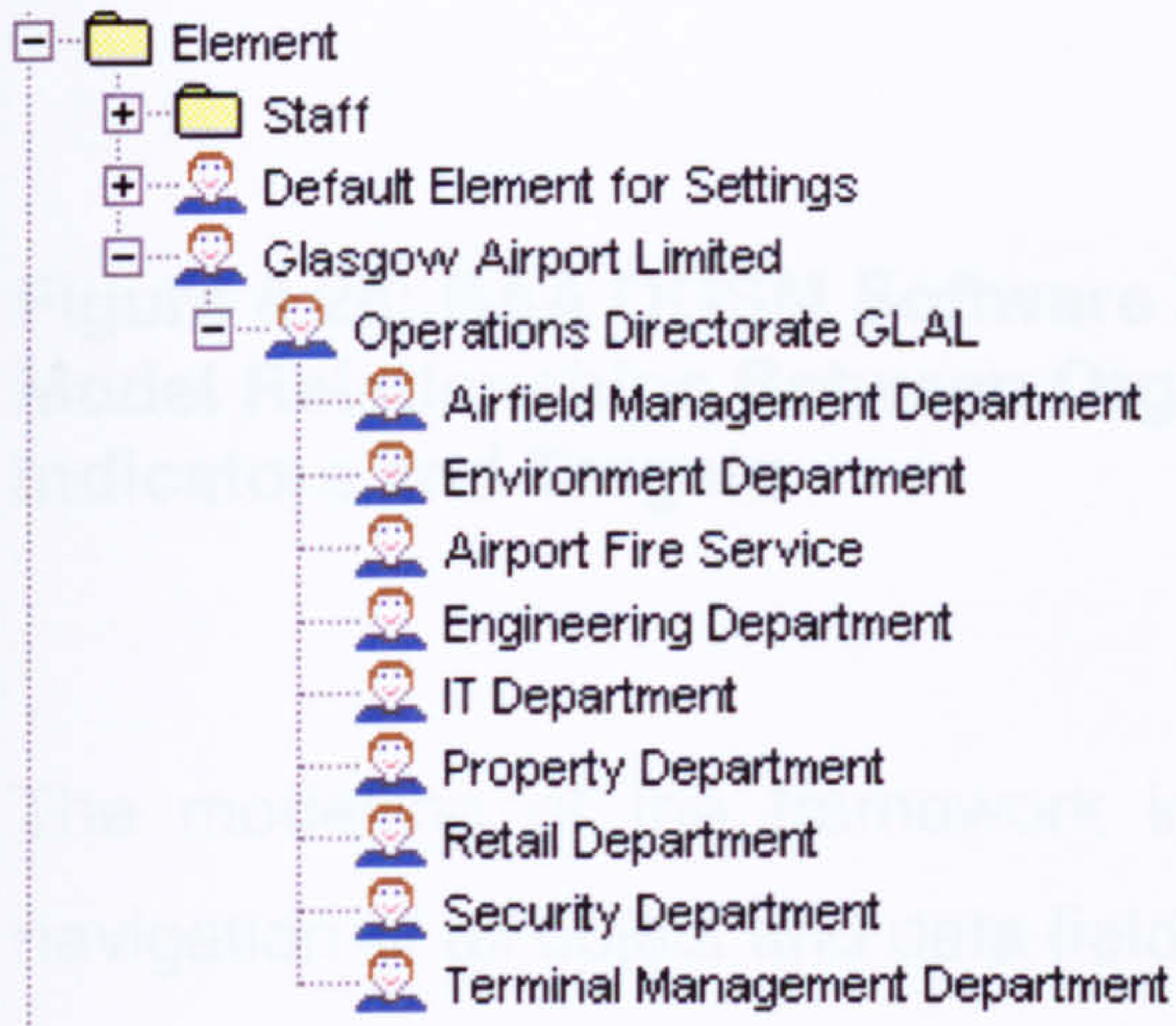


Figure 4.27: Modelling the Organisation Hierarchy of GLAL Operations

The fourth stage of model development was to allocate the Measures to the appropriate organisation element by mapping each department to the appropriate Goals. This allowed a review of the performance indicators presently being reported for validity within the conceptual OGSM model. On several occasions this resulted in the elimination or modification of measurements as their relevance to the OGSM model could not be verified. This exercise improved the quality of the model and ensured that all data reported would be making a relevant contribution to the performance model.

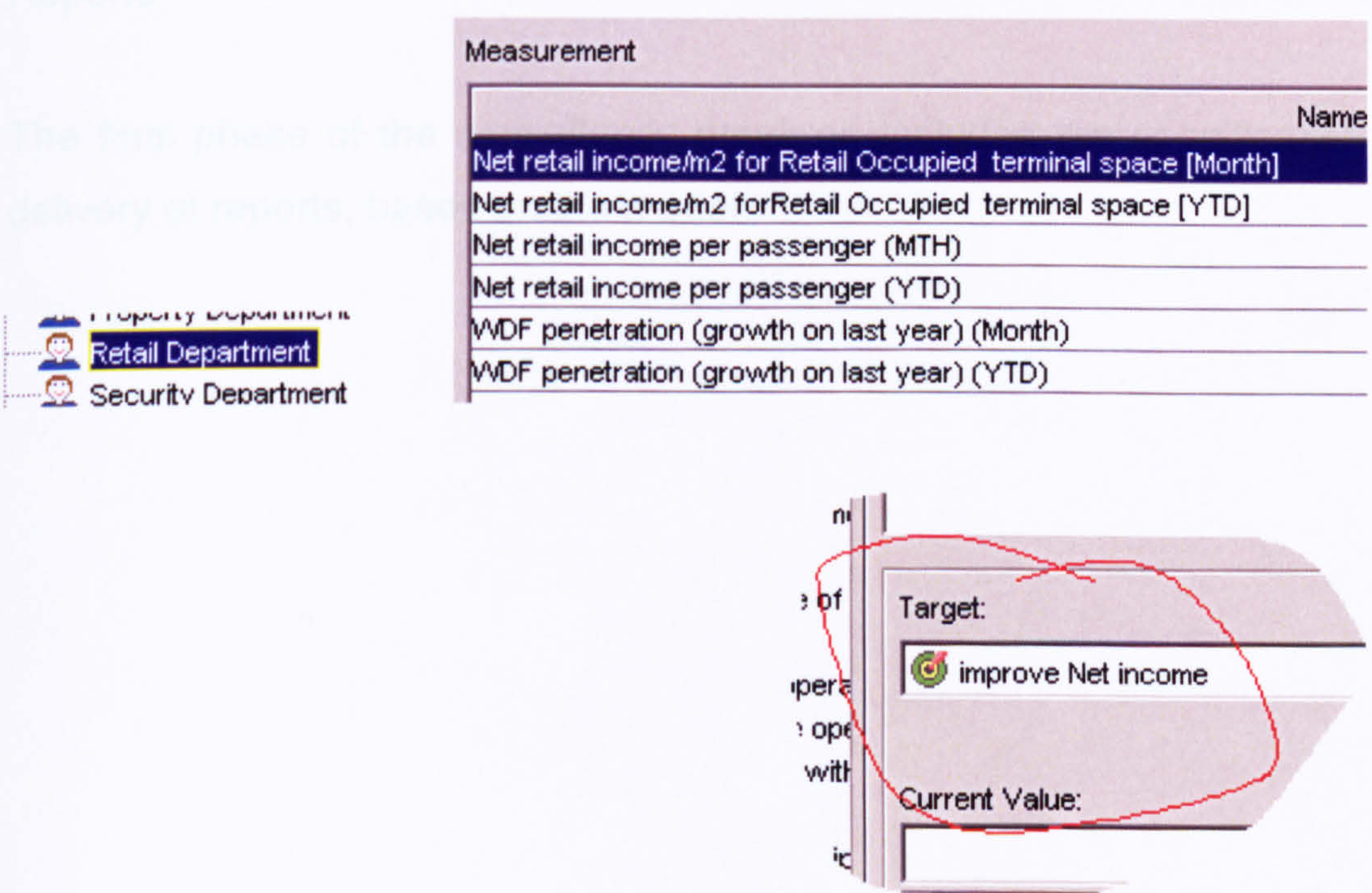


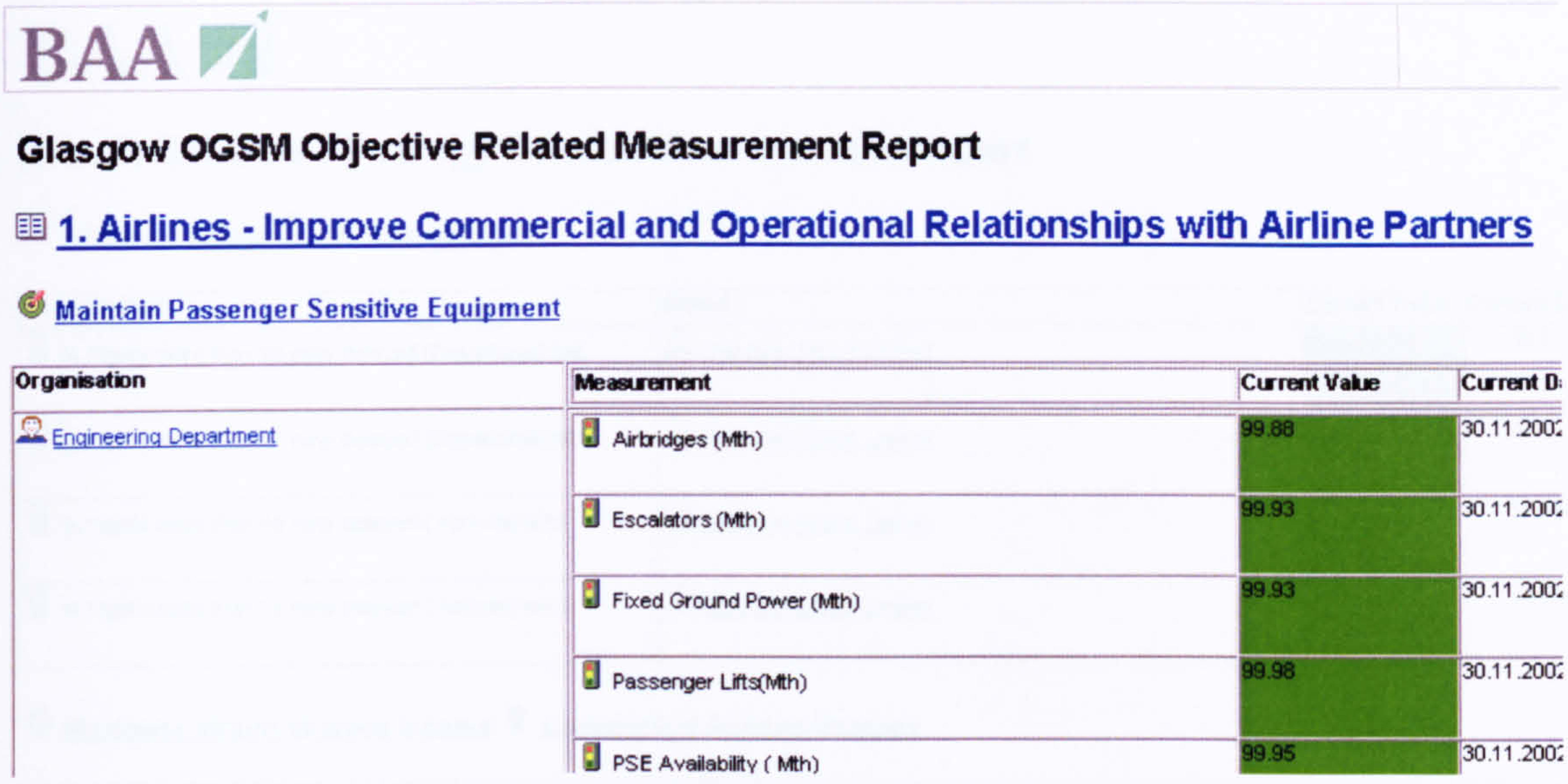
Figure 4.28: BAA OGSM Software Model Screenshots Illustrating the Model Relationships Between Organisational Units, Performance Indicators and Targets

The modelling of the framework in this way allowed the comprehensive navigation of all object and data fields.

This completed the modelling element of the framework. The next phase is data entry. Each department contributed to the model by populating data against their own organisational element and performance measures. The quality of performance data provision was perceived to have been improved. This could have been for a couple of reasons. Either the departments were motivated by the implementation of a new performance management system and applied increased focus to the activity, or each department was aware of increased senior management interest in the airport performance model and also of the transparency of missing data entry in the range of reports which would emerge.

Reports

The final phase of the consultancy provision included the specification and delivery of reports, based on the model.


BAA

Glasgow OGSM Objective Related Measurement Report

1. Airlines - Improve Commercial and Operational Relationships with Airline Partners

Maintain Passenger Sensitive Equipment

Organisation	Measurement	Current Value	Current D
Engineering Department	Airbridges (Mth)	99.88	30.11.200
	Escalators (Mth)	99.93	30.11.200
	Fixed Ground Power (Mth)	99.93	30.11.200
	Passenger Lifts(Mth)	99.98	30.11.200
	PSE Availability (Mth)	99.95	30.11.200

Figure 4.29: BAA OGSM Performance Management Project – Screenshot of Generated Report

The screenshot above demonstrates a typical layout of performance reporting developed on the object basis. The example above displays performance on the basis of "Objective" selection. During the consultation period of this project a desire was expressed for the provision of reports not only from a range of object perspectives such as Objectives Goals and Departments but also for a range of specific target audiences such as the Scottish Airports Limited Executive (SAL Exec). This was facilitated by extending the model to include relations to target audiences.

BAA

SAL EXEC Goal / Strategy Related Measurement Report

Minimise delays Airlines Services

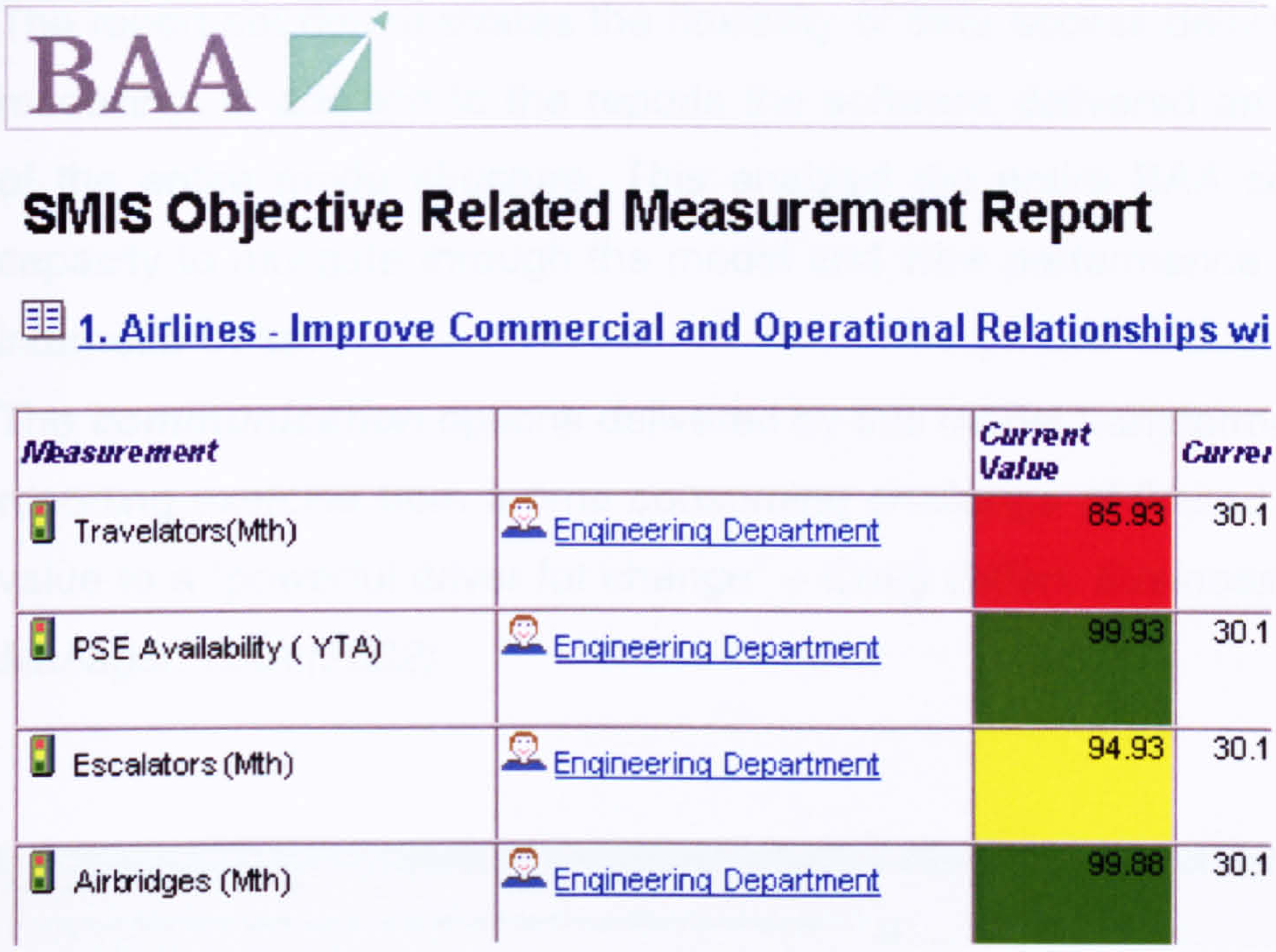
Measurement	Object	Current Value	Current D
% Flights more than 15 mins delayed (Departures) Mat	Glasgow Airport Limited	22.9	30.11
% Flights more than 15 mins delayed (Departures) Mth	Glasgow Airport Limited	20.0	30.11
% Flights more than 15 mins delayed (Arrivals) MTH	Glasgow Airport Limited	27.4	31.10
% Flights more than 15 mins delayed (Arrivals) MAT	Glasgow Airport Limited	none	10.09

Maximise airport charges income Commerical Airlines Strategy

Measurement	Object	Current Value	Current D
Airport Charges Income £000's(YTD)	Glasgow Airport Limited	33731.0	30.11
Yield (YTD)	Glasgow Airport Limited	5.74	30.11

Figure 4.30: BAA OGSM Performance Management Project – Screenshot of Generated Report

Certain targets, in addition to being relevant to the OGSM framework are measures which also determine the outcome of the SMIS (Senior Management Incentive Scheme) – the bonus scheme. By modelling a relationship between targets and the bonus scheme a report was coded to filter these results from all others and provide for the first time a view of performance which conveys throughout the course of the year how progress towards bonus is being made. Additional filters were specified including RAG filter (Red, Amber and Green). This allowed access directly to those indicators of a particular tendency.


BAA

SMIS Objective Related Measurement Report

1. Airlines - Improve Commercial and Operational Relationships wi

Measurement		*Current Value*	*Curre*
Travelators(Mth)	Engineering Department	85.93	30.1
PSE Availability (YTA)	Engineering Department	99.93	30.1
Escalators (Mth)	Engineering Department	94.93	30.1
Airbridges (Mth)	Engineering Department	99.88	30.1

Figure 4.31 BAA OGSM Performance Management Project – Screenshot of Generated Report

The full SMIS (Senior Management Incentive Scheme) report output is appended to this thesis. The list of MSWord generated reports developed during the two day consultancy exercise is as follows:

- Objective Related Report
- Goal Related Report
- Red Measures
- Red & Amber Measures
- All Measures Objective Related Report
- All Measures Goal Related Measurement
- SAL Exec Goal Related Report
- SAL Exec Objective Related Report
- SMIS Objective Related Report
- SMIS Goal Related Report

- OGSM Objective Related Report
- OGSM Goal Related Report

- Goal Related Action Plan List
- Action Plan Report for Red & Amber Measures

The report set demonstrates the flexibility of data access delivered by object modelling. In addition to the reports the software delivered an HTML output of the entire mode structure. This enabled the entire BAA community the capacity to navigate through the model and view performance results via an internet browser.

The ***communication*** options delivered by this model transformed the OGSM reporting exercise from a time consuming challenge of limited management value to a "powerful driver for change" – *Craig Giffen, Business Performance Manager, BAA (2002).*

Figure 4.32: BAA OGSM Performance Management Project – Screenshot of Intranet HTML Navigable Output

The initial objectives of the pilot study were to accelerate the reporting process and at the same time eliminate the onerous workload associated with producing aggregated reports.

Ultimately however the organisation gained additional unanticipated benefits.

Alignment of framework

By building the OGSM model all departmental heads were committed to validate their performance indicator plans against the eight overall objectives of the airport as cascaded by the Managing Director. This presented a challenge to the historic trend of measuring what could be measured and what had always be measured in the past.

Efficiency

Also the model was now far more responsive to change. Changes to the framework were far more easily accommodated. New objectives, strategies could be implemented and the response of the organisation to these additions also modelled quickly and easily. Changes to data also were easily managed and did not result in another manual, cumbersome exercise to accurately aggregate reports. Changes to responsibilities, ownership, organisational hierarchy etc were now minor adjustments instead of complete restructuring exercises. Structural changes such as these are now activities taking minutes rather than days. The result is a reduced risk of the framework losing credibility. On the contrary the ability of the mechanism to quickly respond encourages the business leaders to take a proactive and challenging view of the framework and maintain the currency of the model. The framework resultantly is much more visible, much higher profile and is regarded as the driver for performance improvement.

Sensitivity of Change

Previously, the relationships between objects within the OGSM model were never immediately apparent. Subsequently, the impact of changes on these relations was also not immediately apparent.

4.1.7 BAA Risk Management (MATRA)

The business profile of BAA is "risk averse". A FTSE100 share with the reputation of being a safe haven and an organisation perceived as responsible in part at least for ensuring the safe management of people during periods of leisure and business travel. The organisation exists to provide and maintain airport facilities. In the process and in response to increasing traveller activity, BAA has established a development plan which features significant capital expenditure in the areas of asset expansion, renewal and redevelopment. The inherently "risky" nature of construction, much of it completed in public, operationally active areas presents a potential increase in the corporate exposure to business risk for BAA.

The employee culture within BAA establishes that every person in BAA is responsible for acts and decisions that affect both the risks to the organisation and the risks that BAA could pose to its employees, partners, customers and neighbours.

A core skill which the organisation seeks of managers is the ability to identify, evaluate and decide on strategies for keeping risks at a level which is tolerable to all stakeholders at a proportionate cost, whilst striving to achieve business objectives. In order to equip managers with a method which can be embedded as consistent across the operating units, BAA employs a standard established risk assessment and management and reporting framework.

Change inevitably involves taking risk - new risks may emerge during the course of business activities which impact on others. Understanding all the risks enables the organisation to take informed and better decisions about future business directions.

There are several good reasons why BAA seeks to manage risk responsibly and effectively:

- To improve business performance

  The organisation continually strives to reduce costs, improve processes and reduce losses from failure - the tools of risk assessment and risk management provide a vehicle for continuous improvement and a means of prioritising expenditure and management effort.
- To maintain the operation and the reputation

  BAA seeks to achieve this by providing assurance to stakeholders of the responsible stewardship of people, assets and the environment and the competence of their risk managers.
- To meet ethical standards

  To demonstrate the organisation's role as a responsible company in handling the risks it generates and not passing these onto others or storing them up for future generations.
- To comply with law

  In order to comply with the law of each country in which they operate; legal requirements range from UK and EC safety, security and environmental regulations to employment rights and procurement law.

A comprehensive risk management framework employed effectively must spread examples of good practice in managing operational and business risks, encourage coherence and consistency of process; and integrate this into everyday business process improvement. The aim is not to minimise risk at any cost, but to establish cost effective and non-bureaucratic risk management processes. However, most business crises, even in otherwise well run businesses, are caused by one or more of the following:

- overconfidence in systems and processes designed to control risks;

- failure to appreciate that there has been creeping piecemeal and cumulative change in a system or process, or in the environment in which it operates;

- not making adequate allowance for risks posed by human fallibility and weaknesses;
- allowing too many complex and uncontrollable physical or managerial interfaces to exist or develop; and
- ignorance of risks coming from areas which do not form part of the core expertise.

Risks can arise through the completion of day-to-day activities and processes - the computers may go down, telephone systems may fail, etc. – failures may occur in the support functions - finance, procurement, IT, etc. External sources of risk must also be assessed - interests rates change, exchange rates fluctuation, suppliers failure to deliver exactly what the business needs, business partners introducing new policies, etc. Risks may or may not occur - this is the nature of risk; however the organisation must have the facility to respond appropriately, engage contingencies or mitigate to limit the impact on the continued safe operation of the business activities.

When a risk *does* materialise, the consequences may include:
- loss of ability to innovate and grow;
- disruption, inconvenience, cost to stakeholders,...;
- increased cost, and so poor bottom line business performance;
- damage to assets and their value;

- injury to people;
- harm to the environment;
- loss of reputation - with customers, with business partners, with shareholders, in the business community, with staff, in the local community, internationally,...

i.e. an impaired ability to continuously improve.

BAA has a requirement to implement and demonstrate a coordinated response to the MATRA Risk framework which includes a defined list of risks as follows:

- Aircraft Hijack
- Armed Attack
- Assault
- Bomb Attack
- Breach Of Restricted Zone
- CBRN
- Corruption / Collusion / Fraud
- Cyber
- Drug Trafficking
- Fraud
- High Risk / High Value Cargo
- High Risk / High Value Theft
- Hostage Taking
- human Smuggling
- Human Trafficking
- Impersonation of Staff
- Import and Export Weapons
- Money Laundering
- Protest
- Sabotage to Aircraft/Airport
- Smuggling of prohibited restricted items
- Smuggling of Tobacco
- Smuggling Paaedophile material
- Suicide Bomber (Airside)
- Suicide Bomber (Landside)
- Surface to Air missile Attack
- Theft
- Vehicle Bomb

Figure 4.33: MATRA Risk Catalogue

BAA wished to apply their own generic risk management framework to this project. This is the framework which is used to record, assess and manage all risks to the business – corporate, operational or in this case MATRA risks.

Any risk within the business risk profile can be a key business risk on either financial or non-financial grounds. So a major risk to safety or the environment or reputation can be a key business risk, even if the financial implications alone would not justify this. Key business risks may be very unlikely but may have catastrophic consequences if they do occur, (for example, a major fire in a terminal building) or there may be an accumulation of frequent minor occurrences that add up to a significant business loss.

4.1.7.1 The Framework Employed

Risk management is all about identifying, evaluating and deciding on strategies for keeping risk at a level which is tolerable to all the stakeholders in the business. Risk management is focused on the measures taken to mitigate risk and monitoring the effectiveness of those measured. There are relationships to be recorded between risks, actions, organisational units (agencies) etc.

4.1.7.2 Risk Assessment

Risk assessment increases the chances of getting things right by improving available information. The basic process for assessing risk is the same for all business output variables: financial, quality, reliability, safety, security and environmental. There may be differences in the level of detail or specific methods of tackling an activity, but the fundamental process is always the same. There may also be differences in how to develop risk management strategies because of political, regulatory, historical or public perception issues. Risks must be recorded, owned, controlled and closed out. When a risk has been identified a decision should be whether to tolerate it, treat it or transfer it to someone else.

The outputs of a risk assessment will include a log of all the risks that have been identified and a risk profile indicating how the residual risks stack up against each other. Detailed information may also be recorded on current risk control measures, people's perception of the tolerability of risks, and the alternatives for risk reduction. A key output will be an action plan on the next steps for managing risks, or whether further detailed analysis is required.

On the basis of the risk assessment the organisation is able to decide on actions to tolerate, treat or transfer the risk.

Tolerating a risk means that a decision has been taken not to take any further risk reduction actions now. This is likely to be the case for risks in the Green Zone of the risk profile. But these risks should not just be forgotten - they should be reviewed from time to time to check that they have not become more frequent or important.

Treating a risk means that specific actions are chosen and undertaken to actively eliminate a risk or to reduce the likelihood of the risk occurring and/or the severity of the consequences if it did occur. Those involved in managing each risk will form a view on how it can be best reduced - and this includes considering cost effectiveness and practicality too. Before agreeing a solution, it may be necessary to undertake more detailed studies of risk and the effects of possible risk reduction actions.

Red and Amber Zone risks need to be treated. Red risks can be regarded as intolerable, although sometimes there are exceptions where there is nothing which can be done about the risk because there is no possibility of control either on the cause of it, or on its consequence.

Transferring risk may be achieved through insurance or contractually. The transferral of risk should be preceded by attempts to reduce the risk as much as possible. This keeps claims and insurance premiums down and can lead to better working relationships with contractors and partners. Often a combination of these options will be chosen to achieve the desired risk reduction.

There are a number of sources of information for deriving an overview of the key risks to BAA's business, none of them automatically co-ordinated with any other:

- local risk assessments relating to projects, processes and activities in each Group Company are collated into a risk register and key business risks filtered off and passed on;
- each Group Company checks the comprehensiveness and completeness of the register with an independent brainstorming session from time to time;
- key business risks from each Group Company are reported to the Board through corporate governance statements; and
- at agreed, regular intervals, a group-wide independent brainstorming is used to check the group register for key business risks.

This process is time consuming, inconsistent in terms of frequency and quality, manual in preparation and often the data is out of date prior to consolidated reporting.

The MATRA Risk framework represents a complex model, not in terms of concept but in terms of volume and relationships. The model comprises a number of "object types".

- Agencies
- Risks
- Airports
- Risk Owners
- Risk Action Owners
- Involved Parties

Associated with the objects are data attributes – features of the BAA Risk Management framework:

- Early Warning Indicators
- Reasons
- Embedded Monitors
- Key Targets
- Weaknesses
- Impact Score
- Probability Score
- Aggregate Score
- Impact Categories
- Residual Risk Impact Score
- Residual Risk Probability Score
- Residual Risk Aggregate Score
- Risk Dates
- Risk Actions
- Risk Action Dates

MATRA Implementation

BAA was inclined to attempt a more dynamic response to risk management than was normally the case, but one which conformed to the BAA established framework at the same time. The response by BAA was to explore the implementation of a software supported structured MATRA risk model. There were a number of reasons why this option was explored in preference to the traditional spreadsheet, paper based approach.

1) Modelling risk relationships.

The MATRA framework involves approximately 25 generic risks to which the organisation must respond. The resultant risk register itself forms a collective view of a location's response to each risk or threat. The same set of risks impact on other locations. At the same time, the agencies involved within the risk management exercise e.g. Customs, Special Branch, Airlines, BAA, Handling Agents etc. have interests in mitigating these risks at all locations. There is an interest therefore in adopting a similar risk management framework for the purposes of comparison.

2) Modelling risk responses

As the same risks impact on all port locations to a greater, lesser or similar extent the responses to them becomes an important source of information across the port community. In modelling the risk responses the collective community benefits from the capacity to access best practice.

3) Modelling Ownership

In order to maintain a group-wide coordinated view of risk management which is responsive and allows immediate exposure of high level risks, visibility of responses and access to the identity of the ownership matrix, BAA has developed and implemented a software supported representation of MATRA.

4) Malleability of reporting

The standard risk register reports developed within the scope of the BAA framework served the purpose of routine risk monitoring. In relation to operationally more critical risks during a period of higher threat i.e. MATRA risks, BAA defined a need for a more flexible risk reporting solution. The solution must allow analysis by location i.e. the risk register, but also provide a means to quickly analyse on the basis of risk, risk owner, actions etc. Multi-object modelling supported by a flexible software reporting solution accommodated this requirement.

5) Improved communication

As the model includes the relationships and responsibilities of all stakeholders, controlled access to the model data, including contact details, the MATRA community is able to respond quickly as communication is simplified.

6) Political transparency

Risk management is often viewed within organisations as a "chore" – a discipline which has to be seen to be completed. Often a risk register is prepared, filed and revisited rarely. It is regarded by many as an exercise to comply with corporate policy, a tick in the box and not as a real management aid. Regarding MATRA, and given that BAA is piloting on behalf of the Home Office, the organisation wishes to expose its efforts in this area as clearly as possible. A robust demonstration of coordinated management in the area of MATRA will reassure stakeholders including investors. It also of course wishes to exploit technology to effectively deal with the threat situation, but the importance of being able to quickly demonstrate this capacity for an organisation of the type of BAA which handles 140 Million passengers per year should not be understated.

The MATRA project as outlined in Chapter 1 is an exercise in co-ordinated risk management for each Port Authority. It involves the consultation of several stakeholders and the requirement to develop a common risk register, documenting the assessment of each risk from a collective perspective, a list of the actions prescribed, early warning indicators, residual risk assessment etc. Transparency of ownership is a major attribute of the MATRA risk framework. Ownership of risks and risk actions and identification of involved parties are all key to the effective recording of risk management data. Assessing, recording and managing risk data is one thing: exploiting the information in a way that allows the rapid dissemination of information to appropriate parties for action is another.

BAA has elected to employ a structured model supported by TopEase® XBench software. This exercise was completed by members of the MATRA steering group at Glasgow Airport and also members of BAA Group Security function. The exercise was completed within a two day period. The consultation exercise included the modelling of the MATRA framework, the definition of output requirements (reports) and the delivery of supporting software and user training.

The modelling exercise involved the representation within the software of all objects i.e. risks and agencies.

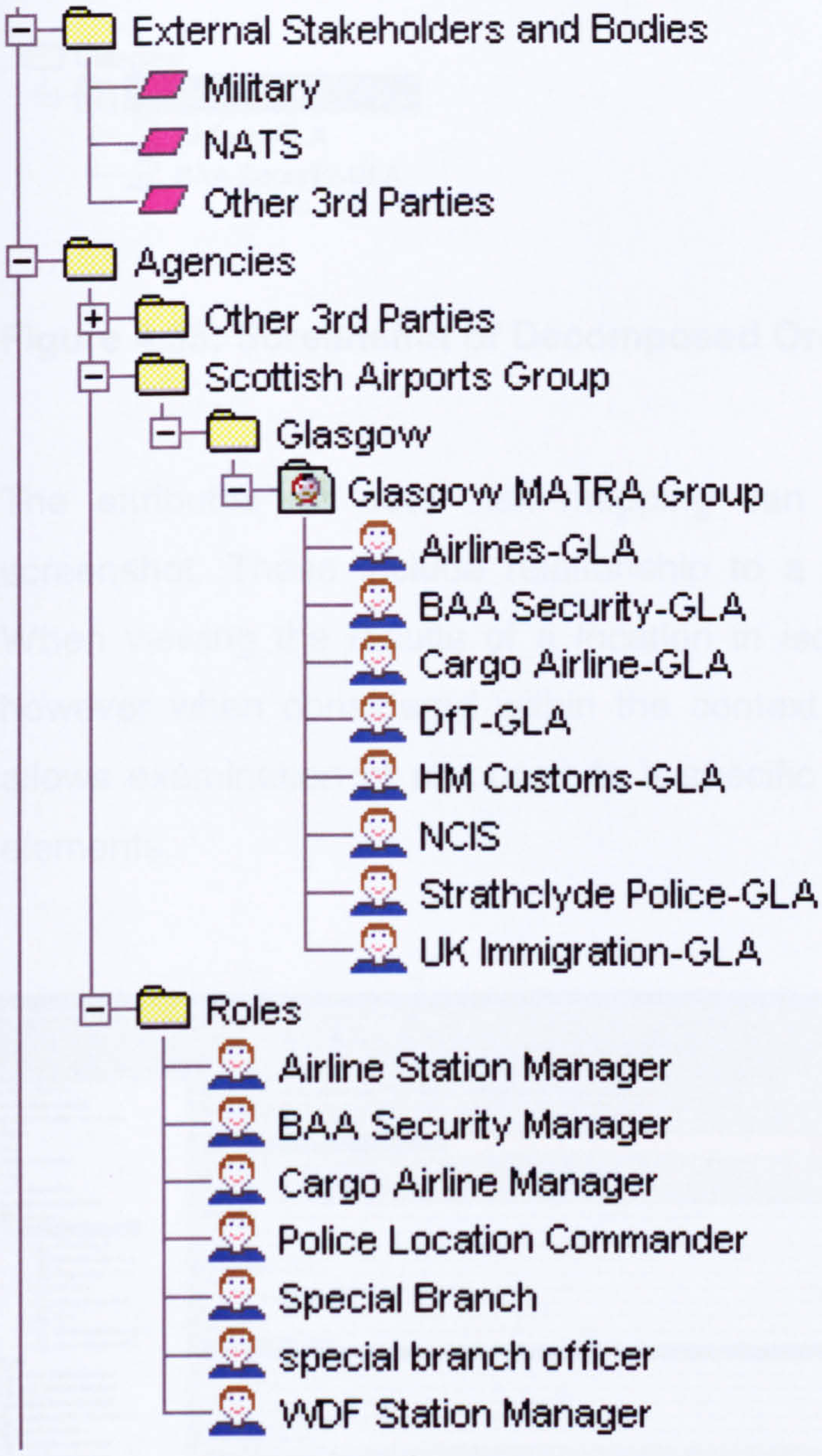


Figure 4.34: BAA MATRA Risk Management Project – Screenshot of Organisational Model Structure

As the assessment of risks is to be made by the location as a collective exercise then the second stage of the implementation was to align the view of the MATRA Agencies during a facilitated workshop. This collective exercise achieved an aligned assessment, documented within the software model.

Figure 4.35: Screenshot of Decomposed Organisational Structure

The attributes for each risk mapping can be viewed on the following screenshot. These include relationship to a risk template or generic risk. When viewing the results of a location in isolation this has little meaning, however when considered within the context of multiple sites, this feature allows examination of response to a specific risk by several organisational elements.

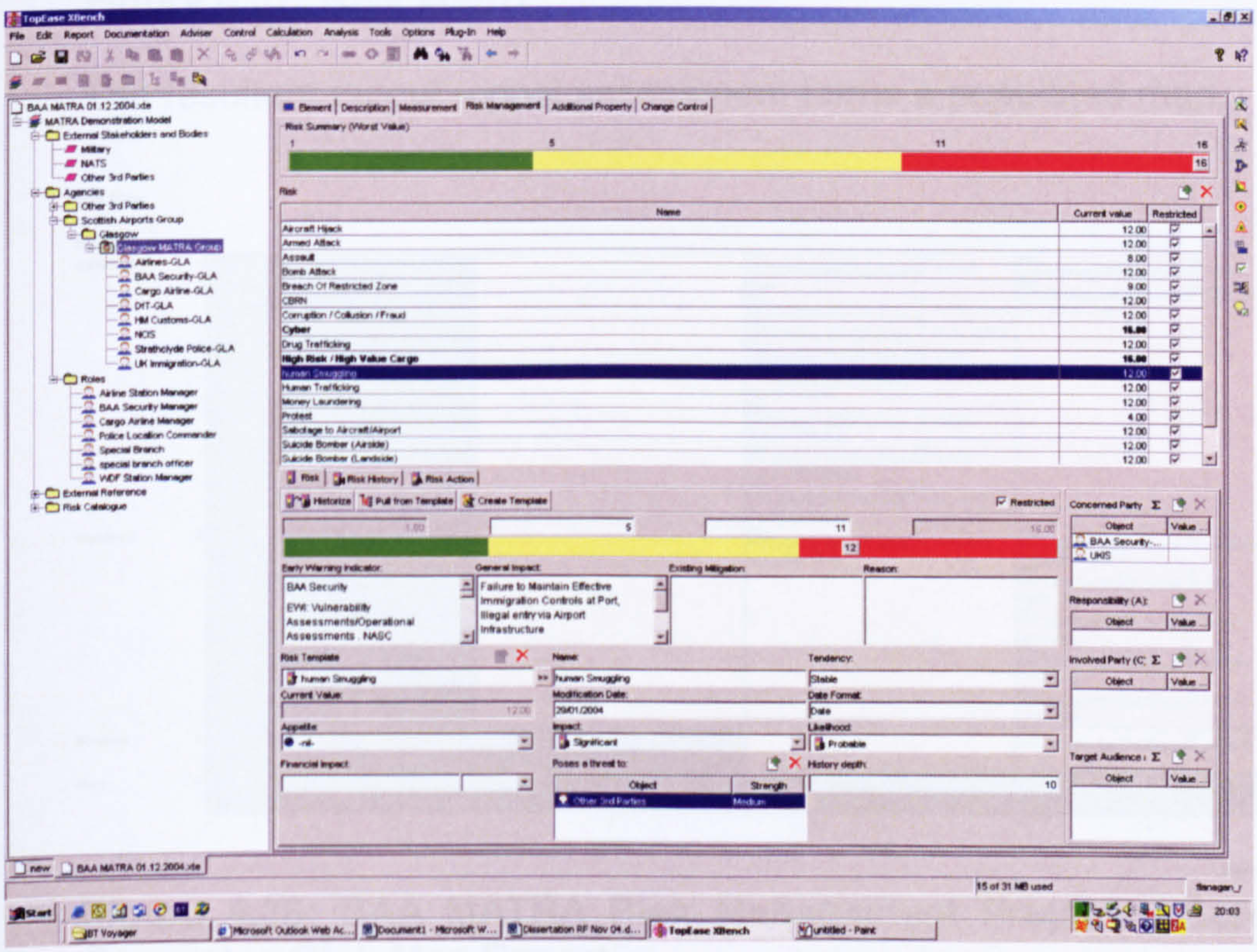


Figure 4.36: Application Screenshot of Risk Management Attributes Relevant to Organisational Units

The data attributes modelled for each risk are listed above. These conform to the preferred framework of BAA. The risk profiling structure is based upon a 4 X 4 matrix of impact and probability. Impact is categorised within 4 standard descriptors: Safety, Security, Economic and Reputation.

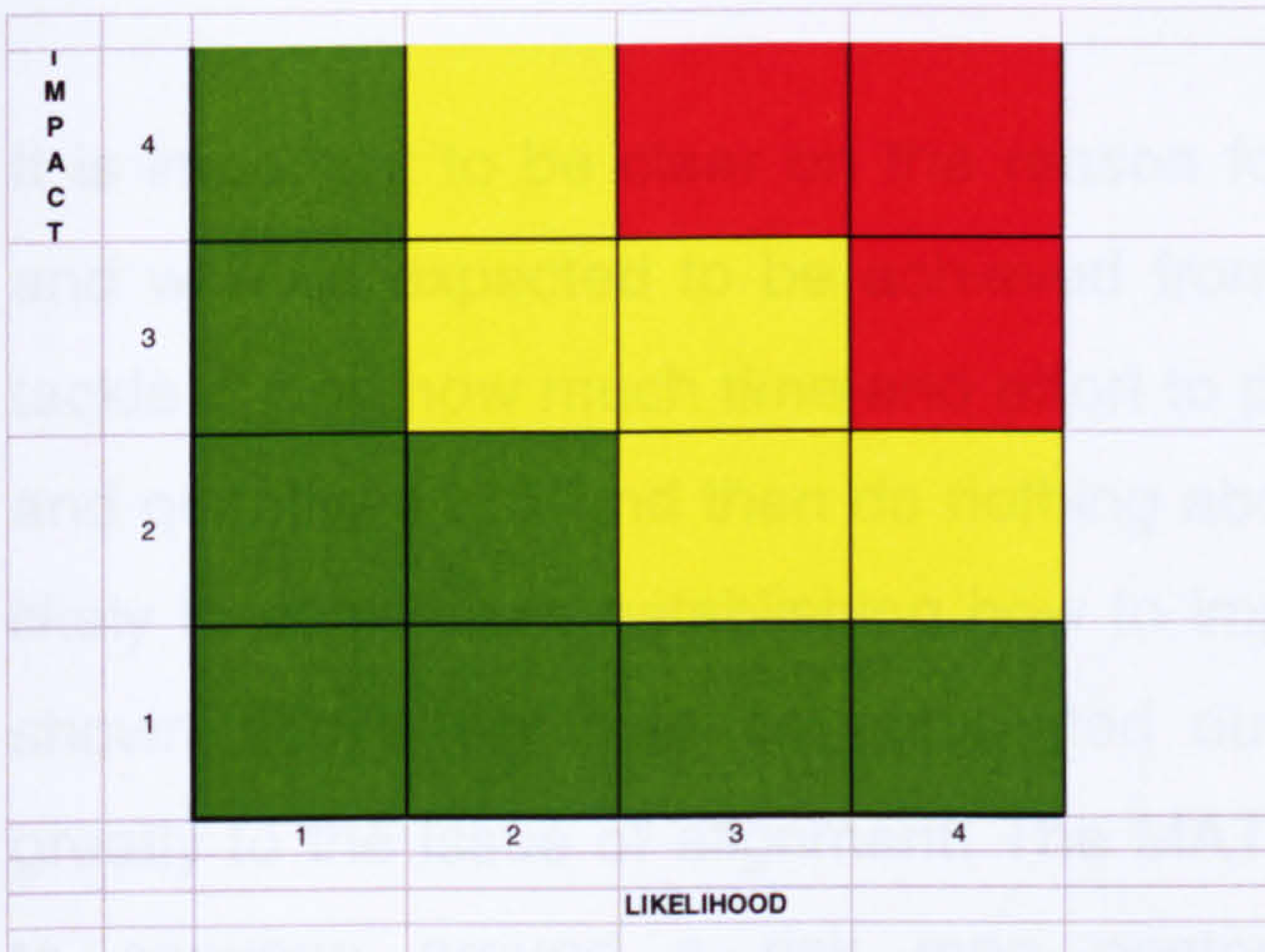


Figure 4.37: Risk Matrix

The resultant output – post assessment forms a populated map.

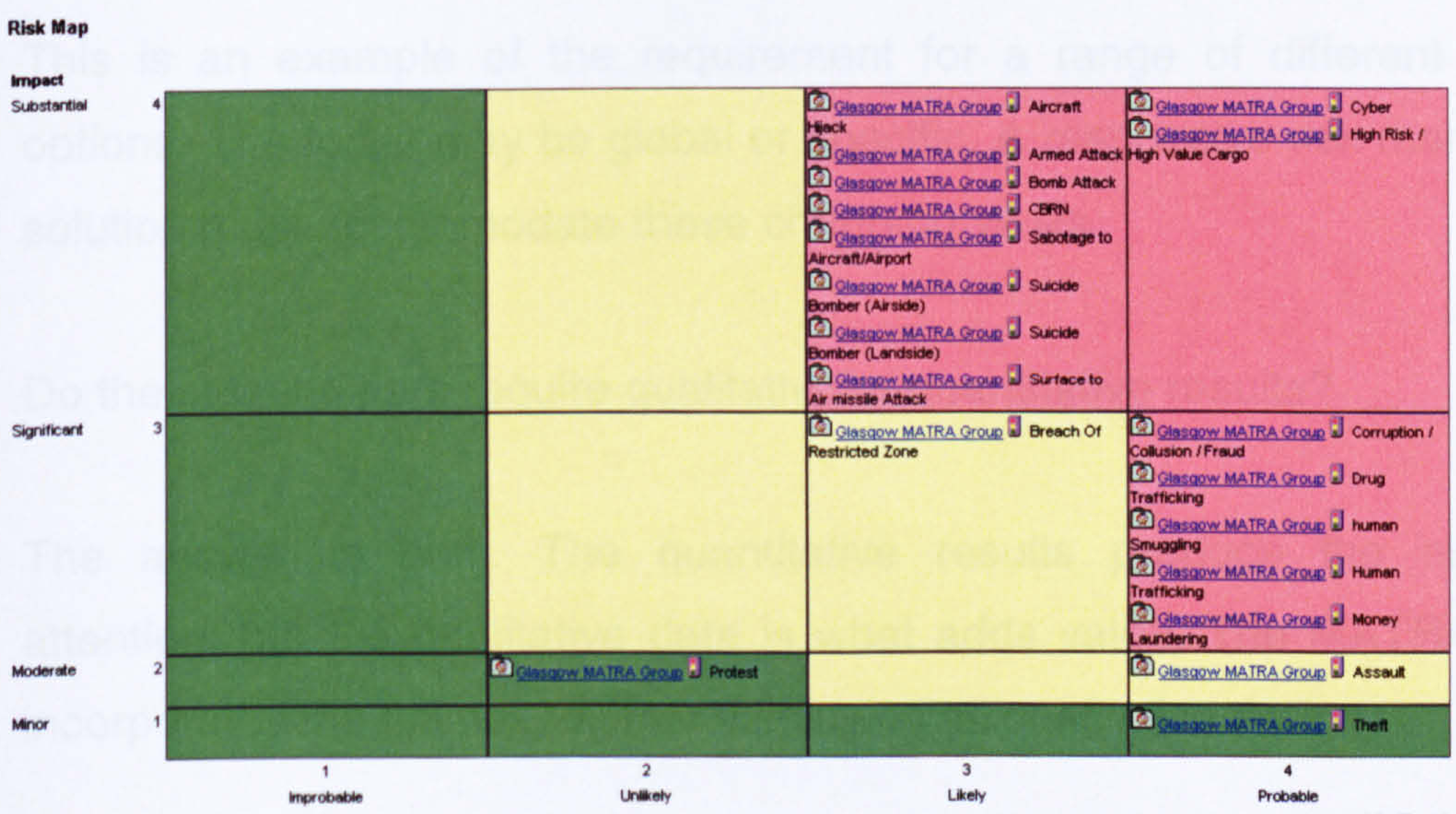


Figure 4.38: BAA MATRA Risk Management Project – Screenshot of Generated Risk Map Report

One of the steps which enable an organisation to draw together a picture of the risks to a Group Company, or to the group as a whole, is to establish a common ranking system, at least for the preliminary risk profiling. The red, amber and green zones, recommended on the risk profile diagram relate to the extent of impacts and the relative likelihood.

The Objective of the Risk Assessment

It is important to be clear on the reason for undertaking a risk assessment and what is expected to be achieved from it. This will help decide how to tackle it, and how much time and effort to put into it. It is pointless to identify and quantify a risk and then do nothing about it. The biggest benefit is most likely to come from establishing how to improve risk controls. The risk map shown above which is an automated output of the software contributes greatly to the issue of alignment. The MATRA Group at each airport is able to convene around a risk map poster, validate the relative scoring assessment and focus on the actions required to "move" risks from the Red zone to the Amber or Green zone.

This is an example of the requirement for a range of different reporting options. The focus may be global or specific. A responsive risk management solution must accommodate these changing views.

Do the stakeholders require qualitative or quantitative results?

The answer is both. The quantitative results produce the signals for attention, but the qualitative data is what adds value. The MATRA solution incorporates the full risk register displaying all qualitative data.

The timeliness of risk information, particularly as high profile as MATRA risks is paramount to maintaining a robust group-wide defence against threats. Access by appropriate parties to the detailed qualitative data is important. The traditional maintenance periodically of a risk register no matter how diligently does not provide the responsiveness required. Decision makers and those with corporate responsibility have often neither the time nor the inclination to leaf through endless risk registers in order to identify RED or high level risks. Modelling the MATRA scenario and the use of software enables this. Management effort is therefore organised and focussed quickly. Software outputs that include on-line access to the model data ensure a common aligned view is provided and that the MATRA community maintains closely co-ordinated.

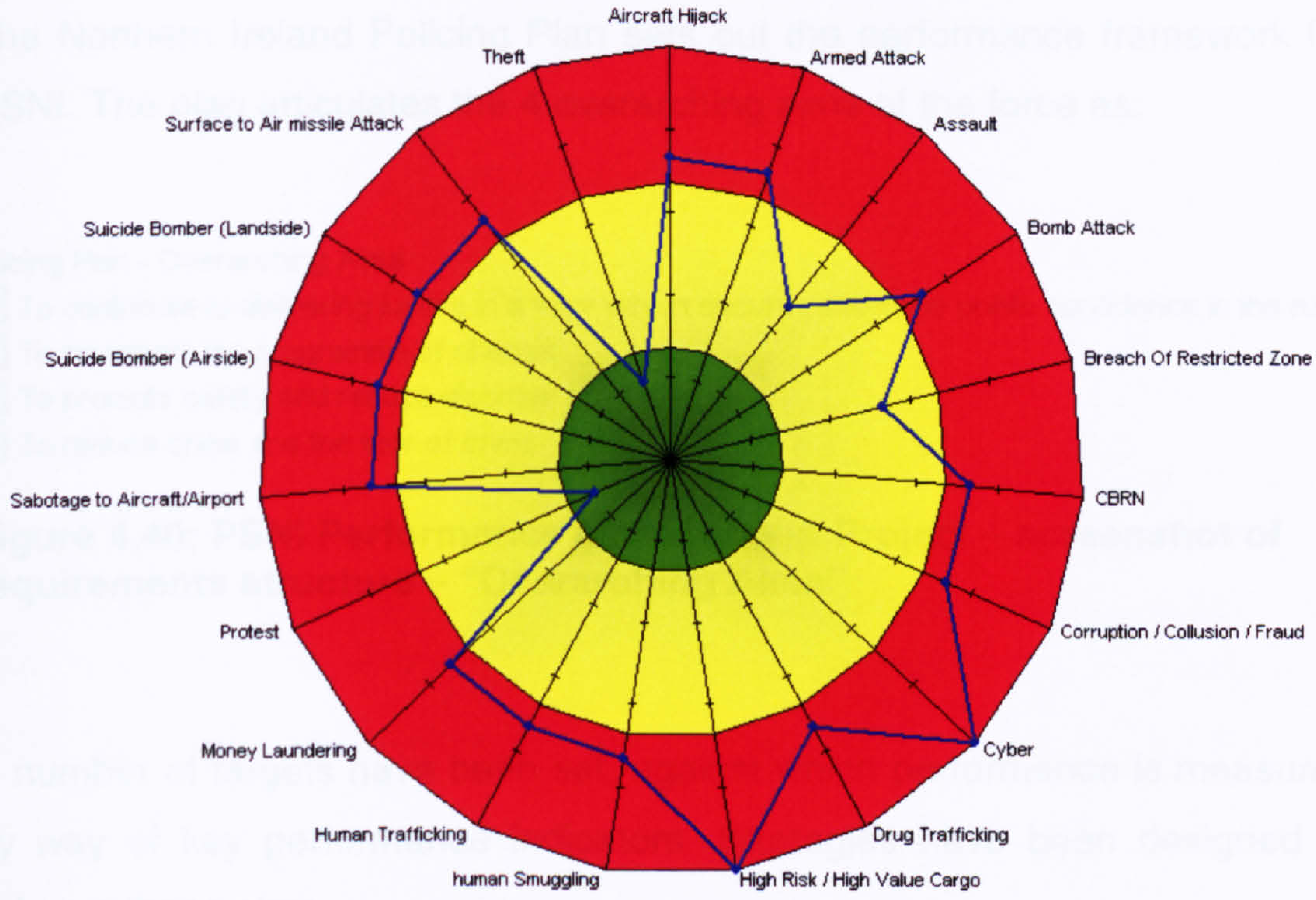


Figure 4.39: BAA MATRA Risk Management Project – Screenshot of Generated Risk Scorecard report

The above figure illustrates a risk scorecard or spider diagram. This is an example of the required flexibility to attain the attention of senior representatives. The avoidance of "too much data" at the wrong time ensures rapid reaction is enabled and allows a delegated response to deal with the detailed qualitative data if appropriate. Manual methods of risk data handling will not enable this stakeholder response and culture will develop accordingly which perceives risk management information as unwieldy.

4.2 PSNI – Change Programme Implementation

4.2.1 Operational Performance Measurement & Reporting in PSNI

The Northern Ireland Policing Plan sets out the performance framework for PSNI. The plan articulates the 4 overarching aims of the force as:

- Policing Plan - Overarching Aims
  - To contribute to delivering justice in a way which secures maintains public confidence in the rule of law
  - To implement the programme of change
  - To promote safety and reduce disorder
  - To reduce crime and the fear of crime

Figure 4.40: PSNI Performance Management Project – screenshot of requirements structure – "Overarching Aims"

A number of targets have been set, against which performance is measured by way of key performance indicators. Strategies have been designed to achieve these aims.

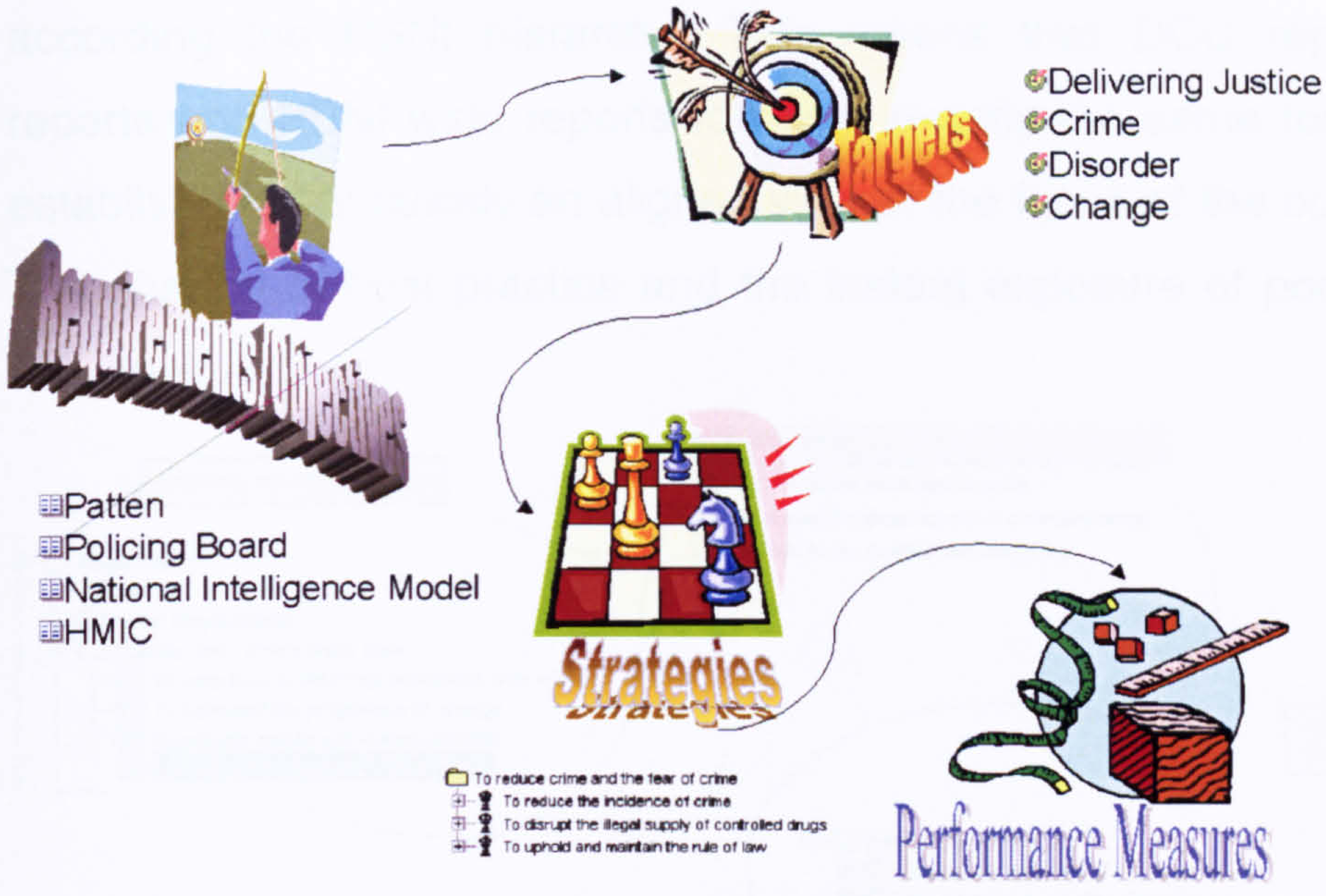


Figure 4.41: PSNI Performance Management Project

This framework resembles to a considerable extent the OGSM performance framework of BAA. The linear relationship between these performance objects and the hierarchical relationships of the elements being assessed suggests that a modelled approach to performance management may be appropriate.

Whereas BAA measured performance against operational and functional departments, PSNI measures performance against DCU`s (District Command Units).

The selection of a modelled approach for this project is supported more so by the fact that each of the 29 DCU`s which collectively form the PSNI front-line operation is required to report against the same set of performance indicators. The BAA model for each department varied and therefore the potential to aggregate on the basis of specific indicators was limited accordingly. The PSNI performance framework enabled linear aggregation according the PSNI hierarchy. This means that DCU reports, Regional reports and PSNI wide reports followed exactly the same format. This also established very quickly an aligned view of the focus of the operational units. The sharing of best practice and the instant exposure of poor performance was enabled.

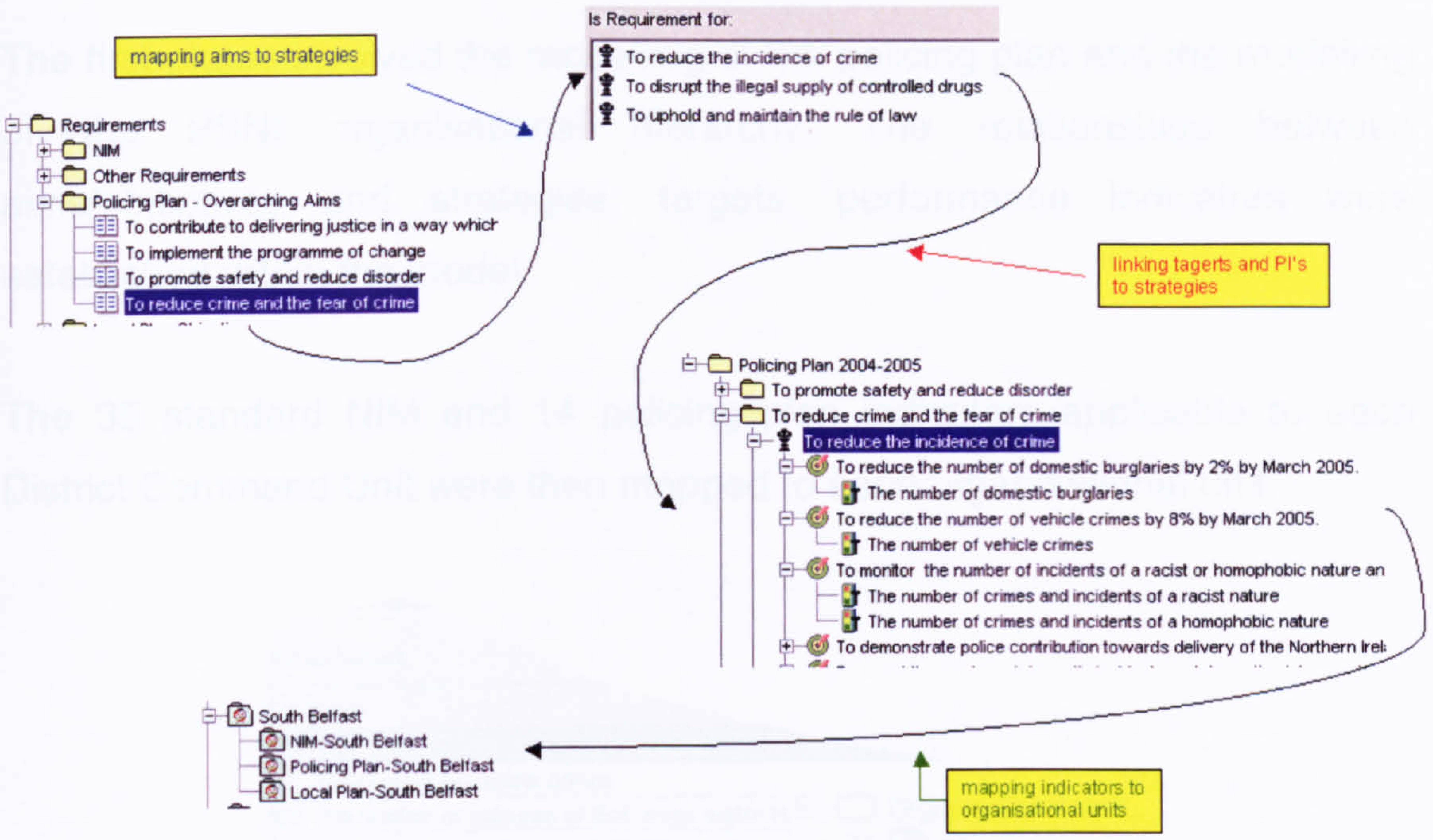


Figure 4.42: PSNI Performance Management Project – relationship of Aims – Strategies – Targets – Performance Indicators

A principle recommendation of the Patten report was the devolvement of accountability for performance to operational units and Commanders. The Performance Accountability framework was devised in specific response to the recommendation. It established a reporting protocol which requires the DCU Commander to explain performance results for each fixed reporting period to the regional Assistant Chief Constable. The format for this performance report is the PACBrief (Performance Accountability Brief). This report had historically been a paper based, manually prepared document, prepared by the Police Analyst within each DCU.

4.2.1.1 The Phases of Implementation

The implementation specified and managed by the writer was categorised by three phases:

4.2.1.1.1 Phase 1 – Model Definition

The first phase involved the modelling of the policing plan and the modelling of the PSNI organisational hierarchy. The relationships between aims/objectives and strategies, targets, performance indicators were established within the model.

The 35 standard NIM and 14 policing plan indicators applicable to each District Command Unit were then mapped to each organisational unit.

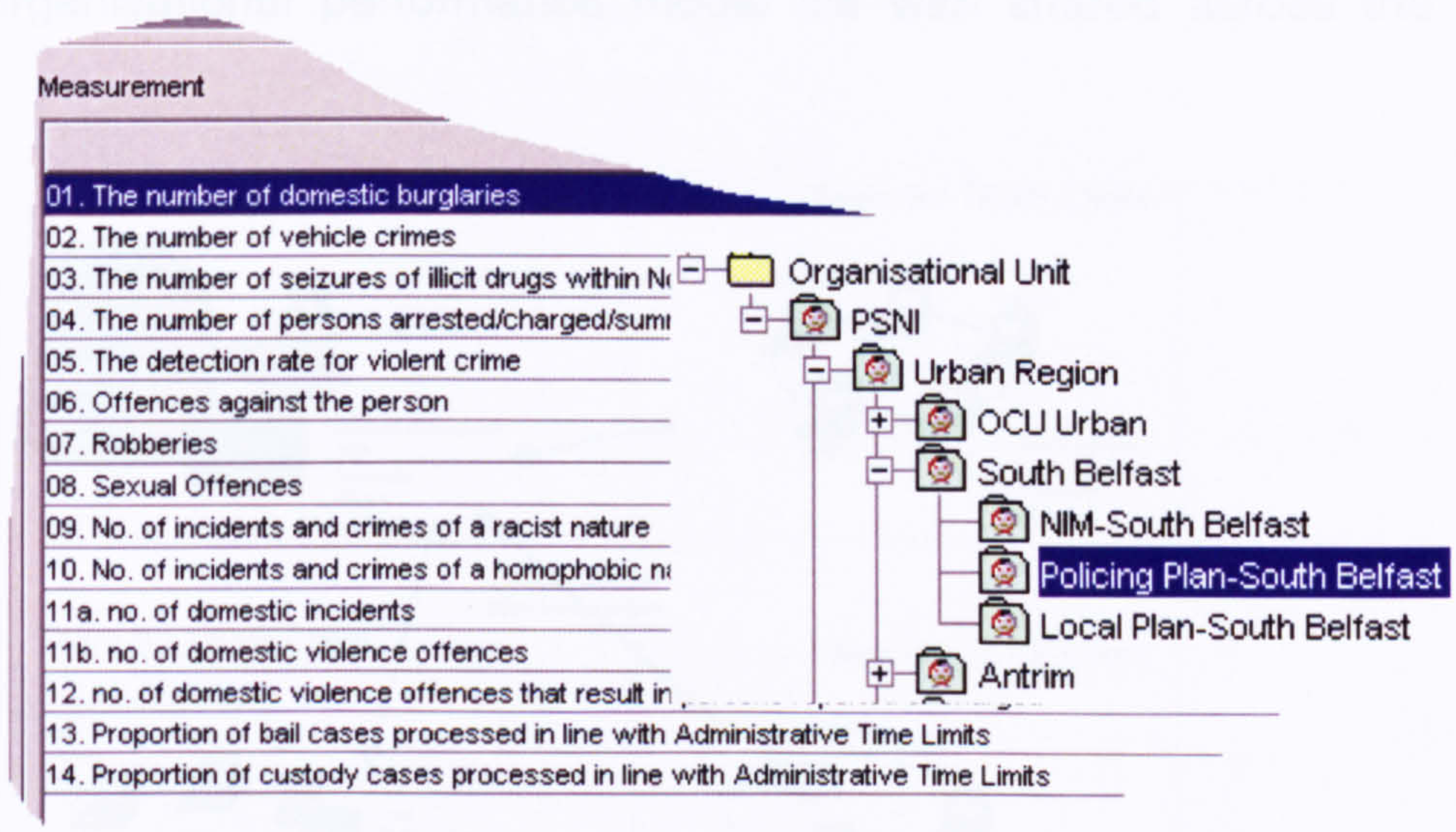


Figure 4.43: PSNI Performance Management Project – mapping performance indicators to organisational units

The structure of the "local plans" which allows an organisational unit to highlight performance in non-policing plan areas of work was also established. This phase included the client specification of reports which at the outset was limited to the PACBrief.

4.2.1.1.2 Phase 2 – User Training and Software Installation

In accordance with the ambitions of the organisation to devolve responsibility for performance management o the operational unit level, the police analysts were trained in the data entry and reporting functionality of the modelling software. User access restrictions limited their view to DCU specific via their own network logon. Access to the core model structure was also restricted to read only in order to prevent the structured basis of the performance model being compromised. Each analyst accesses the software model via the TopEase® XBench application available through their networked PC. The individual data entries made by the analysts synchronise through a centrally located server installation in real time. The server model essentially develops to form a database of performance data.

The same organisational performance model file was shared across the community.

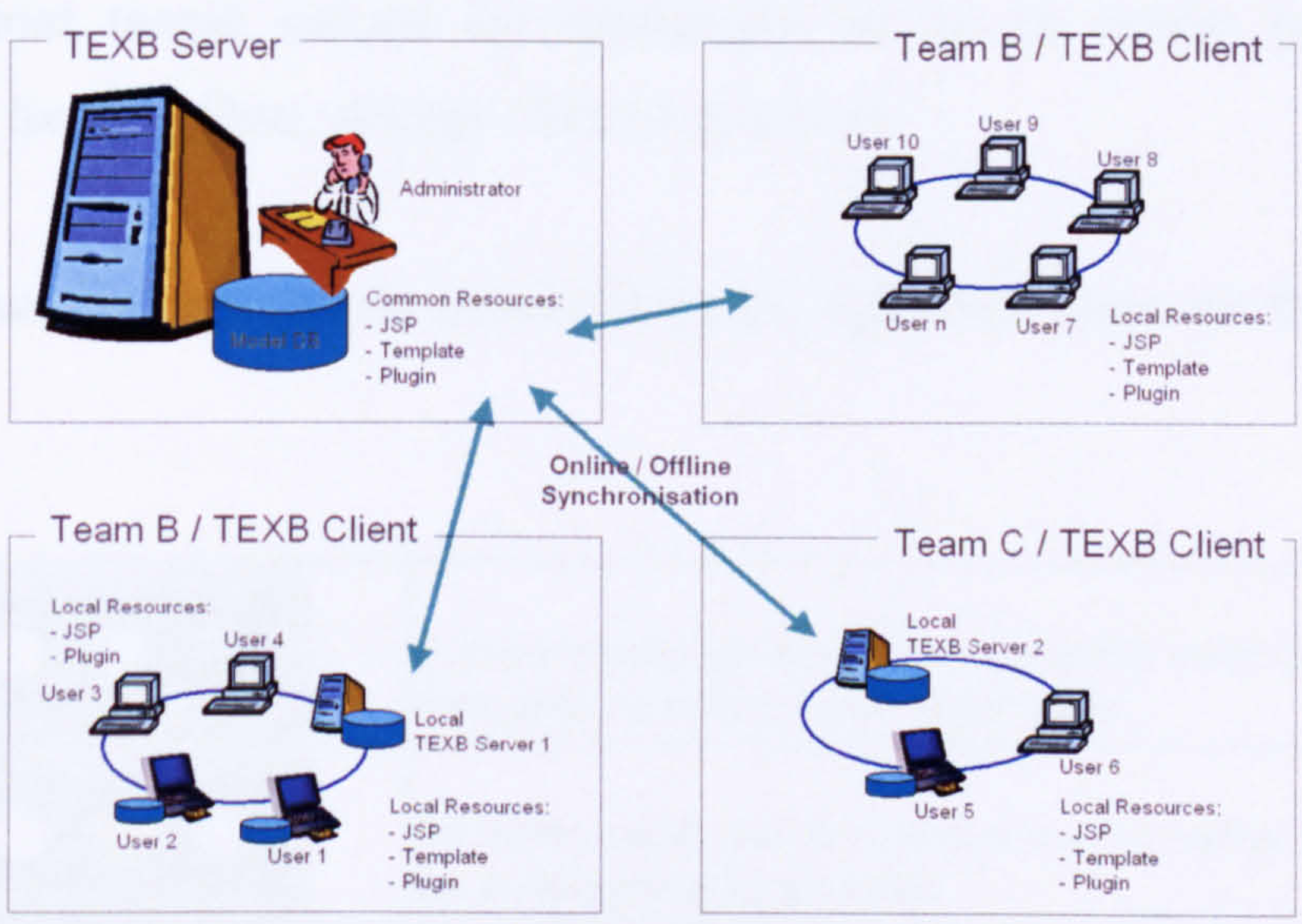


Figure 4.44: PSNI Performance Management Project –client/server infrastructure network

The figure above illustrates how the software and PC infrastructure was implemented to support the new performance management and reporting process. A network of local servers installed at regional locations supported the local network of PCs. These local servers communicated with a central server which managed the data of all district command units and populated a central model file.

4.2.1.1.3 Phase 3 – Solutions Development

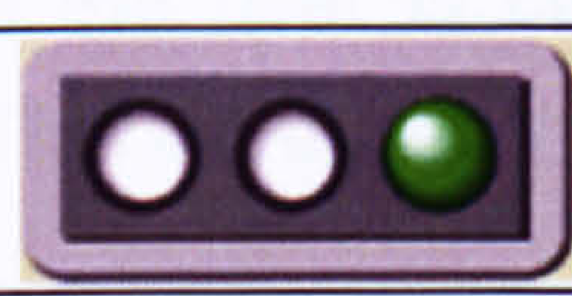
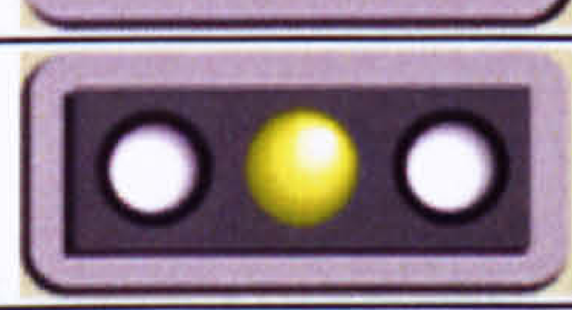
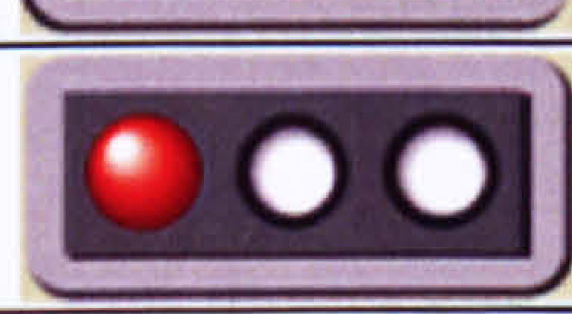
Within the first phase the specification of the performance reports was established. Following the implementation of the modelled solution, new requirements were immediately specified in relation to data handling functionality and report options.

Functionality Enhancement

Target comparison (RAG Zone rule)

During Implementation a request was made that the comparison of actual values against target values be enhanced so as to report performance relative to a fixed % Red, Amber, Green protocol.

The desire was a report that provided traffic light indication on the following basis:

	A green result indicates performance has achieved or exceeded the policing plan target value
	An amber result indicates performance is within 5% of the policing plan target value
	A red result indicates performance is not within 5% of the policing plan target value

This involved the specification of a software data rule which automatically set RAG (Red, Amber Green) or GAR (Green, Amber, Red) limits for each target value entered. The current value when subsequently recorded would be "traffic lighted" accordingly.

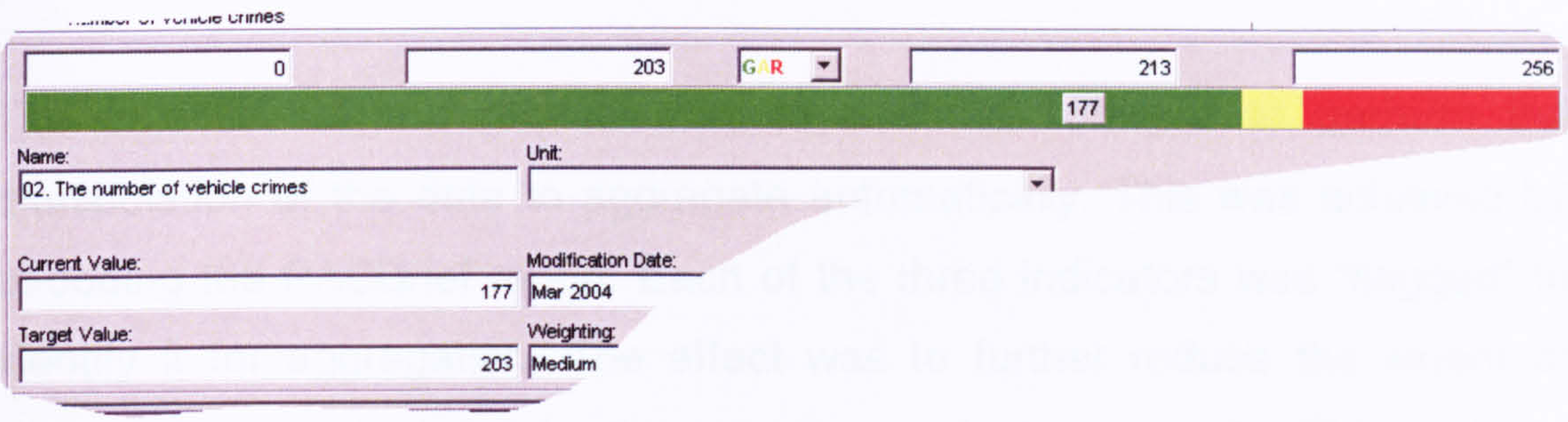


Figure 4.45: PSNI Performance Management Project –Performance Indicators automatic RAG/GAR zone limits

The example screenshot above demonstrates the impact of the data rule. As a target value in South Belfast DCU is entered of 203 vehicle crimes for the month, this has the effect of automatically setting the Green, Amber and Red limits to set % bandwidths of this value. The current value of 177 subsequently entered is immediately plotted and displayed as a Green result within the Graphical User Interface of the software application.

This feature relieves the user of calculating the GAR/RAG limits manually. In so doing the user is concerned only with the entry of target and current values. This increases the extent of automation of the process.

KPI aggregation (violent crime)

Again during the course of the implementation a request was received to automatically aggregate the data for violent crimes which within the performance framework is given by three separate indicators:

- sexual offences

- robberies
- offences against the person

The objective of the request was to use the software to perform the manipulation of the data to aggregate automatically. This was achieved by re-coding the PACBrief report. Each of the three indicators was "flagged" to identify it for aggregation. The effect was to further reduce the extent of manual data manipulation by the reporting analyst community. This assisted greatly the engagement of users who identified the efficiency gains of processing data within a software supported model.

The detection rate for violent crime	To achieve a detection rate for violent crimes of 55 %	Target Crime Value	55.00 %	55.00 %	55.00 %	55.00 %	55.00 %	55.00 %	55.00 %	55.00 %	55.00 %	55.00 %	55.00 %	55.00 %	55.00 %	
		Actual Crime Value	45.45 % [15 : 33]	59.52 % [25 : 42]	57.69 % [30 : 52]	46.00 % [23 : 50]	61.54 % [24 : 39]	60.87 % [28 : 46]	92.11 % [35 : 38]	38.89 % [21 : 54]	54.55 % [24 : 44]	46.81 % [22 : 47]	86.67 % [26 : 30]	85.71 % [12 : 14]	58.28 % [285 : 489]	
Offences against the person	To achieve a detection rate for violent crimes of 55 %	Target Crime Value	55 %	55 %	55 %	55 %	55 %	55 %	55 %	55 %	55 %	55 %	55 %	55 %	55.00 %	
		Actual Crime Value	46.67 % [14 : 30]	60.00 % [24 : 40]	57.69 % [30 : 52]	47.83 % [22 : 46]	63.89 % [23 : 36]	67.50 % [27 : 40]	96.88 % [31 : 32]	46.67 % [21 : 45]	57.50 % [23 : 40]	46.51 % [20 : 43]	96.30 % [26 : 27]	85.71 % [12 : 14]	61.35 % [273 : 445]	
Robberies	To achieve a detection rate for violent crimes of 55 %	Target Crime Value	55 %	55 %	55 %	55 %	55 %	55 %	55 %	55 %	55 %	55 %	55 %	55 %	55.00 %	
		Actual Crime Value	33.33 % [1 : 3]	50.00 % [1 : 2]	N/A [0 : 0]	0.00 % [0 : 3]	33.33 % [1 : 3]	0.00 % [0 : 5]	66.67 % [2 : 3]	0.00 % [0 : 4]	0.00 % [0 : 1]	0.00 % [0 : 1]	N/A [0 : 0]	N/A [0 : 0]	20.00 % [5 : 25]	
Sexual Offences	To achieve a detection rate for violent crimes of 55 %	Target Crime Value	55 %	55 %	55 %	55 %	55 %	55 %	55 %	55 %	55 %	55 %	55 %	55 %	55.00 %	
		Actual Crime Value	N/A [0 : 0]	N/A [0 : 0]	N/A [0 : 0]	100.00 % [1 : 1]	N/A [0 : 0]	100.00 % [1 : 1]	66.67 % [2 : 3]	0.00 % [0 : 5]	33.33 % [1 : 3]	66.67 % [2 : 3]	0.00 % [0 : 3]	N/A [0 : 0]	36.84 % [7 : 19]	

Figure 4.46: Automatic Aggregation And Traffic Light Assessment – Violent Crime, PSNI Pacbrief

NIM (National Intelligence Model) Inclusion

During implementation a further reporting possibility emerged. Police forces throughout the UK are currently implementing the "National Intelligence Model" or NIM. This is an organisational model for police forces.

Performance against its implementation is reportable. It was suggested that the performance framework model may be able to facilitate this reporting requirement. The model was subsequently extended to incorporate both the structural relationships of NIM and also the data handling capacity.

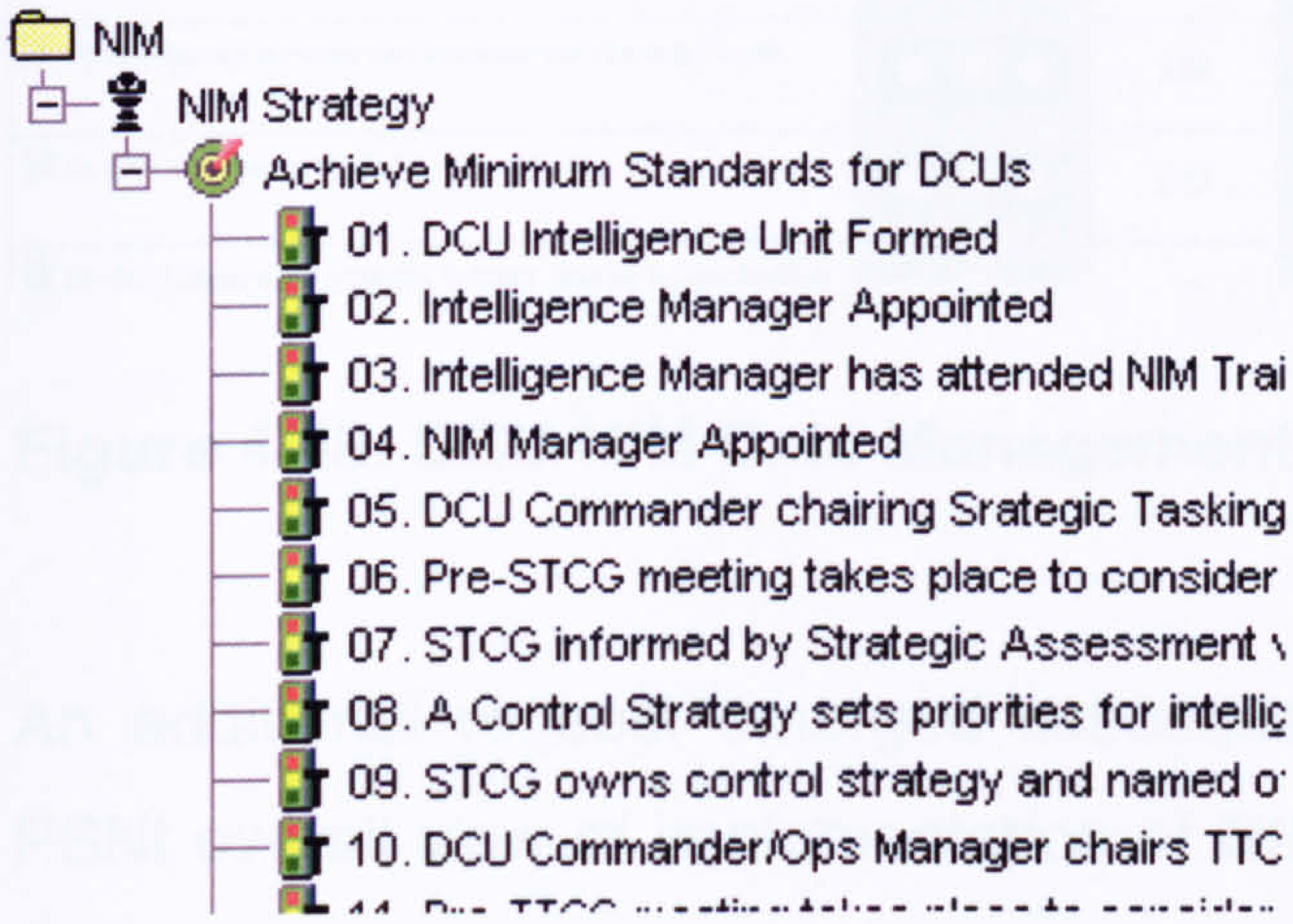
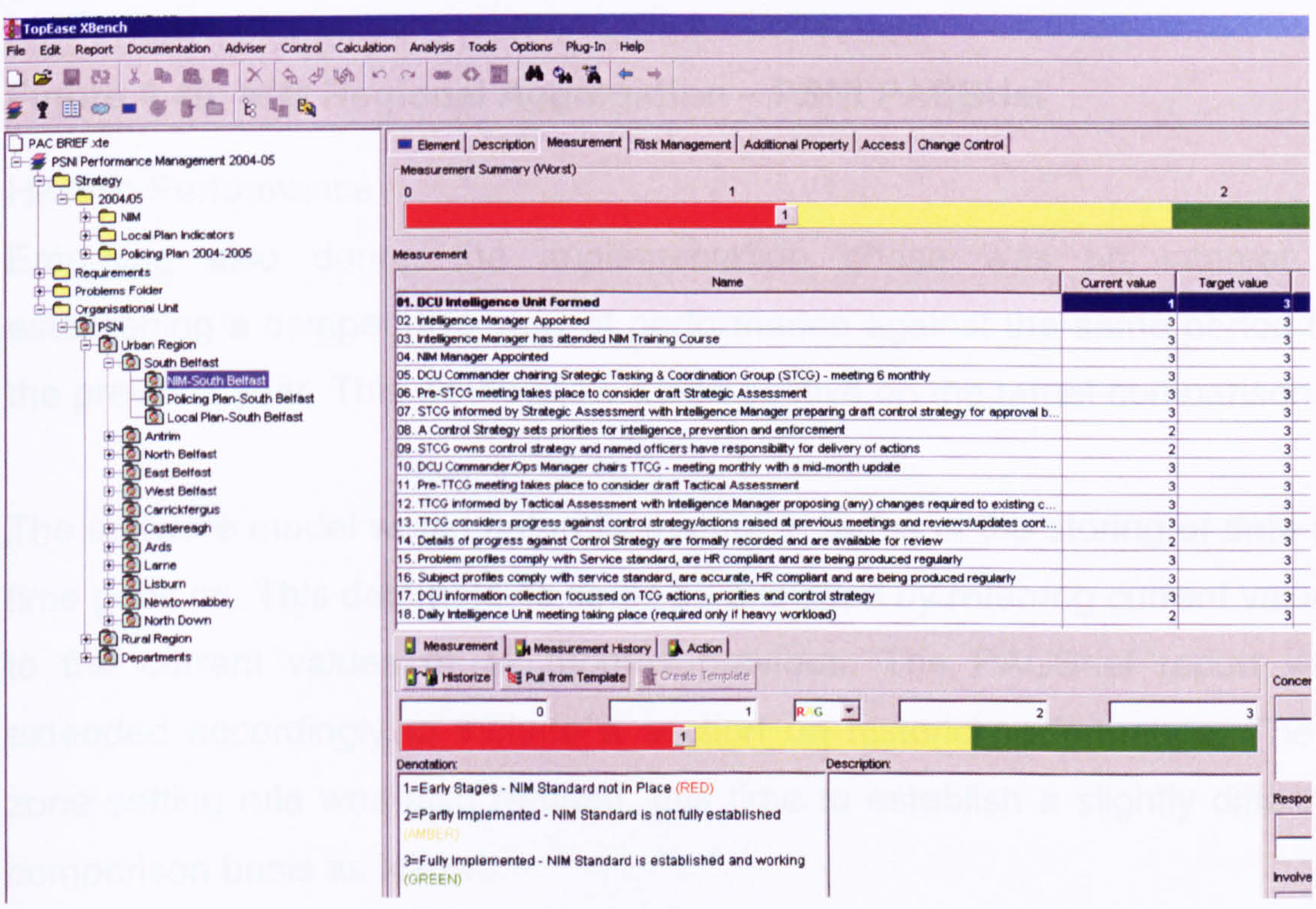


Figure 4.47: NIM Performance Indicator Modelling – PSNI Performance Management Framework



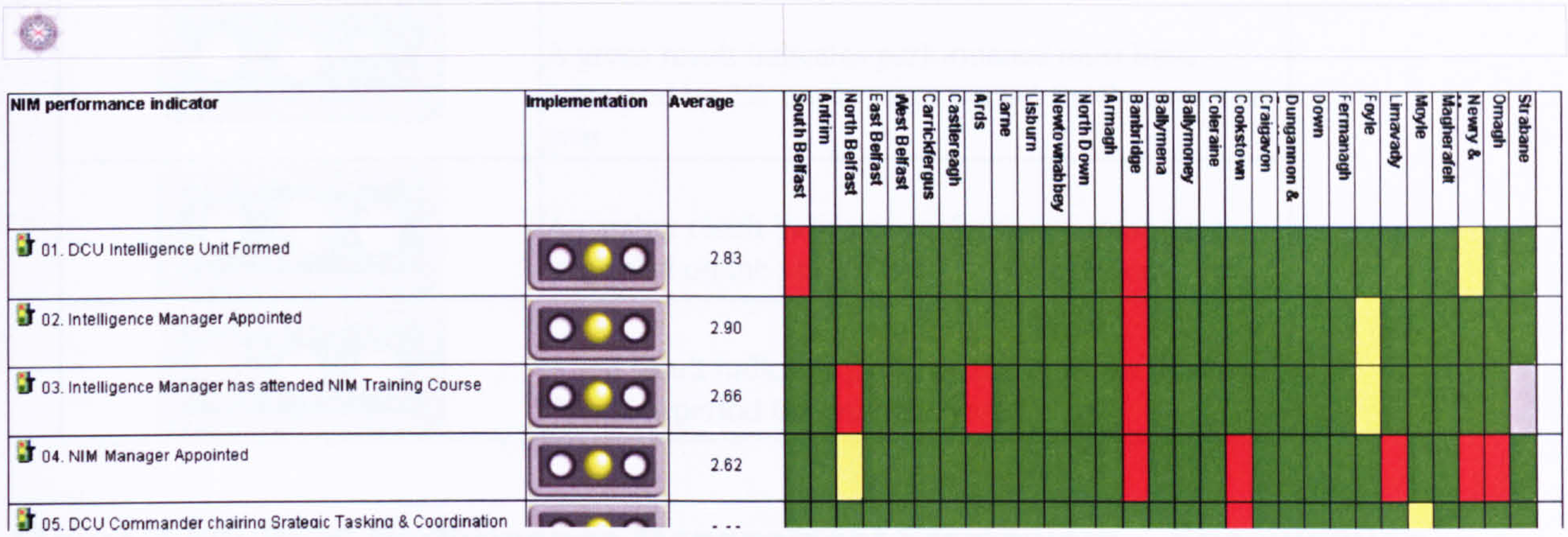


Figure 4.48: DCU NIM Data Management

An additional request emerged subsequently to gain a regional and also PSNI overall view of implementation of NIM. This was provoked by the user community who could now instinctively appreciate the application of structured modelling and wished to exploit the reporting characteristics including the capacity to aggregate. This was achieved by the specification and coding of a user report.

Figure 4.49: NIM Regional Aggregation – PSNI PACBrief

Historic Performance

Emerging also during the implementation phase was an interest in establishing a comparative view of performance against the same period for the previous year. This would allow a perspective on the target comparison.

The software model would naturally mature in terms of the storing of data as time goes on. This data holding could be exploited by referring current values to the current values of 12 months previous. The PACBrief report was extended accordingly to include a section on historic performance. The 5 zone setting rule was also re-used, this time to establish a slightly different comparison basis as follows:

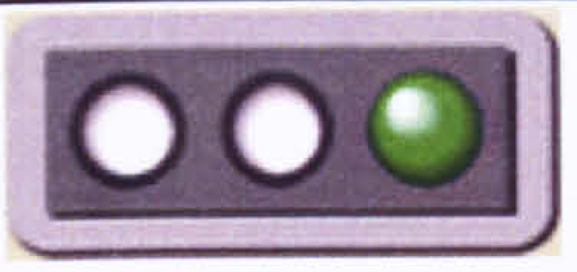
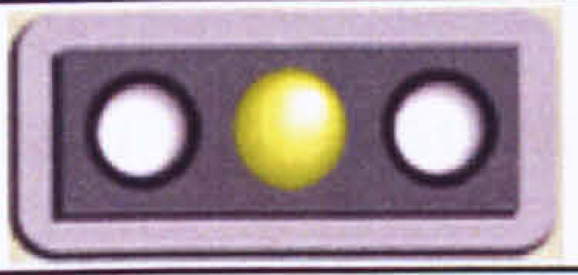
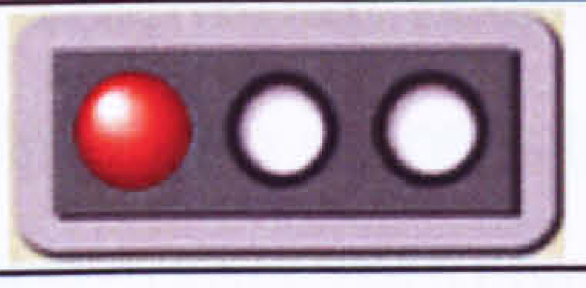
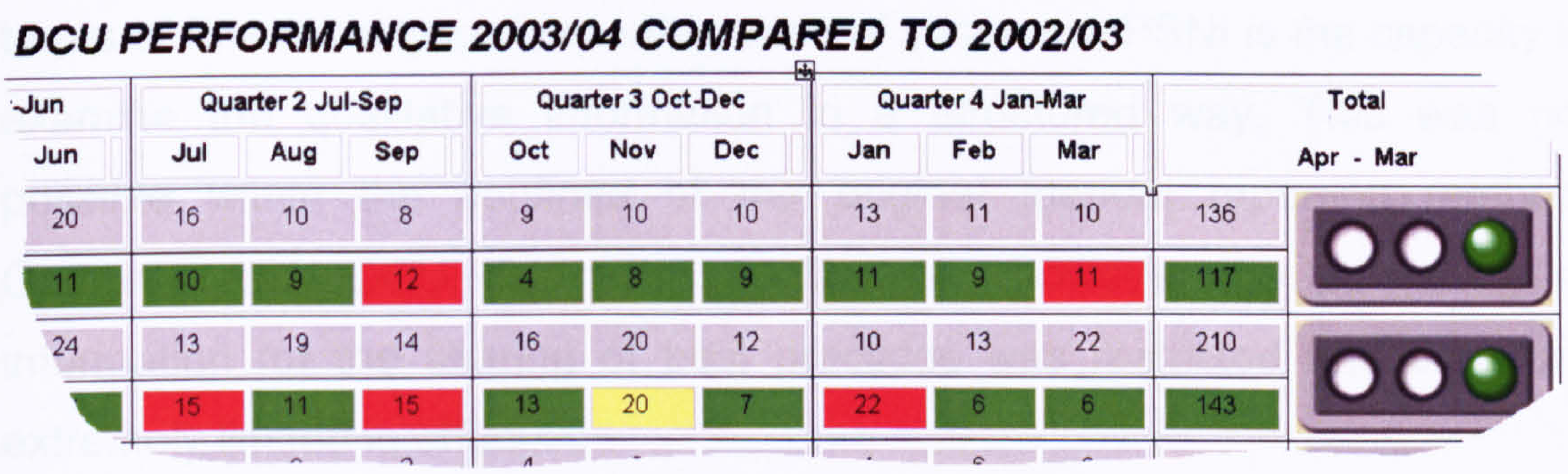
	A green result indicates performance must have improved by 2% on the same period for the previous year
	An amber result indicates performance must have improved on the same period for the previous year
	A red result indicates performance is worse than for the same period the previous year

Figure 4.50: PSNI Performance Management Framework – Specification Of Improvement Margins

The result was an automated output exploiting the availability of modelled data, re-using in the process, rule based functionality previously developed.

The full report output is contained within sections 3 and 4 of the PSNI PACBrief.



DCU PERFORMANCE 2003/04 COMPARED TO 2002/03

-Jun	Quarter 2 Jul-Sep			Quarter 3 Oct-Dec			Quarter 4 Jan-Mar			Total	
Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr - Mar	
20	16	10	8	9	10	10	13	11	10	136	
11	10	9	12	4	8	9	11	9	11	117	
24	13	19	14	16	20	12	10	13	22	210	
	15	11	15	13	20	7	22	6	6	143	

Figure 4.51: Extract From DCU (District Command Unit) PAC Brief Report

The extension of functionality to include comparisons with the previous year further enhanced the profile of the performance framework and served to mitigate the risks of the report structure being challenged on the basis of stretch targetting. The inclusion of historic performance comparison of the data illustrated clearly the extent of improvement on previous reporting periods.

The capacity of a software based solution to evolve and develop according to the incremental requirements of the organisation prevents the framework from falling into disrepute as it is either not able to respond quickly enough to these changing requirements or the workload associated in providing this information becomes excessive. The result is continued leadership buy-in and a growing culture of proactive behaviour towards the exploitation of management information and a change form the previously reactive attitude in response to often out of date and rigid performance results.

Qualitative Data Inclusion

A project which was initiated on the basis of performance measurement within the context of a modelled framework had been gradually extended in terms of functionality and reporting. Also of interest to PSNI is the capacity to examine the qualitative information in a structured way. This was not possible within the confines of the original manual reporting method. Certainly each DCU did report qualitatively, however the accessing of information for the sharing of best practices was restricted and therefore extremely limited in effect.

During the implementation phase a solution was developed which allowed the modelling of qualitative data as a series of attribute fields within the model objects. The following figure shows how "domestic burglary" can be modelled as an object within the software and the accompanying screenshot illustrates how qualitative data can be represented within attribute fields. For the purpose of developing qualitative reports sections which correspond to the NIM framework, sub-objects were created which allowed for comprehensive documentation of problem treatments.

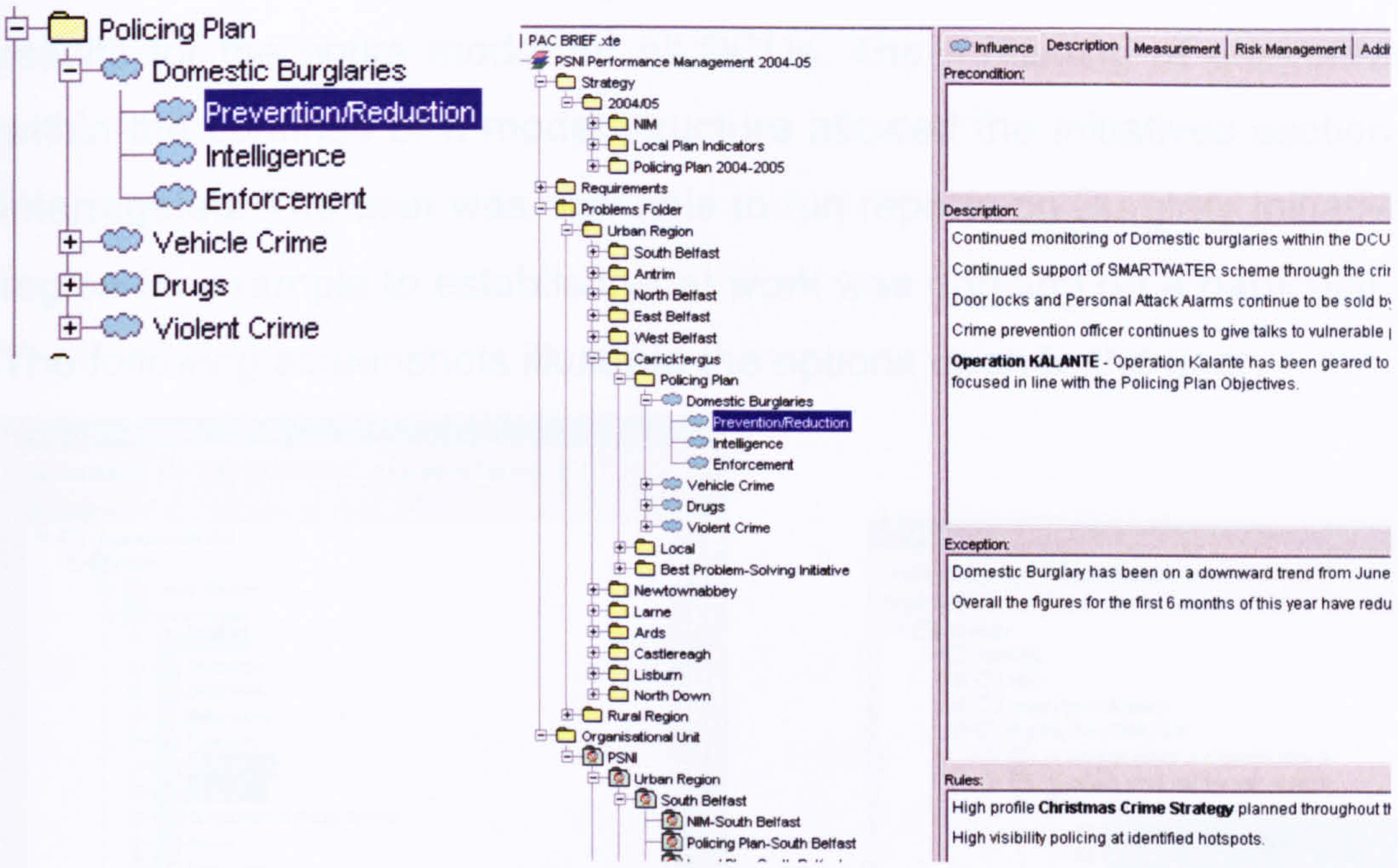


Figure 4.52: PSNI Performance Management Project –Structure of Qualitative Data Modelling and Capture

The significance of this becomes apparent when considering the reporting options which are possible.

Report Options Specification

The software modelling of the framework delivers considerable benefits for PSNI in relation to data quality, alignment, efficiency of data entry etc. Probably the most visible benefit to the interested community is the impact of the outputs. The modelling of the framework presented increased opportunities for examination of the data, beyond the scope of the original project brief. As the model is developed on the basis of objects, it follows that the analysis of results is also object based. Therefore in addition to providing locational reports as had been the original brief, the client was now empowered to examine the model content in additional ways. DCU and Regionally aggregated reports have already been mentioned. Coloured reports were also developed allowing the client the capacity to query for example Red results for burglaries in South Region or Red and Amber results for the entire model for all DCUs. The modelling of qualitative data within the confines of a model structure allowed the initiatives section to be interrogated. The user was now able to run reports on Burglary Initiatives per region for example to establish what work was ongoing on a particular issue. The following screenshots illustrate the options open to the user.

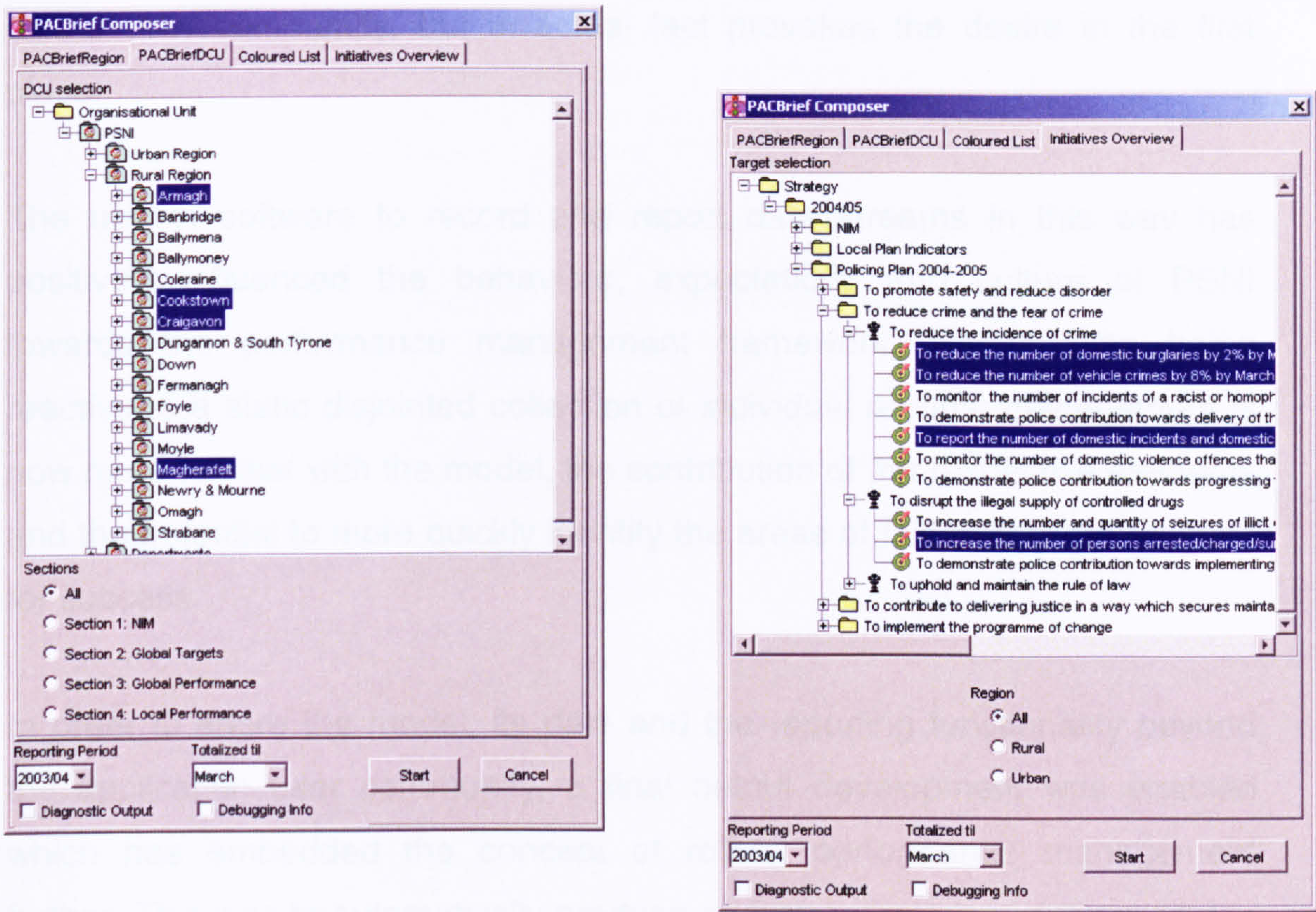


Figure 4.53: PSNI Performance Management Project –Performance Indicators automatic RAG/GAR zone limits

The user is able to generate reports on an object basis and can therefore deliver reports on an organisational unit or alternatively reports on particular targets or performance indicators. Coloured lists offer the user the capacity to filter RED results across the organisation for selected measurements in order that the senior management team can quickly establish exactly where the problems are. The user is also able to generate reports which filter qualitative information for effective comparison of initiatives applied to particular problems. The effect is to provide a mechanism for performance data management and performance reporting ina range of ways which assists the organisation to be better informed and in a position to react.

The key point here to note with respect to the aim of this study is that the transparent modelling of relationships of the PSNI performance framework not only enables the enhancement of manipulation and interrogation capacity of the user community, but in actual fact provokes the desire in the first place.

The use of software to record and report data streams in this way has positively influenced the behaviour, expectations and culture of PSNI towards the performance management framework. Rather than being reactive to a static disjointed collection of individual reports, management is now more familiar with the model, the contribution of the respective elements and the potential to more quickly identify the areas of failure and the reasons for success.

In order to share the model, its data and the reporting functionality beyond the application user community, a final output development was enabled which has embedded the concept of robust performance management further. This was to automatically produce an intranet version of the model in HTML code. Incorporating PSNI corporate identity, this intranet link provides navigable access to the entire software model structure, all the data contained within and access to all report outputs. It extends to provide links to externally referenced documentation where included.

The effect of this is to provide to all parties immediate rationale for operational activities. All activities can be traced quickly back through the modelled targets , strategies and overarching aims of the policing plan. This confirms and provides tangible evidence of the alignment of the PSNI hierarchy and their engagement of the policing plan. All users are served as analysis is provided by location, region, organisation, target, initiative, strategy etc.

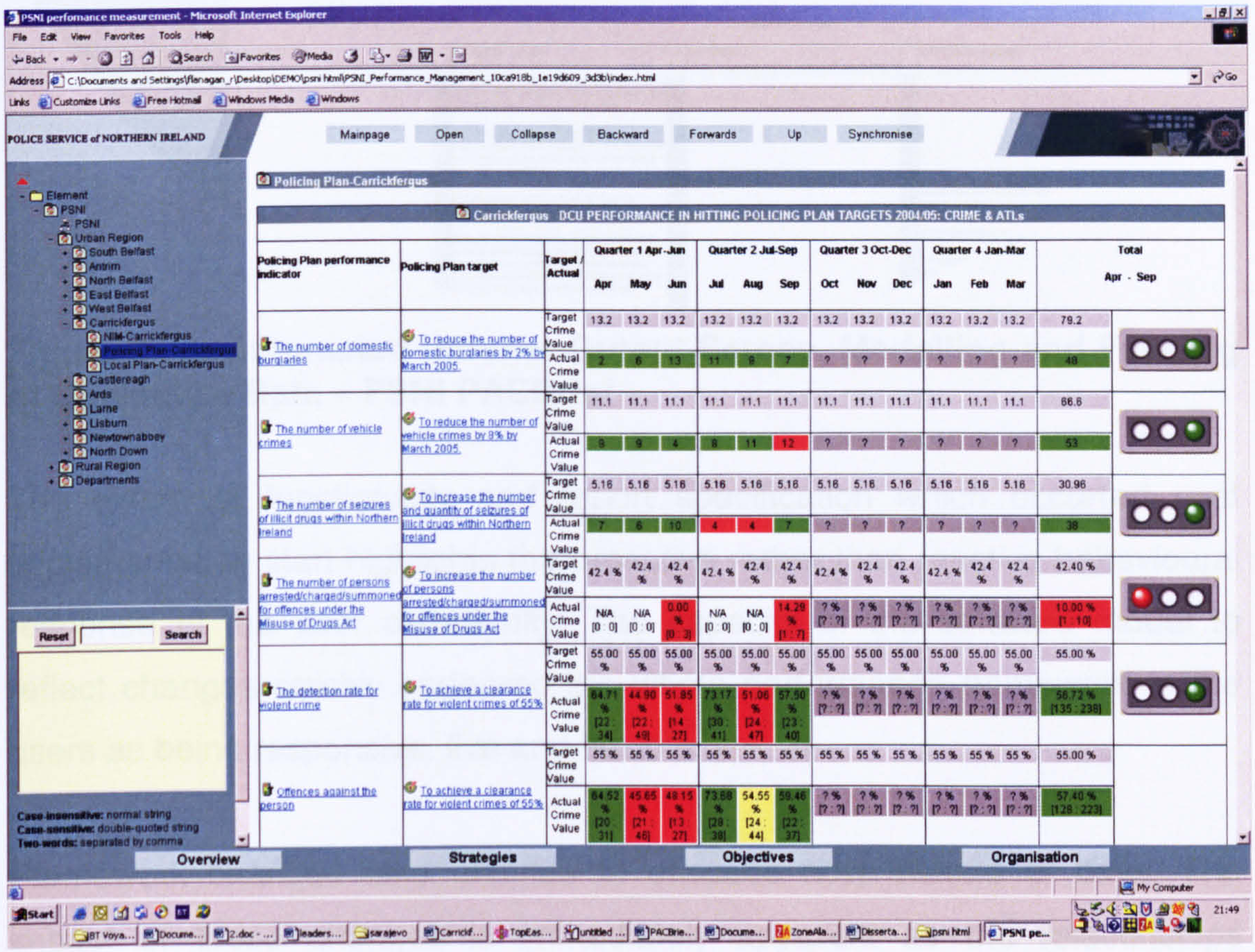


Figure 4.54: PSNI Performance Management Project – PSNI Intranet "PoliceNet" navigable HTML model output

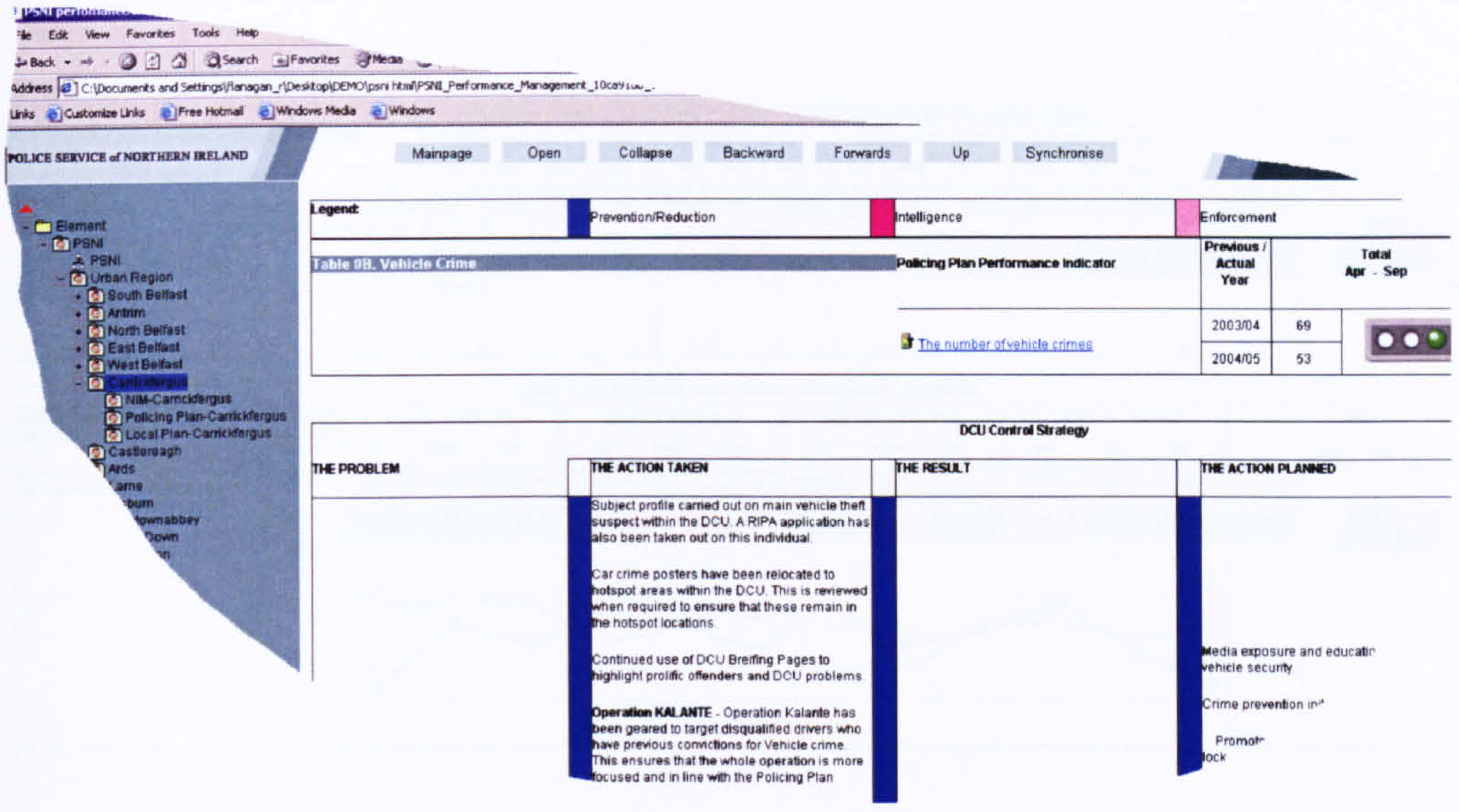


Figure 4.55: Automated Intranet Output Screen, Modelling and Filtering of Qualitative Data – PSNI PACBrief

The extent of functionality and report specification which occurred post implementation start highlights the proactive rather than reactive behavioural response of the user community. The capacity of the software model to reflect changes quickly endeared the whole performance framework to the users as being responsive, live and flexible.

Framework changes take minutes to cascade now instead of days. The impact of these changes is immediately apparent as the relationships between objects are visible.

Subsequently PSNI requested to change the presentational output of the PACBrief report. The understanding of the performance framework user and target audience of senior officers matured during the course of the first year of implementation. An increased sophistication of output was sought. The model outputs were redefined to provide this increased sophistication. The new performance features included speedometer gauges illustrated below instead of simple traffic lights and also trend charts.

2A. Domestic Burglaries

Larne DCU PERFORMANCE IN HITTING POLICING PLAN TARGETS 2003/04: CRIME & ATLs															
Policing Plan performance indicator	Policing Plan target	Target / Actual	Quarter 1 Apr-Jun			Quarter 2 Jul-Sep			Quarter 3 Oct-Dec			Quarter 4 Jan-Mar			Total
			Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr - Mar
The number of burglaries	To reduce the number of domestic burglaries by 5 %	Target Crime Value	10	10	10	10	10	10	10	10	10	10	10	10	120
		Actual Crime Value	2	11	8	12	12	12	13	8	10	14	7	2	111

Larne DCU PERFORMANCE 2003/04 COMPARED TO 2002/03														
Policing Plan performance indicator	Previous / Current Year	Quarter 1 Apr-Jun			Quarter 2 Jul-Sep			Quarter 3 Oct-Dec			Quarter 4 Jan-Mar			Total
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr - Mar
The number of burglaries	2002/03	13	14	14	8	11	7	15	4	11	11	9	10	127
	2003/04	2	11	8	12	12	12	13	8	10	14	7	2	111
	Chart													

Figure 4.56: PSNI Performance Management Project –Amended Layout of PACBrief report

The modification of the performance framework output was specified and implemented within a 3 day period. It would be possible for PSNI analysts to represent the data in the graphical way shown by manual means, however the complexity of the workload and more importantly the time which it would take means that what is possible would not necessarily be sustainable.

A full copy of the DCU PACBrief is Appended to this thesis.

4.2.2 Operational Risk Management in PSNI

In order to meet Treasury requirements, PSNI developed a Risk Management Policy. Risk management for PSNI meant having in place a corporate and systematic process for identifying and evaluating the risks associated with the activities and responsibilities of PSNI, assessing and addressing their impact and providing for appropriate disclosure of the progress made in managing the risks identified. The policy developed and implemented explains the underlying approach to risk management, documents the roles and responsibilities of the Chief Constable, senior management and other relevant parties such as line management.

PSNI recognised that risk management is not an end in itself, but a process, which contributes to a range of benefits. These include:

(a) better service delivery;

(b) more efficient and effective use of resources;

(c) minimising waste, fraud and poor value for money;

(d) more innovative approaches to the delivery of objectives;

(e) improved strategic and operational planning.

Given the potential benefits involved, PSNI's Policy with regard to risk management is as follows:

> (a) Risk management should be embedded in the line management processes of PSNI.
>
> (b) The Chief Constable's Forum (CCF) owns, supports, promotes and accepts leadership responsibility for the adoption of risk management procedures and practice throughout the organisation.
>
> (c) CCF has developed a corporate risk register, which clearly sets out the key strategic risks facing the organisation and how they are managed. This is reviewed on a half yearly basis by the Audit and Risk Committee and subsequently any major changes reported through CCF on a timely basis.
>
> (d) Departmental and DCU registers are developed, maintained and reviewed on a regular basis.
>
> (e) The Accounting Officer will make an annual public statement on the operation of internal controls put in place to manage risks. This will be informed inter alia by assurance statements provided by CCF members on the operation of controls within their areas of responsibility.

4.2.2.1 PSNI Risk Management in Practice

PSNI practices risk management within the confines of a corporate framework. As Accounting Officer for the Police Service of Northern Ireland, the Chief Constable has responsibility for maintaining a sound system of internal control that supports the achievement of PSNI's policies, aims and objectives, set by the Northern Ireland Policing Board, whilst safeguarding the public funds and assets for which he is personally responsible, in accordance with the responsibilities assigned to him in Government Accounting. The system of internal control is designed to manage rather than eliminate the risk of failure to achieve policies, aims and objectives. It can therefore only provide reasonable and not absolute assurance of effectiveness. The system of internal control is designed to:

> (i) Identify and prioritise risks to the achievement of organisational policies, aims and objectives;
>
> (ii) To evaluate the likelihood of those risks being realised and the impact should they be realised; and
>
> (iii) To manage them efficiently, effectively and economically.

The following key principles underline PSNI's approach to risk management:

> (i) PSNI recognises the importance of making prudent assessment and disclosure of the financial and non-financial implications of risks;
>
> (ii) The Chief Constable has overall responsibility for risk management within the organisation;
>
> (iii) CCF encourages management to adopt an open and receptive approach to discussing and addressing risks at all levels within PSNI;
>
> (iv) DCU Commanders and Departmental Heads are responsible for risk management within each business area and are also responsible for notifying ACC Operational Support where exposure to risks are of a material nature;

4.2.2.2 Implications

4.2.2.2.1 Efficiency

For PSNI, implementation of risk management across the organisation (reflecting ACPO (Association of Chief Police Officers) good practice recommendations) will bring significant benefits. It will assist in identifying key strategic and operational risks, which may prevent PSNI from delivering against core objectives and targets. The process is inextricably linked to the development of corporate and operational plans and other projects, which are currently ongoing throughout the organisation.

In order to facilitate CCF performing these duties they will receive regular reports prepared by ACC Operational Support through the Audit and Risk Committee.

4.2.2.2.2 Reporting and Monitoring

(1) DCU Registers
DCU Commanders as owners of DCU Risk Registers must ensure appropriate arrangements are made for maintenance and updating the register. The risk register will also form part of the Performance Accountability (PAC) Brief review.
(2) Regional Registers
Regional ACC's as owners of the regional risk registers must ensure appropriate arrangements are made for maintenance and upkeep of the register.

(3) Departmental Registers

(a) The head of each department must ensure that appropriate arrangements are made for maintenance and update of the risk registers. The contents of the register should be reviewed on half yearly basis using mechanisms deemed most appropriate by the departmental head.

(b) While the Risk Registers should be reviewed on a regular basis, there will be a requirement to formally advise ACC Operational Support on a half yearly basis.

(4) Annual Review

(a) The aim of this process is to review how PSNI's system of internal control has performed during the year and to assess whether the significant risks that face PSNI are being effectively managed.

The Solution Implementation

PSNI elected to employ a modelled solution. This decision was encouraged by the experience in implementing a modelled solution for performance management. There were several conceptual similarities between the two projects. Both projects impacted on, and according to, the PSNI hierarchy. Both projects made reference to a structured framework model. They each required specific output reports to comply with a consistent format. In addition there was a requirement to demonstrate a high degree of transparency and to reach a wide audience with timely, quality quantitative and qualitative data.

PSNI engaged the writer to develop a change programme to implement an automated risk management solution based upon their own corporate model. In a similar way as was done for the performance project, a model was first of all developed using the TopEase® XBench software modelling tool reflecting the PSNI hierarchy and the catalogue of risks. Then against each organisational object such as DCU`s (District Command Units) and functional departments etc. risks were modelled and assessed. The data source for this exercise was the paper based risk assessment sheets completed by the responsible parties during local risk assessment workshops. The quality of the data was varied at this point. The risk registers were not widely available or referred to in this format and the significant risks were not easily identifiable.

The framework to be implemented was developed by Deloitte and Touche, and comprised of an assessment based on a 3X3 matrix of impact and likelihood. This was accompanied by a number of qualitative data fields.

This framework was cloned to produce risk register reports of exactly the same format, this time delivered by a software user defined report.

The user community this time comprised the business managers from the organisational units. The business managers are responsible for maintaining accurate account of amongst other things the financial performance of the business unit e.g. a district command by monitoring spend against budget, preparing forecast. As such these role holders maintain strong and routine lines of reporting and communication with the central corporate body. Accordingly they were selected as the appropriate persons to maintain the risk register. The risk model is "shared" across the network in a similar manner to the performance model. User access restrictions prevent business managers from corrupting or accessing the data stored for alternate organisational units.

At first sight this solution does not in itself add particular value to the management of risks. However with no further enhancement, PSNI has secured a platform from which to share current risk management information across the organisation via reports and intranet outputs. In addition the application of a model which bases assessment across multiple objects (29 district commands plus 40 departmental bodies) provides the capability to take the "risk view".

This turns the model around and examines the relative assessment of a particular risk instead of examining risk always from the same perspective i.e. the organisational unit perspective. The benefits of being able to do this are to enable quick comparison, establish best practise and align the leadership on the required courses of action.

Consider the impact of further modelling related functionality. The range of stakeholder reports such as the risk map, and the scorecard help to engage the senior leadership. The real issues are quickly identifiable, absolutely critical if leadership attention is sought. Leadership attention must be engaged to have any hope of effectively aligning a positive leadership action culture to routinely act on risk results.

Risk Register

Risk		**Risk Rating**	
Breaches of Internal Security Procedures		**Impact:** Serious (3) **Likelihood:** Almost Certain (4)	
		Residual Risk Rating	
		Impact Category: Performance **Impact:** Minor (1) **Likelihood:** Possible (2)	
Risk Owner (Responsibility)		**Specific Objective (Poses a threat to)**	
DCU Security Officer		To promote safety and reduce disorder - Medium To contribute to delivering justice in a way which secures and maintains public confidence in the rule of law - Medium To reduce crime and the fear of crime - Medium	
Risk Indicators		**Potential business implications**	
Breaches of standing orders relating to security procedures Number of IIB investigations / referrals relating to breaches of DCU security Increases and amount of numbers of matters arising / issues raised at DCU Security Committee meetings Unauthorized disclosure of materials or information to public or media		Adverse media publicity Compromising of individuals personal safety, both internally and externally Lack of trust in police by members of community, allegations of collusion Destabilizing police and community relations Failure of planned policing operations	
Potential root causes (Reason)		**How is this risk currently managed (Existing Mitigation)**	
Failure to adhere to standing orders re security information Lack of knowledge of standing orders and procedures for dealing with security and intelligence information on behalf of officers Malicious intent/ Personal Grievance/ Subversive actions Inappropriate physical security measures Misuse of IT system by individuals		Bi-montly meetings to review internal security issues Continual review of physical security measures across estate Publication and dissemination of standing orders and directives on internal security	
Additional Actions required to fully manage the risk	**Criticality (H,M,L)**	**Owners (Concerned Party)**	**Estimated Date (Start)**
Continuous review of measures in place at the bi monthly security meaning and follow up action of identified issues	H	DCU Security Officer	

Figure 4.57: Example of PSNI Departmental Risk Register

The application of a software supported framework helps to embed the discipline of operational risk management as a business as usual task. The failure to contribute is immediately y apparent to all management layers and therefore the model framework becomes an enabler of behavioural change. A full copy of a DCU Risk Register is appended to this thesis.

Framework Changes

RISK IMPACT CATEGORIES

Impact	Financial	Performance	Litigation	Injury
1 Minor	Potential or actual loss up to £50k	Little impact on Departmental/ District Plans or Service Delivery	One-off settlement – no implications beyond the instant case	Less than 3 days absence
2 Significant	Potential or actual loss £51k - £249k	Non-achievement of 1-2 targets on Departmental/ District Plans or Service Delivery.	Moderate financial impact on limited range of cases	More than 3 days absence/ hospital stay
3 Serious	Potential or actual loss £250k - £499k	Non-achievement of a number of targets in Departmental/ District Plans or Service Delivery.	Serious financial impact on larger range of cases. Prosecution for minor criminal charges	Fatality; Permanent disability; Multiple injuries .
4 Major	Potential or actual loss £500k or more.	Non achievement of the majority of Departmental/ District Plans or Service Delivery	Serious and long term effects on organisation. Loss of credibility and public confidence. Officers facing prosecution for serious criminal offences	More than 1 fatality

Table 4.4: PSNI Risk Framework Impact Classifications and Gradings

Shortly after the completion of the implementation the organisation decided to develop the assessment matrix to provide further guidance to assessors. This involved a shift from a 3X3 matrix of impact and likelihood (High, Medium, Low) to a 4 X4 matrix with defined categories of impact.

Likelihood ratings were also redefined as follows:

QUALITATIVE MEASURES OF LIKELIHOOD

SCORE	DESCRIPTOR	DESCRIPTION	
1	Unlikely	The event may occur only in exceptional circumstances.	(up to 25%)
2	Possible	The event might occur at some time.	(26-49%)
3	Very likely	The event will probably occur at some time.	(50-74%)
4	Almost certain	The event is expected to occur or happen in most circumstances.	(76-100%)

Table 4.5: PSNI Risk Framework Likelihood Guidance Notes

This change to the framework, including the classification of impact and likelihood terms to those detailed above were accommodated immediately by implementing settings changes within the software and then "pushing" these changes through the software model.

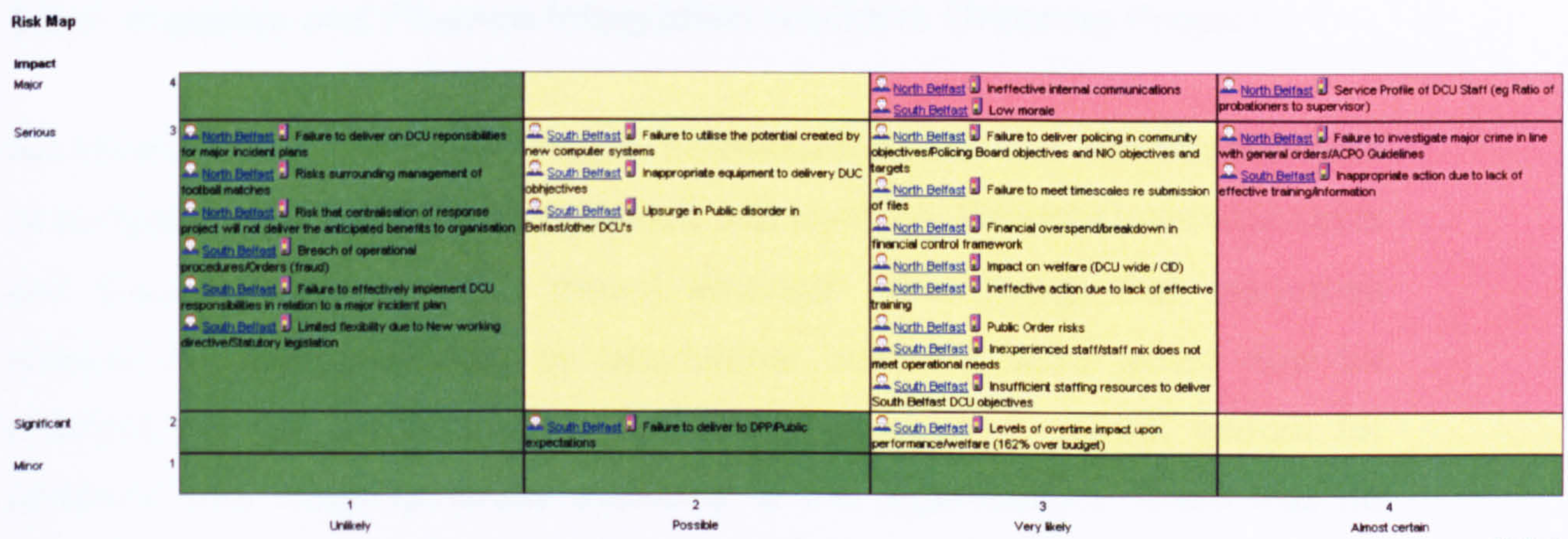
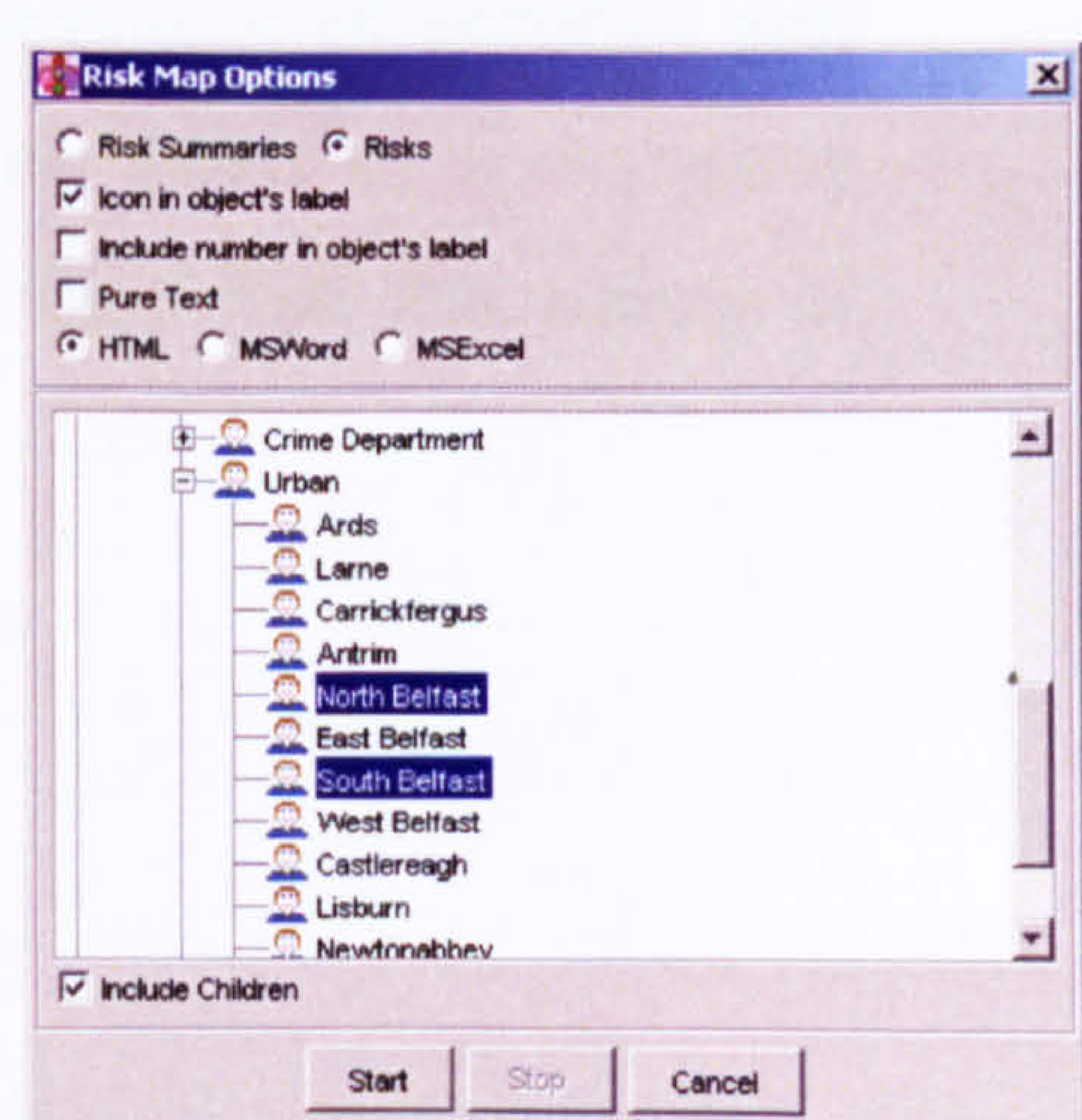


Figure 4.58: Revised Risk Map On Basis Of New Framework Settings

The result was that these fundamental changes were made to the model without a requirement to prepare and roll out new documentation. The assessors were required to reassess all risks on the basis of the new 4X4 framework; however this change was timed to coincide with a scheduled annual review of risk scores. The framework change was implemented



with no disruption to the user community. The risk management framework retained its credibility and this particular exercise demonstrates once again the contribution which the software modelled approach makes towards sustaining the viability of a framework for dynamic management information.

The modelling approach enabled rapid comparison and in so doing rapid re-alignment of activities relating to mitigation. The preceding risk map is the output of a report selection for two particular DCUs.

Figure 4.59: Multiple Object Selection for Report Generation

This capacity to "slice and dice" the model provides the user community with the range of tools required to establish a risk reporting mechanism which forms the basis of action and not just for documenting past performance or assessment results.

4.2.3 Supplies and Finance Integration (Uniform Ordering Project)

An implication of the Patten report, mentioned earlier was the devolvement of budgetary responsibility to business unit level i.e. District Command Units and Department level. This meant amongst other things that resources ordered by and consumed by operational business units would now be charged against the budget of that unit. Previously a central budget for uniforms was made generally available to the organisation. There was no accountability on the part of the DCU's for the amount of uniforms or uniform items consumed. As a result there was little incentive for am operational unit to monitor let alone control the extent of uniform items being ordered.

The programme to complete the devolvement of budgetary responsibility coincided with the awarding of a new contract for the supply of uniforms and uniform items and also the stockholding of all such items to a company called Turner Virr. The contract negotiation established that the supply of uniforms by Turner Virr would commence during December 2003. The terms of the contract also dictated that all orders placed with Turner Virr must utilise the Turner Virr on-line requisition facility.

During August 2003 a workshop was held at PSNI headquarters to establish the implications of the contract award and to set about redefining the business process for uniform procurement. The workshop was attended by representatives of the IT function, the Finance function, the Supplies Branch function (procurement) and also the writer. The writer was engaged on a consultancy basis for the purposes of providing process modelling expertise. The challenges were to design and document the new business process and subsequently specify the IT activity required to support the new process, including the interface of systems, the provision of access to on-line ordering, the specification of user training requirements and any data cleansing or preparation work required. The deadline for the completion of all preparatory works was agreed as being end November 2003.

The writer utilise TopEase® XBench modelling software to document the existing and new processes. The software supports a "layer" framework approach to process modelling. This layered approach allows first of all the documentation of activities and their flow (the RED layer), followed by a specification of supporting resources i.e. who is responsible for each activity, what software, hardware or other tools are employed (the BLUE layer). The process is comprehensively modelled once the GREEN layer is documented. The GREEN layer specifies the IT components and functionality of the supporting resources. It includes a description of all data classes, attributes such as screen fields etc. at each stage of the process.

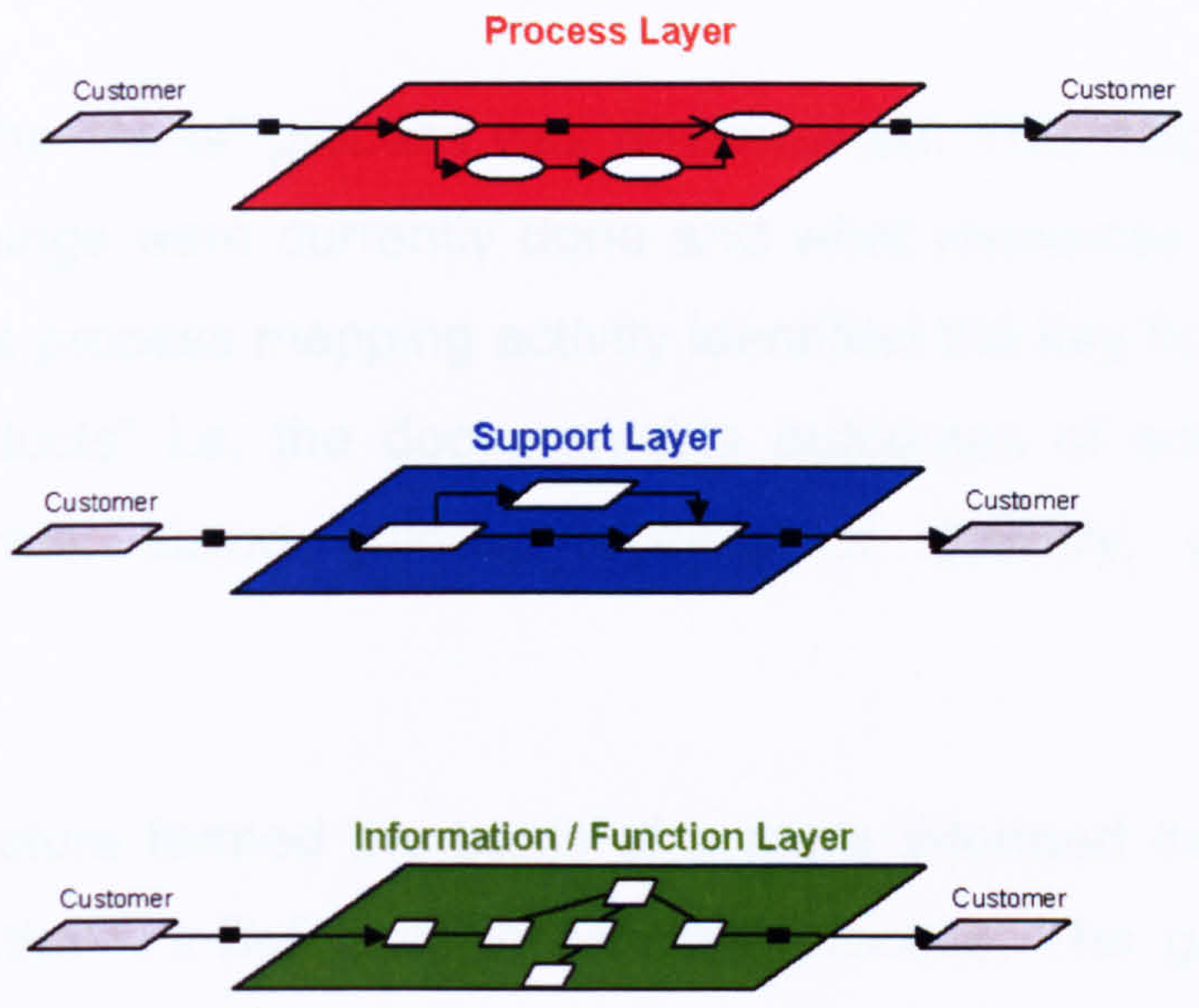


Figure 4.60: The Layer Framework Approach (RED/BLUE/GREEN)

The initial workshop established the goals of the project. These were:

- establish the most efficient process for uniform ordering
- determine a plan of activities to complete the integration with existing business processes, particular finance and accounting
- determine a specification for IT activities including technical software integration, hardware roll-out, user training etc.
- complete the exercise in advance of the contract engagement i.e. 30.11.2003.

The initial workshop was followed by a series of process design workshops. The writer initiated a debate regarding the formulation of a new uniform ordering process. For these debates, representatives of the business units and the supplier company Turner Virr were invited to participate. This strategy ensured that the resultantly documented process would be the result of an aligned view of all stakeholders. The technique employed utilised the software to graphically illustrate the flow of activity and to initially document the roles involved.

At the outset the “As-Is” process was documented. This helped to align the view of how things were currently done and what resources were presently employed. This process mapping activity identified the key flows of data and the “work products” i.e. the documentable outcomes of activities such as requisition forms, sizing guides, receipts of delivery, goods delivery notification.

This “As-Is” picture formed the basis of a more informed debate regarding the design of the “To-Be” uniform ordering process. The graphical use of swim lane diagrams secured the collective understanding of the detail of each step of the current process. This very quickly established a common view amongst the workshop participants.

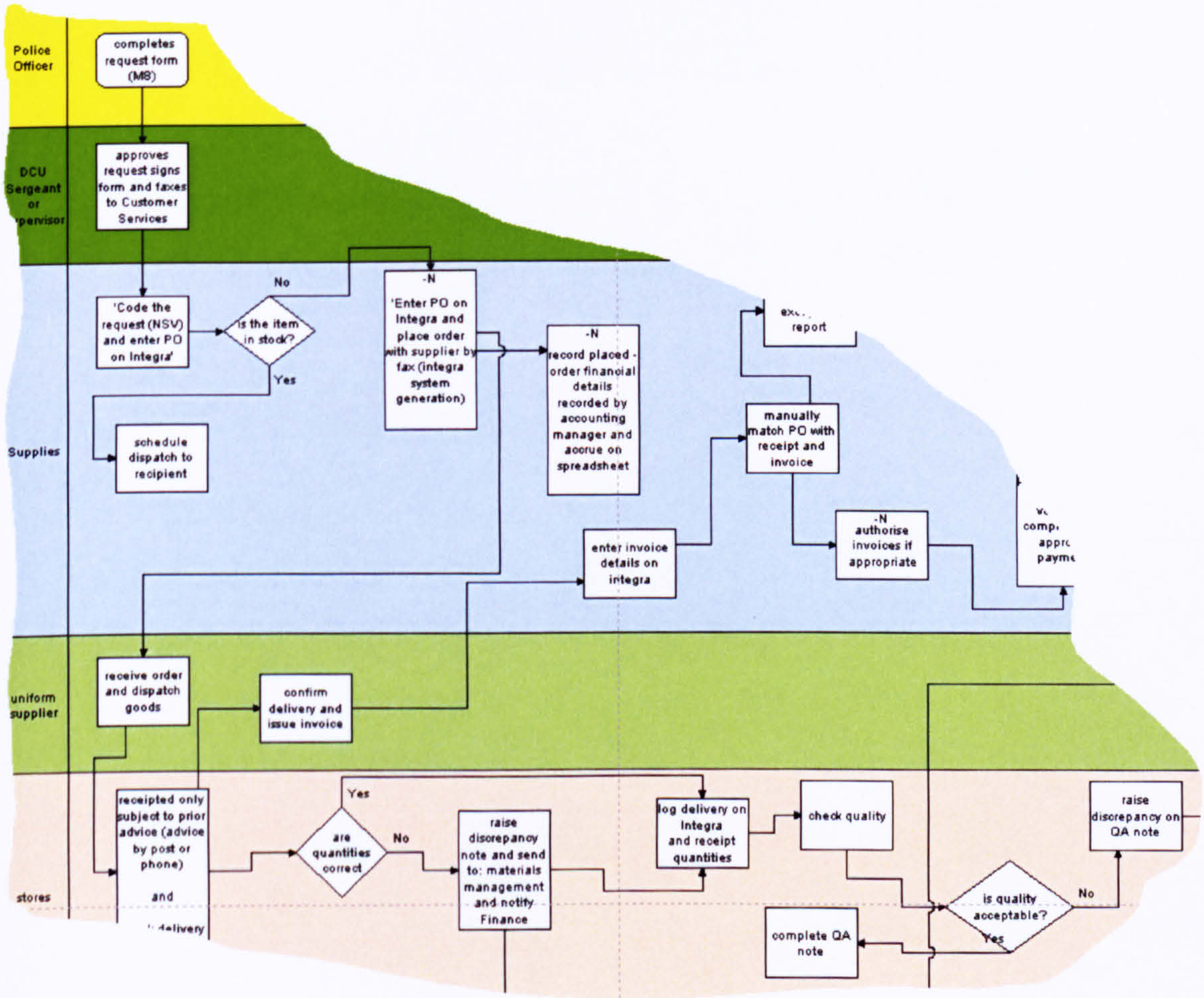


Figure 4.61: Screenshot of the "As-Is" PSNI Uniform Ordering Process

The next stage of the exercise involved the formulation of the new process. The contributions of all attendees were captured as the new process was graphically developed using the software application and digital projector. All of the activities and data flows required to process a requisition for new uniforms or items were identified including the capture of all financial and budgetary related details.

Once again the use of the swim-lane diagrams allowed the attendant community to jointly define the new process and validate this as a flow of activities and outputs. The intricate detail of the new process is not relevant to this study, rather the approach taken and its impact on the outcome.

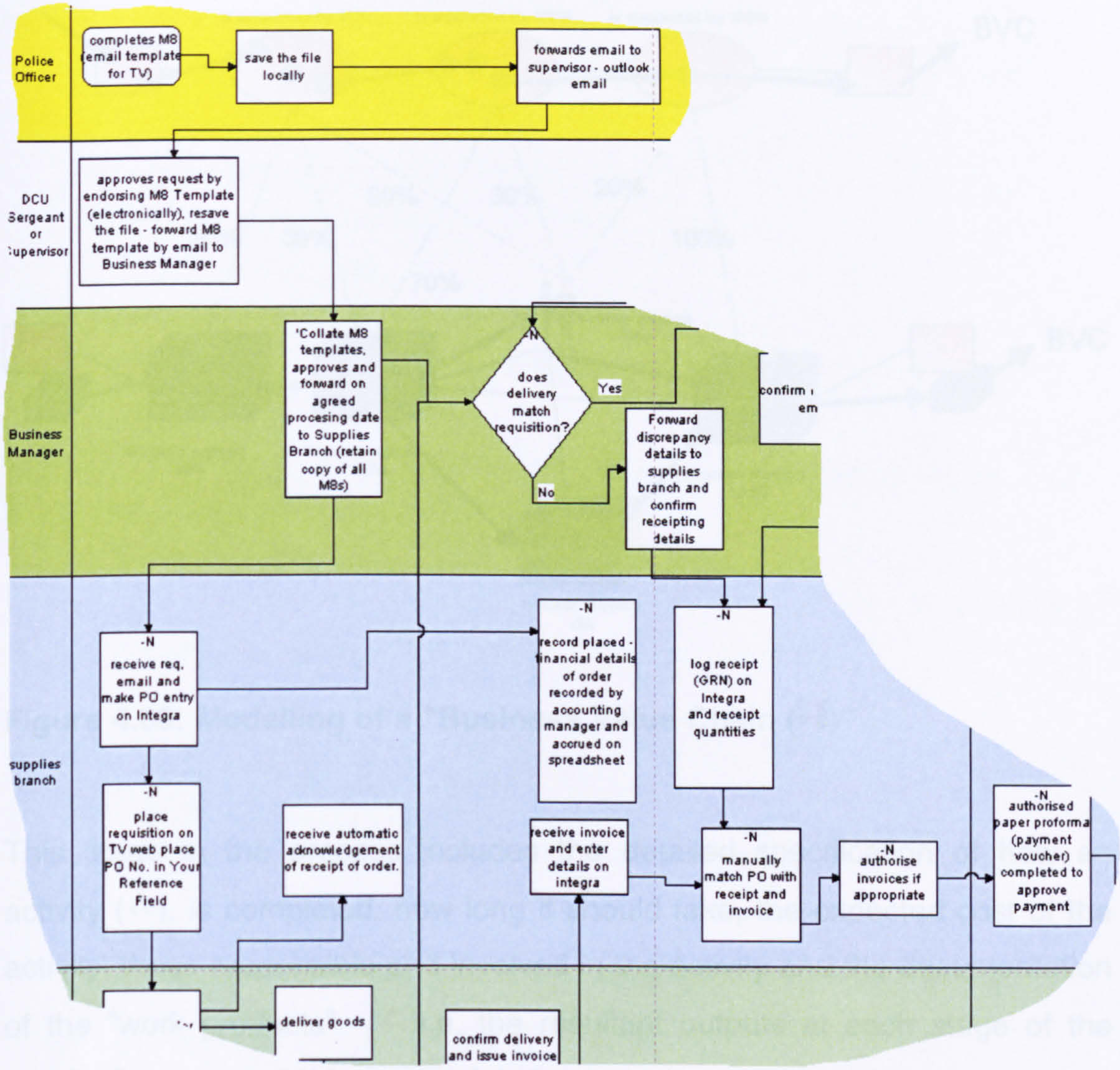


Figure 4.62: Swim-Lane "To-Be" PSNI Uniform Ordering Process

The swim lane diagrams effectively provide the basis for the modelling of the RED layer. This identifies the flow of activities as "Business Value Chains" ( ). The ordering of a uniform item forms one business value chain. The ordering of a new recruit's uniform forms another business value chain. Both value chains utilise the same network of interconnected processes.

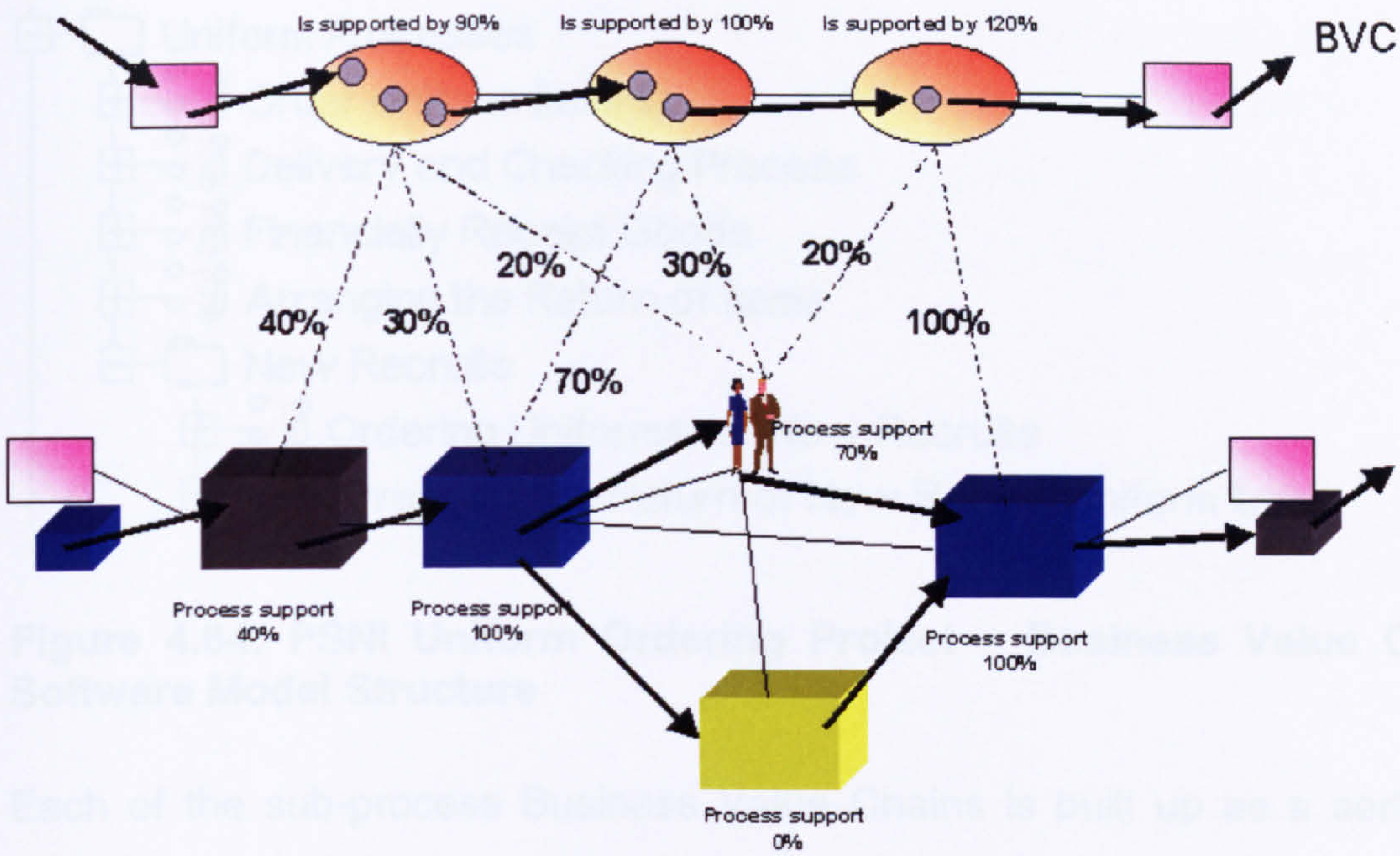


Figure 4.63: Modelling of a "Business Value Chain ( )"

This stage in the process includes the detailed specification of how an activity ( ), is completed, how long it should take, the expected cost of the activity, those responsible and involved in the activity and the documentation of the "work products" ( )i.e. the resultant outputs at each stage of the activity flow e.g. order form, receipt etc.

This stage of the project was completed by the writer in consultation with the stakeholders using software to capture and relate the information. The various business value chains were modelled as sub-process flows. This was done in order to increase the flexibility of the model and enable quick and easy re-engineering.

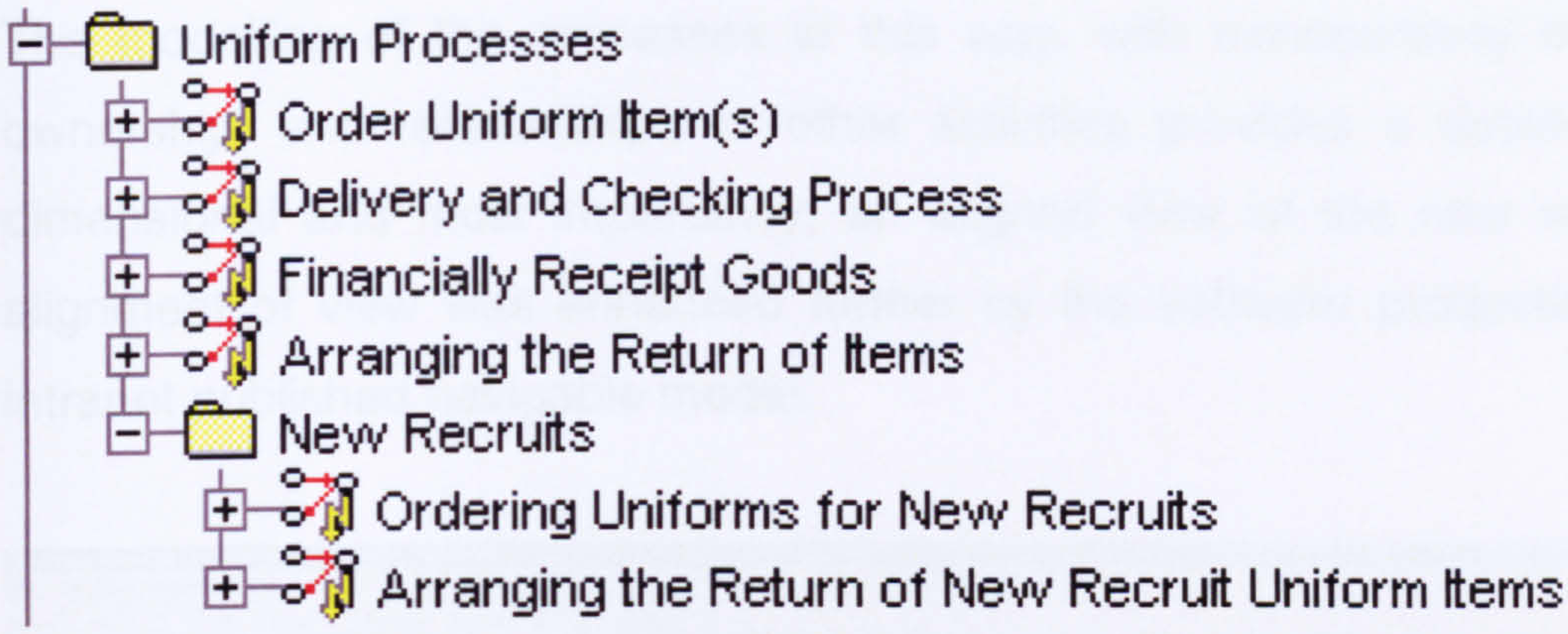
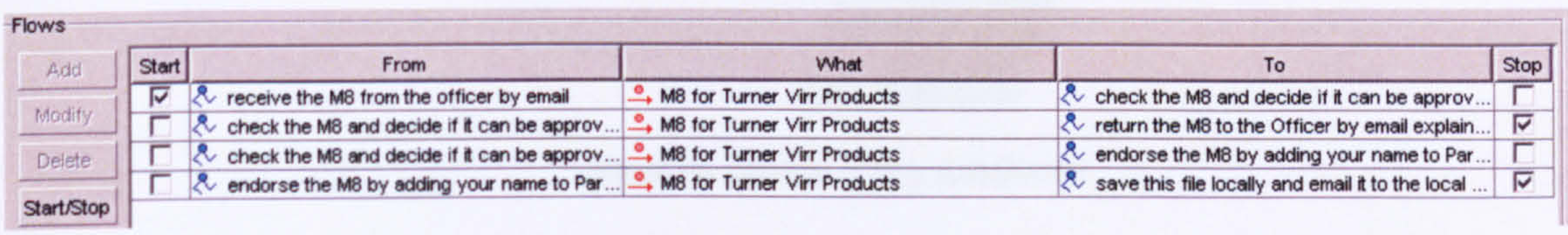


Figure 4.64: PSNI Uniform Ordering Project – Business Value Chain Software Model Structure

Each of the sub-process Business Value Chains is built up as a series of related activities and represented as a single parent entity.



Start	From	What	To	Stop
☑	receive the M8 from the officer by email	M8 for Turner Virr Products	check the M8 and decide if it can be approv...	☐
☐	check the M8 and decide if it can be approv...	M8 for Turner Virr Products	return the M8 to the Officer by email explain...	☑
☐	check the M8 and decide if it can be approv...	M8 for Turner Virr Products	endorse the M8 by adding your name to Par...	☐
☐	endorse the M8 by adding your name to Par...	M8 for Turner Virr Products	save this file locally and email it to the local ...	☑

Figure 4.65: Activity Flow Object Modelling Software Screen

These are arranged to compile a series of activity flows.

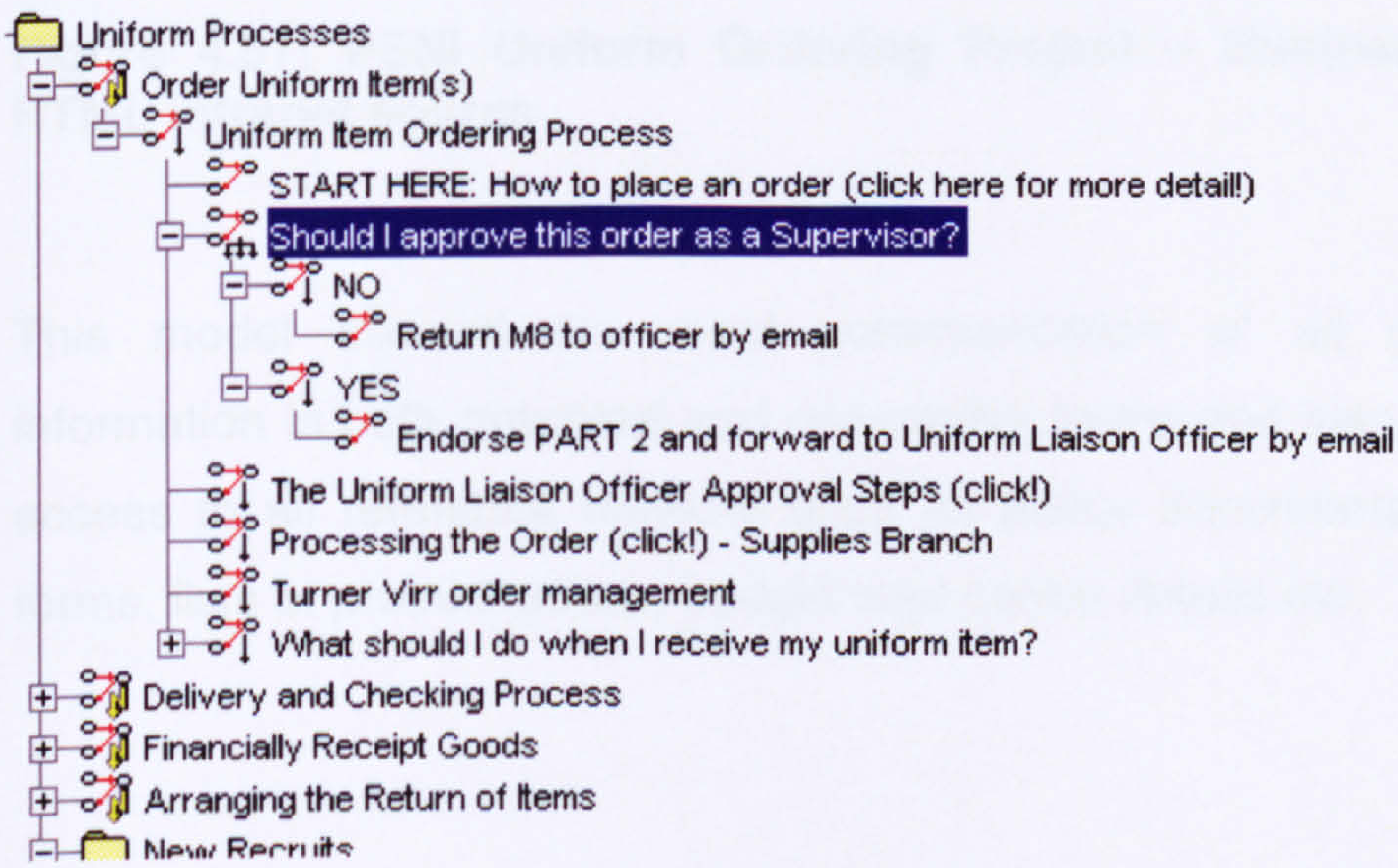


Figure 4.66: Compilation of Business Value Chains( )

The modelling of the processes in this way, with transparency of activity ownership, and relationships to other activities provides a detailed three dimensional and most importantly, an aligned view of the new way. This alignment of view was enhanced further by the software production of an intranet published navigable model.

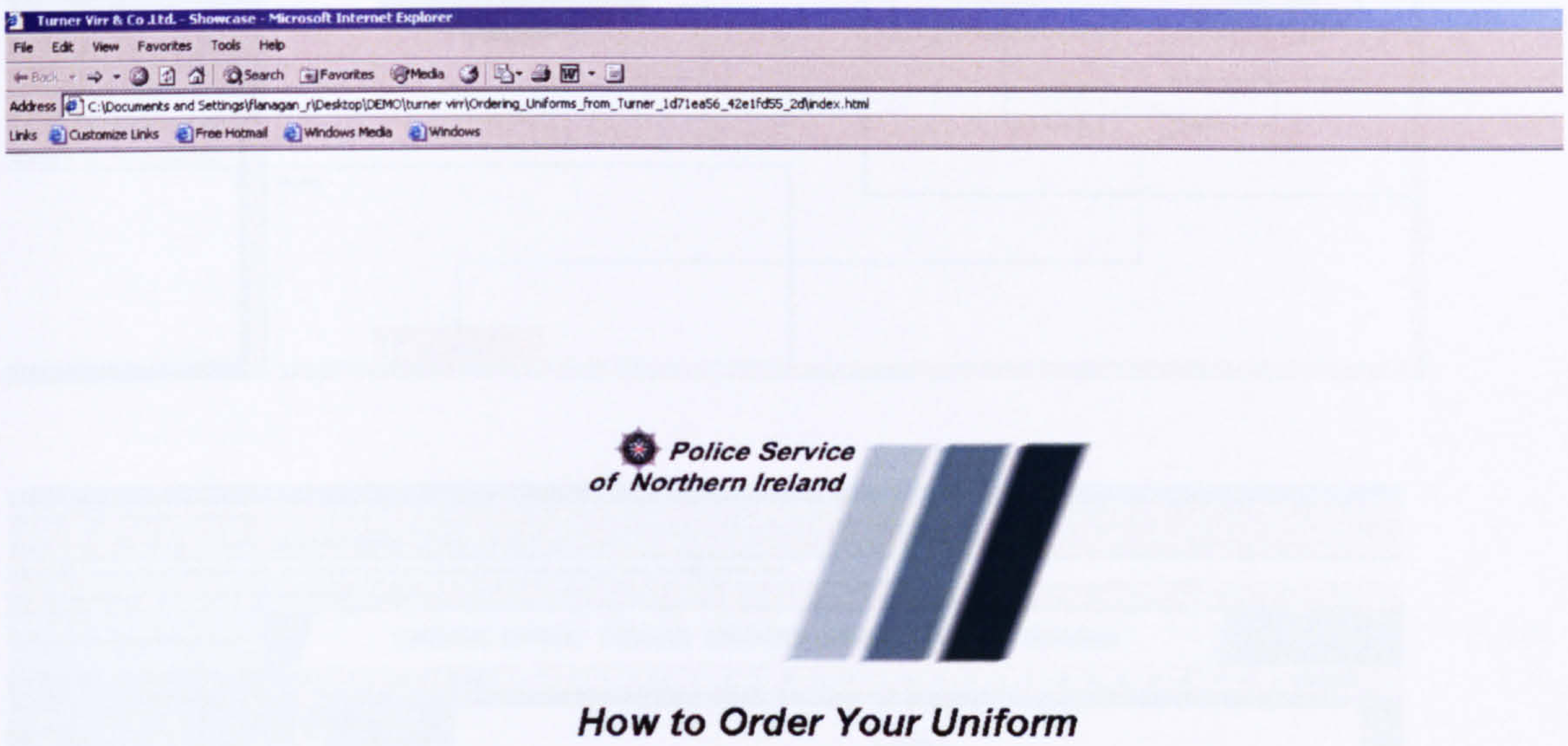


Figure 4.67: PSNI Uniform Ordering Project – Business "PoliceNet" HTML Intranet source

This model allowed the rapid communication of all process related information in both graphical and descriptive forms and also enabled on-line access to all reference material such as policy documentation, requisition forms, lists of product codes, budget cost centre details etc.

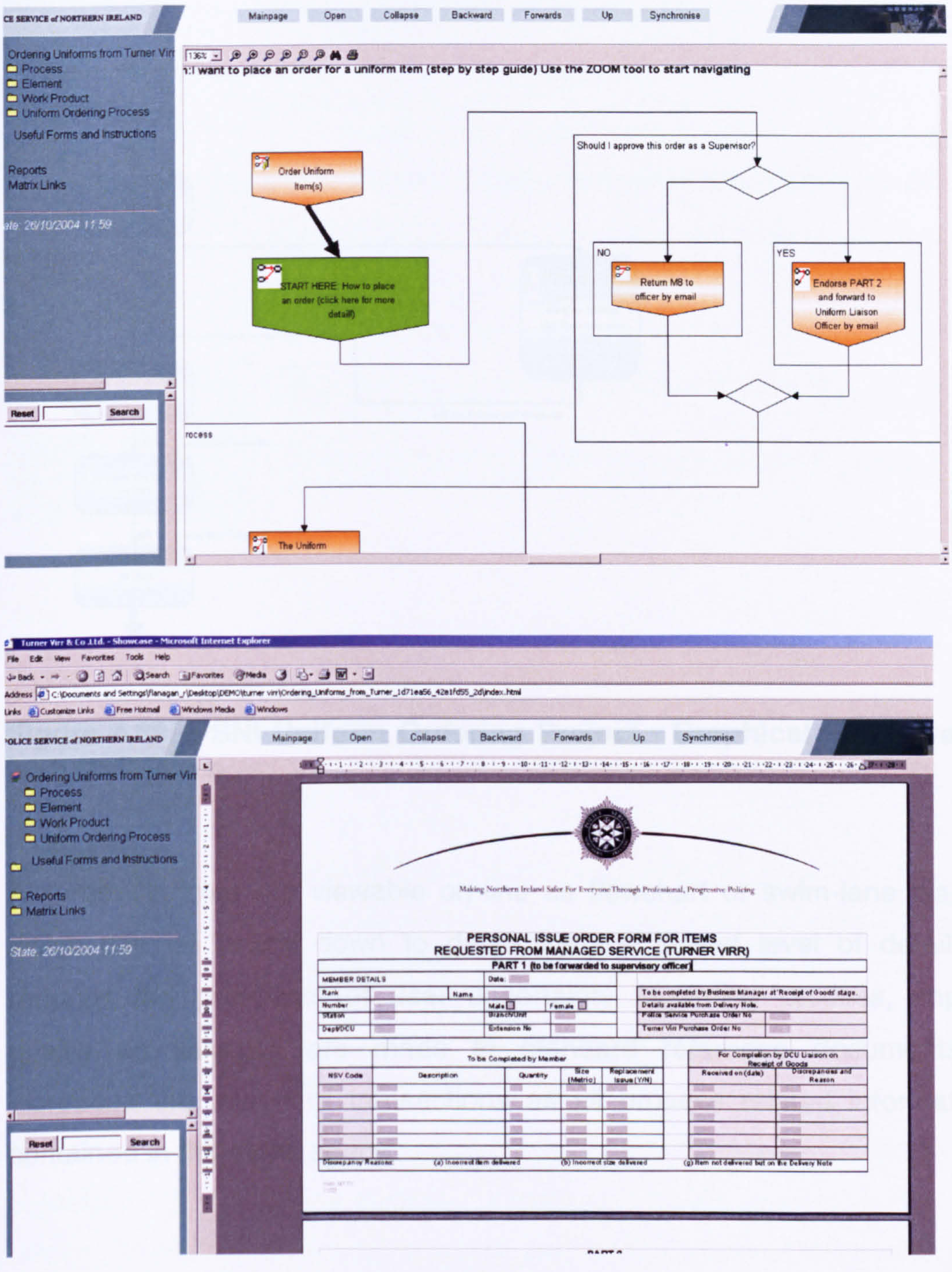


Figure 4.68: PSNI Uniform Ordering Project - Intranet Views of the Navigable Process Model for Uniform Ordering

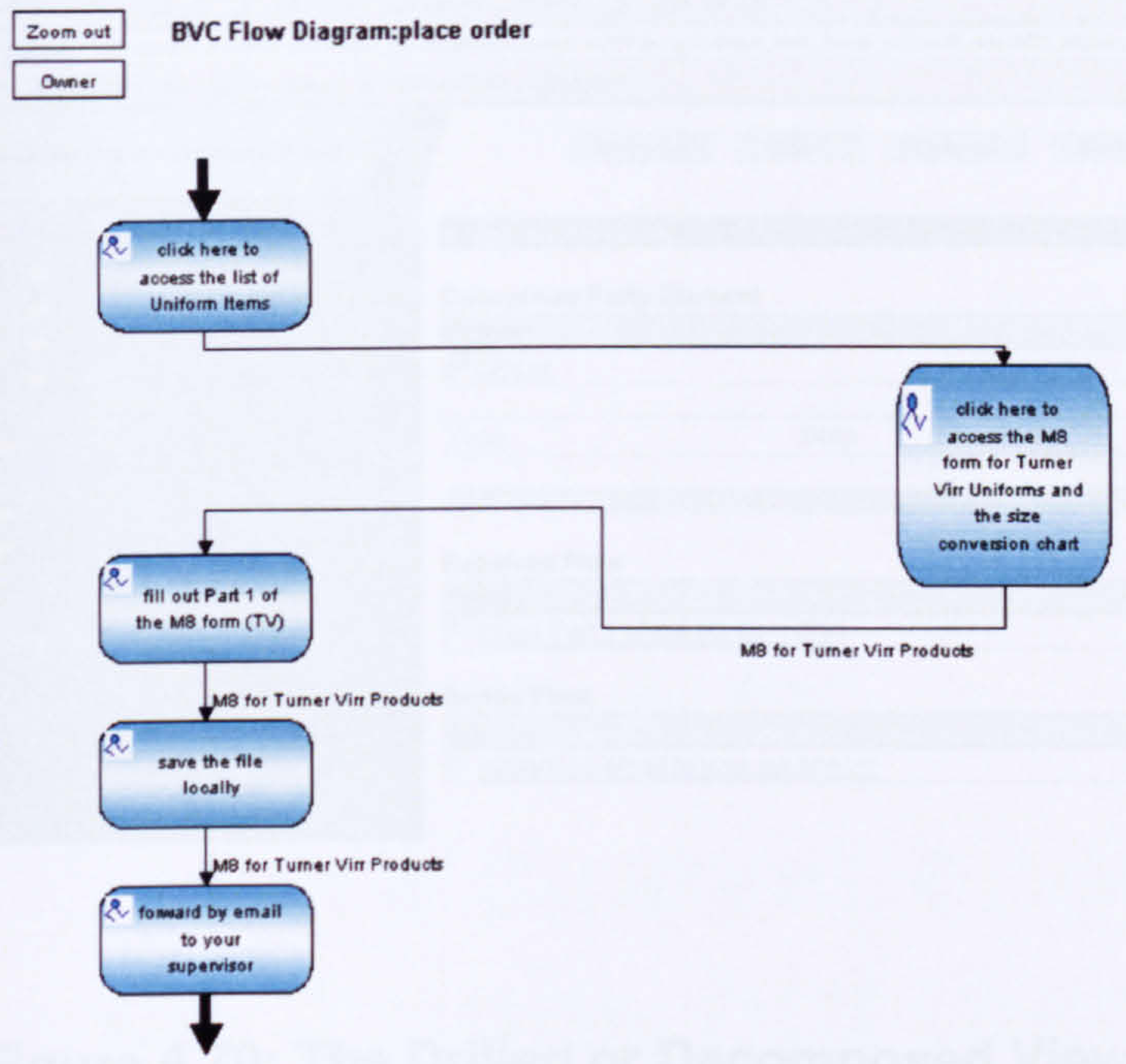


Figure 4.69: PSNI Uniform Ordering Project - Graphical Flow Available with Drill Down

All process flows are viewable on-line as flowchart or swim-lane diagrams which can be drilled down to determine the lowest level of detail. This reduces the prospects of user uncertainty regarding process, improves quality as linkages are made to standard reference documents and increases the speed of transactions as all process related information is contained in the same space.

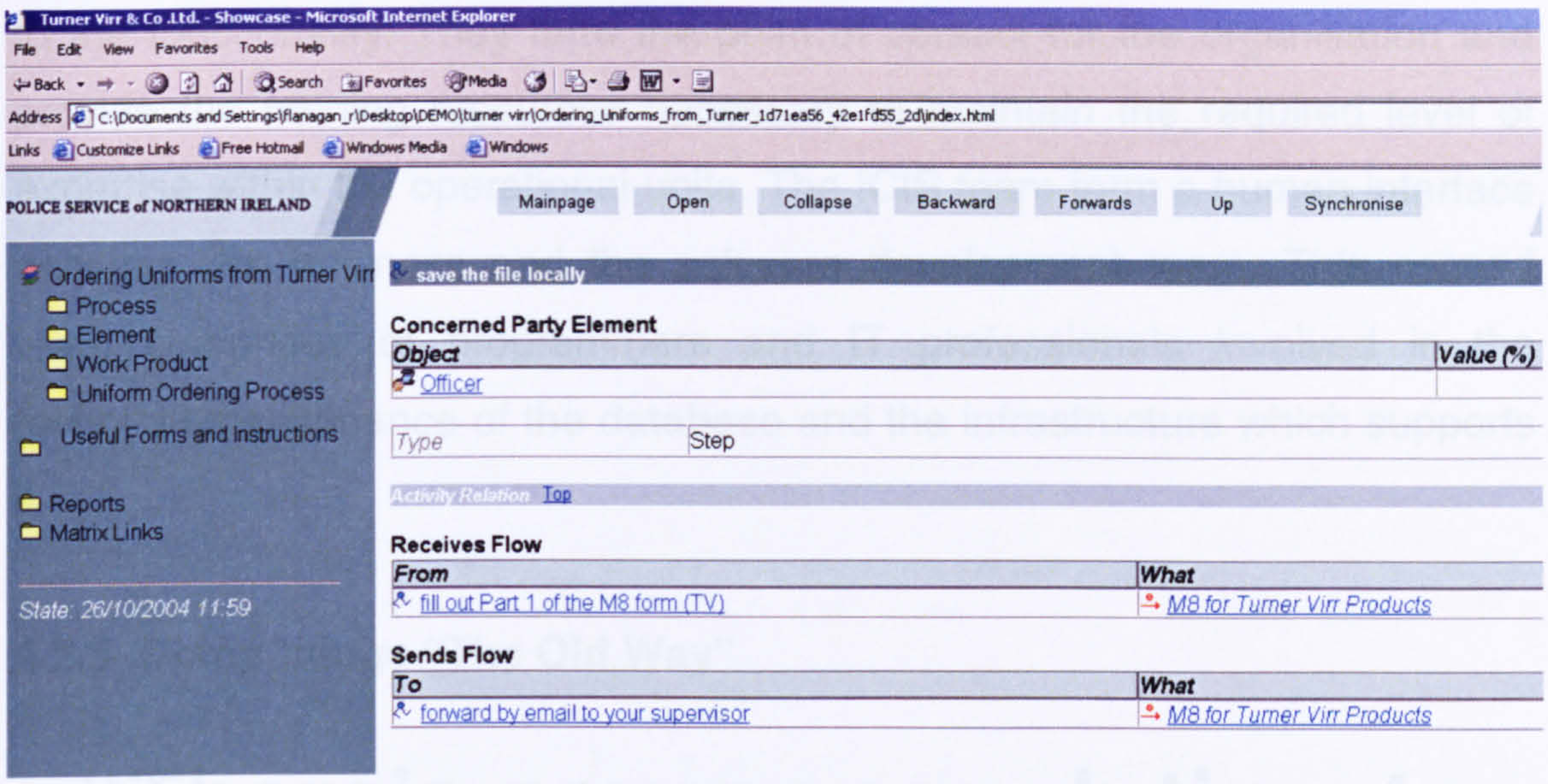


Figure 4.70: The Drilled or Decomposed View of a Single Activity

The ***communication*** of process flow detail, including the support specification profile of the activity was regarded as critical to the effective and rapid implementation of the new process. A high degree of compliance of the new process was required in order to incur the high costs associated with incorrect orders or deliveries.

4.2.4 ICIS Functionality Specification Project

ICIS (Integrated Crime Information System), as explained in Chapter 1 is a management information database system. It provides access to information relating to criminals, events, property e.g. vehicles, firearms, banknotes and allows the users to track and update their status.

There are two organisational bodies responsible for the maintenance of the application's functionality. First of all the ICIS team are responsible for maintaining a liaison with the business users i.e. the operational policing community within Northern Ireland. They must assess the development requirements of the business and specify any alterations and enhancements to the functionality. They form the point of contact for the organisation and provide the training resources necessary to maintain the required level of expertise within the operational units. The ICIS team form a human interface between the business and the software development team. This second team comprises of programmers and IT professionals involved in the technical maintenance of the database and the infrastructure which supports it.

4.2.5 Doing things "The Old Way"

"There's never enough time to do it right, but there's always time to do it again."

(J. Steinbeck)

Prior to this project, alterations to functionality were not formally documented. The trend was for informal communications, often verbal between the ICIS team and the development team describing required changes. Several issues emerged as the application developed over a number of years.

4.2.5.1 Confusion

Confusion over the terms of the specifications for change often resulted. The absence of a documentation framework introduced inconsistency and placed a high reliance on the relationships between members of the two teams. The quality of specification communications was variable, often resulting in reworking of programming effort. This confusion caused inefficiencies in the process. The results of the programming work required additional testing to verify that the required functionality enhancements had in fact been delivered.

4.2.5.2 Inefficiency

Secondly, the efficiency of the database development architecture was challenged by this specification method. There was no transparency provided which related the new prescribed functionality changes to existing data classes and attributes. This meant there was a tendency to continually reinvent the same wheels. The absence of a documented relationship to existing functionality eliminated the prospects for re-use of previously engineered programme code.

4.2.5.3 Quality Issues

The quality of the coded changes could not be guaranteed. The basis for the programming work was after all less than comprehensive in terms of structure, there was no reference to existing code classes and the specification of functionality was not consistently presented. Resultantly the end product was not always delivered as expected by either the business users or the ICIS team. The quality issues impacted on the business directly and compromised the status of the ICIS application. The perception prevailed that enhancements may not be delivered according to business requirements. The requirement to test in order to validate functionality and the inevitable reworking required delayed the ultimate delivery of finished enhancements to the business.

4.2.5.4 Change Control

Subsequent changes to specifications of functionality were not easily or at least efficiently accommodated. With no technical reference base forming the foundation of the specification, any changes required development of a new functionality description.

4.2.5.5 The Risks of Informal Links

The absence of any kind of documentation framework does have the effect of informalising the relationship between the two ICIS parties. This may be seen as advantageous in certain circumstances. The relationship between the ICIS team and the programming team is more personal and verbal communication of requirements becomes the norm. Minor changes are accommodated quickly and effectively. There are also disadvantages however associated with this mode of working. As the requirements of the business for functionality enhancement become more complex there is a higher risk of the failings previously described emerging. There is also the risk of a breakdown in personal relationships impacting directly on the delivery of business objectives. Change of personnel or restructuring of organisational units can also present risks to the use of informal specification practices.

4.2.6 Software Modelling of Application Functionality

In order to eliminate the problems inherent with the use of informal communications with respect to the detailing of functionality enhancements, PSNI elected to establish a framework for documentation. This framework must establish the infrastructure response to newly detailed business requirements. For example, a request was received from the business for improved functionality relating to the provision of missing persons' information. The business requires additional information fields to be displayed upon a query submission, based upon a name or address entry. Previously the response from the ICIS team would involve a verbal or perhaps written description of required functionality addressed to the ICIS developers.

The selected method of documentation had to be one which included reference to the initial requirement and also reference to the existing structure of the ICIS application. To achieve this, the organisation adopted software modelling tools.

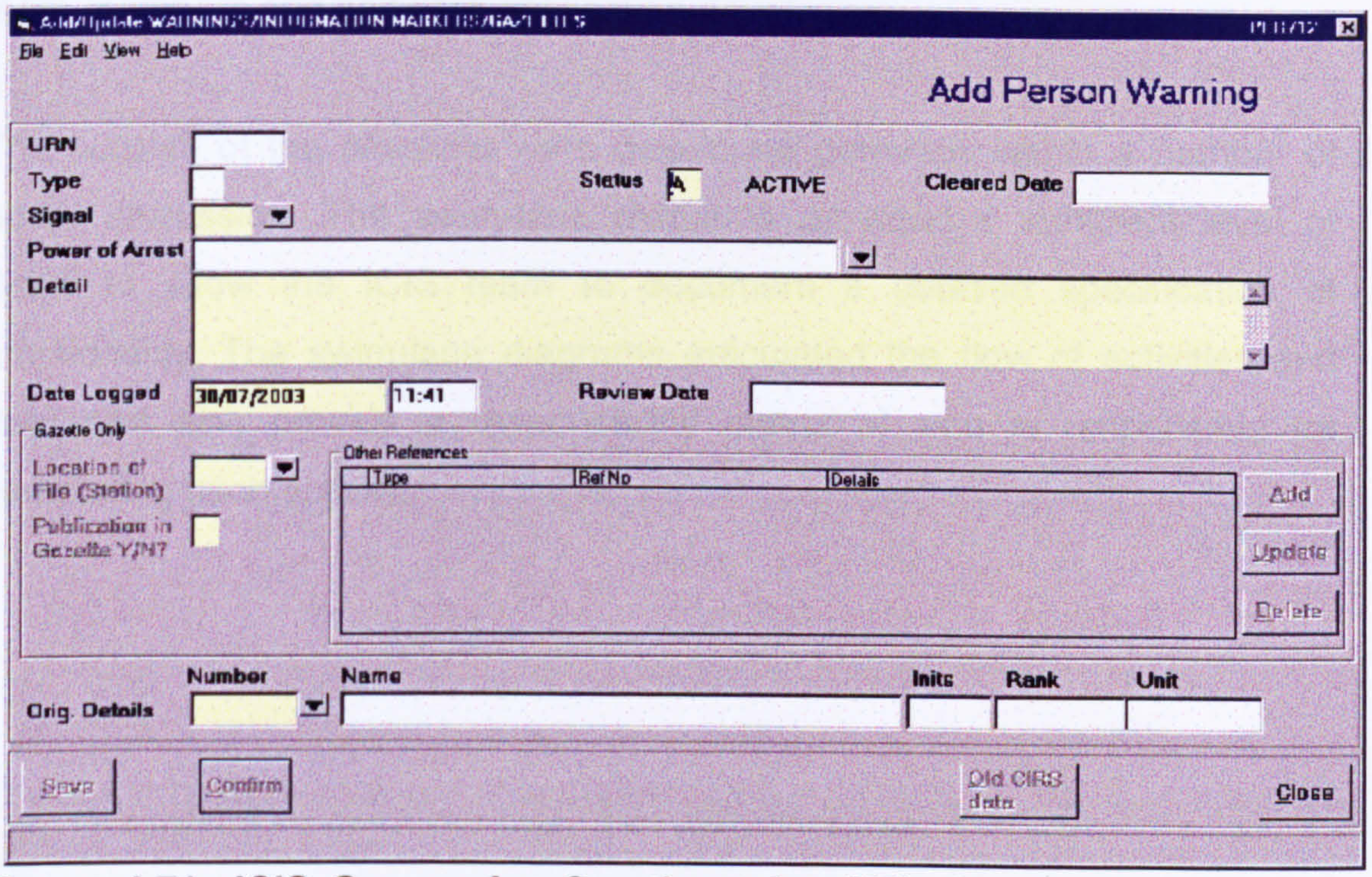


Figure 4.71: ICIS Screen for Creation of a "Missing Person" alert – (2004)

4.2.6.1 Phase 1 – Modelling Client Requirements

First of all the ICIS team elected to adopt a software approach to the documentation of "client" or business user requirements. The writer was engaged as a consultant in this process to introduce the concept and to complete the software training. Rather than requesting functionality changes as textual descriptions via email or memo, the team engaged the business users for the first time in workshop sessions and using swim-lane diagramming to map the changing process. The initial objective was to first of all create an environment which investigated the process possibilities rather than simply solving every problem with additional functionality. Secondly it was hoped that this approach would produce higher quality specifications by improving alignment in the first place and also by allowing some capacity for process development prior to programming. The swim-lane diagramming of the flow of activities and data inevitably allowed an informed discussion to take place between the relevant stakeholders, including business users, ICIS team members and software application developers.

The outputs of the sessions were developed generally within a number of hours discussion. The swim-lane diagrams provided a sufficient level of detail to allow the ICIS team to document a detailed specification of functionality. The swim-lane diagrams articulated the flow of activities and data and also provide a responsibility matrix of who is responsible for completing each activity.

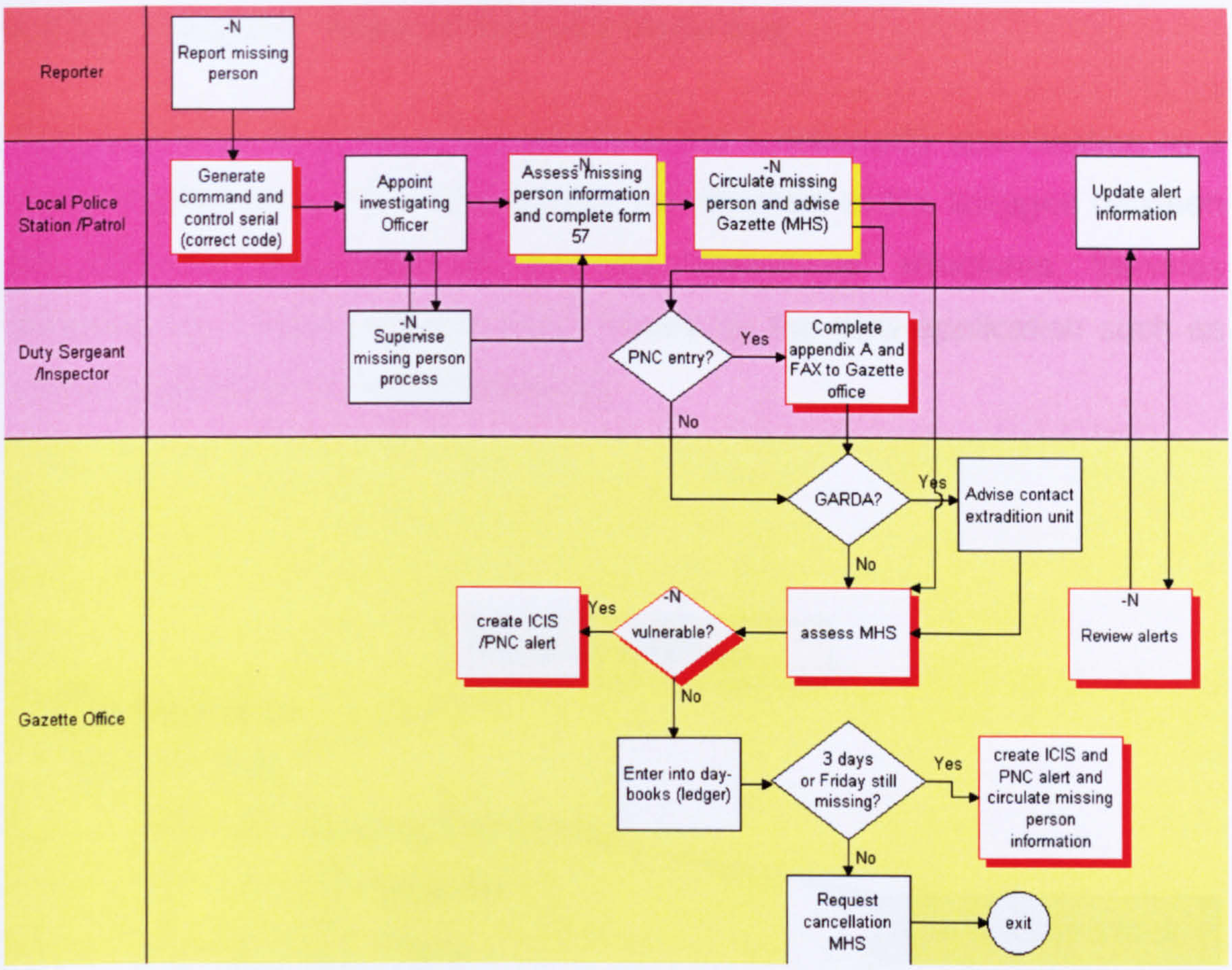


Figure 4.72: Swim-Lane Diagram for ICIS Data Processes Specification

The diagram above is an example of the outcome of an ICIS business user workshop. It was recorded using process modelling software. This enabled the easy accommodation of changes during the workshop. This capacity ensured that a debate could continue to develop a process solution and not be delayed. This exercise ensures the alignment of stakeholders with respect to the role of the ICIS application. The diagram clarifies the basis for the change request and also helps to establish the expectations of the business users. The establishment of this primary level of detail within the confines of a workshop also allows all parties to "contract" to the delivery of the preferred solution directly rather than by informal communications e.g. from business user to ICIS team and then from ICIS team to development team.

4.2.6.2 Phase 2 – Detailed Process Modelling

This phase involved the development of the functionality specification to a more detailed level. This included the identification of the linkages between the ICIS interface "services" and the "operations" structures. Services describe the ranges of functionality offered by the ICIS application such as "missing persons" or "wanted persons".

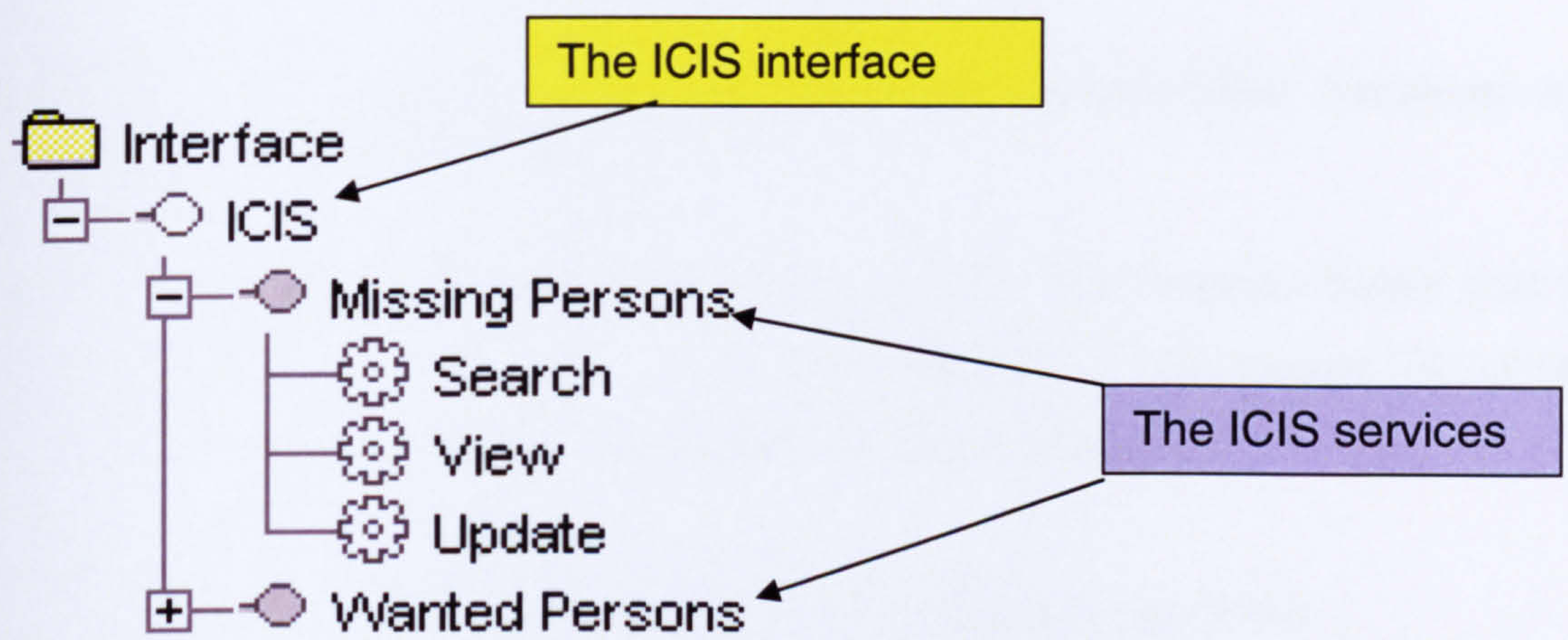


Figure 4.73: Software Model Screen-Shot of Interface Services and Operations Relationships

Each service is provided with a number of operations. An example of an operation may be the capacity to perform a search, view a result or update a record. The relating of these attributes to each other as objects allows the ICIS team to build up a model of the application.

The next stage in the development of the ICIS software model is to articulate the input and output parameters of each operation. The function of an operation relies

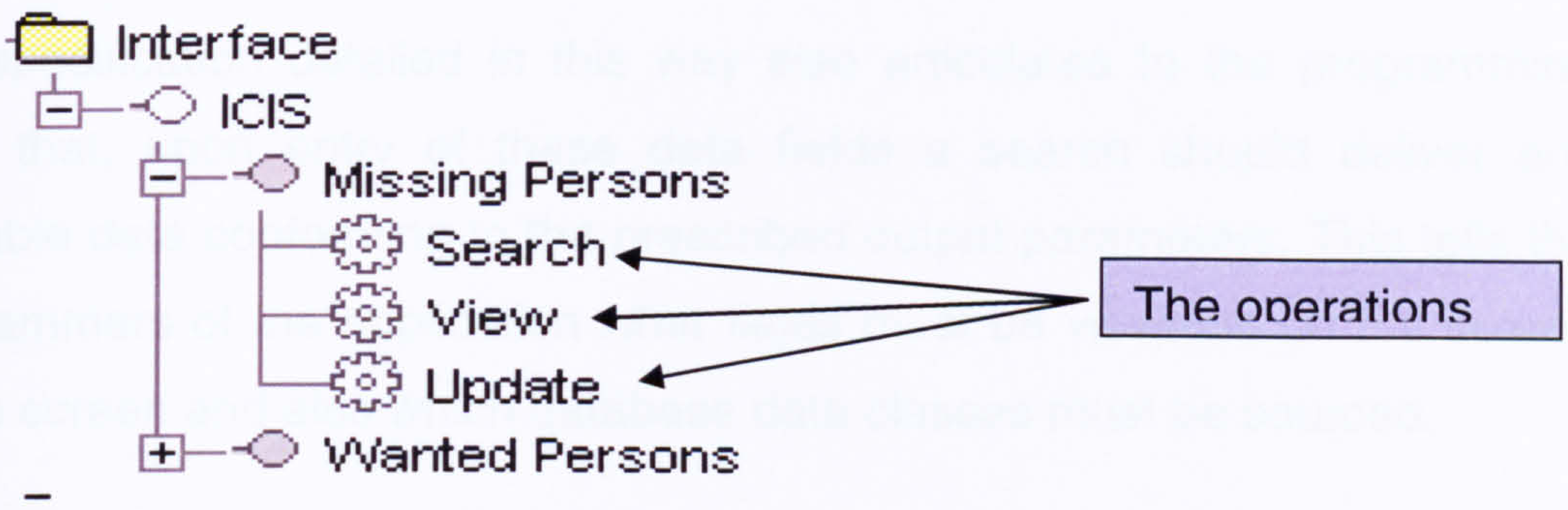


Figure 4.74: Software Model Screen-Shot of Interface Services and Operations Relationships

upon the use of data classes e.g. we can see in the example below that the Search operation can be facilitated by entering any or all classes (⊟) of data conforming to the list below, according to this specification.

Input parameters for ICIS "Missing Persons" Search operation:

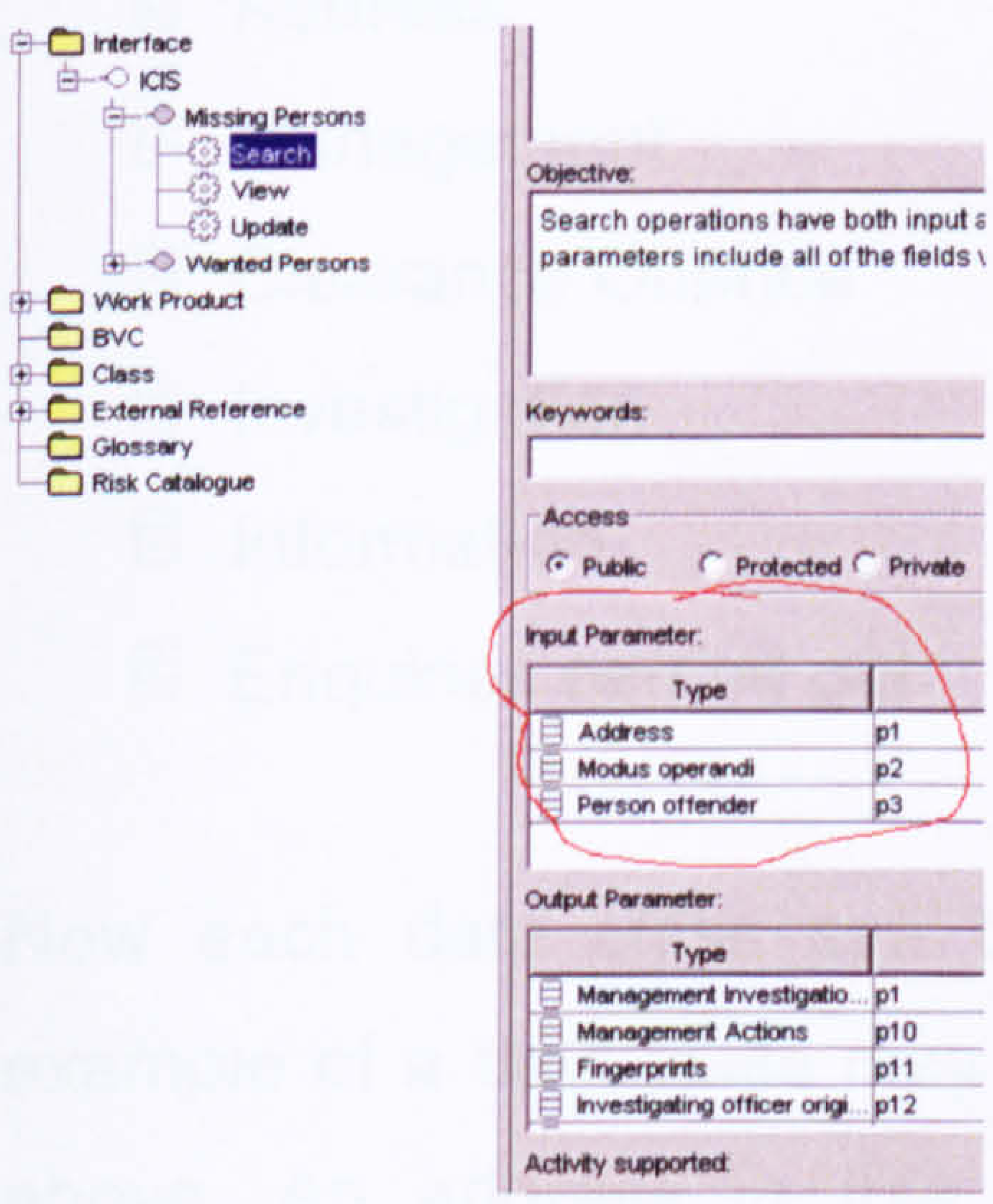


Figure 4.75: Software application model screen-shot illustrating modelled input and output data class parameters

- Address
- Modus Operandi
- Person Offender

The specification detailed in this way also articulates to the programming team that, upon entry of these data fields a search should deliver any available data conforming to the prescribed output parameters. This tells the programmers of the application what fields must be viewable on the search return screen and also which database data classes must be sourced.

Output parameters for ICIS "Missing Persons" Search operation:

- Management Investigation Log
- Management Actions
- Fingerprints
- Investigating Officer Original
- Declarations
- Links
- Address
- Management"
- Clearance Offence
- Investigation
- Information
- Enquiries carried out

Now each data class can be specified by its component attributes. An example of a data class may be an address as used as an input parameter above. An address in this context may comprise any of the following attributes:

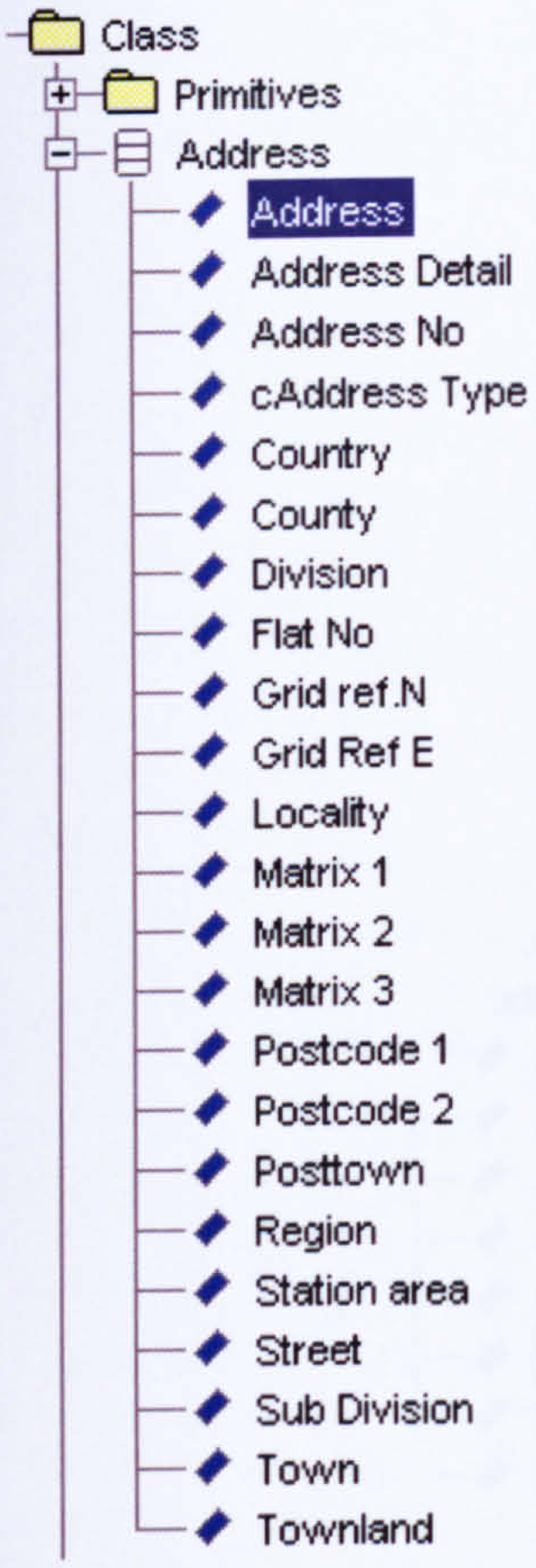


Figure 4.76 PSNI ICIS Specification Project – Screen-Shot of Data Class and Associated Attributes Structure

This "Address" class as modelled above articulates all of the attributes which may be expected to be required in the comprehensive detailing of address functionality within the ICIS software application. Further to this the ICIS team wished to specify the structure of each attribute within each class. This is necessary as the programmers require knowing whether to provide dropdown menu's e.g. a list of selectable options for say "County" or perhaps provide an open data string field and if so for how many characters. The view below shows that the ICIS team have defined that the "County" attribute should be defined as a drop down or "combobox" option to the user.

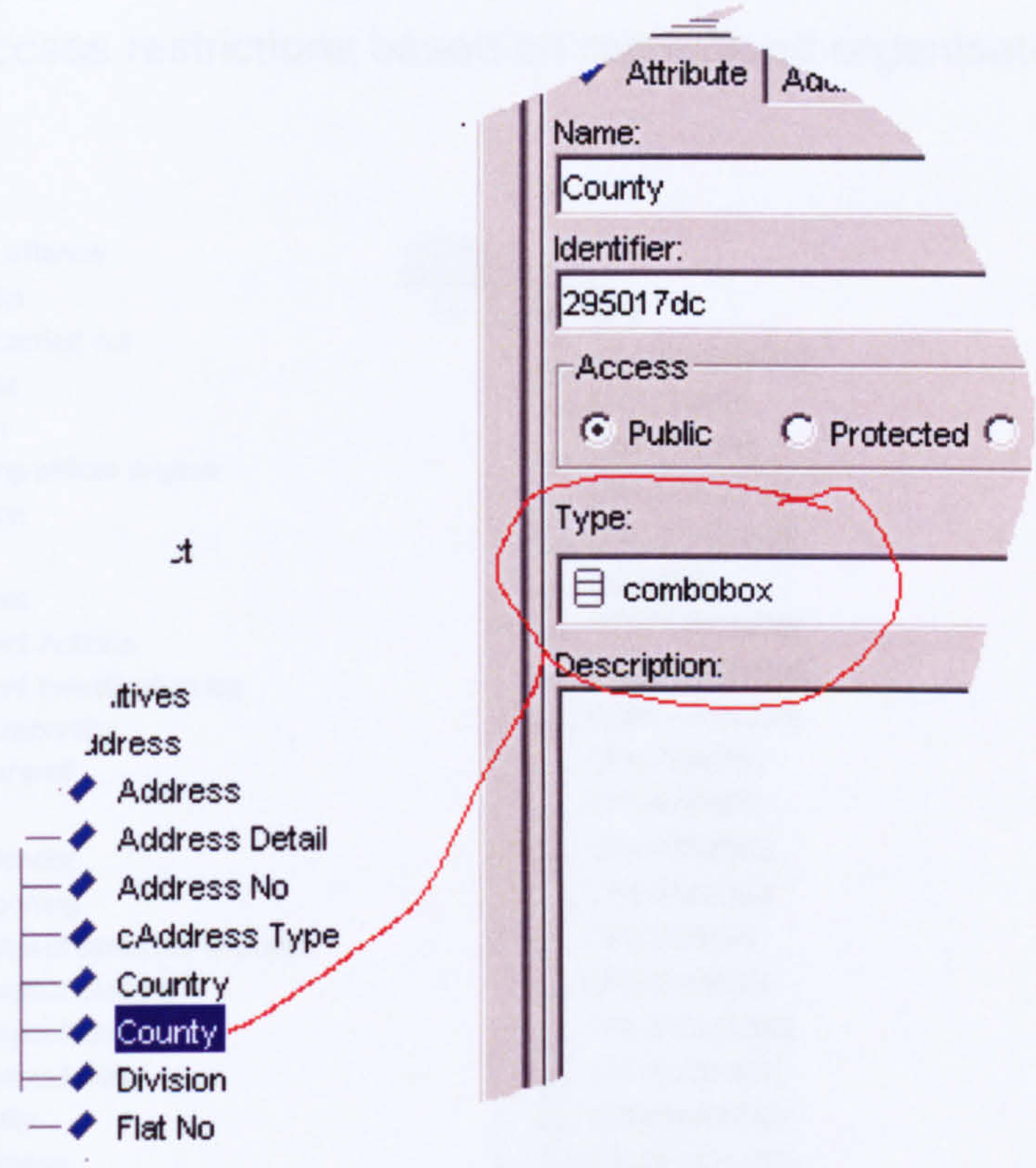


Figure 4.77: PSNI ICIS Specification Project – Screen-Shot of Data Class Attributes Definition Modelling

Import of Existing Data Classes and the Options for Re-Use

During the project an investigation was initiated by the writer who was engaged as a software modelling consultant. This investigation sought to explore the potential for importing the existing ICIS database data class and attributes structure. The development team successfully exported the data class structure to an MSEXCEL format which the writer then imported into the modelling application. This marked a big win for the project, the ICIS team and the ICIS developers as this provided a "library" of existing data classes which could now be referred to and re-used in the building of specification for new functionality. The import was not restricted to data classes. The project also achieved the import of all organisational units recognised within the ICIS application. This meant that during the specification off new functionality the ICIS team could also model the appropriate access restrictions based on recognised organisational objects.

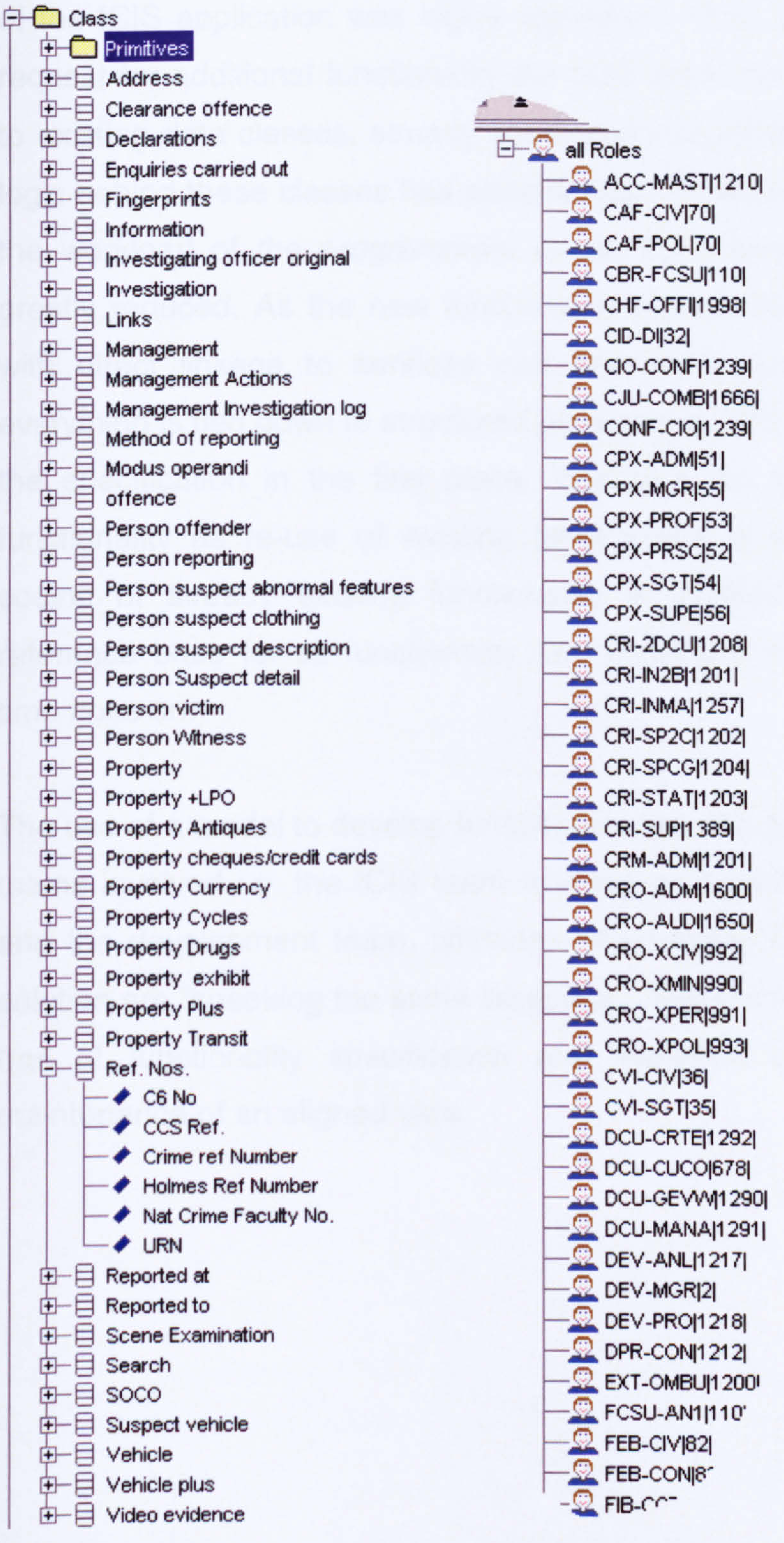


Figure 4.78: Import of Existing Data Classes and Associated Attribute Structure Direct from ICIS Database Code Parsing/import of ICIS Organisational Unit References

The impact of this import exercise and its incorporation into a software model of the ICIS application was highly significant. Now, when confronted with a request for additional functionality the ICIS team can make ready reference to existing data classes, already structured with attribute specifications. The logic behind these classes has already been previously coded and therefore the workload of the programmers in the ICIS development team can be greatly reduced. As the new functionality is expressed in data class terms with direct linkage to services and operations there is no ambiguity – everything is tied down to structured parameters. This improves the quality of the specification in the first place, improves the quality of the delivered functionality as re-use of existing functionality is enabled and duplicated coding of already existing functionality is avoided. The model forms a reference base for all functionality and continues to build and develop as time goes on.

The use of a model to develop functionality specifications means that the two teams involved i.e. the ICIS team working on behalf of the business users and the development team, ultimately responsible for delivering the coded solution are "speaking the same language". The model provides an auditable trail of functionality specification and therefore contributes toward the maintenance of an aligned view.

4.3 Govan Initiative – Performance Management Implementation

As outlined in Chapter 1 Govan Initiative has a requirement to demonstrate the effect of their activities in supporting the regeneration of Govan. It achieves this by reporting against sets of indicators mapped to overall Goals via targets and strategies. This model is represented within the published document called the Operational Plan. Govan Initiative has three main groups of clients for its performance indicators:

1. External funders (public and private)
2. The GI Board
3. Senior Management, Executive Officers and GI staff

All three groups require information to be presented in a slightly different way, but the essential data remains the same. It is useful to group the information under goals, strategies and projects. The timescales for reporting are quarterly (July, October, January and April) and annually (May/June), though this may become more rigorous in future.

4.3.1 Goals

GI has five goals. Four of these relate to the services provided to clients, while the fifth is concerned with internal (corporate) performance. There is some overlap in the area of customer care. The goals are:

GOAL 1: Encourage and support an informed community to participate fully in the life of the city

GOAL 2: Establish a technology rich and sustainable economy

GOAL 3: Create a lifelong learning community

GOAL 4: Build an environment that meets the current and future needs of all its communities

GOAL 5: To be recognised as an excellent company by all our customers

Each goal links in with at least two strategies, which in turn connect with individual projects. ACEs (Assistant Chief Executives) with overall responsibility for goals, and E.O.s (Executive Officers) with responsibility for groups of projects, manage the process.

The full detail of the model is not particularly relevant, suffice to say that it includes a network of relationship complex enough as to make manual reporting and aggregation cumbersome, time consuming and as such a threat to not conveying effectively enough the efforts of the organisation to its stakeholders.

The implementation method adopted by the organisation matched exactly that followed by BAA for the OGSM project and to a lesser extent PSNI during its own Performance Management project.

The writer, accompanied by a consulting colleague facilitated a three day workshop within GI to model the performance framework using software. This exercise focussed initially on the established and documented performance framework of GI. This was referred to as the "Operational Plan". The plan contained reference to "Goals", "Strategic Priorities", "Targets" and "Performance Indicators". Performance was to be measured not against organisational units, but projects.

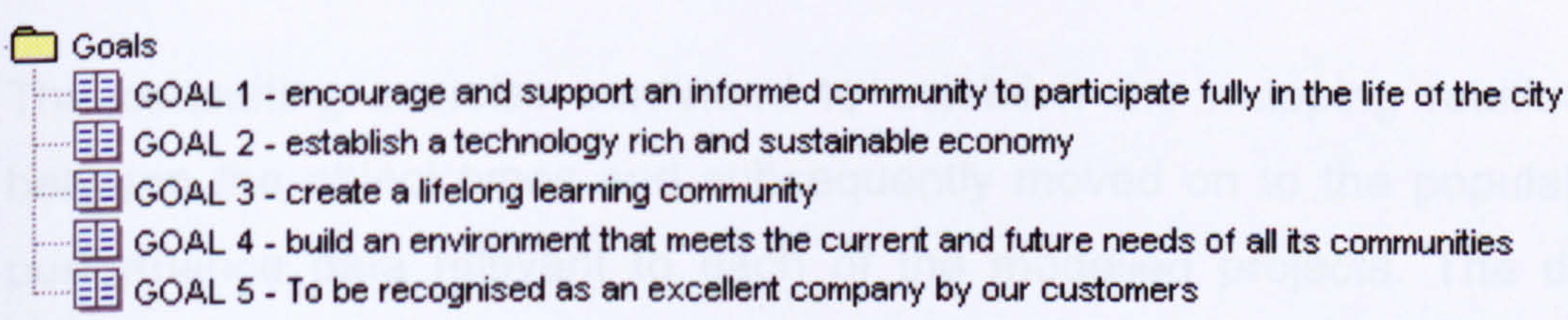


Figure 4.79: GI Operational Plan –Software Modelling of High Level "Goals" – (2003)

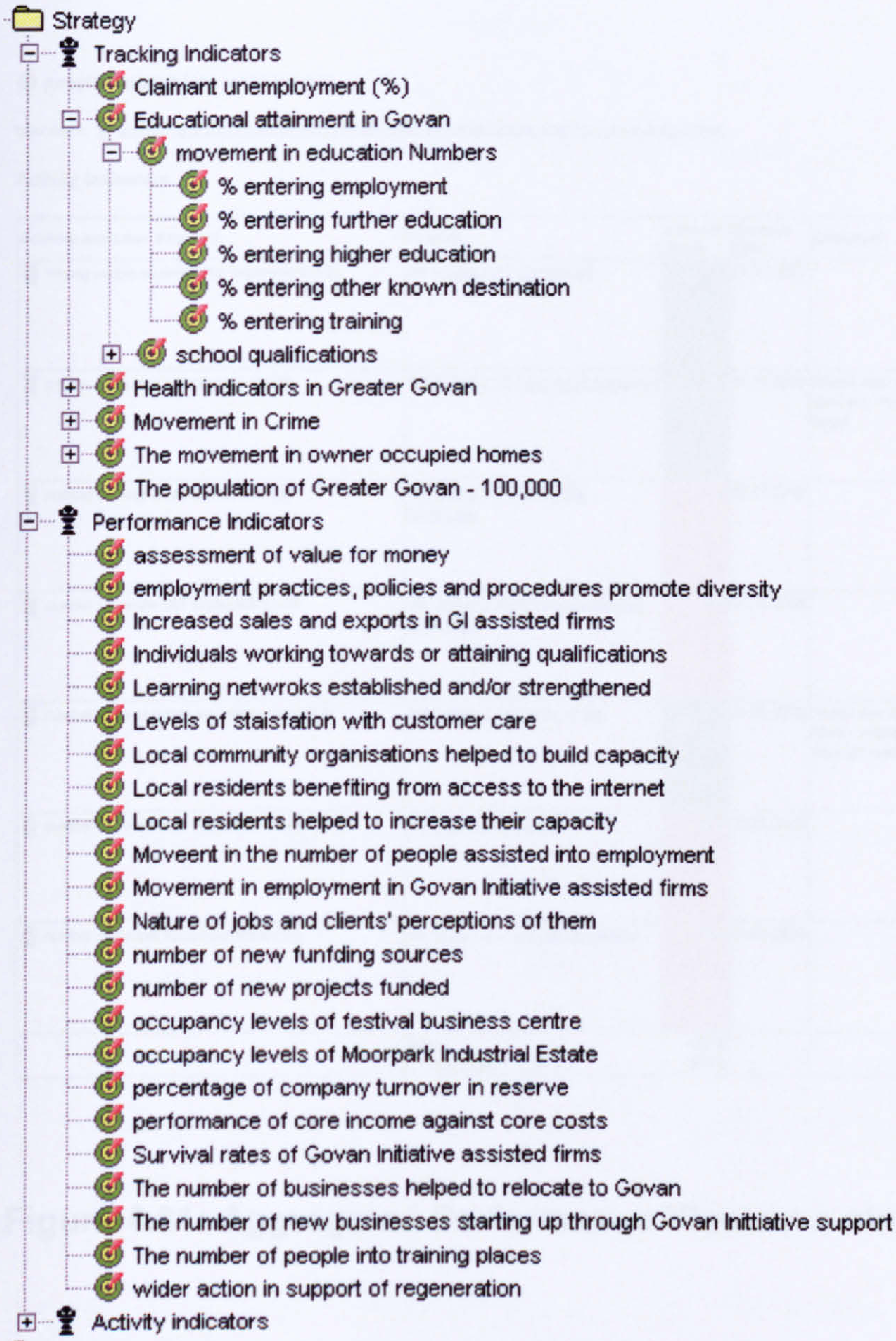


Figure 4.80: GI Strategic Priorities, Targets and Performance Indicators

The consulting exercise continued to establish the mapping relationships between the object types and subsequently moved on to the population of performance data relevant to each of the modelled projects. The defined model reflected the relationship between each project and the framework of performance indicators. The intention was to enable the aggregation of performance against generic targets such as " people assisted into employment". The construction of a model and population of data in this way it was hoped could allow this selective view.

people assisted into employment

belongs to: Develop and secure employment opportunities that offer choice and encourage progression

Activity Indicators

Activity Indicator (Project)	Project	Current Value	Current Date	Comment	Limits
Young people assisted into employment (12)	Project 1.11 Youth Team	16.0	01.10.2002		Lower = 11.0 Upper = 100.0 Lower = 0.0 Upper = 6.0
carers supported in employment (13)	Project 1.10 Fresh Start Nurseries	31.0	01.10.2002	Please note: throughout, targets in brackets are quarterly. Red is 50% or less of the quarterly target.	Lower = 13.0 Upper = 100.0 Lower = 0.0 Upper = 12.0
number of people into employment (9)	Project 3.33 CISCO ESF Programme	1.0	01.10.2002		Lower = 8.0 Upper = 40.0 Lower = 0.0 Upper = 4.0
number of people into employment (15)	Project 3.20 Hills Trust Learning Community	0.0	01.10.2002		Lower = 13.0 Upper = 100.0 Lower = 0.0 Upper = 8.0
number of participants into employment (12)	Project 3.30 Govan Works	14.0	01.10.2002	Please see Community Works for additional stats - whole of GW 21 in Q1, 14 in Q2, but 3 from Q2 were CW clients	Lower = 12.0 Upper = 100.0 Lower = 0.0 Upper = 10.0
number of people into employment (38)	Project 3.32 REACT	19.0	01.01.2003		Lower = 34.0 Upper = 300.0 Lower = 0.0 Upper = 19.0
number of people into employment (50)	Project 3.31 Active Recruitment	19.0	01.01.2003		Lower = 45.0 Upper = 100.0 Lower = 0.0 Upper = 25.0
	Total: Overall Target:	100.0 500.0			

Figure 4.81: Aggregated Performance View on a single Target

The challenge for GI was how a small semi-private sector organisation could effectively monitor a considerable number of performance indicators and report selectively on these to a range of target audiences. Using manual methods this was a cumbersome task, requiring the repeated handling of data and the consumption of inordinate levels of staff resource. The profile of the organisation and their dependence n external sponsorship for the funding of projects meant that this exercise could not be avoided.

Modelling presented the opportunity to manage the operational plan on a sustainable basis and from this platform populate the model with data such that predefined target audience reports could be generated on demand.

Target / Strategy Related Measurement Report for Red Values

%S4 roll gaining 5+ standard grades at 1-4 Tracking Indicators

Measurement	Object	Current Value	Current Date	Comment
% S4 roll gaining 5+ standard grades at 1-4 (Scotland)	GOAL 3 - create a lifelong learning community	76.0	31.03.2002	

The number of people into training places Performance Indicators

Measurement	Object	Current Value	Current Date	Comment
job focused	Improve the learning, social and vocational skills of our local community	89.0	16.01.2003	

safety programmes for school children To encourage our residents of Greater Govan by supporting and encouraging individual growth

Measurement	Object	Current Value	Current Date	Comment
safety programmes for school children (125)	Project 1.12 Secure Communities	0.0	01.01.2003	

external safety programmes To encourage our residents of Greater Govan by supporting and encouraging individual growth

Measurement	Object	Current Value	Current Date	Comment
external safety programmes (2)	Project 1.12 Secure Communities	0.0	01.10.2002	

Figure 4.82: User Defined Report for Selective Reporting – Govan Initiative Performance Management

A copy of the report illustrated above is appended to this thesis.

The embedding of the operational plan as a performance framework was seen as an important success factor for the organisation. Accordingly the "sharing" of the navigable model structure, access to report outputs etc. was regarded as important to the creation of the right approach to performance information management. The HTML output of the software model performed an important role in establishing the operational plan as a working framework rather than a conceptual and politically important static statement of intent.

The HTML was made available to all management employees within GI and is now used as the basis for accountability meetings.

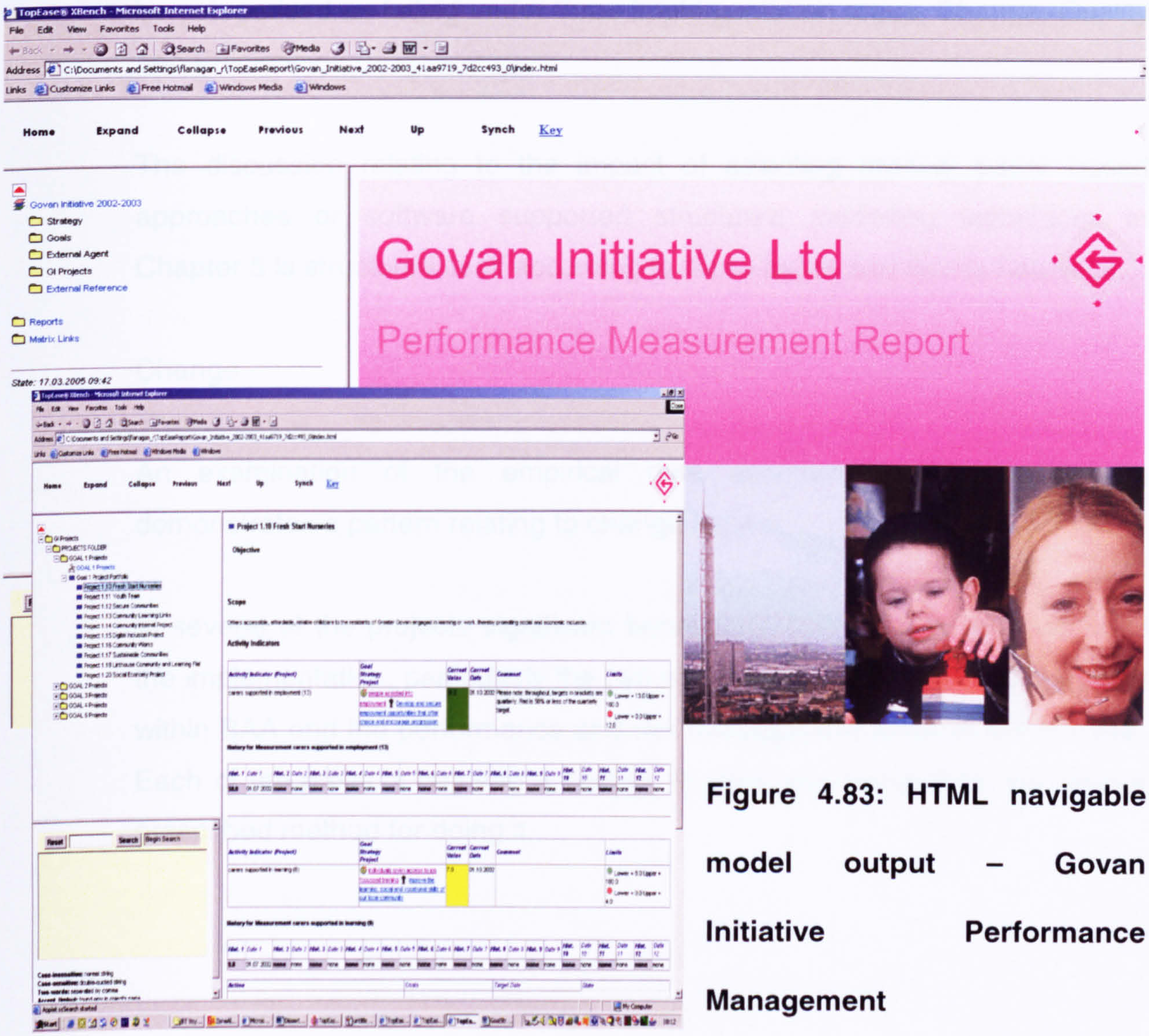


Figure 4.83: HTML navigable model output – Govan Initiative Performance Management

The selective views offered by software modelling in this case enabled the establishment of an aligned culture and renewed and proactive approach toward performance management.

4.4 The Emerging Themes

Throughout the implementation experience of the projects described in this chapter a number of themes have emerged. These are dealt with also to varying degrees within the literature (Chapter 2). The themes identified can be categorised as falling under three implementation areas, Change, Quality and Efficiency.

The discussion relating to the impact of selecting manual paper based approaches or software supported structured modelling techniques in Chapter 5 is structured itself according to these areas and theme headings.

Change

An examination of the empirical data associated with the projects demonstrates a pattern relating to change issues.

In several of the projects significant behavioural change is a key feature of the implementation, particularly the two major business process programmes within BAA and the performance and risk management projects within PSNI. Each of the projects required a change to what was being done and also a prescribed method for doing it.

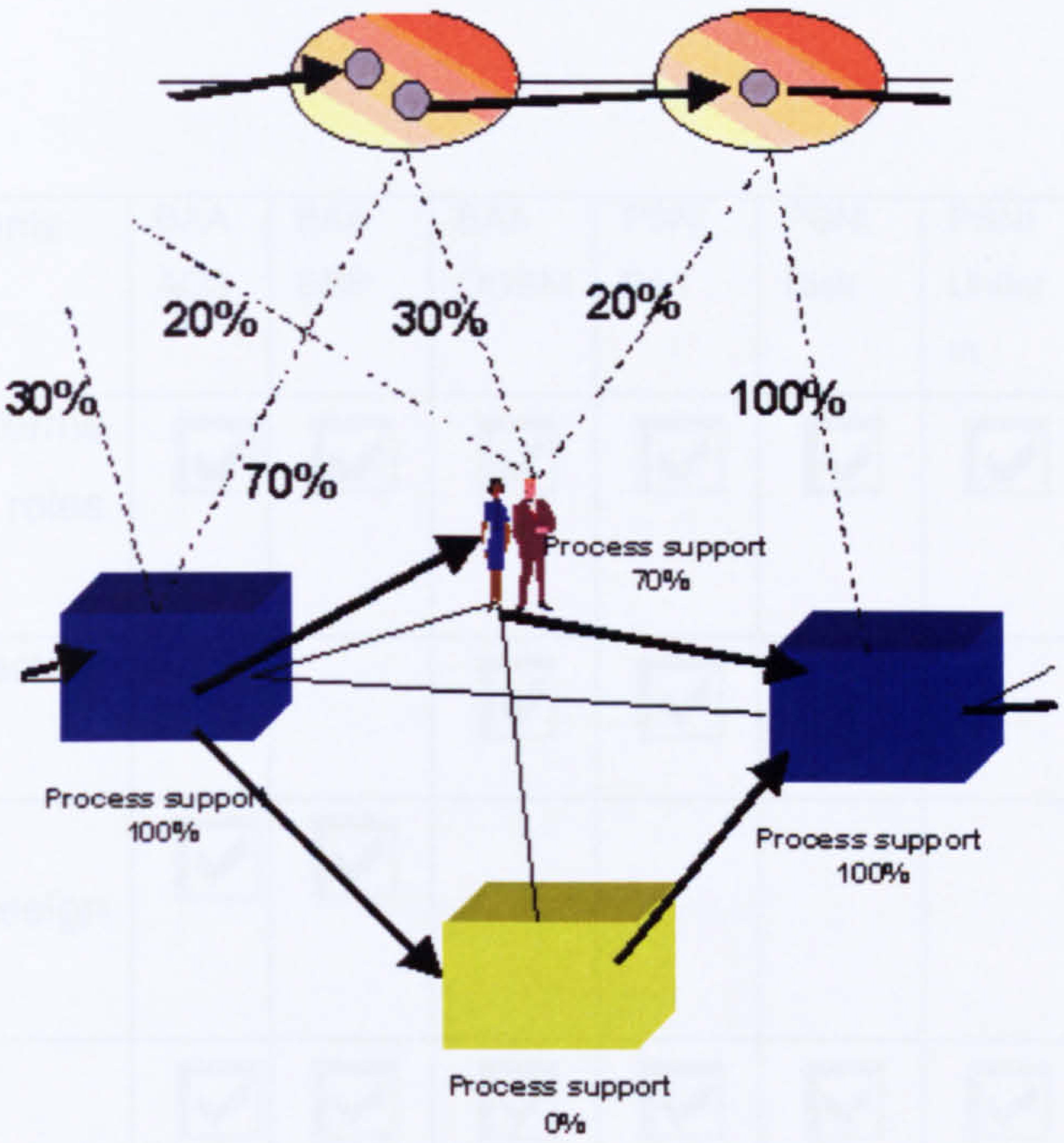


Figure 4.84: The Relationship Between Process Flow and Supporting Resources.

Referring to each of the projects the writer has identified a number of common issues emerging relating to business process change. In all cases the organisations involved were faced with a new requirement or set of requirements. In addition all organisations were required to implement new intellectual and technical supporting methods and infrastructure. The organisation design work associated with the BAA ERP and AOS projects for example; the training and re-skilling requirement associated with the change, workplace changes, and authority changes. Similarly the PSNI organisation required to respond to new corporate governance requirements for performance and risk management processes and new commercial management requirements presented by the Turner Virr uniform supply contract. The BAA MATRA project presented a range of diverse stakeholders with an obligation to adopt a new business process for risk management and a requirement to establish a support structure of human and technical resources. The following table describes the generic "Change" related requirements presented by each project.

"Change" Requirements	BAA AOS	BAA ERP	BAA OGSM	PSNI Perf	PSNI Risk	PSNI Uniform	BAA MATRA	GI Perf	PSNI ICIS
New compliance terms between parties and roles (contractual/SLAs)	✓	✓	✓	✓	✓	✓	✓	✓	✓
New intellectual framework			✓	✓	✓		✓	✓	✓
New/significant organisation design required	✓	✓					✓		
New roles identified	✓	✓	✓	✓	✓	✓	✓	✓	✓
New technical solution required	✓	✓	✓	✓	✓	✓	✓	✓	✓
New accountabilities	✓	✓	✓			✓	✓		✓
Transfer of authority	✓	✓			✓	✓			
New processes communications methods	✓	✓	✓	✓	✓	✓	✓	✓	✓
New skills/training	✓	✓	✓	✓	✓	✓	✓	✓	✓
New process/framework ownership/leadership (centralised)	✓	✓	✓	✓	✓	✓		✓	
Increased speed/ responsiveness/flexibility	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 4.6: Change Related Requirements by Project

The table above demonstrates the largely generic nature of business process "change" requirements as they apply to the range of projects. These requirements can be further classified for the purposes of discussion as falling into one of the following:

a. Communications
b. Alignment & Resistance
c. Suspicion
d. Flexibility

The "Change" discussion exposes the impact of achieving and maintaining alignment of perception during and following the implementation. The change control aspects of model maintenance are referred to as a mechanism for ensuring continued alignment within the organisation.

Quality

The "Quality" discussion highlights the outcomes of the cases which demonstrate the variation in quality. The term quality relates to quality of data (input and output), quality of framework maintenance, quality of understanding and quality of implementation. The following table describes the "Quality" impacts of the projects.

Quality Aspects	BAA AOS	BAA ERP	BAA OGSM	PSNI Perf	PSNI Risk	PSNI Uniform	BAA MATRA	GI Perf	PSNI ICIS
System data should be controlled as auditable reference source	✓	✓		✓	✓	✓	✓	✓	✓
Data transactions should be regulated by limitations and authority settings	✓	✓	✓	✓	✓		✓	✓	✓
Processes should be designed to comply with intellectual framework, regulation, contracts,	✓	✓	✓	✓	✓	✓	✓	✓	

Quality Aspects	BAA AOS	BAA ERP	BAA OGSM	PSNI Perf	PSNI Risk	PSNI Uniform	BAA MATRA	GI Perf	PSNI ICIS
audit etc.									
Access to the system (data entry) should be controlled and restricted to trained users	☑	☑	☑	☑	☑	☑	☑	☑	☑
Data interfaces should be automated to core systems and sources	☑	☑		☑		☑			☑
Data reporting should be consistently formatted	☑	☑	☑	☑	☑		☑	☑	☑
Management Information should be available on-demand (ad hoc reporting)	☑	☑	☑	☑	☑		☑	☑	☑
Data output should be configurable according to audience requirements	☑	☑	☑	☑	☑	☑	☑	☑	☑
Supporting organisation design should be clearly established (roles/responsibilities)	☑	☑	☑	☑	☑	☑	☑	☑	☑
Process management must be controlled centrally with identified owners	☑	☑	☑	☑	☑	☑	☑	☑	☑

Table 4.7: Quality Related Requirements by Project

The "Quality" aspects can be further classified by the following headings for the purposes of further discussion.

e. Data quality
f. Adherence to Policy and Compliance
g. Access to data
h. Comprehensiveness of detail
i. Transparency to stakeholders

Efficiency

The "Efficiency" discussion examines the impact of modelling on the processing of data, the flexibility opportunities and the impact this has on the implementation. Reference is made to the prospects to integrate software performance models with other data systems to reduce further the extent of manual data entry and also improve the quality of the model database.

Efficiency Factors	BAA AOS	BAA ERP	BAA OGSM	PSNI Perf	PSNI Risk	PSNI Uniform	BAA MATRA	GI Perf	PSNI ICIS
Data entry is maintained as "real-time" i.e. always current	☑	☑	☑	☑		☑		☑	☑
Report outputs deemed as based on validated current data	☑	☑	☑	☑	☑		☑	☑	☑
Data entry should be limited to single entry (interfaces to core systems)	☑	☑		☑	☑	☑	☑		☑
Manual data entry is eliminated where possible (data interface)	☑	☑		☑			☑		☑
Process transactions should be change controlled/monitored.	☑	☑	☑	☑	☑	☑	☑	☑	☑
Data backup, archiving, versioning is automated	☑	☑	☑	☑	☑	☑	☑	☑	☑

Efficiency Factors	BAA AOS	BAA ERP	BAA OGSM	PSNI Perf	PSNI Risk	PSNI Uniform	BAA MATRA	GI Perf	PSNI ICIS
Support systems provide agreed service levels wrt maintenance/support/fault	☑	☑	☑	☑	☑	☑	☑	☑	☑
System and process changes are enabled by an established procedure	☑	☑	☑	☑	☑	☑	☑	☑	☑
Process changes are specified/developed/deployed within a pre-agreed timeframe	☑	☑	☑	☑	☑	☑	☑	☑	☑
The process change procedure employs existing process architecture as base for redesign	☑	☑	☑	☑	☑	☑	☑	☑	☑

Table 4.8: Efficiency Related Requirements by Project

The considerable efficiency related factors enabled in the management of changes to model structure are referred to.

j. Datedness
k. Change Control
l. Re-usability

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5. Chapter 5 – Implementation Outcomes and Analysis

This chapter analyses the resultant outputs of the projects from an implementation perspective. The outputs are examined against the emerging issues covered in previous chapters. These include those emerging from the literature and also those identified within chapter 2. Reference is made to evidence relating to the way in which the implementation was conducted and the tools which were employed.

The chapter is organised this time not by project but by the themes that have emerged previously. Any number or all projects are measured against these themes dependent on applicability. The emergent themes identified within the study fall into three categories. These were previously identified in the review of literature, 2 and from the empirical chapter 4.

The categories are:

1) Change
2) Quality
3) Efficiency

These are the three areas into which all of the identifiable themes can be included which refer to the impacts of chosen method of implementation. This chapter will now discuss these themes in light of the implementation evidence from the portfolio of projects. Reference will be made to documentary evidence pertaining to the projects.

5.1 Change

A number of the emergent themes from an examination of the studied projects can be gathered under the term “Change”. These are

Communication, Alignment and Resistance, Suspicion and Flexibility. This section addresses each one and presents evidence from the projects of their presence and the impact of the selected implementation method.

5.1.1 Communication

One of the six strands of change management as offered by the Deloitte Consulting Group and as referred to earlier in this thesis within Chapter 4 is Communication. This field is generally accepted as being pivotal to successful implementation of business change programmes and practices. The case projects studied within this research exercise provide evidence which suggests that the chosen implementation methods can have a direct and significant bearing on the effectiveness of communication with regard to making a positive or negative contribution toward successful implementation.

The two major **business process** change programmes completed within BAA; AOS and Enterprise, employed very different communication strategies. The AOS project communicated process detail in very direct, unambiguous terms. Significantly, no "Change Partner" was employed for this project. AOS was presented very much as an IT solution implementation whereas the Enterprise programme went to great lengths to stress that the project was not an IT project and was a business process change project which supported "new ways of working" and "behavioural change". Enterprise invested significantly in addressing the "Change" issues, employing Deloitte Consulting as the lead in navigating the communications and behavioural elements of business process change.

The AOS project communications delivered "need to know" messages directly to concerned parties. Process documentation was developed during workshops as specific outputs and "signed off" as the activity schedule to be employed by appropriate parties. The operational criticality of the Airport Operational Systems was reflected in the no nonsense approach to communications. The focus was very much front-office processes as compared with the back-office process integration of the Enterprise project. It is also important to reflect on the audiences involved here. The AOS project deployed a technical solution to be operated by purely operational resources, Air Traffic Controllers, Check-in Staff, flight planning Ops, etc. The Enterprise project relied heavily on the behavioural change of functional department staff including HR, Finance, Procurement, etc. The personality and competency make-up of these two populations – functional and operational are very different. In contrast to the AOS project, Enterprise involved a much greater transfer of responsibility and ownership and as a result there was a perception of transfer of power and security.

AOS communications comprised first of all a process for securing high-level 3rd party buy-in. and secondly, a limited content of purely instructional messages including swim-lane diagrams articulating the flow of activities for operational processes and identification of the responsible parties. Commercial communications with airlines, handling agents and other 3rd party authorities such as Customs, Immigration, Special Branch etc. were formalised according to the terms of a contractual arrangement surrounding the provision of fixed IT hardware and software access. The second level communications strategy focused on the delivery of operationally relevant messages, identification of training requirements and confirmation of time schedules and accountabilities.

The following is an extract from the communications strategy for securing high-level buy-in to the project:

"Strategy

The strategy being used is fourfold:

Stage 1 - Identification of stakeholders

Planning sessions have been held at each of the 4 locations that have identified key stakeholders for AOS.

Stage 2 - High level buy - in

High level buy - in is essential at an early stage to allow local discussions to take place. The approach being taken to ensure high-level buy - in is as follows

- Letters sent from MD/SAL and MD/SIAL that describe the AOS product and invites third parties to attend STN on the 24 January, and to have individual briefings. This letter was sent from MD/SAL on 24 December 1999 and is due to be sent from the MD/SIAL by end of January 2000. A separate session will be organised for SIAL as required.
- A visit to STN is planned for the 24 January that will allow third parties to see AOS in operation. Both BAA and third parties users of AOS will be visited. A key element of the day will be time with third parties who have all bought into AOS.

Stage 3 - Local level briefings

- Local briefings at each phase II airport with third party station managers that will discuss AOS in more detail, the role of third parties, commercial arrangements and names of supper users and those requiring training.

Stage 4 - Active involvement with process definition

- The active involvement of third parties in process definition

- The requirement for third parties to sign - off AOS processes.

At each of these stages it is important to provide a common approach so that appropriate messages are given. It will also be important to fully understand the third parties specific role, the change this will be from the current, background to their operation at the airport, likely benefits to the third party (e.g. reduction in manual communications with BAA operations and access to a better level of information) and any impact on the conditions of use/licenses for their operation at each airport. Briefings will be arranged with local management, FD/SAL and MD/SAL regularly to ensure the appropriate message is given. *(Note: each of these areas will be explored further before the visit to STN)*"

The strategy reflects the importance of aligning the change audience – a common thread throughout all of the change programmes and also the importance of direct communications and "sign-off" activity to ensure that this is achieved. The AOS project achieved this successfully without a sophisticated modelling solution. The inclusion of graphical process documentation upon which sign-off is achieved could be interpreted as software modelling to some extent however the strict contractual framework employed, the strict project timescales and the scheduled withdrawal of prior support systems from use proved critical alignment factors delivered via the very clear communications strategy.

Enterprise communications employed an alternative philosophy – one more based on engagement and persuasion, much softer and less direct and confrontational. A perception of inclusion was created, one that was designed to engage the users as potential influencers in the process design stage. Enterprise communications adopted a product brand with consistent corporate project identity.

Enterprise

Countdown to Enterprise at Glasgow Newsheet 2

13 Dec 2000

AMA - Supply Chain

What will the new AMA Supply Chain Process mean to us here at Glasgow?

From Go Live there will be FOUR ways to buy goods and services using our PCs these are:

•Route 1 - purchases from the electronic catalogue in OSSP (Oracle Self Service Purchasing) which are covered by existing Supplier Agreements.

Route 2 - purchasing cards-for purchases less than £250 where no supplier agreement exists ie. it is not in the catalogue.

•Route 3 - purchases under £5000 which are not in the catalogue. Contact the Business Support Centre (BSC). Suppliers for these items will be set up on a temporary basis only.

•Route 4 - purchases over £5000, for strategic or complex purchases where no supplier agreement is in place. Contact Karen Bolton in Supply Chain on 04 4568.

Training will start in January for those people at Glasgow who will need to use the new system. *Key people who will need to use it frequently will be trained last - to gain the maximum benefit.*

In the meantime, or to keep your memory fresh you can watch the Supply Chain Video ask your Line Manager or Collen lupton on X4255. Also check out the Supply Chain Intranet Site for latest news, information and FAQ (frequently asked questions)

!! IMPORTANT PURCHASING RESTRICTIONS !!

Goods and services which are not critical to the operation of our business SHOULD NOT be ordered between 10 January 2001 and 19 February 2001. Contact Karen Bolton on ext04 4568 in Supply Chain for further information.

Don't forget...Glasgow goes live with the new Enterprise systems and processes in February 2001

Figure 5.1: "Enterprise News" – Glasgow Airport Implementation, BAA Enterprise Communications (2001)

Significantly, and unlike the AOS project, the user community was not included within the process development stage. This activity was completed centrally between Oracle® and BAA functional representatives. The communications strategy therefore focused upon the delivery of implementation messages only.

Date	Activity	Audience	Message	Responsibility	Status
Dec - Feb	Weekly Sheets at EAL/AAL/ GLAL/SAL		Implementation messages	ER & Lims	ongoing
3 Jan	Business Restrictions E- Mail /Newsletters	Rest of group		ER	Due circulation 4th Jan
15 Jan	E-mail and Hotlinks E- Mail	EAL/AAL/ GLAL/SAL	Change in Intranet Weekly Countdown sheets	ER to revisit e- mails	attached for review
26 Jan	E-mail E- Mail	EAL/AAL/ GLAL/SAL	How we are going to communicate with them over Go Live period	ER to revisit e- mails	attached for review
5 Feb	Final Business Restrictions E Mail E- Mail	Rest of Group		ER to revisit e- mails	
5 Feb	Hot Links Email E- Mail 5	All at EAL/AAL/ GLAL/SAL	Reminder	ER to revisit e- mails	attached for review
9 Feb	E-mail and Hotlinks E- Mail Attachment	All at EAL/AAL/ GLAL/SAL	Reminder What to do if guide Attach Support Walkers Updates on Intranet	ER to revisit e- mails	attached for review
12 Feb	PC Wall paper if possible	All sites		To be confirmed	
12 Feb	Penguin Displays in key areas Posters in key areas	EAL/AAL/ GLAL/SAL	Enterprise Go-Live Tomorrow's possibilities begin today	Production ER Distribution All	
12 Feb	Desk Top Tent cards ■ Support ■ BSC BSC Leaflet 2 versions	EAL/AAL/ GLAL/SAL Especially front line staff such as Security etc	Enterprise Go-Live **Tomorrow's Possibilities Begin Today**	Production ER Distribution all	
12 Feb	E-mail to all EAL/AAL/ GLAL/SAL staff E- Mail	EAL/AAL/ GLAL/SAL	Reminder that Today is go Live – BSC Go-Live too - BSC hotlinks What if... ... Guide Intranet Update Keep to process	ER to revisit e- mails	ER to review
12 Feb	E-mail to all Rest of Group E- Mail E- Mail - systems back early	Rest of Group	Systems back EAL/AAL/GLAL/SAL successfully went Live Any key knock on messages for Rest of Group	ER to revisit e- mails	ER to review
12 Feb	Thank You and well done card	Implementation Team, DIMs, DCs, PIMs, at EAL/AAL/ GLAL/SAL	Thank You card signed by Donal etc	ER to pass over	
12 Feb	Intranet Updates through the day		9.00am - switched on 12.00 - still progress	ER/Central team	

Figure 5.2: Enterprise Communications Activity Plan

The Enterprise communications plan was built around the delivery of pre-planned messages to ensure the correct behavioural response from the user community. Extensive use is made of informal yet co-ordinated communication media. Email and intranet resources feature strongly. The timeliness of message dissemination offered allows for the selective or global distribution of messages during implementation critical periods.

It is notable that no detailed workflow process documentation was included within the communications plan. No flowcharts or accountability matrices were shared with the users. Rather, the only platform employed for the communication of technical process activities for the users was the formal training exercise. The absence of detailed process documentation certainly influenced the extent of debate occurring between users during implementation phase. However, issues arising following implementation suggest that the lack of detailed documentation may lead to variances of operational implementation. Several instances arose which demonstrated the impact of not "modelling" and communicating in some way the prescribed relationships between process activities and organisational elements i.e. roles. The Enterprise project post project review (PPR) documented this. The PPR is attached as APPENDIX A.

The following extract includes reference to those communications activities that were perceived as having gone "not so well".

"Communication…..not so well

- Poster campaign started too early - messages were too vague – not sufficient role detail.
- Leaflets too high level?
- Central team need to be sensitive to local programme requirements and local support structures.

- Comms need to articulate specifics of process application
- Too much information, too often, not generally appropriate to Scotland for example
- Same information sent out from several sources - overloaded during previous location rollouts, R1 and R2 – no relationship to implementation state.
- Communication required a bigger effort in specifics than we initially realised.
- 10 Weeks prior to 'Go Live' most intent activity for communications.
- Clarify the before and after - what's the difference!? Great tool to use in the future (virtual form burning!!) – swim lane diagramming (AOS)
- Consider the people who are <u>not</u> affected.
- What do they need to know and when?
- Didn't communicate well enough to suppliers / external stakeholders e.g. airlines especially afterwards supplier felt they have been treated badly.
- Need to issue process timelines and details of responsible parties – duration of payment timescales etc for suppliers."

The areas highlighted above refer to those areas of the communications effort which reflect a lack of detailed relationship modelling between process activities and support resources i.e. organisational roles and supporting systems and infrastructure. Evidence also emerges within the PPR strategic review analysis recognising the limitations of a non-integrated documentation approach.

- The overall holistic working methodology, in linking process and system change to organisational development and change, that could then be implemented in BAA's location based structure did not arrive early enough in the life of the implementation. The Deloitte methodology chosen was effectively only implemented nine months from go-live : when implemented it forced rigour and understanding of the connection between process and organisation .

- locally, most locations have since reported in the post implementation reviews that there should have been both a single, unifying programme plan, reinforced by a single local plan, rather than a series of plans, and that the dependencies be electronically connected at one source.

Figure 5.3: BAA ERP Implementation Post Project Review (Extract)

The PPR does not advocate the use of software modelling methods as an alternative; however the sentiment behind the observation can be articulated by an integrated model forming the source of all process related detail and implementation communication. The figure below illustrates once again the nature of detail at the process level which was not provided within the scope of the communications effort during the ERP implementation.

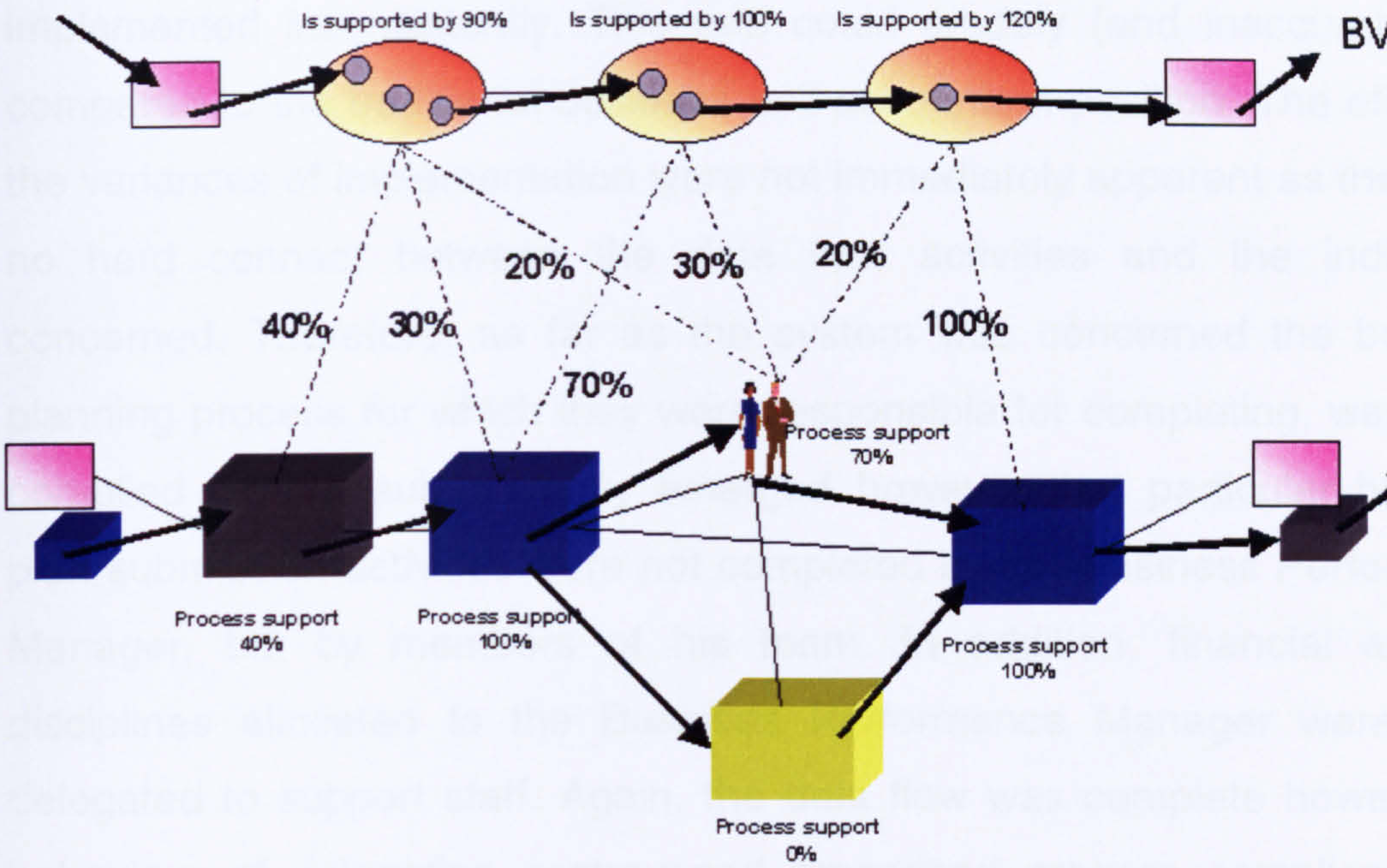


FIGURE 5.4: Defined pProcess Activities and Supporting Resources Profile

An example of this re-occurring failure is given by the variations employed by the organisation to support the process of annual leave request approvals using the Oracle® HR self-service suite. According to the original process design all annual leave requests are to be submitted by the user to their line manager according to the electronic hierarchy within the database structure. Following implementation it was discovered that some parts of the organisation were routinely deviating from this protocol, particularly the senior Corporate Office functional resources. The seniority of these post holders presented a difficult compliance challenge for the project team, as they electronically delegated this discipline to their subordinate administrative staff. The effect was to undermine the prescribed behaviour of devolving tasks to line managers and increased operational accountability. This is a challenge that may have been avoided by the prior distribution and communication of fixed activity-role relationship detail.

This example was repeated during the completion of the business planning process. The Enterprise role of "Business Performance Manager" was implemented inconsistently. This role could crudely (and inaccurately) be compared to the traditional business unit accountant position. The effects of the variances of implementation were not immediately apparent as there was no hard connect between the data flow activities and the individuals concerned. Therefore, as far as the system was concerned the business planning process for which they were responsible for completing, was being complied with. It subsequently emerged however that particular business plan submission activities were not completed by the Business Performance Manager, but by members of his team. In addition, financial approval disciplines allocated to the Business Performance Manager were being delegated to support staff. Again, the data flow was complete however the behaviour of delegation contravened prescribed process compliance and compromised effective governance frameworks.

The experience of the Enterprise communications activity compares poorly with both the AOS project which documented activity-role relations clearly and directly and also with the PSNI uniform ordering process project which modelled the relations using business process modelling software.

The PSNI uniform project required rapid design of new processes to facilitate the introduction of a new supplier ordering system. The resultant operational activities associated with the ordering of uniforms required to be defined and communicated to police officers who would from now on be required to order uniforms and uniform items directly themselves. This challenge required effective communication that eliminated ambiguity and prevented the avoidance or delegation of prescribed actions. The documentation produced by the software model included the provision of activity flow diagrams accessible via the police service intranet. The graphical representations provide access via “drill-down” to supporting information which connects the activities to the supporting organisational detail i.e. “who does what”.

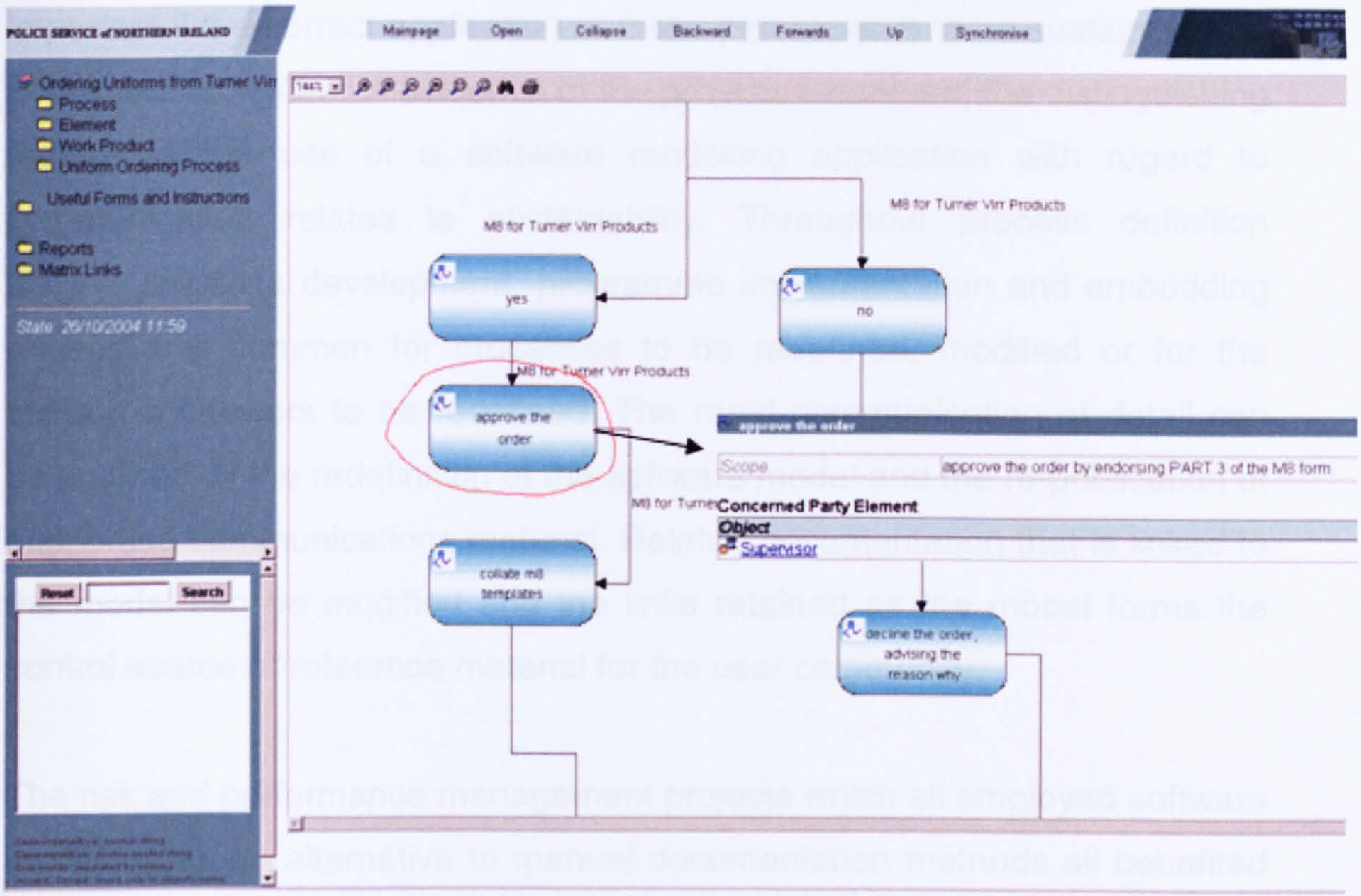
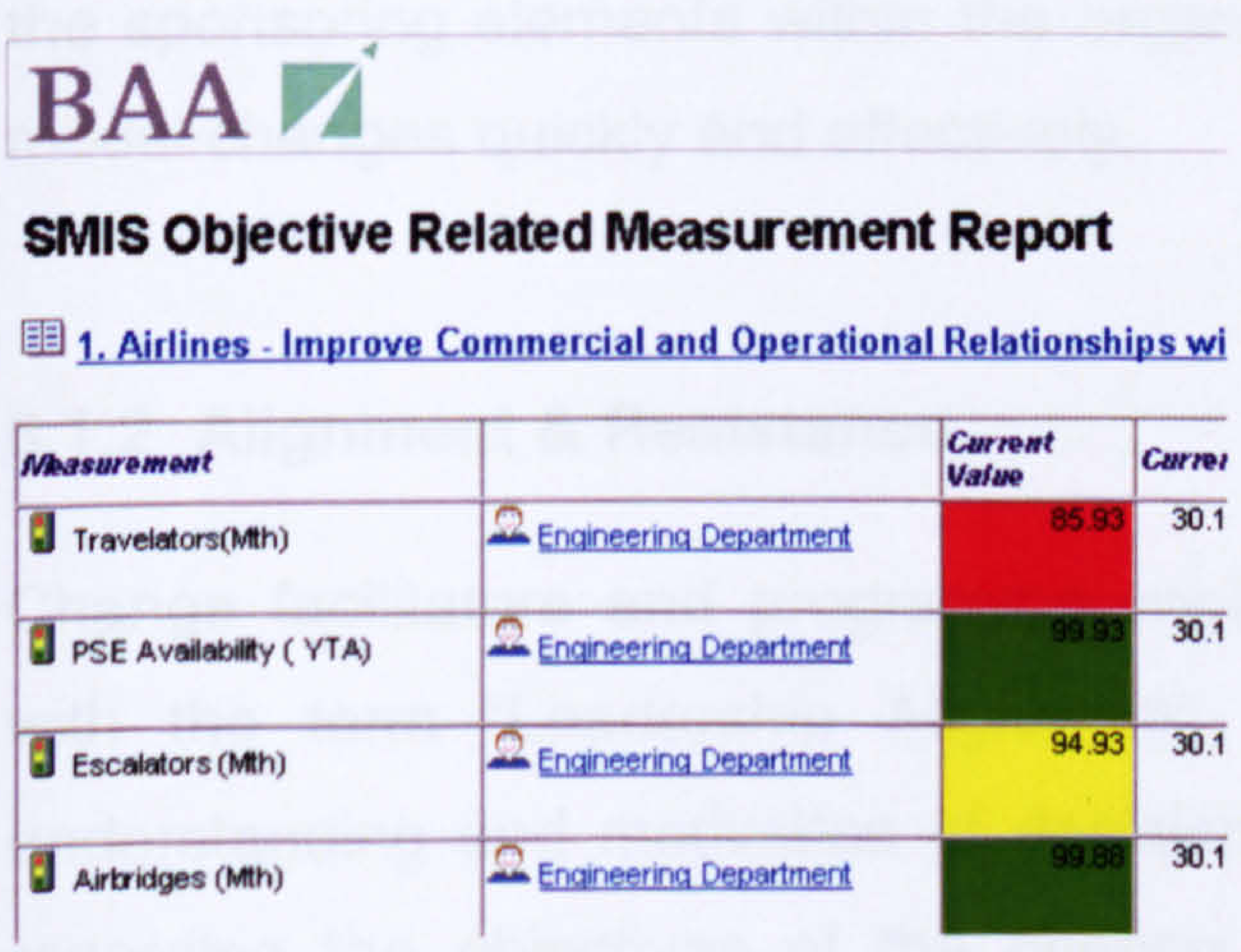


Figure 5.5: PSNI Uniform Ordering Processes Project - Activity Flow and Supporting Resource Definition , Police Intranet Model Communication – (2004)

The inclusion of detailed activity-role information within the communications material eliminated any confusion for supporting resources relating to who was responsible for which activity in the flow. In addition the documentation of flows in the form of swim-lane or flowchart diagrams clearly articulates to the target audience the relationships between activities and also of data flow. The AOS project benefitted from this feature through the manual preparation of model based documentation. Similarly the PSNI uniform ordering process managed the communication of process detail from the foundation of a software model. It can be concluded from this examination that the detailing of process activities and their supporting profiles is important to the successful implementation of prescribed business processes. Furthermore there is evidence which confirms that the communication of processes to users in a way which models the relationships between activities and roles is important if the correct application of those processes is to be sustained post implementation. On the evidence of the projects examined, the distinguishing feature of the use of a software modelling application with regard to communication relates to sustainability. Throughout process definition stages, solutions development, programme implementation and embedding phases it is common for processes to be redefined, modified or for the support framework to be redefined. The rapid communication of detail can be enabled by the redefinition of the software model and the re-publication of supporting communications material. Related documentation that is linked to the model can be modified and the links retained as the model forms the control source of reference material for the user community.

The risk and performance management projects which all employed software modelling as an alternative to manual documentation methods all benefited from enhanced communication possibilities. The BAA OGSM performance management project exploited the opportunity to generate filtered data reports for specific targets audiences. The SMIS (Senior Management Incentive Scheme) report was generated as an after thought as the possibilities to scrutinise the software model quickly on demand became apparent.


BAA

SMIS Objective Related Measurement Report

1. Airlines - Improve Commercial and Operational Relationships wi

Measurement		Current Value	Currei
Travelators(Mth)	Engineering Department	85.93	30.1
PSE Availability (YTA)	Engineering Department	99.93	30.1
Escalators (Mth)	Engineering Department	94.93	30.1
Airbridges (Mth)	Engineering Department	99.88	30.1

Figure 5.6: Screen-Shot of Objective Related Performance Management Report

Within one week of implementation the report portfolio of BAA OGSM had increased from the original monthly report on performance indicators to a portfolio of 15 separately defined reports.

- Objective Related Report
- Goal Related Report
- Red Measures
- Red & Amber Measures
- All Measures Objective Related Report
- All Measures Goal Related Measurement
- SAL Exec Goal Related Report
- SAL Exec Objective Related Report
- SMIS Objective Related Report
- SMIS Goal Related Report
- ---
- OGSM Objective Related Report
- OGSM Goal Related Report
- ---
- Goal Related Action Plan List
- Action Plan Report for Red & Amber Measures
- Action Plan List for Excel

The HTML intranet export of the software models also positively influenced communication for the performance and risk projects in that all data and navigable relationships were communicated in the current form to all concerned parties. This provided a mechanism for documentary control to the sponsoring elements within the organisation and the capacity to publish model changes quickly and effectively.

5.1.2 Alignment & Resistance

Change facilitators and programme implementation resources are familiar with the term "Leadership Alignment". This refers to the alignment of understanding and motivation of decision makers and those with influence regarding the objectives of the change programme and the methods by which the objectives will be realised. The effective identification and management of resistance also features significantly within the scope of the change programme resource. Resistance to change in its many guises has been analysed previously. This project provides evidence that supports the hypothesis that the management of resistance can be positively influenced by the methods employed for the documentation of business change programmes and in particular by the use of software modelling.

The BAA AOS project documented process detail in the form of swim-lane activity flow diagrams. The flow diagrams were analysed during group workshop sessions and final development of process definitions. Considerable effort was invested in ensuring that all concerned parties attended the process development workshops. These “concerned parties” comprised all those who would be responsible either for signing up to the new processes commercially or be involved in the completion of process tasks. The effect was to align the views of all attending stakeholders toward a shared view of the prospective processes. The specific inclusion of collective sign-off of all graphical process documentation in advance and as condition of the rollout of supporting hardware, secured to a greater extent the commitment of all 3rd parties. The resultant enhanced process model documentation constituted a key communication opportunity. The risk of post implementation resistance by concerned parties is reduced, as there is a clear understanding of the detailed activity workload and activity order agreed in advance.

The project risk register recorded a low assessment of non-compliance as a result of the detailed communication and signed off activity flow documentation.

Product Deliverable or Milestone	Risk & Impact	Priority\ Affected	Impact Value	Prob'y 5=High	Impact 5=High	Rating	Status\ Decision	Actions	Risk Owner	Date of Last action
	Unable to obtain 3rd Party buy-in. BA & BM present greatest risk.			3	5	15	Mitigate	Regular consultations. Continually update action plan and give reassurance	HA/RF	01/06/2000
	Identified benefits do not justify local spend			3	5	15	Accept	Investigate every possible opportunity - revisit benefits and cost plan	TH	02/06/2000
	Inability to agree commercial arrangements with 3rd Parties			3	3	9	Mitigate	Regular consultations to highlight long-term benefits.	HA/RF	01/06/2000
	Risk of process non-compliance post implementation			2	4	8	Mitigate	Complete sign off workshops - process flows to be mapped graphically and signed by all parties.	RF/JD	10/06/2000
	Local IT satff unable to support AOS			3	5	15	Mitigate	Ensure additional training is available if required	IM/JG/DH	30/06/2000
	Programme is delayed due to non-ratification by [illegible] Board			3	5	15	Mitigate	Early release of information, supported by Programme Board	HA	14/07/[illegible]
	[illegible]mittment to provide resources is not [illegible] cause			3	5	15	Mitigate	Senior pressure on 3rd parties to secure committment	T[illegible]	

Figure 5.7: BAA AOS Project - Extract from AOS Project Implementation Risk Register

This situation compares favourably with the Enterprise project experience. During the implementation phases of the Enterprise processes no detailed process information was provided to the user community with the exception of the individual module training exercises. There was no attempt to engage the user community in either the definition of process flows or the validation/verification of them. No formal commitment was required of the users; rather a greater emphasis was placed on formalising the buy-in of senior management levels. The risks of non-compliance were not recognised and when eventually realised had a much greater impact than had been assessed within the risk assessment exercise.

Ref	Risk (Threat to achievement of business objective)	Root causes (BAA responsibility)	Owner	The risk scored at inherent level		Mitigating Actions
	Format: EVENT leading to CONSEQUENCE resulting in EFFECT ON BUSINESS OBJECTIVE			Likelihood	Consequence	Format: Who, What action, How frequent, How evidenced
1	**Support Model fails**	Insufficient reource. Knowledge concentrated in few people	TH	3	3	Planned resource allocation - OD
2	**Colides with AOS**	Parallel running of programme with AOS. Limited accessibility of training facilities and inability to release staff.	RF/TH	2	3	Liaison with AOS co-ordinators - LIM
3	**Supervisory Staff Unable to completePC based tasks during course of working day**	Time constratint on access to PC workstation due to operational requirements	RF/CMG	3	3	Time Management for supervisors and awareness of requirements for for input to PC. Complete advance supervisory PC training.
4	**Unwillingness of staff to adopt new processes**	Increased responsibility apprehension over use of computers	RF/TH	1	3	Develop communictaion plan for introduction to new processes to reduce apprhension

Figure 5.8: BAA Enterprise ERP Project - Extract from Enterprise Pre-Implementation Project Risk Register

Compare this assessment with the post-implementation assessment of the risk following the emergence of non-compliance issues. Repeated reference is made to the lack of understanding of process detail pre-implementation.

Ref	Risk (Threat to achievement of business objective)	Root causes (BAA responsibility)	Owner	The risk scored at inherent level		Mitigating Actions
	Format: EVENT leading to CONSEQUENCE resulting in EFFECT ON BUSINESS OBJECTIVE			Likelihood	Consequence	Format: Who, What action, How frequent, How evidenced
1	**Lack of Stakeholder Buy-In/Leadership**	selective interpretation of process roles		5	4	increased comms activity with senior management
2	**Poor Management Information Supplied By New Systems**	limited reporting functionality		2	3	report specification scheduled - HR/OFA/Projects
3	**Competency Issues - Core Apps**	inadequate training/familiarity with Core Applications		3	3	New training - resourced by local fuunctional superusers
4	**Organisational Structures Do Not Support New Processes**	Non-compliance of administrative tasks from operational line manager roles - "confusion" regarding process flows		5	4	Re-engineer self-service workflow hierarchy - remove task delegation regarding admin tasks.
5	**Compliance with new processes**	Inadequate understanding by user community of impacts and role definitions		5	4	Re-training schedule devised - New comms endorsed by SAL Board
6	**Business As Usual Support Model Not Defined**			3	3	
7	**Failure of Locations to Adopt Robust Schedule of Reporting Measures/Indicators**			3	3	
8	**Mix of Old and New ways of working**			3	2	

Figure 5.9: BAA Enterprise ERP Project - Extract from Enterprise Implementation Project Risk Register

The conclusion can be made that the preparation and "sign-off" of detailed process documentation would have offered prior mitigation of these risks.

This would have maintained the integrity and reputation of the new processes and saved on post-implementation resources. The delays to fully implement new ways of working mean that the benefits from implementation cannot be achieved according to the original timescales. On top of this the costs of implementation are increased, as post implementation actions must be completed.

The PSNI Performance Management project exploited the capacity of software modelling in order to achieve alignment within the leadership and also assist in the rapid dissemination of communication. The PSNI "Big Picture" developed a high level view of connectivity between performance measurement and the organisation model in graphical terms. This allowed the implementation team the capacity to demonstrate the context for performance measurement and its relationship to the process model and the compliance requirements on the organisation.

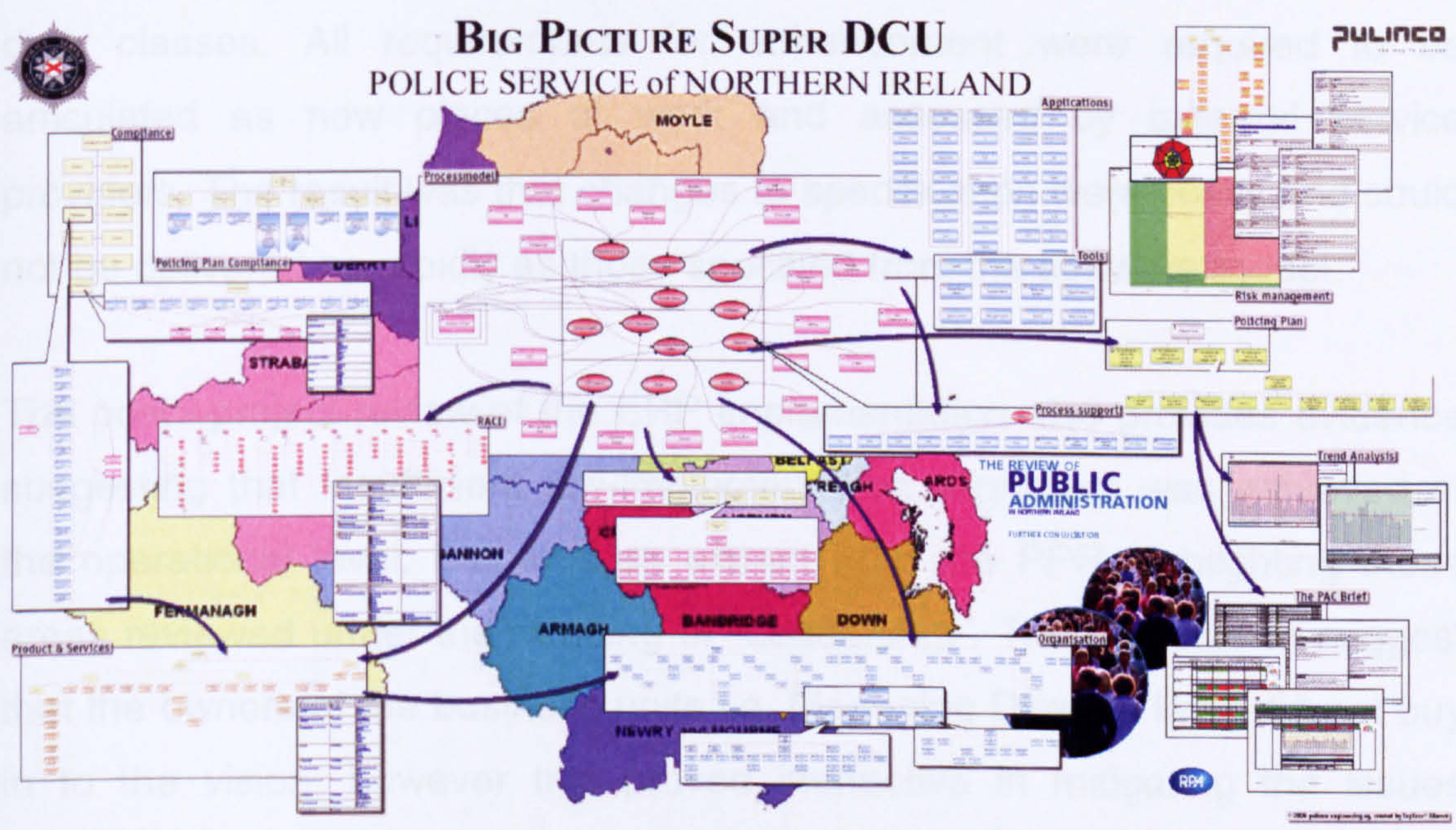


Figure 5.10: PSNI "Big Picture" Model for Rapid Communication and Alignment

The capacity of the software model to present a holistic view of the corporate environment including the relationships between requirements, processes, resources and infrastructure enables the implementation team to demonstrate dependencies to the leadership and in so doing provide a clearer basis for decision making.

Similarly the BAA MATRA risk model enabled a better understanding of risks and their management across the stakeholder groups of control authorities by demonstrating the linkage between generic risks and on-site resources. The capacity to slice and dice the model provides access to information to justify courses of action with respect to implementation. This can provide an aid managing resistance to change. The PSNI ICIS specification project allowed the users to justify added functionality enhancements on the basis of functionality previously coded within the application. This model enabled the ICIS team to request the development of features at little additional investment. This contrasts sharply with the BAA ERP implementation. Functionality enhancements could not easily be specified in terms of existing data classes. All requirements for enhancement were required to be articulated as new pieces of work and assessed by external service providers. The result was that changes to specification were costly and could not be delivered as rapidly as those specified from the software model.

The post –project review of the ERP implementation also provides evidence suggesting that insufficient pre-implementation alignment was achieved at the operational level. Below is an extract from the PPR highlighting those areas reviewed under the heading of "Leadership". There is little to suggest that the owners of the business units i.e. Managing Director level did not buy in to the vision, however this proved ineffective in mitigating the issues associated with non-compliance post-implementation.

Leadership behaviour ..... bad examples

- Lack of interest by Line managers, particularly early on within the Enterprise programme.
- Lack of commitment from Line staff within departments.
- Doubts should be aired privately by Line managers regarding Enterprise.
- Non attendance of training and critical meetings.
- Failing to seek clarification regarding roles within Enterprise.
- Malicious compliance to process.
- Delegating incorrectly e.g. HR data management.
- Insufficient resource to do the job.
- Fudging the vision.
- Compromising the implementation of Enterprise.
- Signing off gateways etc without realising the consequences - failure to resist pressure to sign off Gateway documentation.
- Information from CTH leadership was sometimes wayward and ambiguous - goalposts moved.
- Create a focus on 5% roles - came to light too late.
- Not making sure people have the right skills e.g. IT skills / programme management skills.
- Wasn't always clear what was required of us e.g. spreadsheets
- Lip service to areas of possible contention - e.g. redeployment

Figure 5.11: BAA Enterprise ERP Implementation Project - Extract from BAA Enterprise Post Project Review

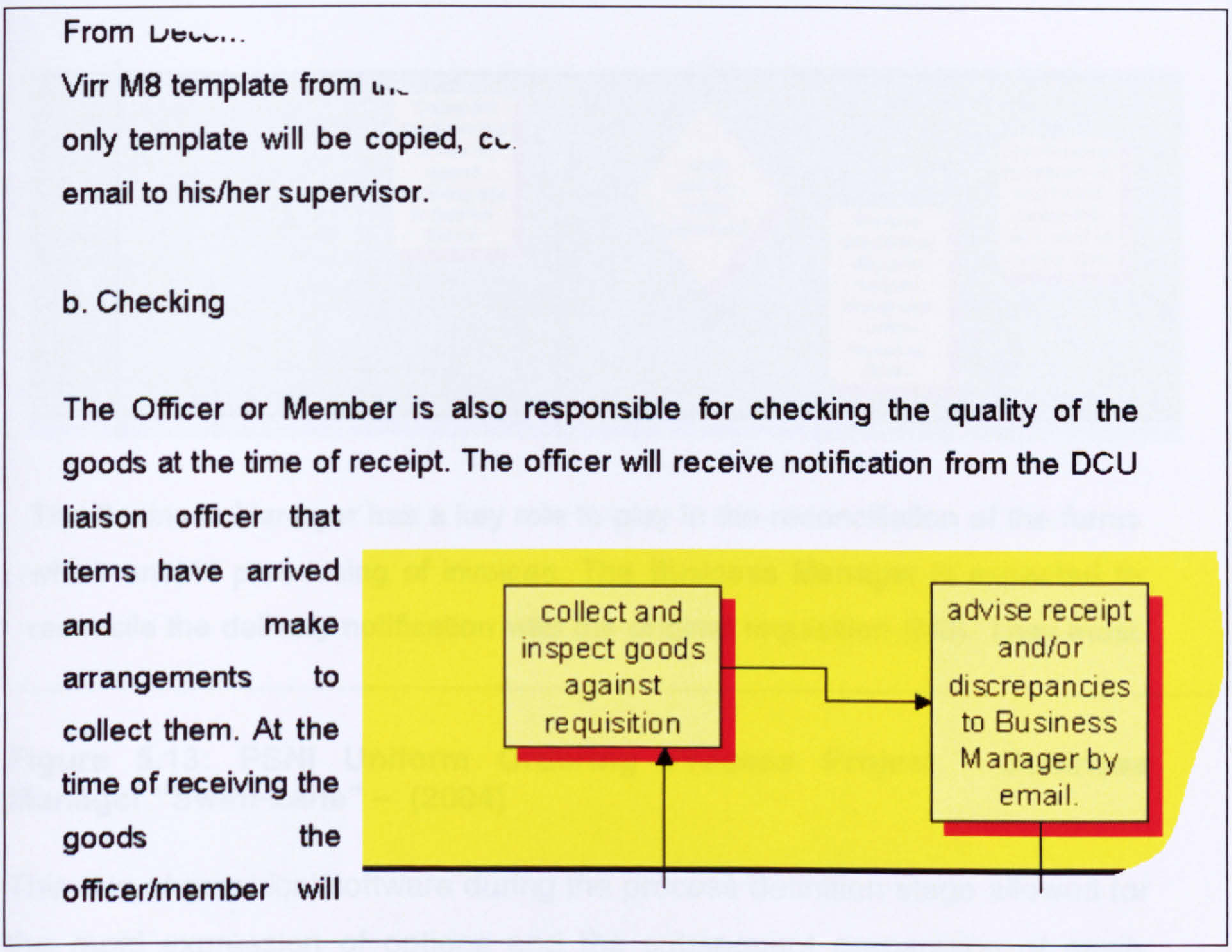
The "lack of commitment from line staff within departments" referred to reflects on the imposition of new processes and systems for which no consultation or alignment effort had been made. No recorded or "sign-off" type buy-in was completed at this level and therefore the traditional sources of resistance could be anticipated to emerge.

There is also further reference to the confusion surrounding roles and designation of activities. The lack of consultation and inclusion of operational resources in the alignment process has provoked the highlighted results above. Comprehensive pre-implementation documentation of activity-role relations, combined with stakeholder inclusion would have achieved a stringer alignment of views and reduced the level of post-implementation resistance.

The software modelled business process project (PSNI Uniform Ordering), demonstrated the effectiveness of clear documentation of process definition and detail in achieving rapid alignment and in limiting resistance. This project, of the nine examined was completed within the shortest period. The PSNI organisation was confronted with the prospect of a changed way of working due to the imposition of a contract to a 3rd party supplier. Very little time was made available to the functional supplies branch element of the organisation to communicate, train and implement all process related information to the entire organisation. Critical to the success of the project was to employ a delivery vehicle of unambiguous process detail and one which eliminated the prospect for time delaying resistance and resistance management activity. The deadline for the contract implementation could not be renegotiated without significant financial penalty and political loss of face. The style of implementation was therefore very direct and resembled to a great extent the approach taken for the BAA AOS project. "Change Management" activity and stakeholder buy-in activity was ignored and the focus was on the development of robust and accurately detailed business process documentation. Much effort was invested in the detailing of the end-to-end process on an activity and processing perspective and very little attention paid to the "behavioural change" element. As this was a process which was now being devolved to police officers across the organisation it was generally felt that this party of resource would be receptive to instruction from uniformed authority and that procedural alignment would not be a major issue.

The preparation and communication of the revised process documentation formed the critical part of the implementation project. The process data flows were clearly understood by both the central supplies branch who would retain responsibility as before for financial reconciliations and also by the 3rd party supplier Turner Virr, Ltd. The significant risks to the project lay with the operation and their success or failure in understanding, adopting and maintaining the new processes. To mitigate these risks the documentation was developed at a number of levels. Business Managers were furnished with detailed process documentation describing the step-by-step approach to be taken during the end-to-end processes. The Business Managers, one in each operational business unit were nominated to "own" the process on behalf of their business unit and oversee the performance of all local resources with respect to its application.

The Business Managers were involved in communication sessions and furnished with all flowcharts and supporting explanatory process detail.


From Dec…
Virr M8 template from t…
only template will be copied, c…
email to his/her supervisor.

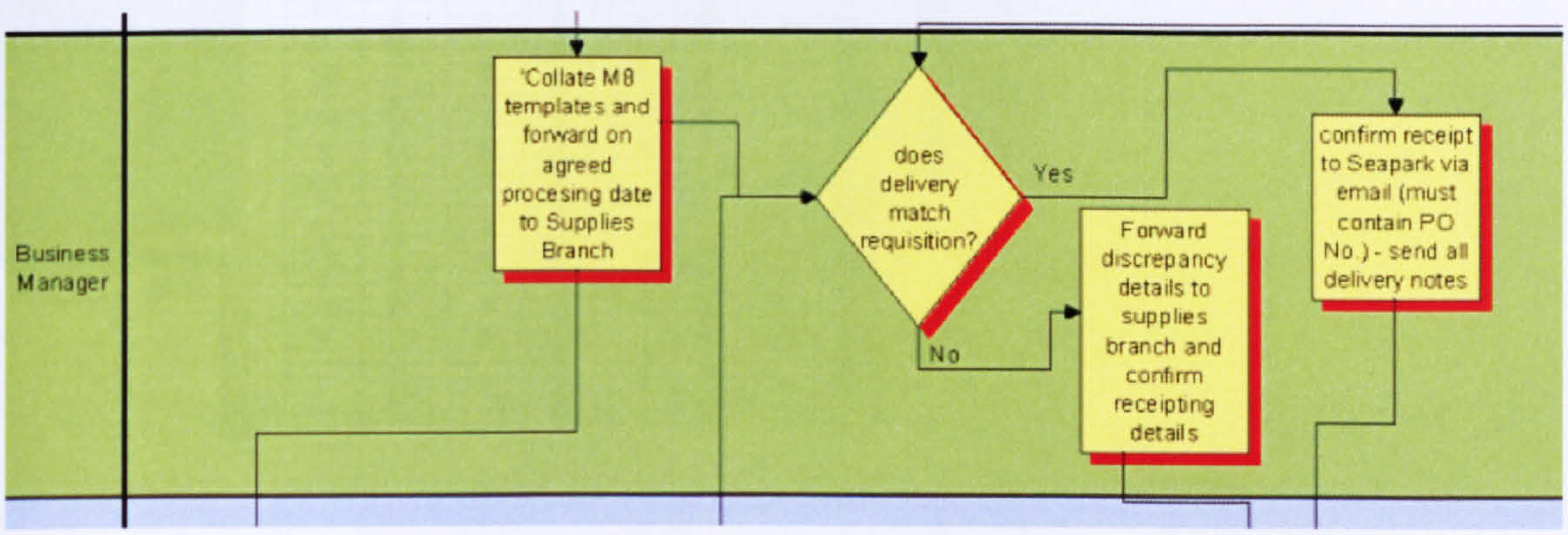
b. Checking

The Officer or Member is also responsible for checking the quality of the goods at the time of receipt. The officer will receive notification from the DCU liaison officer that items have arrived and make arrangements to collect them. At the time of receiving the goods the officer/member will

Figure 5.12: PSNI Uniform Ordering Process - Business Manager Explanatory Documentation

The documentation was prepared in swim-lane form. This was deliberately done in order to clarify for all parties the respective responsibilities for each activity. A risk was identified early on in the implementation planning of confusion surrounding who should be doing what. The illustration of the process flow, accompanied by step-by-step explanatory notation mitigated this risk. This detail was provided primarily for the use of the Business Managers who would form the responsible parties within each of the operational business units.

3. Business Manager



The Business Manager has a key role to play in the reconciliation of the forms which enable processing of invoices. The Business Manager is expected to reconcile the delivery notification with the original requisition (M8). They must

Figure 5.13: PSNI Uniform Ordering Process Project - Business Manager "Swim-Lane" – (2004)

This use of graphical software during the process definition stage allowed for the rapid expression of options and the subsequent preparation of easily conveyed documentation to the user community. In addition to this the graphical outputs formed the basis of a more detailed process modelling exercise which provided the general user population with an intranet uniform ordering process reference site.

The use of process modelling software enabled the dynamic linking of activities and also the linking of template reference documentation such as order forms and items lists. The establishment of a central model and the communication of the integrated outputs via intranet aligned the organisation with a common view of the new way of working and a central reference site for related documentation.

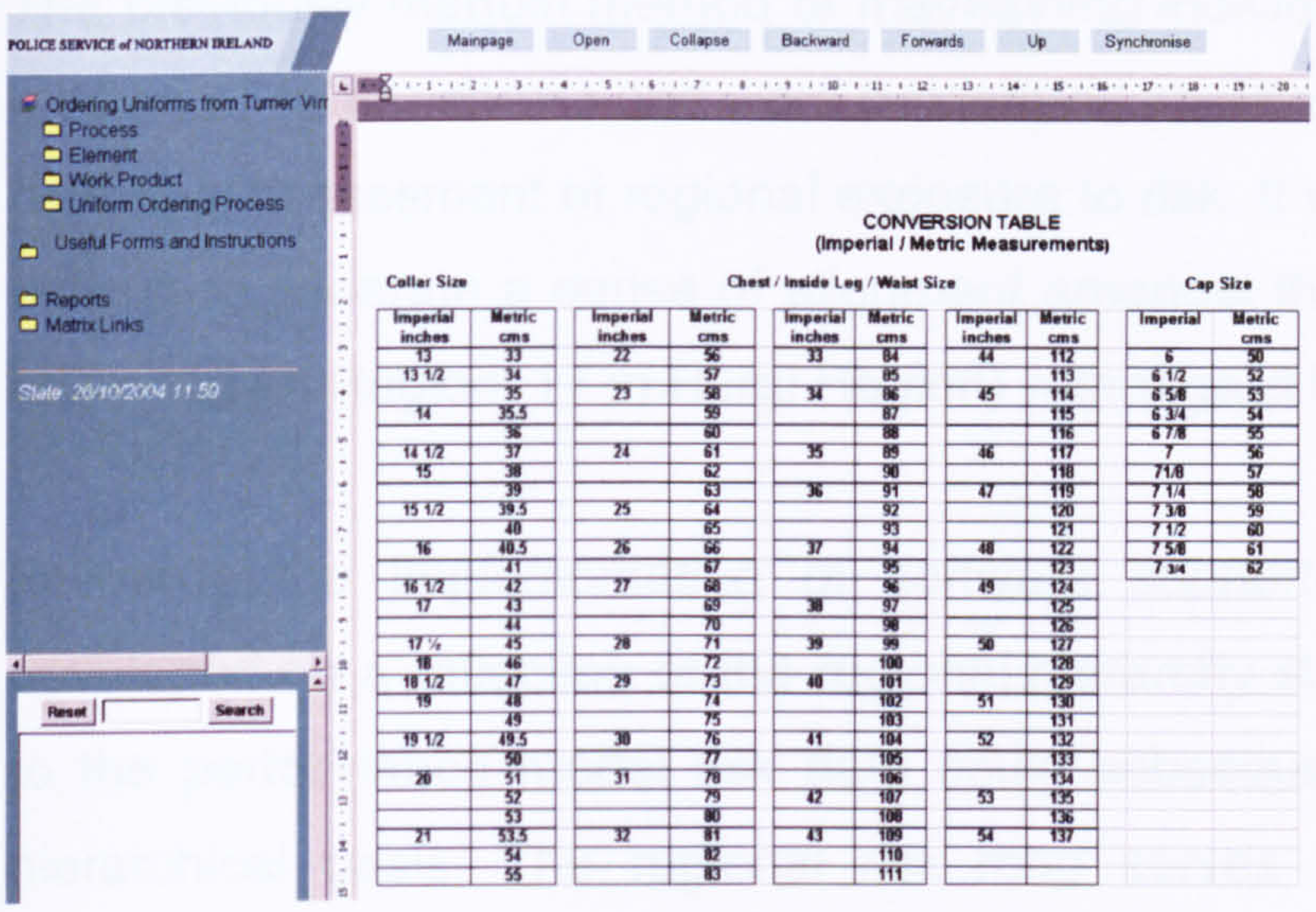


Figure 5.14: PSNI Uniform Ordering Process Project - Intranet Output Linking Reference Documentation to Activity Flow

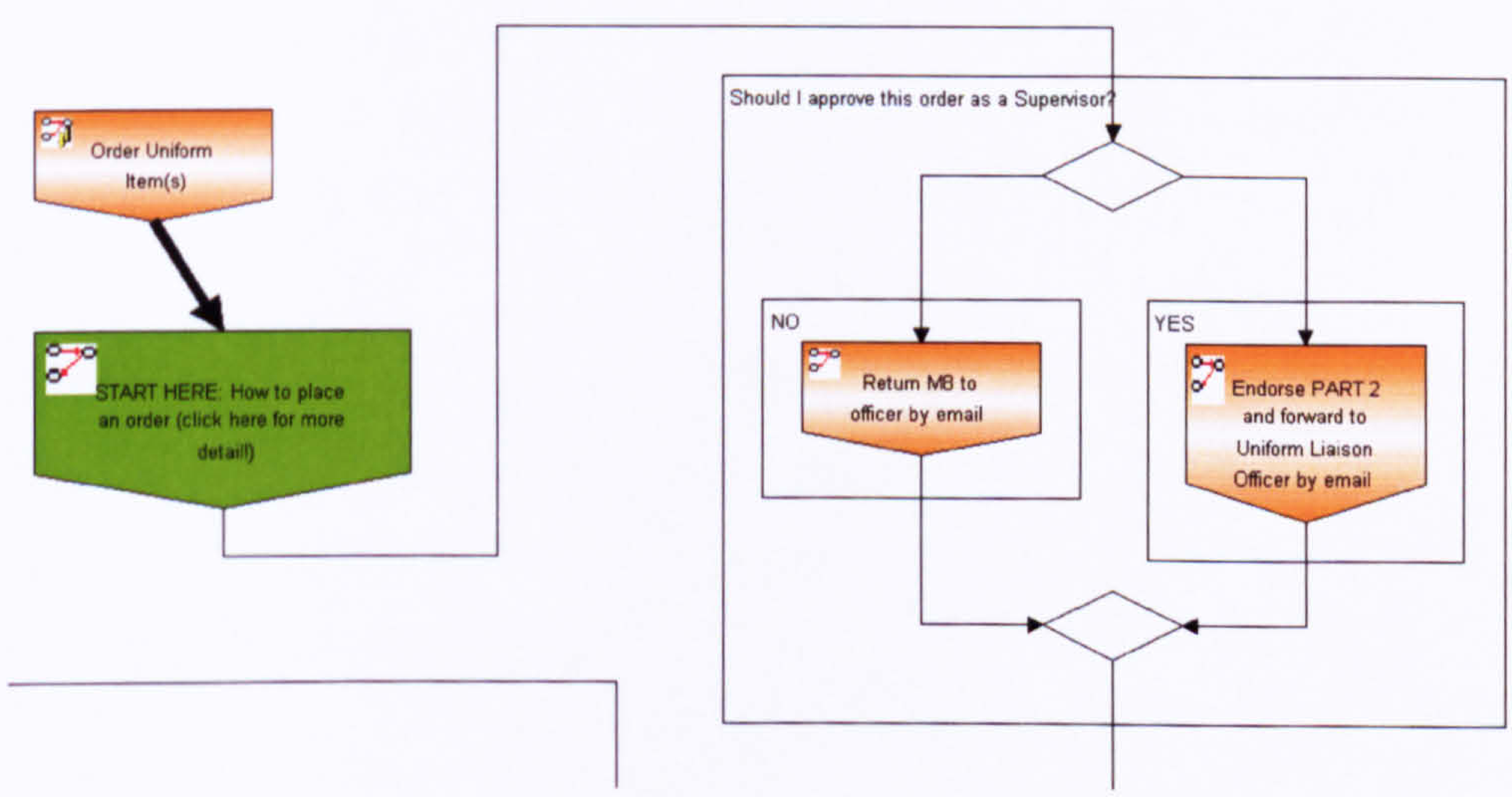


Figure 5.15: PSNI Uniform Ordering Process - HTML Intranet Output of Process Flowchart Documentation

The PSNI Risk Management project demonstrates the impact of employing co-ordinated software supported modelling solution to the challenge of attaining alignment.

The previously manual method of maintaining individual risk register using a mixture of spreadsheets and word processing applications did not enable the collective assessment of regional exposure to risk. It was therefore extremely difficult to generate a sense of alignment amongst the DCU command team (12 in Urban Region, 17 in Rural Region) with regard to the risk priorities.

Following the implementation of software supported modelling solution, developed on a reflection of the regional hierarchy structure in a similar way to the performance model risk data could subsequently be analysed on a hierarchical basis. The regional risk map serves as a tool to establish alignment of view and risk management priority. The workload associated with the generation of such a view via the previously manual process was considered too great to be possible.

Figure 5.16: PSNI Operational Risk Management Project - Regional Operational Risk Map (Concept Only) for alignment of District Command Priorities

The regional risk map demonstrates the capacity to selectively display data for a particular nee. In this case the requirement is to efficiently identify the distribution of risk across a region. The data is obscured due to its sensitivity. In presenting information in this particular way the Regional Assistant Chief Constable is able to align the views of his District Commanders and focus their understanding on common priorities.

The previously manual method of maintaining separate risk register for each operational and functional unit meant that no alignment could be achieved, even for the considerable number of generic risks impacting on the various parts of the police service.

5.1.3 Suspicion

In the absence of information to the contrary it can be expected that staff groups subject to impending "new ways of working" may view the prospects with suspicion. Natural reactions to change generally include a suspicion that the change may not prove beneficial to those upon whom the change is being imposed. Uncertainties will arise regarding what the real long-term implications will be. Concerns may be of a personal nature or relate to a loss of ownership, territory, influence, resource etc. The mitigation for suspicion is the effective and timely delivery of process information, comprehensive in detail and direct to those affected.

The BAA ERP project failed to prevent the arising of suspicions. The style of implementation and the method of documentation did not provide the level of detail required by the line managers to fully communicate the post go-live vision of process operation. The profile of the BAA line manager varies significantly from the Police Officer at PSNI. The expectation of the BAA line manager is one of being engaged and consulted rather than being instructed and accordingly complicit. In recognition of this expectation BAA was very careful to adopt a "softly-softly" approach to the implementation of change. This may well have been confused however with providing insufficient detail in the process. Great efforts were made to achieving the alignment of the senior management team within the confines of the project governance structure; however no structured effort was given toward the exposure of line manager concerns.

programme.

- Lack of commitment from Line staff within departments.
- Doubts should be aired privately by Line managers regarding E

- Create a focus on 5% roles - came to light too late.
- Not making sure people have the right skills e.g. IT skills / programme management skills.
- Wasn't always clear what was required of us e.g. spreadsheets
- Lip service to areas of possible contention - e.g. redeployment

Figure 5.17: BAA Enterprise ERP Implementation Project: Extracts from PPR – Examples of Poor Leadership

The impacts were captured during the post project review.

- Next time ensure solid understanding of what is being delivered and when.
- Too many interactions of governance - next time understanding who is core, needs to be involved

Figure 5.18: BAA Enterprise ERP Implementation Project: Extracts from PPR – Examples of Poor Structure

The engagement of the operational line management resources was not required by the implementation team in order to ensure that the approval Gateways were secured. In hindsight the inclusion of confirmation of these very important groups would have identified suspicions arising from the lack of comprehensive understanding that the post project review highlighted.

The software modelled projects, including the BAA AOS project avoided the problems of suspicion. The clarity of process definition delivered by the detailed user documentation eliminates the suspicions that what will be implemented may not be "as advertised". There may also be suspicions concerning the rationale for implementation. Further than this the PSNI performance management model allowed the demonstration of direct linkage of the new process to corporate governance requirements and legislation. Stakeholders were able to visualise the raison d'etre of the change. The emergence of suspicion was therefore mitigated.

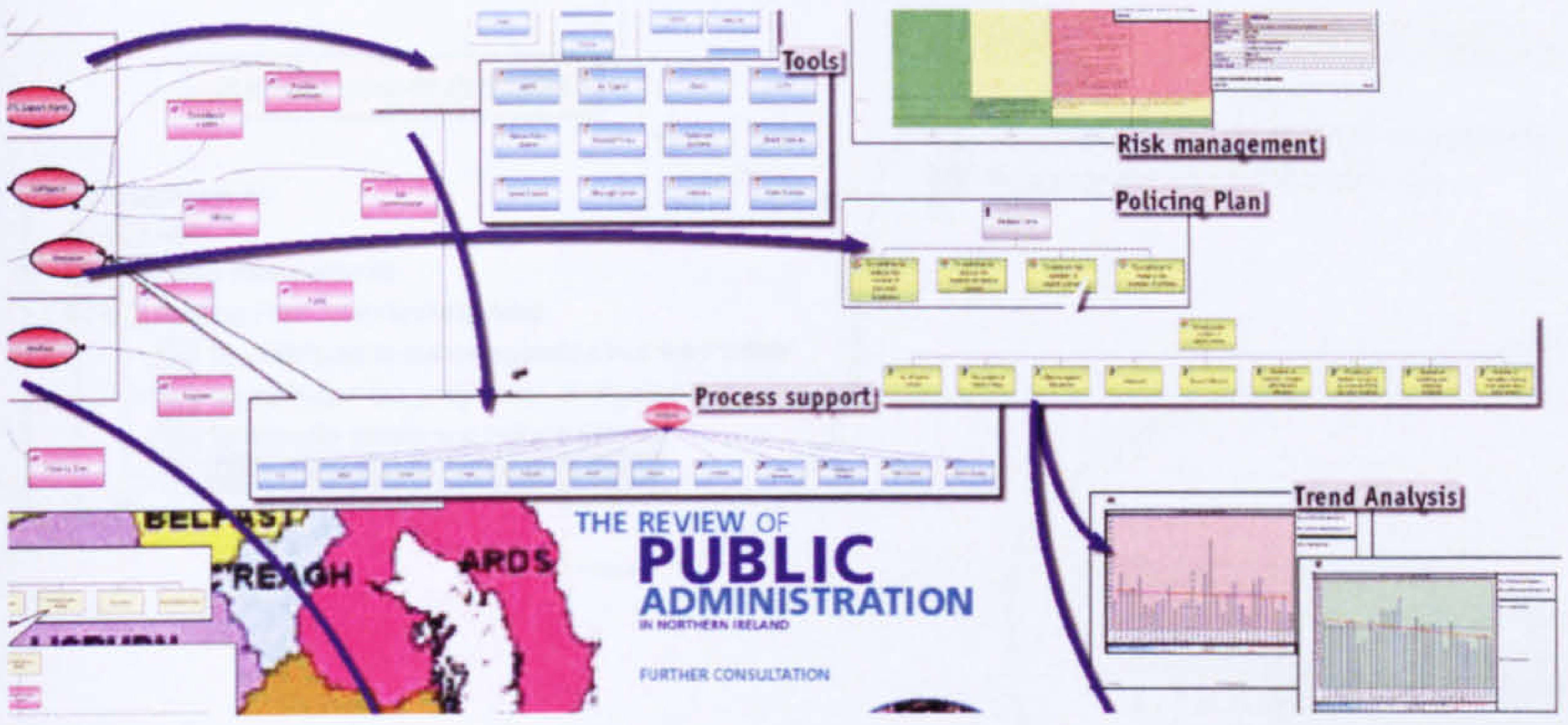


Figure 5.19: PSNI Performance Management Model – The linkage between performance measurement and corporate reporting responsibilities

The figure above was used as an output from the model to demonstrate the relationship between the performance management framework from strategies through targets and down to KPI's and the compliance requirements of the organisation including amongst others, the Policing Board Plan. This ability provided a rationale for each performance measurement indicator and validated the framework. In fact the model extended beyond these relationships to articulate the linkage to police operational processes, establishing the context of operational activities with the expectations of political stakeholders. This example demonstrates how the software model provides more than just a platform for statistical manipulation but also acts as a driver for change by enabling the organisation to articulate relationships in an extended fashion, improving the quality and depth of understanding of all stakeholders.

The BAA, PSNI and Govan Initiative performance management projects all modelled the statistical representation of performance data within the confines of a fixed performance management framework which relates KPI's to targets, strategies and up to high level objectives.

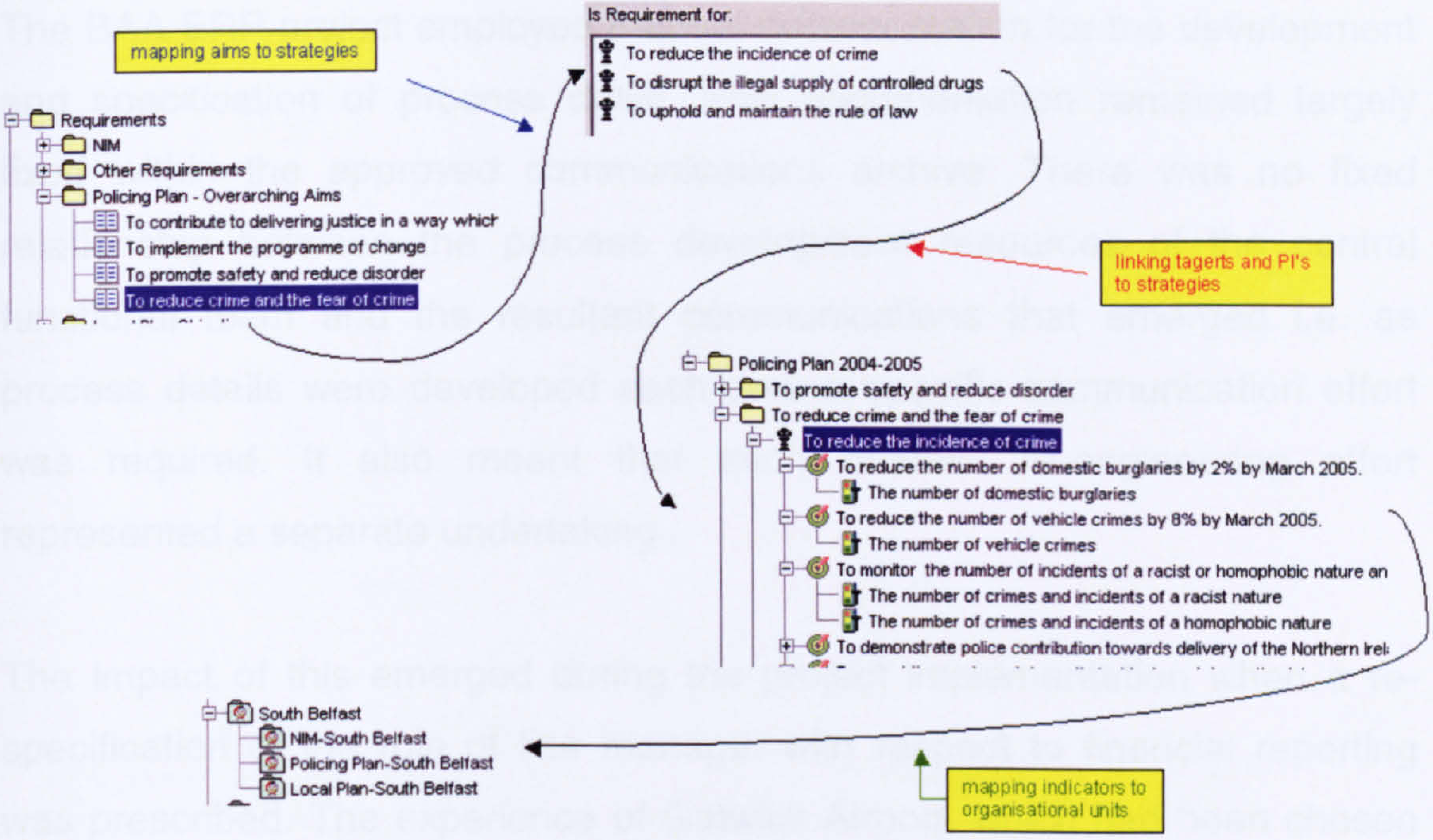


Figure 5.20: PSNI Performance Management Software Model – Transparent Linkage from Aims – Strategies – Targets – KPI's

The linking of these objects and the identification of ownership specifically provides transparency and removes suspicions regarding the reasons for operational focus and performance measurement. In previous years PSNI engaged two rounds of lengthy debate between the central analysis centre and the regional and district senior management team to establish the validated performance framework and verify the relevance of measures as being consistent with the policing plan. Post implementation, these two rounds of review exercises were eliminated as the modelled framework could transparently be examined as reflecting the published policing plan document as validated by the Policing Board. PSNI estimate the elimination of this exercise saved 60 man days each year and more importantly accelerated the roll-out of the annual performance plan by more than six weeks.

5.1.4 Flexibility

The BAA ERP project employed manual documentation for the development and specification of process detail. This documentation remained largely fixed within the approved communications archive. There was no fixed relationship between the process development resources of the central functional team and the resultant communications that emerged i.e. as process details were developed each time a specific communication effort was required. It also meant that each process re-engineering effort represented a separate undertaking.

The impact of this emerged during the project implementation when a re-specification of the role of line manager with respect to financial reporting was prescribed. The experience of Gatwick Airport, which had been chosen to implement the new processes in advance of the rest of the group companies, suggested that the activities associated with financial reporting should not in fact be set against the role of "line manager" but instead be done by an alternative and new resource to be located within the local Business Performance Unit. This prescribed change seriously impacted on the structural support profile of the processes. The flow of data however was not changed. From the IT system's perspective therefore the data flow activities were complete. The reality is however that inconsistency emerged between locations in the structure employed to support the processes.

The method of documentation employed did not allow for the flexibility required to vary the specification of the process support structure, or prove effective enough in preventing the selective application of prescribed support structures. Particular locations, reluctant to incur the additional costs of further, unplanned Business Performance resources either reverted to the original specification of line manager role, or delegated the financial reporting activities to alternative administrative resources. This distortion of the prescribed structure, apart from the organisational inconsistencies referred to, introduced quality issues (issues which had been identified during the Gatwick roll-out and had led to the re-specification in the first place) and also to resistance from those Business Performance Units who perceived non-compliance as a threat to their ownership of financial reporting responsibility.

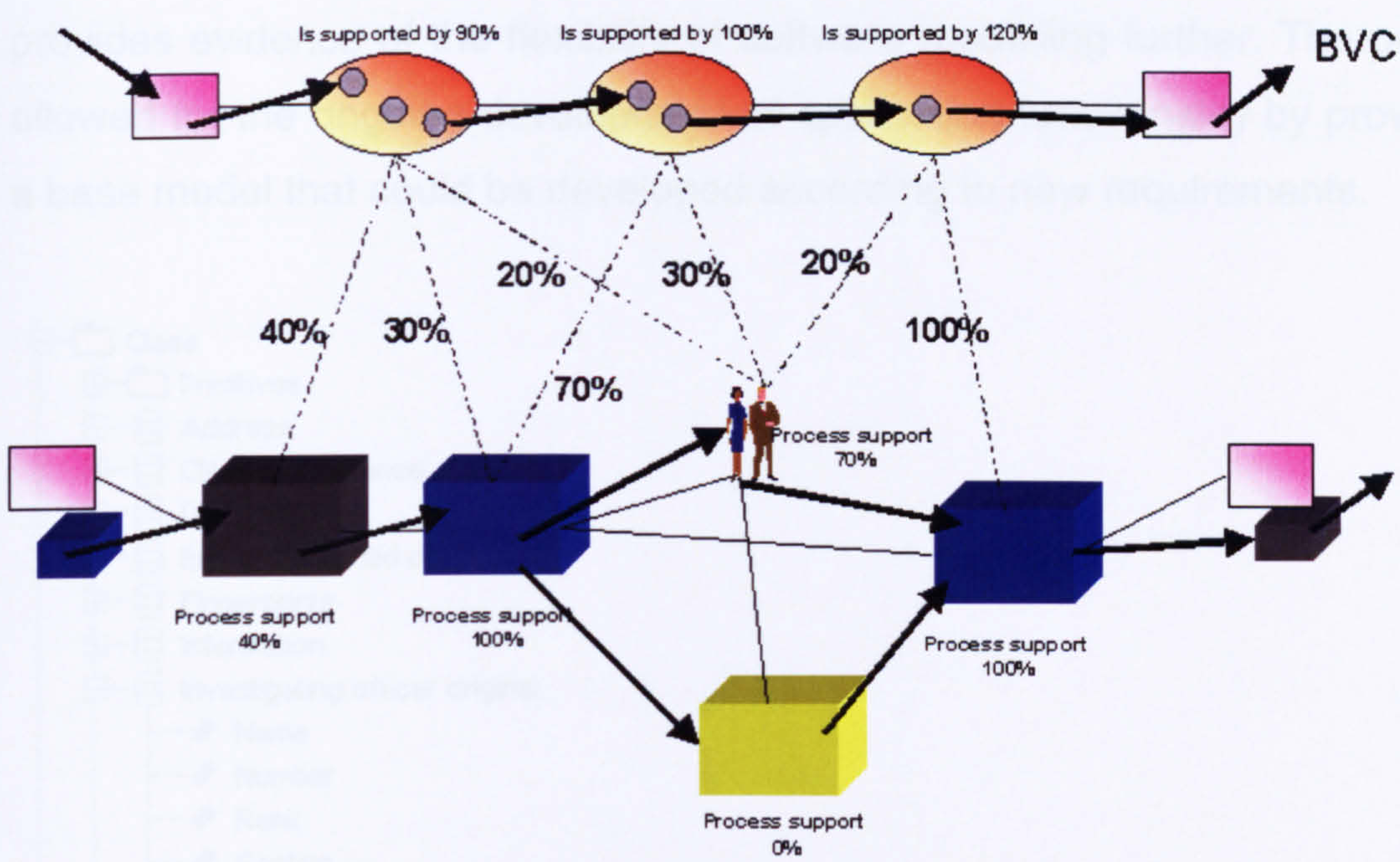


Figure 5.21: Specification of Process Support Structure

The employment of software for the development of business process or other corporate models such as performance and risk management or project management models offers flexibility during the development stage that can be exploited to efficiently develop and test variations using the same base or reference model. The BAA AOS processes varied slightly from location to location. The site-specific business processes were developed from a central control source of business process flowchart models using MS Visio as the tool for documentation. The processes were well documented at each location; however there was no control source of communication such as integrated model which conveyed the locational variances. This meant that evolving process support structures post Go-Live were no transparent to the central project team. It also meant that implementation reviews required to re-document the processes at each location each time and re-publish paper based process literature to the concerned parties.

The PSNI ICIS (Integrated Criminal Intelligence System) modelling project provides evidence of the flexibility of software modelling further. The project allowed for the ongoing development of application functionality by providing a base model that could be developed according to new requirements.

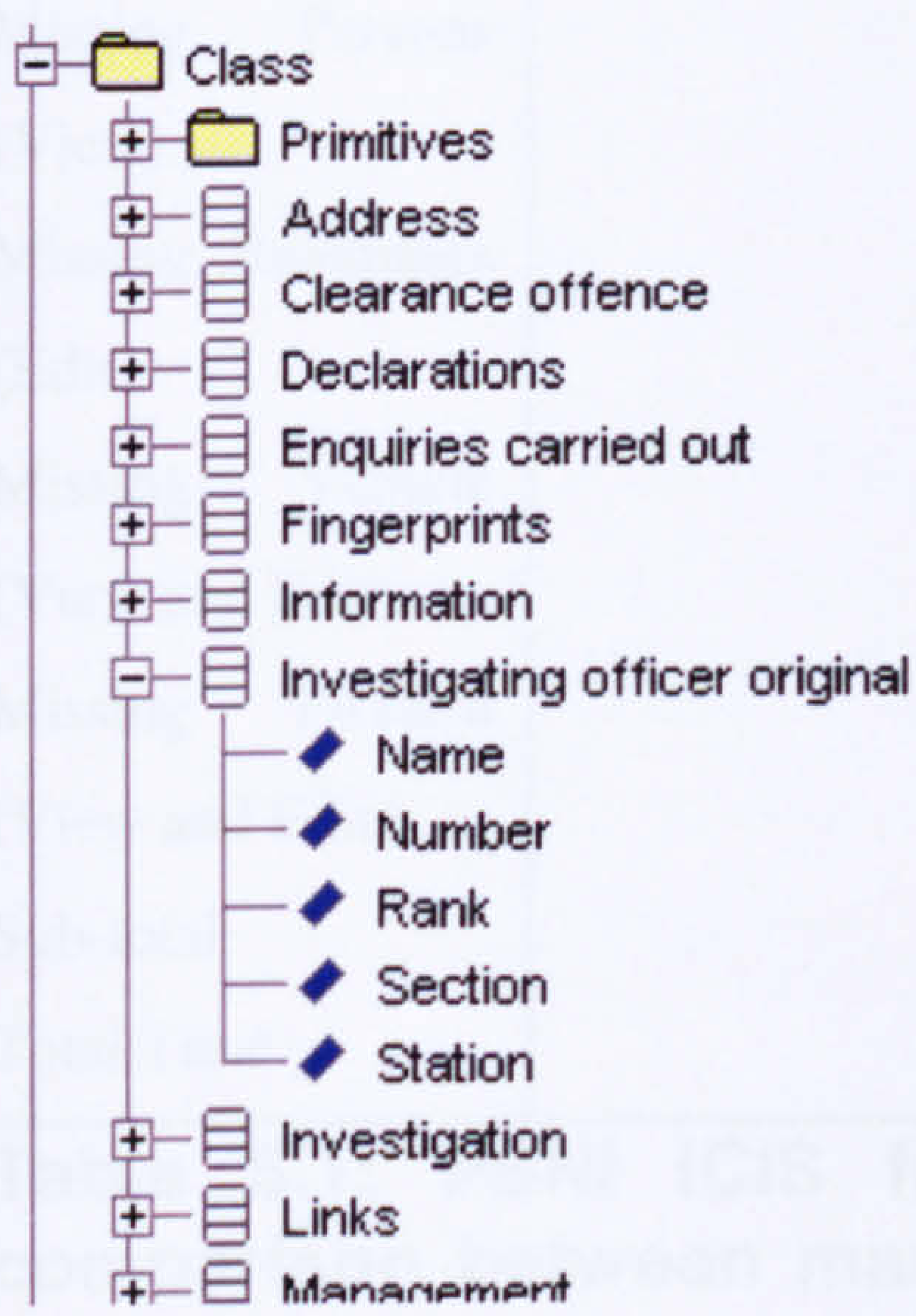


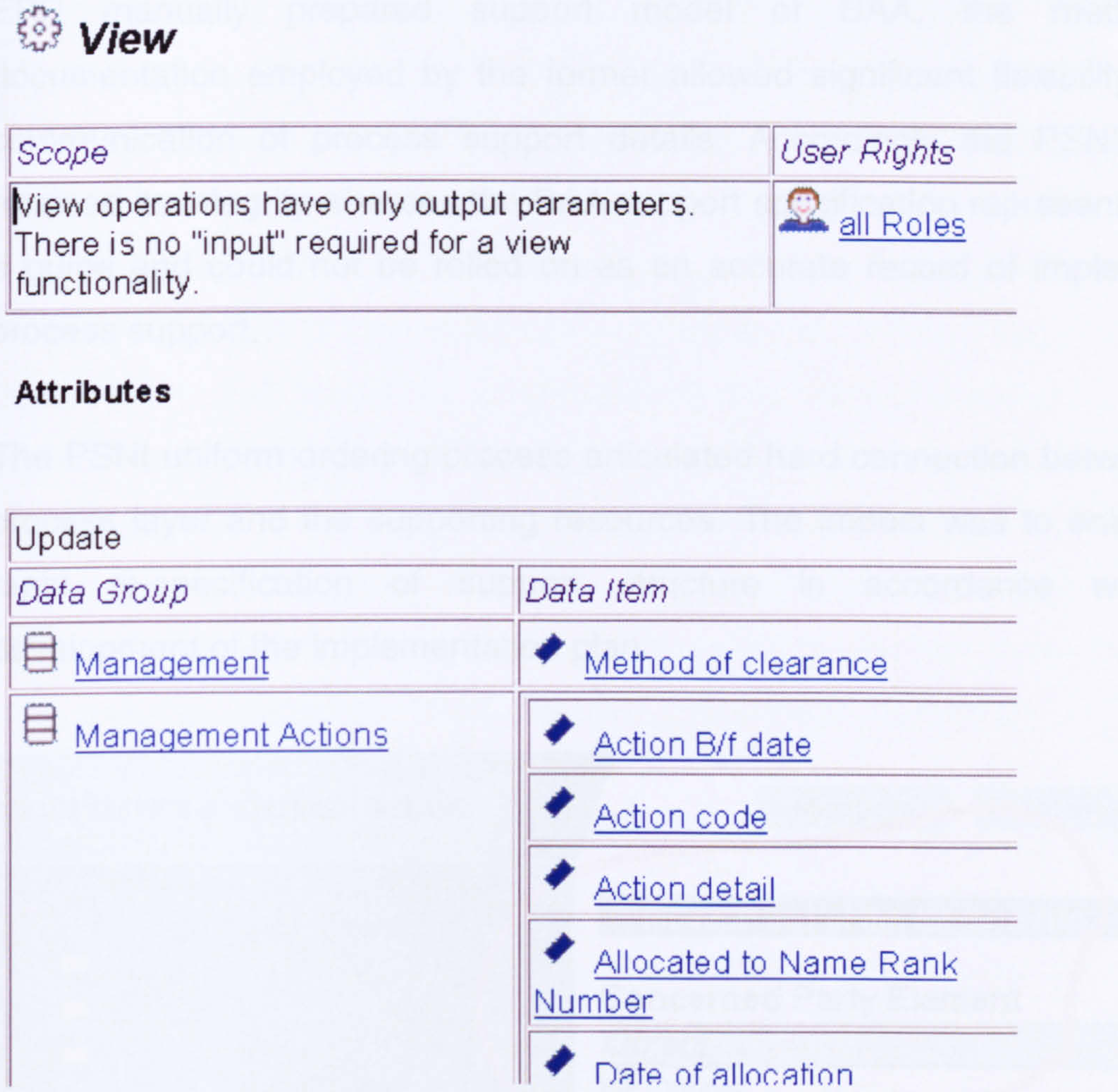
Figure 5.22: PSNI ICIS Functionality Specification Project: Modelling Screenshot of Existing Imported ICIS Data Class Structures

The data class library developed from an import of the application enabled the ICIS team to specify new functionality first of all in terms of already existing data classes. The flexibility to re-use existing data structures provides for a more responsive software development environment and more efficient delivery of newly coded functionality. The effect within PSNI was to reduce the development time of newly specified search requirements functionality from and average of **6** days to **1** day. This was enabled by the improved clarity of specification documentation and the enabled re-use of already defined code, identified from the model based documentation. This new standard for specification of functionality is particularly useful during and following periods of staff turnover as there is reduced reliance on the personal familiarity of application developers with specific areas of product coding.

ICIS Functionality Delivery	***Time to Delivery on manual specification***	***Time recorded to redevelop post implementation***	***Time to Delivery on software model based specification***	***Time recorded to redevelop post implementation***
Missing Persons (View)	5	1	1	0
Missing Banknotes (Edit)	4	0	1	0
Missing Vehicle (View and Edit)	6	2	1	0
Missing Firearm (View and Edit)	5	1	1	0
Sub-total	20	4	4	0
Total Time		<u>***24***</u>		<u>***4***</u>

Table 5.1: PSNI ICIS functionality specification project: delivery comparison between manual specification and modelled specification documentation

The table above illustrates the recorded comparison of functionality delivery times recorded by PSNI relating to the specification of three new requirements of the ICIS database. This test was conducted for the purposes of establishing the impact of using a software model developed on the basis of ICIS structured data classes. The presumption was that two benefits may be gained: a reduction in time taken to deliver revised or enhanced functionality, and an improvement in coding quality. The time spent developing coded ICIS solutions for the tests completed demonstrated a reduction of 83.3%. The time spent reworking coded solutions post implementation was eliminated from a previous average of 20% of the original development time. The extract of a screenshot below illustrates the automated document used as the basis to present the specification of new functionality based on the imported data class model. The data classes (Data Group) and attributes (Data Item) referred to are all pre-existing code structures to which the developer can make reference and re-use.


View

Scope	User Rights
View operations have only output parameters. There is no "input" required for a view functionality.	all Roles

Attributes

Update	
Data Group	*Data Item*
Management	Method of clearance
Management Actions	Action B/f date
	Action code
	Action detail
	Allocated to Name Rank Number
	Date of allocation

Figure 5.23: PSNI ICIS Functionality Specification Project: Screen-Shot Of ICIS Operation Specification For New View Screen Development Using Standard Data Classes And Attributes

The reference base for all parties is now the ICIS data class structure and there is a reduced reliance on informal communications. All functionality changes are formalised within the context of the PSNI software based ICIS reference model. It could be argued that the elimination of informal communications, particularly for elementary changes has slowed the process and introduced bureaucracy that was not there previously; however the time saved generally in the delivery of new ICIS Search, and View functionality supports the position that reference modelling for application functionality provides an efficient platform for software application maintenance and development. Comparing the PSNI functionality specification model with the ERP manually prepared support model of BAA, the method of documentation employed by the former allowed significant flexibility in the communication of process support details. Accordingly the PSNI model retained its integrity whereas the BAA support specification represented only a guide and could not be relied on as an accurate record of implemented process support.

The PSNI uniform ordering process articulated hard connection between the process layer and the supporting resources. The impact was to enable the rapid re-specification of support structure in accordance with the development of the implementation plan.

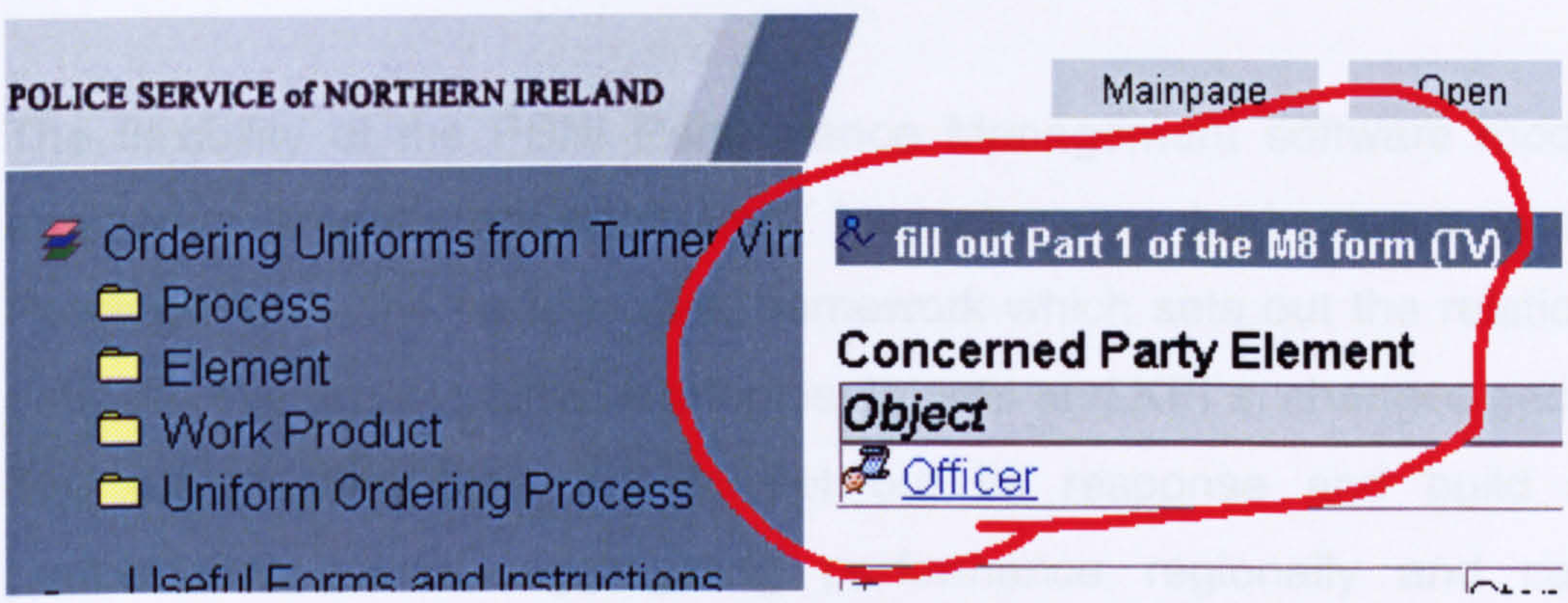


Figure 5.24: PSNI Uniform Ordering Process Project: On-line PSNI Intranet Process Guide

This capability facilitated the implementation of a project subject to very tight time constraints. Communication of the specification was enabled via an on-line intranet reference model. This provided a controlled source of process support material which clearly articulated at any particular stage during implementation of the prescribed structure of support resources. The re-specification of process support can be confirmed and communicated to the target audience theoretically in a matter of seconds. This compares with a period of four weeks on average for the BAA ERP programme to re-define and republish process support documentation. This period was set as an attempt to manage the extent of prescribed changes and reduce to a minimum to cost of continual republication of documentation. It should be noted that the flexibility of software modelling to re-engineer business processes remains the reserve of the BPR practitioner. The communication of process details and changes to them serves as no more than that to those employing the process. There remains no further or enhanced mechanism for the line staff to actively contribute toward the continuous improvement of the process. This could be embedded by the manual intervention of the process user via the population of performance data to the model relating to activity duration, complexity, cost etc. This would require extension of modelling expertise however to the wider community and there may well remain significant political and ownership issues to resolve before the line is even invited to contribute to the redesign of business processes.

The flexibility of the PSNI Performance Management software model has enabled a smooth transition from business year to business year. The Policing Plan – the performance framework which sets out the relationships between overarching aims, strategies, targets and KPI`s, changes each year. The organisation then has to set out its response and build a new performance model, aggregating performance regionally and centrally. Managed manually this exercise formed a laborious time consuming exercise that threatened the sustainability of the framework as an effective day-to-day operational performance management tool.

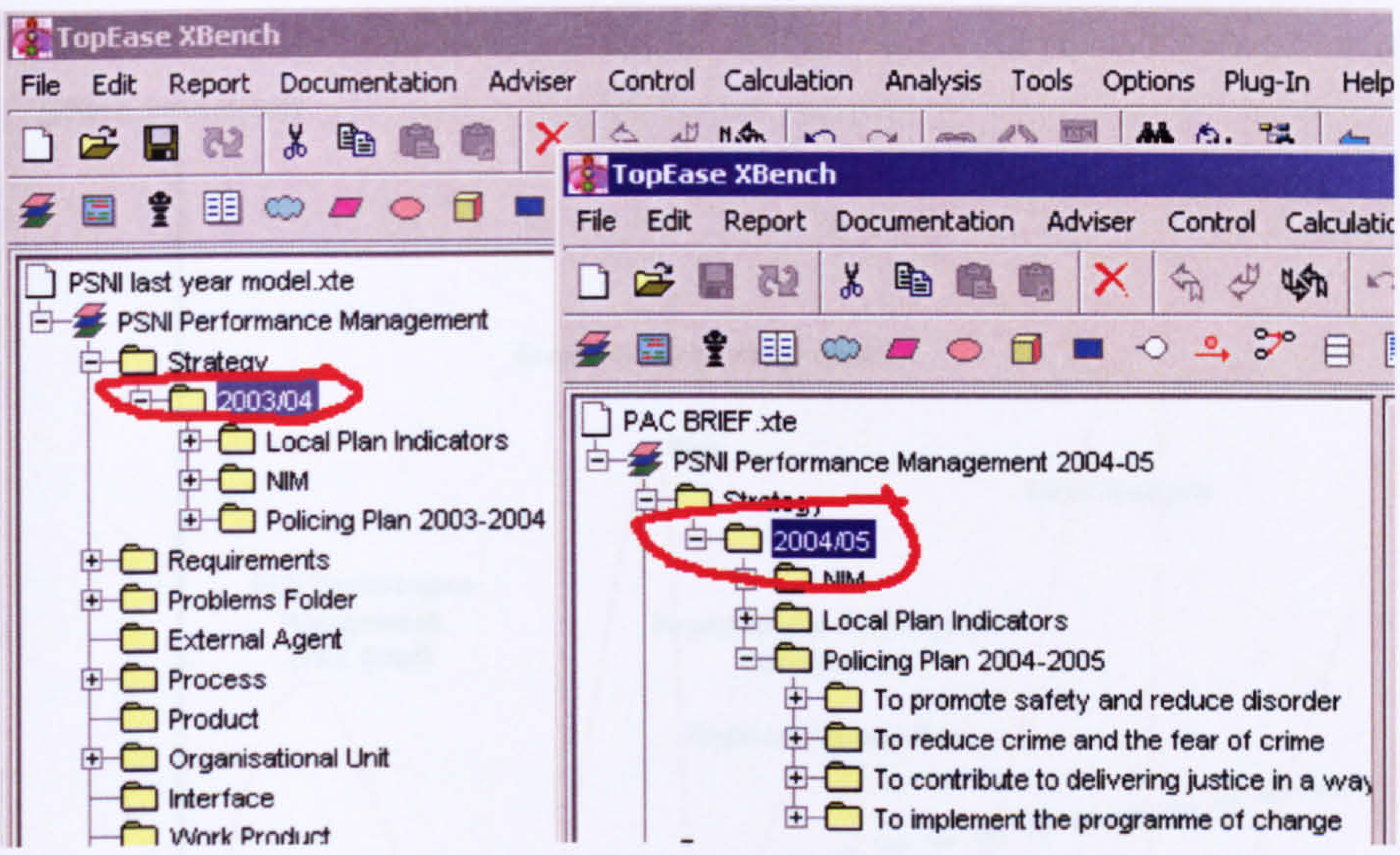


Figure 5.25: PSNI Performance Management Project: Software Model Screen-Shot – Modification Flexibility

The modification of performance parameters such as comparison or improvement margins resulted in considerable effort and continual retraining of the police analyst community – those members of staff responsible for reporting against set performance indicators. Prior to the use of software modelling tools to document the policing plan, this exercise was recorded as taking ten days to compile the documentation manually using spreadsheets and word processors. Following the initial policing plan modelling exercise, subsequent remodelling of the plan each year has reduced this period by 90% to ½ a day.

The development of the performance management model has enabled subsequent corporate development opportunities to be incorporated as time goes on.

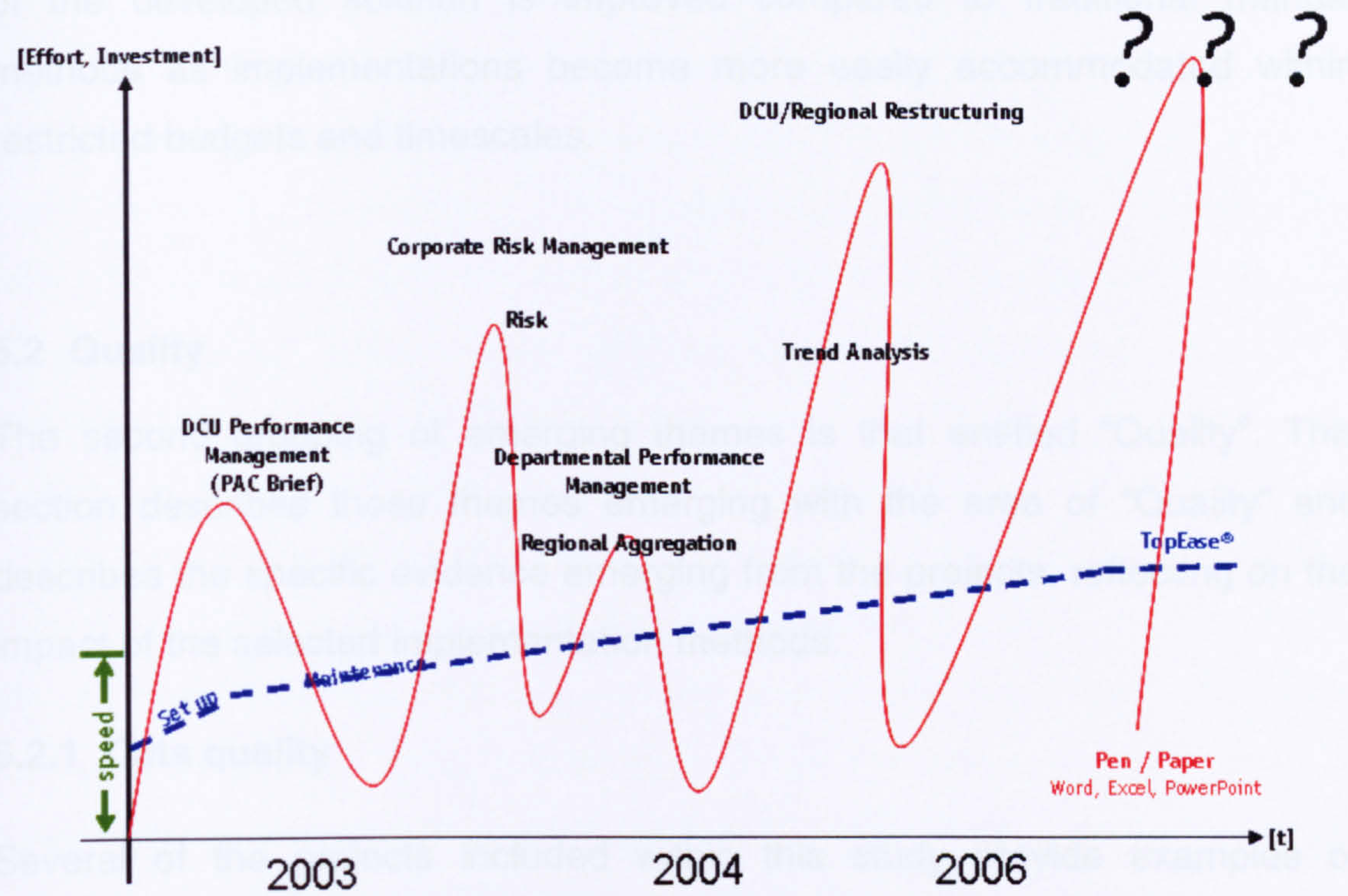


Figure 5.26: The Evolution Of The PSNI Corporate Development Software Model For Sustainable Compliance.

This figure demonstrates the development of the PSNI corporate development model from its initial inception as the performance management model. This is a significant development in corporate development flexibility. As organisations become subject to ever increasing compliance requirements in the face of increased stakeholder demands, the organisation must seek more efficient methods to respond. Software modelling has enabled PSNI in the example above to build on previous development. What started out as an exercise in DCU performance management evolved to include functionality including risk management, departmental performance, performance aggregation, DCU restructuring and the inclusion of trend analysis. This feature of software modelling not only enables rapid corporate development in response to additional compliance requirements but actively encourages it. The flexibility provided by supporting models removes many of the barriers to rapid change facilitation. The quality of the developed solution is improved compared to traditional manual methods as implementations become more easily accommodated within restricted budgets and timescales.

5.2 Quality

The second grouping of emerging themes is that entitled "Quality". This section describes those themes emerging with the area of "Quality" and describes the specific evidence emerging from the projects, reflecting on the impact of the selected implementation methods.

5.2.1 Data quality

Several of the projects included within this study provide examples of business practice change that adopt a software modelling solution to replace a previously manual activity whether it be the documentation of process specification or the manual data management of risk and performance information. These include the performance management projects of BAA, PSNI and Govan Initiative and the operational risk management projects of BAA and PSNI. There are a number of examples within these projects that demonstrate that the use of software modelling improves the quality of data entry and management information produced compared to those projects employing manual methods.

The PSNI performance management project resulted in the replacement of a manual method of performance reporting with one dependent upon the operation of a software modelling tool which represented both the hierarchy of the organisation and the policing plan in terms of relationships between KPI`s, targets, strategies and overarching aims. Prior to the inception of this project, PSNI like BAA and Govan Initiative had developed an aligned performance management framework that encompassed targetted plans for each of the 29 operational business units within the force. Unfortunately the maintenance of the performance framework in this from relied on a significant amount of manual data management for each of the units. In addition to this the hierarchical arrangement of the force into three regions complicated the challenges of aggregating performance results. The workload associated with the collection of performance data was such that full performance reports could only be prepared twice each year. BAA experienced a similar result with performance reporting only achieved each quarter. In each case, the preparation of the performance reports took 4 weeks to complete for each operational unit following the end of the reporting period. By this time the report was perceived as being effectively out of date and all responses regarded as overdue and reactionary. Given the highly seasonal nature of both crime and travel indicators the performance management frameworks of both BAA and PSNI failed to be adopted as useful operational tools. The manual processing of data also introduces a risk of poor quality as incorrect data, through human error, malicious motivation or datedness will pollute the reports and provide an incorrect portrayal of organisational performance.

PSNI exploited the use of software to eliminate the manual processing of data by developing a software interface to populate the performance model from a validated management information system (SATURN) which holds all official crime statistics. The import used comma separated value (csv) files exported from SATURN. The interface can be engaged on demand to update and overwrite existing model values and therefore eliminate the prospect of human interference.

The figure below is a screen-shot of the exported csv file prior to import to the performance model software. Apart from the reduction in manual processing time detailed later on, this functionality validated entirely the data quality of the model output and in so doing guaranteed the credibility of the PACBrief report which historically had been roundly doubted. This doubt was generally well founded for the risks to data quality previously identified.

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01 Domestic Burglary of autocrimewip (Explorer)
Thursday, February 24, 2005 4:00:07 AM
Date,Service,Domestic Burglary,Clear,Age,RepMonth,Gender,Injury,Recorded
,"Antrim","Ards","East Belfast","North Belfast","South Belfast","West Belfast","Carrickfergus","Castlereagh","Larne ,
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Feb 2003,24,28,47,40,90,14,11,38,9,41,28,58,27,16,21,5,16,3,32,25,30,10,36,14,8,15,49,20,16,0,0,0,771
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ug 2003,21,22,48,40,83,22,9,33,12,39,31,41,19,13,51,7,21
p 2003,13,22,32,38,82,17,12,42,12,38,35,51,29,10,32
2003,17,19,51,59,89,13,4,20
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Figure 5.27: PSNI Performance Management Project: Csv File Screen-Shot (Exported From SATURN MIS)

The Govan Initiative performance indicators are highly influential in the attraction of ongoing and new investment from a range of stakeholders and interested parties. The organisation, comprising less that 50 employees, has identified 115 performance indicators relating to a range of investor and sponsored development projects. The associated workload of maintaining useful performance reports for the wide range of interested parties (of which there are 10-12 at any time), each one concerned with a specific set of indicators, seriously impacts upon the organisation's capacity to maintain the interests of these parties and secure continued funding. This monthly exercise, employing manual means consumed the full-time resources of two full time employees. The resultant reports provided no flexibility in that they were prepared to a fixed pre-defined format and offered no opportunity for alternative interrogation.

The manual handling of data, originally employed by the BAA, PSNI and GI performance management processes presented the opportunity for human error and also fraudulent reporting. GI staff of which only two were involved with data collation and reporting were responsible for the manual data handling each month of 115 performance indicators, each applied to up to 30 projects. Reliance on individuals to correctly manually process performance data which often reflects on the abilities of their own business units to demonstrate achievement toward targets cannot be preferable to an independent automated process that eliminates these sources of quality failure. In fact it could be argued on the basis of the projects examined that in order for a performance management system to be regarded as reliable it must be one supported automatically with as little human interference as possible.

The introduction of software modelling techniques had a direct impact on the quality of data collated and reported through the performance management solutions of BAA, PSNI and Govan Initiative.

The BAA ERP project suffered as a result of poor quality in the definition of the relationship between activities and supporting resources. No clear and detailed relationships were included within the documentation relating to the specification of method and technical knowledge required to complete each task. This absence of quality resulted in inappropriate Organisation Design selections being made and a requirement for each operational department to conduct a review of its OD within two weeks of the "Go-Live" date.

The PSNI ICIS specification project also demonstrates the impact which software modelling has on the quality data contained. This particular model was constructed by importing data from two validated sources, SAP-HR and the ICIS application itself. The purpose of the model was to detail the specification for desired functionality in order that the application development team could code solutions in response. The capacity of the model application to import data directly from valid sources means that the resulting specification is based upon pre-existing and validated data sets.

The two data sets included date relating to personnel and also existing data classes including attribute structures.

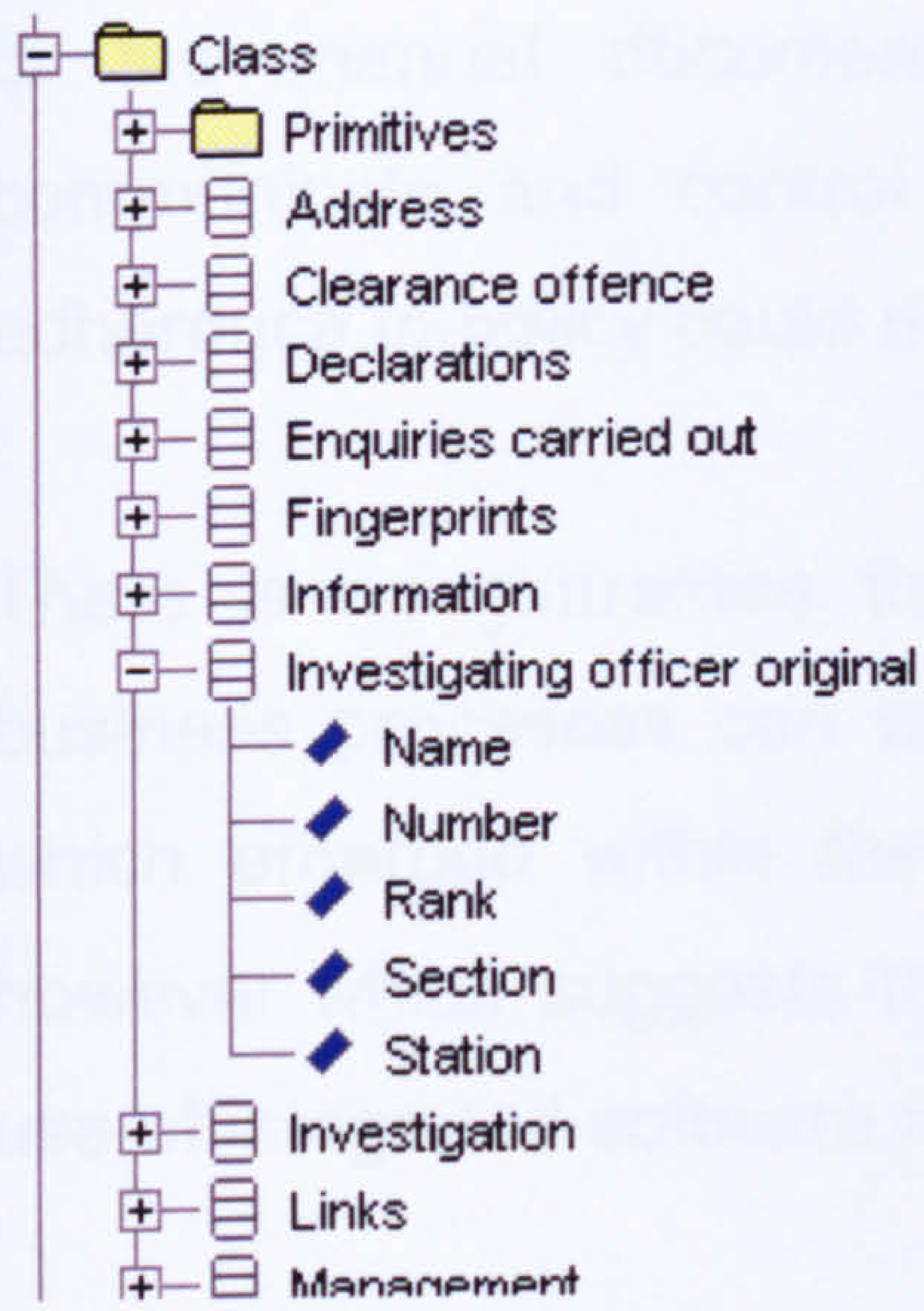


Figure 5.28: PSNI ICIS Functionality Specification Project: Modelling Screenshot Of Existing Imported ICIS Data Class Structures

5.2.2 Adherence to policy and Compliance

The BAA ERP implementation documentation did not relate activities to roles directly. Separate policy documents relating to OD were prepared and issued as a secondary exercise. The result was a disjointed portfolio of communication which presented the opportunity for the non-compliance of prescriptive operation of new processes. This emerged soon after "Go-Live" in February 2001 as a number of departments within the Corporate Office body chose to delegate line manager system tasks to centralised admin posts. The tasks included the recording of employee absence and annual leave on the Oracle® HR module. This was contrary to the Enterprise Vision as documented, however the communication of this vision was complicated by the difficulties in maintaining up to date literature and controlling its circulation. Even more of a problem was the challenge to control the disposal of out of date documentation.

Resultantly there quickly developed a mismatch of implemented OD. The risk to the programme was that the Enterprise benefits, upon which the business case for capital expenditure was based would not be realised. The limitations of the manual documentation method in the capacity to effectively communicate and control the flow of information to users meant that adherence to policy could not be ensured.

There is no guarantee that software modelling of the specifications for business processes can ensure compliance with process and avoid issue which emerged within the BAA ERP implementation. There is evidence however which suggests the extent of compliance can be improved by the use of integrated software models.

The PSNI software model for uniform ordering process managed to control the application of process by forming the source for documentation templates such as order forms, returns forms, sizing charts etc. This ensured at least that the process activities employed the correct documentation forms.

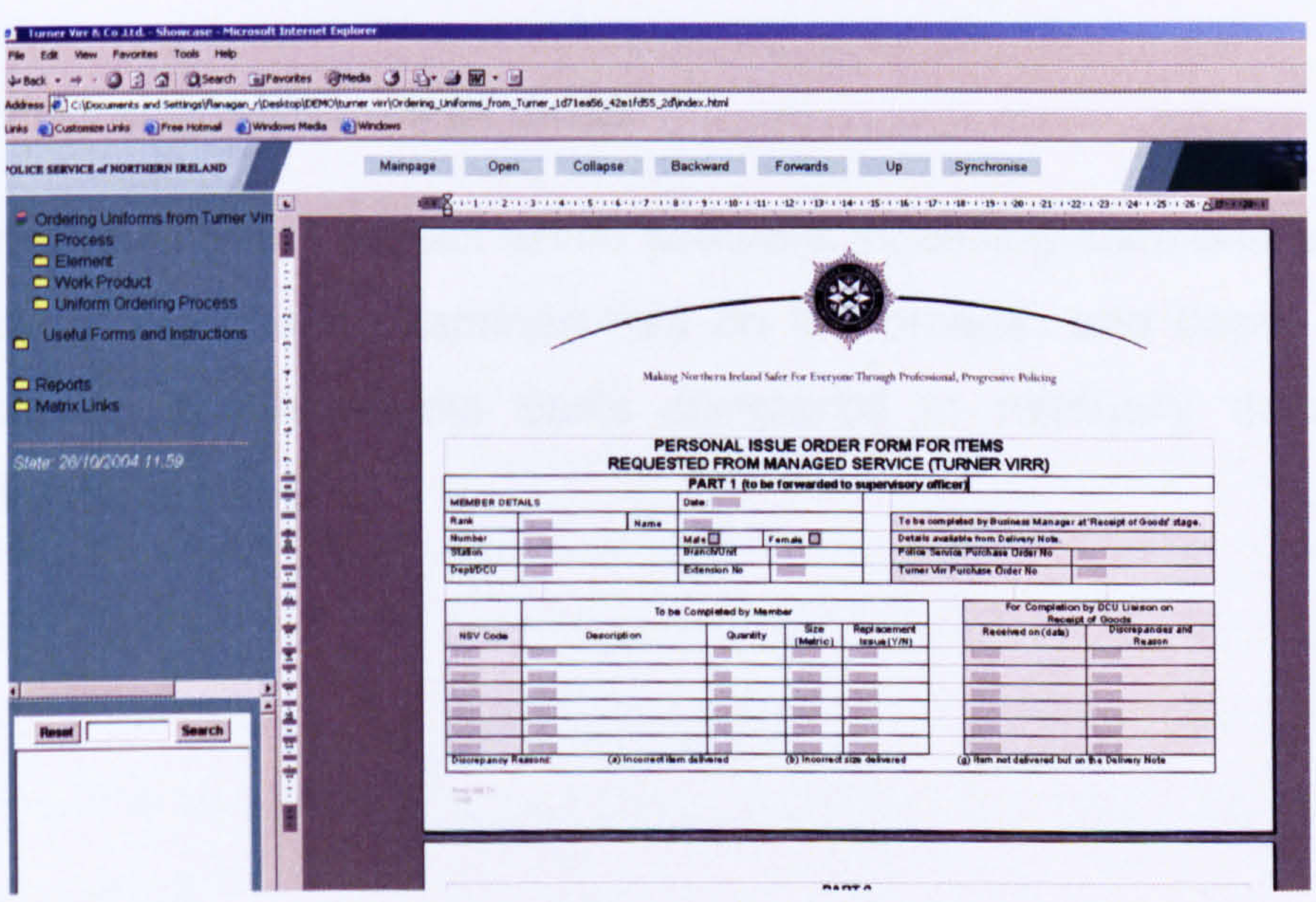


Figure 5.29: PSNI Performance Management Project: Software Model Intranet Output Providing Electronic Links To Template Documentation

The PSNI performance management model makes direct reference from compliance objects such as requirements, legislation and policy to the performance framework employed by the organisation and ultimately to the operational organisational units themselves. This feature allows the organisation to design its frameworks in a manner which is cognisant of policy and compliance requirements.

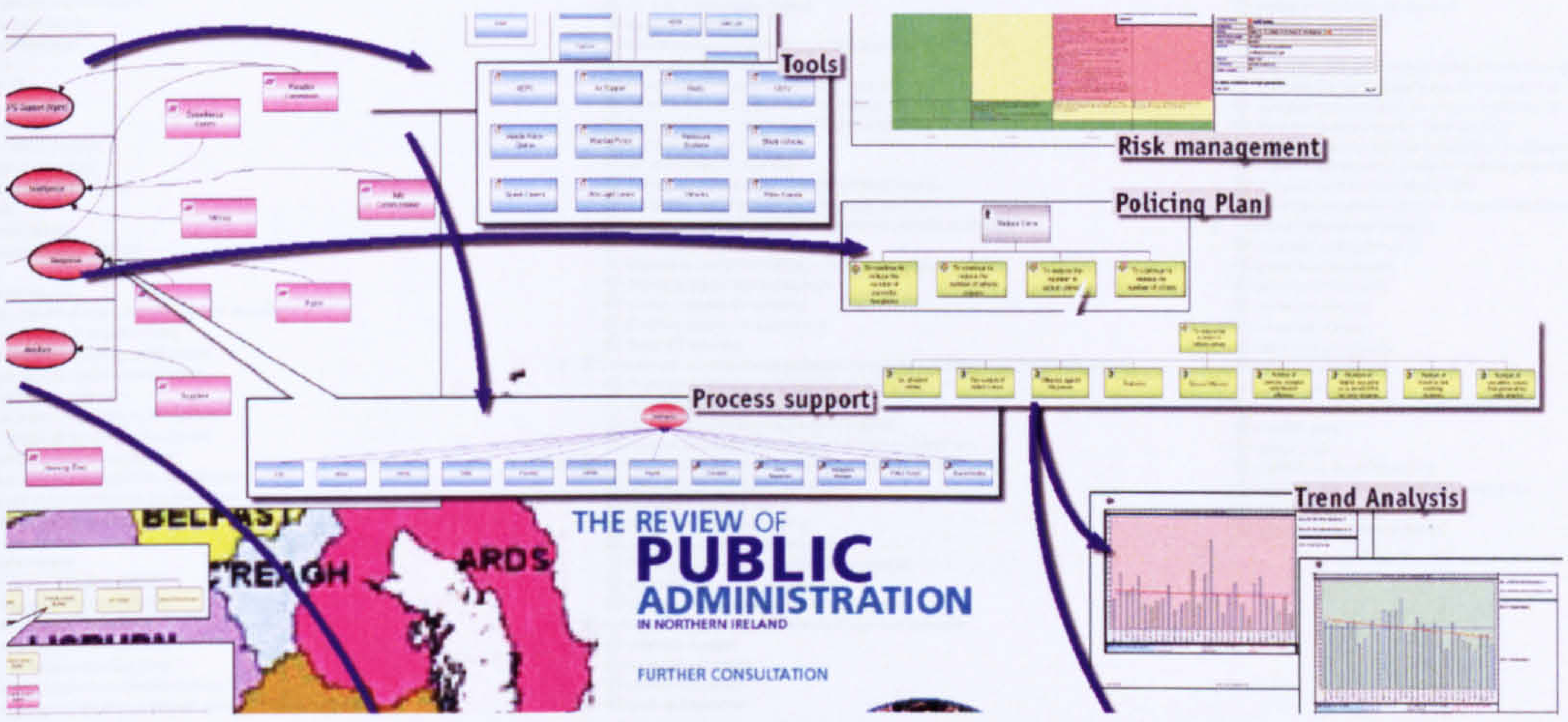


Figure 5.30: PSNI Performance Management Model – Demonstrating the link to Policy and Compliance

5.2.3 Comprehensiveness of detail

This theme reflects the impact which software modelling solutions employed by several of the cases examined had on the breadth and depth of detail achievable on a sustainable basis compared to manually documented process implementations.

The Govan Initiative performance management framework imposed a considerable workload on a small organisation which would have been all but consumed by the administrative burden of routinely reporting on the vast number of performance indicators structured for the purposes of conveying progress to a wide range of interested parties.

Figure 5.31: Govan Initiative Performance Management Framework, Performance Indicator Modelling

The realistic assessment here is that the implementation of a software supported solution did not as much simplify the process of performance management and reporting but enabled it. The prospects for achieving this via manual methods were extremely remote as the burdens on human resources were assessed as having been too great. The original assessment calculated that preparation of a single monthly performance report would have consumed the resources of two full time staff members. This did not allow for the possibility of report analysis or preparation of target audience reports i.e. reports specific to particular stakeholders. The estimated delivery of performance reports was not less than six weeks following the close of the reportable period.

Following the implementation of the modelled solution the data entry workload remained consistent at four days in total. This related to the time taken to enter performance values for all performance indicators against each of the related projects. This did not correspond to a saving compared to the previously manual method of data management. The efficiency gain was made in the process of report generation which was now of course automatic and was now flexible enough to be developed for individual target audiences. The PSNI performance project was initiated as an alternative, more efficient method of reporting the statistical performance of District Command Units against targets and performance from the previous year. The software modelling of the data enabled this and allowed the flexible generation of data reports, an example is shown below.

Castlereagh DCU PERFORMANCE 2004/05 COMPARED TO 2003/04

Policing Plan performance indicator	Previous/ Current Year	Quarter 1 Apr-Jun			Quarter 2 Jul-Sep			Quarter 3 Oct-Dec			Quarter 4 Jan-Mar			Total
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr - Mar
The number of seizures of illicit drugs within Northern Ireland	2003/04	6	3	4	6	6	2	8	6	4	3	3	4	55
	2004/05	5	4	4	4	4	2	3	3	6	1	5	4	45
	Chart	Comparison chart excluded.												
The number of persons arrested/charged/summoned for offences under the Misuse of Drugs Act	2003/04	100.00 % [2 : 2]	0.00 % [0 : 3]	120.00 % [6 : 5]	25.00 % [2 : 8]	33.33 % [1 : 3]	160.00 % [8 : 5]	50.00 % [4 : 8]	50.00 % [1 : 2]	50.00 % [2 : 4]	50.00 % [1 : 2]	100 % [0 : 0]	200.00 % [4 : 2]	70.45 % [31 : 44]
	2004/05	100.00 % [3 : 3]	50.00 % [1 : 2]	100.00 % [3 : 3]	133.33 % [4 : 3]	50.00 % [1 : 2]	N/A [2 : 0]	N/A [4 : 0]	0.00 % [0 : 3]	57.14 % [4 : 7]	N/A [3 : 0]	50.00 % [2 : 4]	N/A [0 : 0]	100.00 % [27 : 27]

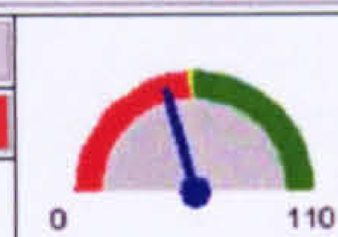


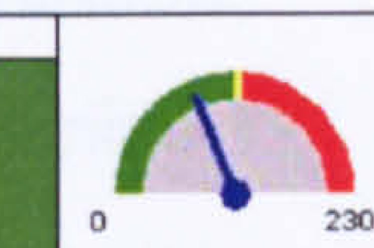
Figure 5.32: PSNI Performance Management Project: Automated Representation Of Performance Data – PSNI Performance Management Project

In addition to the handling of data, the software model scope was extended to include in a structured way the entire qualitative data set related to the PAC Brief (Performance Accountability) framework. The inclusion of all qualitative explanatory data within the software model of the performance framework allowed for the comprehensive structuring and treatment of all performance related information within the same application. This also allowed the selective reporting of qualitative information in a similar way to that employed for the reporting of quantitative data. The figure below demonstrates the structured output of qualitative data entered within the confines of the NIM (National Intelligence Model) framework.

Table 1 - 3 . Policing Plan-Carrickfergus

To reduce the number of domestic burglaries by 2% by March 2005.

Policing Plan Performance Indicator	Previous / Actual Year	Performance totalized Apr - Mar
The number of domestic burglaries	2003/04	115
	2004/05	87



DCU Control Strategy

THE PROBLEM	THE ACTION TAKEN	THE RESULT	THE ACTION PLANNED
Domestic Burglary figures have reduced significantly on last years' figures. Overall there has been a 24.3% reduction. Year 03/04 - 115 Domestic Burglaries Year 04/05 - 87 Domestic Burglaries. ***Clearance Rate for Domestic Burglaries*** Year 03/04 - 20 cleared = 17.4% clearance rate Year 04/05 - 22 cleared = 27.2% clearance rate (up to the 20th March 2005 end of year figures unavailable at present) The DCU has remained below the target of 13.2 burglaries per month for the year. Overall domestic burglary figures have remained below the figures experienced during the same period last year with the exception of June, July, October and March. The chart above shows the breakdown of burglaries for 04/05 compared to 03/04. From this you can see that there are definate peaks during June, December and March. During the period covered by this report Operation Kalante has covered burglary suspects who are also disqualified drivers.	High profile **Christmas Crime Strategy** throughout the DCU during the festive period. Continued monitoring of Domestic burglaries within the DCU in order to identify 'hotspot' areas and suspects within the DCU. Continued support of SMARTWATER scheme through the crime prevention officer. All victims of domestic burglary continue to be offered a smartwater kit for use in their own home. Door locks and Personal Attack Alarms continue to be sold by the crime prevention officer to vulnerable persons. Crime prevention officer continues to give talks to vulnerable persons. Continued use of DCU Breifing Pages to highlight prolific offenders and DCU problems. **Information Tasking Sheets** - Information tasking sheets have been in operation within the DCU for 12 months during this time a number of sightings have been submitted on burglary suspects within the DCU. This use of information tasking sheets ensures that all section personnel are more focused in line with the Policing Plan Objectives. **Problem Profile** - A problem profile was carried out on domestic burglaries in the Boneybefore area. This been used in the planning of operations in this area.	Domestic Burglary increased by 6 during the Christmas Crime Strategy 2004 . Even though there was an increase in Domestic Burglary during the christmas perios this year overall there was still a decrease on the previous years figures. This was the 3rd year of the christmas crime strategy. Domestic Burglary peaked in June when a series of burglaries occurred in Whitehead on the one day. Another peak occurred during December when a series of burglaries occurred in a concentrated area in the Victoria area. Another peak also occurred during March when a series occurred in the Craigowen area. Overall the figures for the year have reduced by a significant amount on the previous years figures. With a reduction from 115 during the 03/04 year to 87 during the 04/05 year.	High visibility policing at identified hotspot areas. Work in partnership with others, developing a problem solving approach towards crime. Continued development of Good Neighbour Schemes within the DCU. **Results Analysis** - Results analysis will be carried out on the Information Tasking Sheets with the aim of evaluating the first year results. Crime prevention initiatives: Smartwater Property Marking. Promote Secure by Design Lock. Promote the use of Crimestoppers. Media exposure and education to publicise home security. Use of subject and problem profiles.
	Ongoing continuation of Night Duty VCP's within the DCU in an attempt to prevent crime and attempt to apprehend offenders both entering and	One person was apprehended for 6 burglaries in the Whitehead area. 22 of the domestic burglaries have been cleared	Identify linked burglaries (crime series analysis). Suspects and those arrested to be subject to

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Figure 5.33: PSNI Performance Management Project: Qualitative Data Modelling And Report Generation – PSNI Performance Management Project

For PSNI this strengthens the case for data modelling as although the manipulation of qualitative data is not technically complex and comprises only the structured re-presentation of textual input, the accommodation of date related qualitative data which is related to statistical data improves the comprehensiveness of detail of performance reporting and eliminates sources of quality failure by relating all data within a single integrated and structured model.

5.2.4 Transparency to stakeholders

The literature relating to BPR, Management of Change, Performance Management and Risk Management makes continued reference to the importance of stakeholder management. The inclusion routinely of stakeholders is continually referred to as important for the successful implementation of planned solutions. The method of documentation, communication and change control employed by the nine projects examined impacted on the perceptions and degrees of understanding which the stakeholders retained throughout the implementation experiences. Resistance can emerge during the implementation phases and post implementation as a result of the non-inclusion of stakeholders and/or the failure to communicate routinely. The post project review of the BAA ERP project identifies this clearly. This is highlighted also under the section concerning communications as an emergent theme (Section 5.1.1). The AOS project did identify the importance of engaging stakeholders positively. The highly commercial nature of the stakeholder relationship and the operational criticality of the process functionality placed an onus on BAA to provide clearly articulated and well communicated process documentation. This communication capacity was restricted by the limitations of manually prepared documentation. The documentation could not easily be controlled as it was published to a disparate community of stakeholders from a variety of organisations with varying degrees of interest in the content.

The application of modelled software solutions relating to the preparation and representation of process specification and/or data provides a solution to this challenge. By employing a common communication medium e.g. intranet, the organisation can engage stakeholders according to their varied roles and control the flow of information to which they are subject.

The PSNI corporate development model lends itself readily to stakeholder sensitive response.

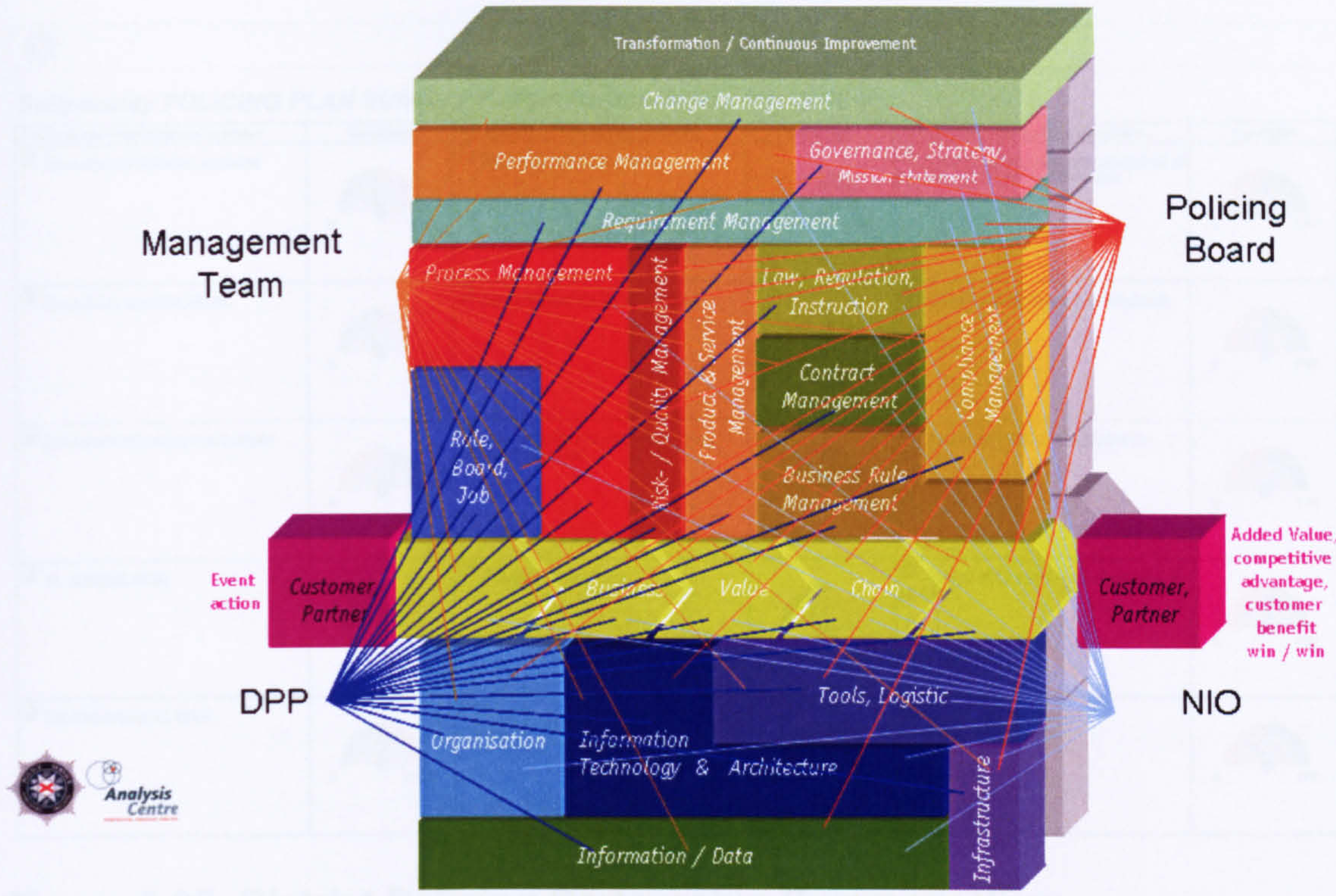


Figure 5.34: The PSNI Corporate Model and Contrasting Stakeholder Interest

Following the implementation of the new performance management framework and the development of the reporting environment, one of the main public body stakeholders, the District Policing Partnerships expressed a preference for high level summarised reports. The DPP as an overseeing body held no interest in the detailed operational activity which accompanied the original reporting framework. In response PSNI were able to generate from the software model a format which reflected the preferences of the DPP. The results were validated as they were sourced from the same model as that responsible for the detailed views. This demonstrates the retention of quality provided by software modelling regardless of stakeholder preferences.

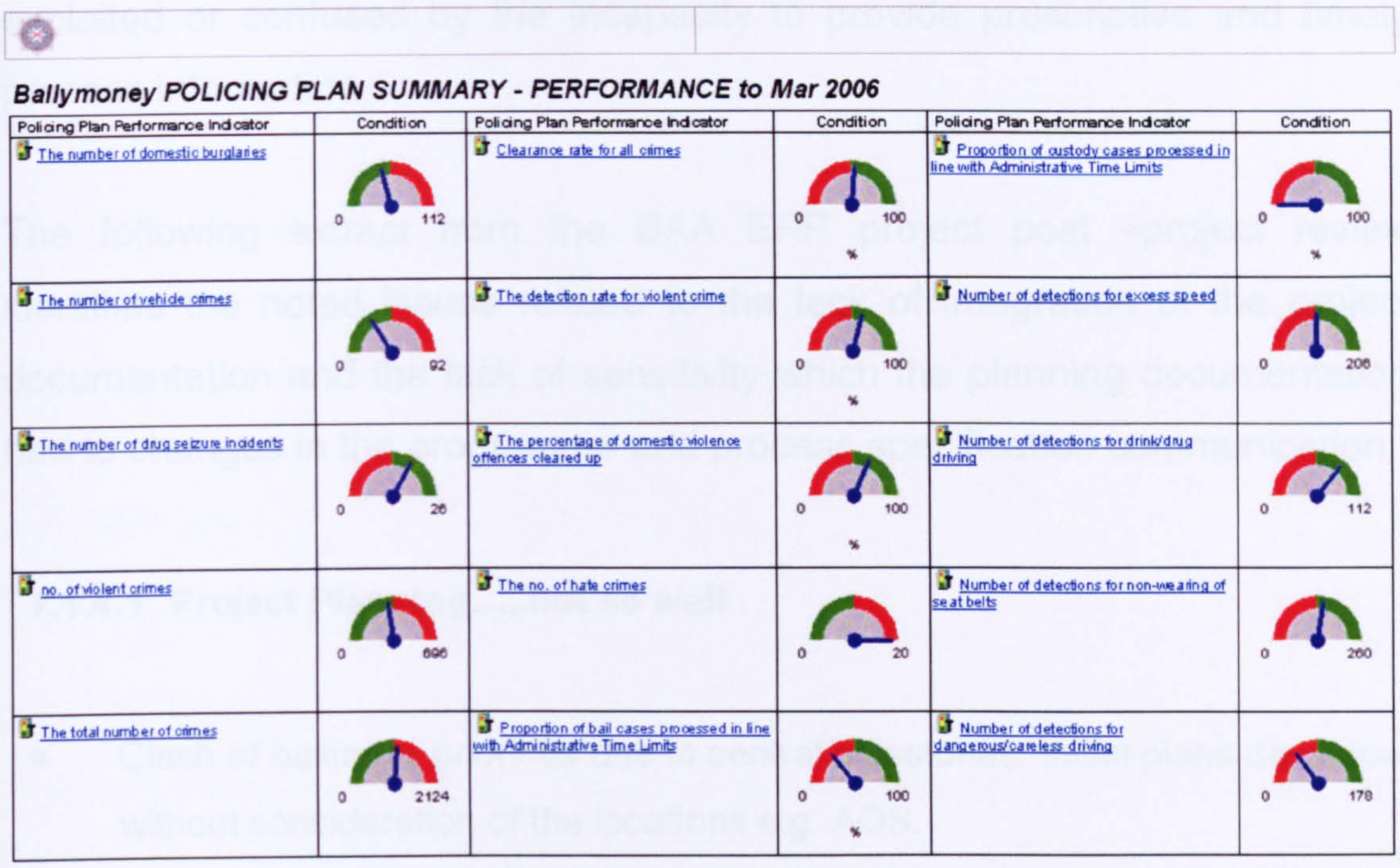


Figure 5.35: District Policing Partnership Summary View

5.2.5 Sensitivity to change

This theme relates to the sensitivity of the methods employed to accommodate and respond to change of requirements. Change control is established as a critical feature of effective project implementation frameworks. Change control however can introduce delay to the effective communication and ultimate implementation of the planned change. This delay can form the basis of confusion and add costs to the implementation. As BAA employed manual methods for the specification and documentation of the two business process change projects AOS and Enterprise (ERP), communication of changes to process specification were subject to delays (up to four weeks on average). These delays resulted in differences of application between locations, reports of non-compliance, and sources of resistance from users seeking to exploit the confusion for locally preferred implementation conditions etc. The availability of an integrated model which controls process documentation and its publication eliminates the time delays associated with changes and prevents the implementation from being exploited or confused by the incapacity to provide prescriptive and timely process information.

The following extract from the BAA ERP project post –project review identifies the noted issues related to the lack of integration of the project documentation and the lack of sensitivity which the planning documentation had to changes in the programme and process specification communication.

7.1.4.1 Project Planning.....not so well

- Clash of business priorities due to central milestones. Initial plans developed without consideration of the locations e.g. AOS.
- Too many plans - too difficult to track.
- Co-ordination of Implementation plan came too late.
- Capability of project management and Microsoft project was patchy.
- Link inter-dependency of plans electronically and have paper change control process.
- Baseline all plans, ability to monitor actual against deliverables.
- Plans were an over complicated means of delivery.
- Detailed plan was 'false' reassurance?
- 'Rules' about how plans would be used were unclear.
- Competence issue around project planning - this can actually be done well and be helpful e.g. AOS

Figure 5.36: BAA Enterprise project: PPR Extract "Project Planning ....not so well" (2001)

Software modelling as employed by several of the other projects enables the accommodation of changes much more efficiently. This efficiency gain provides other benefits in that the change aspect can be communicated effectively in order to eliminate sources of confusion, error and disharmony as encountered during the ERP project which employed a more laboured method of managing documentable changes.

As demonstrated earlier the PSNI Uniform Ordering process project demonstrated the improved effect which a software modelling solution can have on the accommodation of change to project detail.

5.3 Efficiency

5.3.1 Data Management

The PSNI performance management project introduced automation to a previously manual exercise. The capacity of the supporting software model to enable automatic interfacing with the main statistical management information system of PSNI (SATURN) which maintains all crime data has reduced considerably the workload associated with the population and assessment of performance management data.

The exercise of populating data monthly for, on average 20 indicators including actual, target and historic entries took an estimated 2 days (16.7 hrs) to complete using traditional spreadsheet and word processing tools, for each analyst. On each occasion parameters including % improvement margins were required to be calculated on historic values and on standard baseline figures. On completion of data entry a manual comparison check was required to be completed and traffic light indicators applied, also manually. The table below sets out the comparison of event durations recorded for each of the 29 PSNI DCUs. The table compares the preparation period for the PACBrief (Performance Accountability Brief) reporting period of March 2003, prior to the implementation of the software supported performance management solution. Each analyst was required to record the time spent each month on the manual processing of data. The purpose was to quantify the lost time to crime analysis and also assess the business case for solution implementation.

The net effect was to reduce the monthly reporting burden on the organisation from 65 person days to 0.

(Hrs)				
	Data collation (manually)	**Data Entry (manually)**	**Target Profiling & Comparison Assessment (manually)**	**Total Time**
Urban Region				
OCU Urban	2	8	10	20
South Belfast	1.5	7	7	15.5
North Belfast	2	10	6	18
East Belfast	2.5	9	5	16.5
West Belfast	2	8	5	15
Carrickfergus	2	10	6	16
Larne	3	5	5	13
Newtonabbey	1.5	4	7	12.5
Castlereagh	2	6	7	15
Ards	3	5	8	16
Lisburn	1.5	4	9	14.5
North Down	2	6	7	15
Antrim	2	8	8	18
Rural Region				
OCU Rural	3	10	6	19
Magherafelt	2	6	8	16
Strabane	1	9	5	15
Dungannon and South Tyrone	1	5	8	14
Foyle	3	7	6	16

(Hrs)				
	Data collation (manually)	**Data Entry (manually)**	**Target Profiling & Comparison Assessment (manually)**	**Total Time**
Craigavon	2	8	7	17
Down	2	8	8	18
Moyle	2	9	6	17
Newry and Mourne	1.5	10	7	18.5
Ballymoney	2	6	10	18
Ballymena	1	7	7	15
Omagh	2	8	6	16
Limavady	3	7	6	16
Armagh	1	9	8	18
Banbridge	2	8	6	16
Coleraine	2	10	7	19
Cookstown	1	6	7	14
Craigavon	3	7	7	17
Limavady	2	7	8	17
Total Time (person hrs per month)				**520.5**

Table 5.2: PSNI Performance Management Project: data processing time for manually documented methods

All of this work was eliminated by the development of an interface which enabled the automatic population of data into the software model from the SATURN system. Given that the SATURN system processed data from the Command and Control system, the interface could be initiated at anytime for the purposes of delivering up to date, validated performance management reports on demand as opposed to within the confines of a rigid monthly reporting schedule.The theme of flexibility also emerges during the consideration of user options for the retrieval and representation of results. The PSNI performance management project started off as a project to automate the generation of a single report – the PAC Brief. It quickly developed according to the realisation of the client team of the possibilities for object based data interrogation. The specification of the performance management solution extended to include regional aggregation, coloured reports i.e. reports filtered according to red, amber, green results, qualitative reports and finally trend analysis reports.

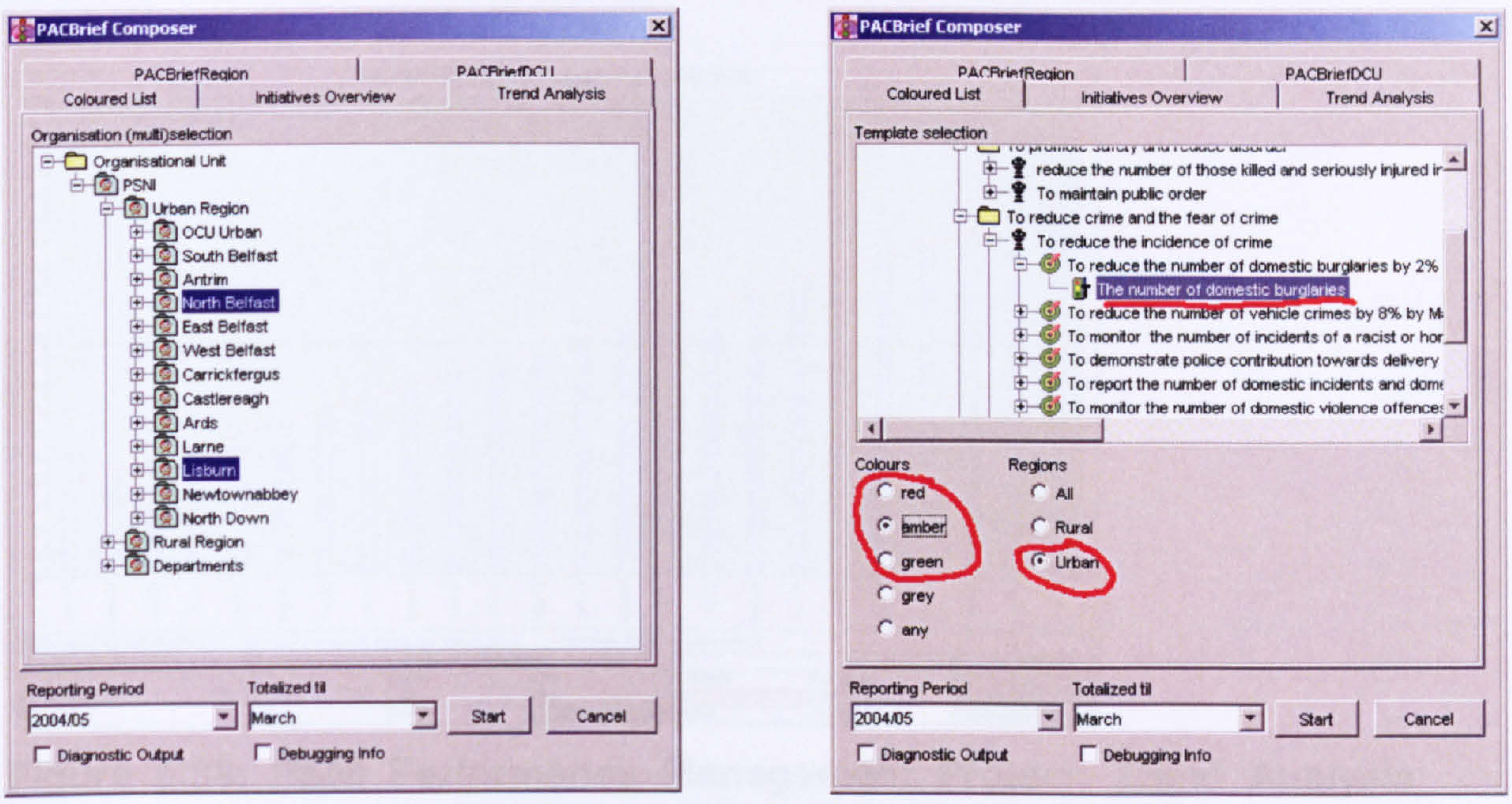
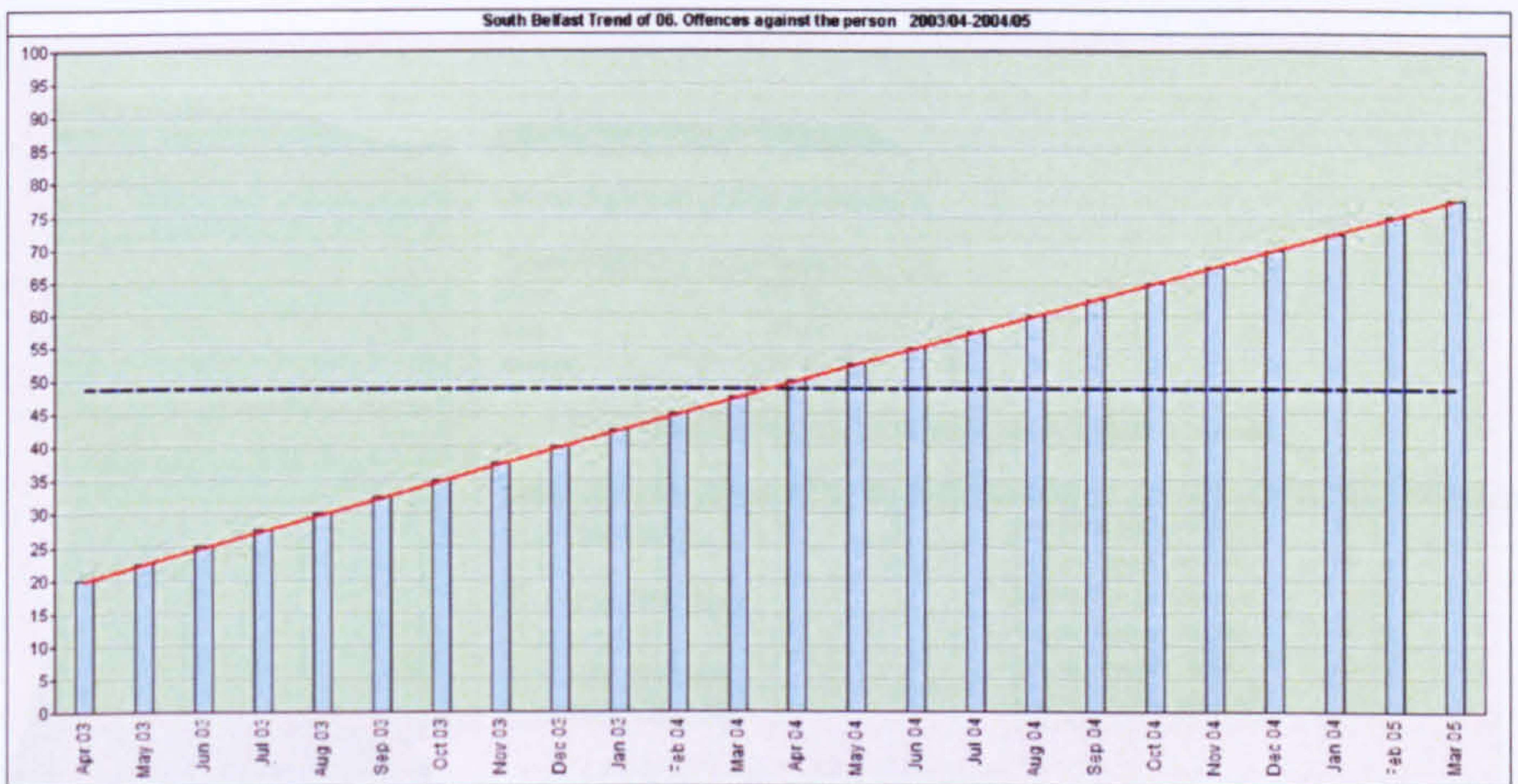


Figure 5.37: PSNI Performance Management Project: Report Generation Options Developed On Object Based Data Management

In addition to the filter based reporting on the basis of object data, the modelling solution presents the opportunity for variable reporting parameters. An example of this was implemented for the purposes of examining trends in crime statistics and performance. This task was historically completed using manual means and involved the use of MSExcel spreadsheets as a graphical presentation tool. This task involved regional resources employed to report on behalf of District Command Units (29) and took on average 15 man days each month to complete on receipt of validated crime data. Following the coding of a report to facilitate this requirement, the trend analysis reporting feature was enabled within two weeks and by utilising the SATURN interface functionality now eliminates the manual intervention to complete this exercise. In so doing the organisation eliminates the sources of data quality risk including manual error, fraudulent reporting and risk of disrepute due to datedness. The figure below illustrates the automated graphical output of trend for a performance indicator (clearance rate for "offences against the person) generated for a single District Command Unit (South Belfast).



	Apr - Mar Comparison				Trend Analysis
	PFYTD	FYTD	+/- Relative	DCU Target	+/- Trend
Nr of Occurrences	2400	2400	0.0%	-20%	not evaluated
Clearance Rate	33.75 %	63.75 %	+88.88%	48.75%	+30% per year

Figure 5.38: PSNI Performance Management Project: Trend Analysis For "Offences Against The Person" (South Belfast) – PSNI Performance Management Project

This report option uses a pre-specified method of collating, arranging, manipulating and reporting data. The inclusion of algorithms for data comparison on standard or user defined margin parameters allows the user the flexibility to manipulate the model data. The "what-if" capabilities operated on adjustable parameters providing data management possibilities which were not previously possible due to the demands which this placed on human resources. The theme of "data management" re-emerged during the implementation of the risk management solutions for BAA (MATRA) and PSNI (Operational Risk). The previous employed manual processing of risk data presented very little scope for effective data management and scrutiny. The two projects were concerned with multi-site responses to, generally, a set of generic risks i.e. common risks. The paper based risk register approach provided however access to only one particular view – the location view. To examine the organisation's global position on a particular risk was a cumbersome task. It involved the collation of all risk organisational registers and the manual interrogation of the data and it's representation in a separate document. The software modelling of the risks allowed the systematic examination of risk data not only by organisation, but also now by risk.

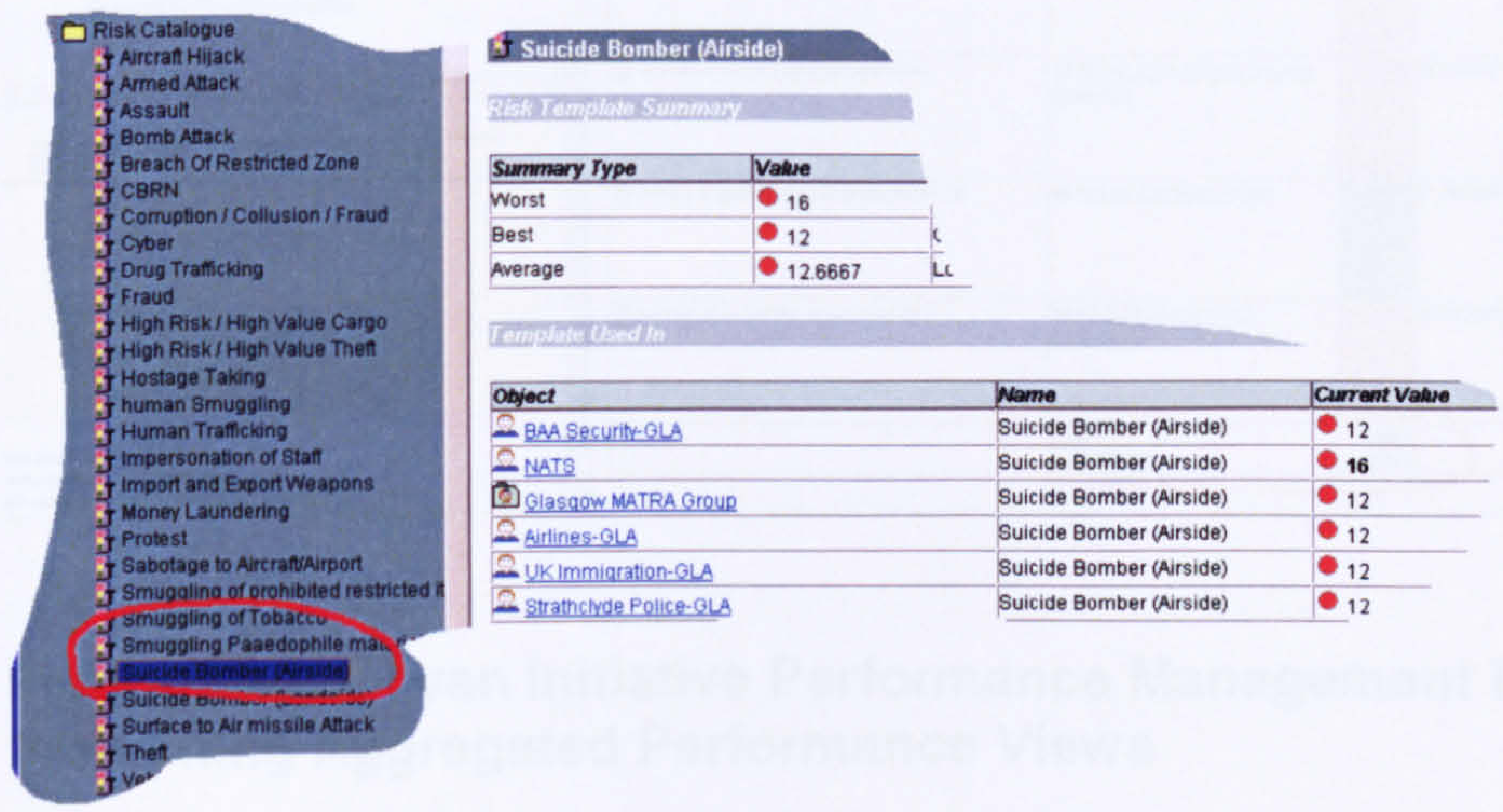


Figure 5.39: BAA MATRA Risk Management Project: The "Risk View" – BAA MATRA Risk Management Model

The figure above illustrates the alternative object based views enabled by multiple element modelling. This addressed the issue of establishing the global position of the organisation against generic risks. This feature satisfies the requirements of central control resources such as the central security management team within BAA or the regional police command resources within PSNI.

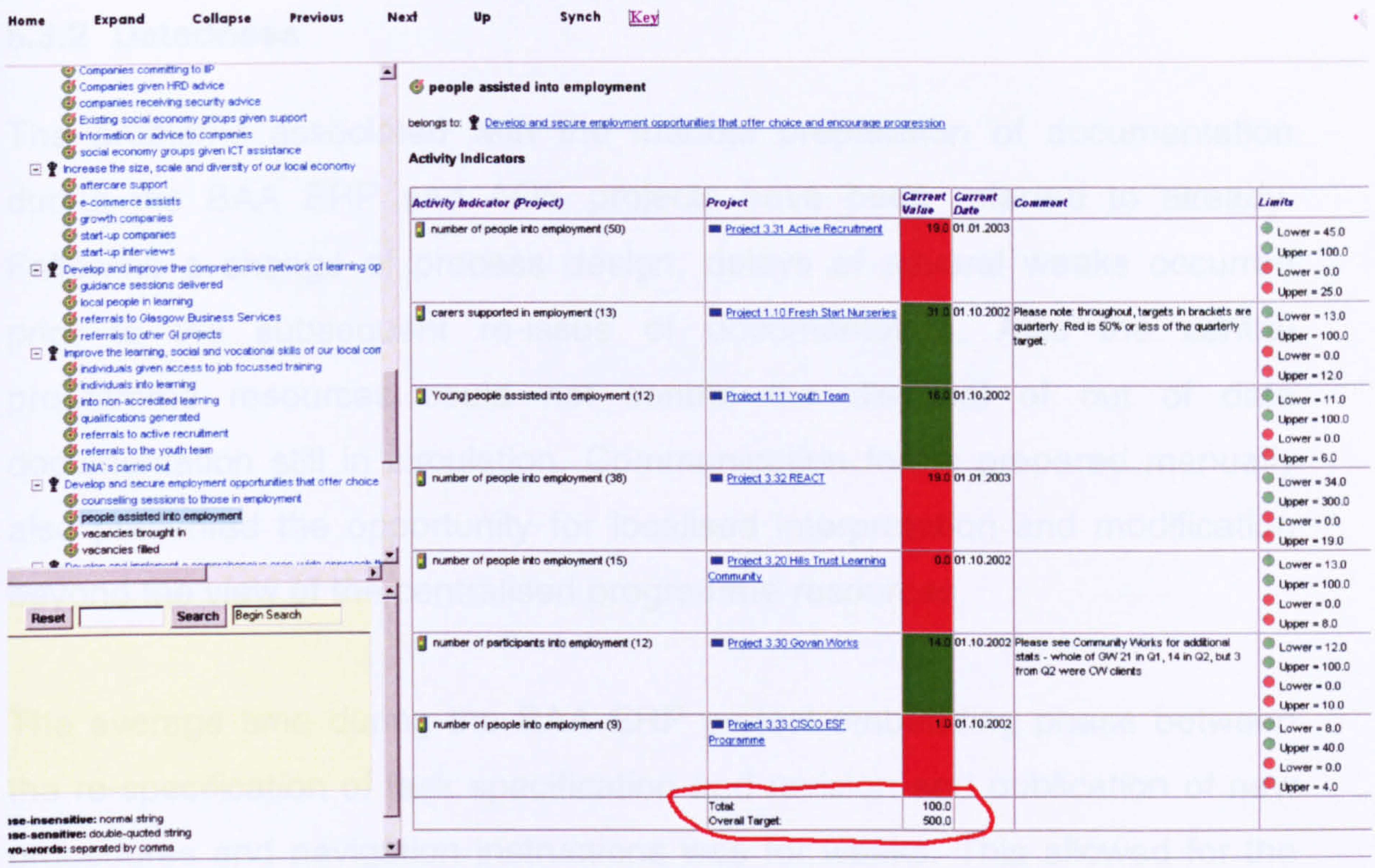


Figure 5.40: Govan Initiative Performance Management Project: Intranet Presenting Aggregated Performance Views

The efficiency of data management theme is continued for all modelled projects as the user responsible for data entry is no longer required always to generate documented reports. The central resource or target audience, subject to access, may generate the report centrally. The result is an elimination of paper based report generation and document handling for internal communication purposes. The continual generation of paper based reports added cost to the previous methods employed and also introduced change control and date quality related issues. The BAA ERP and AOS projects suffered from the inability to integrate documentation sources on a shared basis. All documentation was prepared on a distinct basis, some of which was issued via intranet sources. This did not prevent issues arising regarding the currency of documentation, the control of redundant material in circulation and the limited scope for re-usability and modification.

5.3.2 Datedness

The problems associated with the manual preparation of documentation during the BAA ERP and AOS projects have been referred to already. Following a change of process design, delays of several weeks occurred prior to the subsequent re-issue of documentation. Also the central programme resources could not control the disposal of out of date documentation still in circulation. Communication forms prepared manually also presented the opportunity for localised interpretation and modification beyond the view of the centralised programme resources.

The average time during the BAA ERP project embedding phase between the re-specification of task specification and revision and publication of new procedures and navigation instructions was for weeks. This allowed for the inadequate resourcing of the business process within the interim period and the occurrence of inconsistencies between locations.

The uniform ordering process project of PSNI employed a different approach to the documentation and publishing of process information. The organisation exploited the software functionality to re-engineer the uniform ordering process and simultaneously control the reference information available to the user community, in this case the entire complement of uniformed staff (approximately 7000).

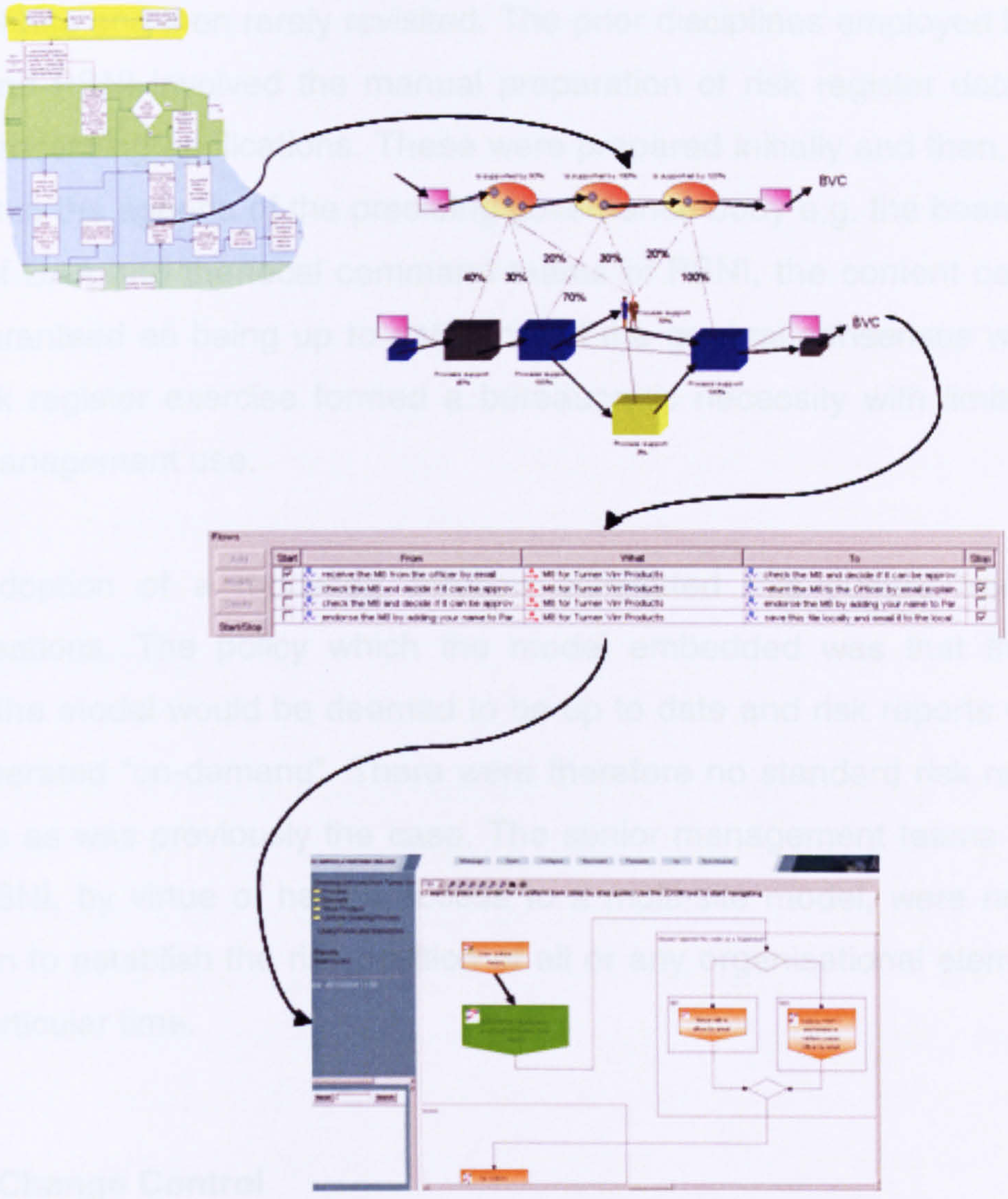


Figure 5.41: PSNI Uniform Ordering Process Project: Process Re-Specification Procedure And Documentation Publication

This translation of process re-specification form a graphical flowcharting exercise through to software model re-engineering and documentation publication took on average 1-2 days typically for minor modification changes. In addition, as the documentation was intranet based, no issues arose relating to the circulation of outdated material.

The theme of datedness of data also emerges as critical conceptual issue for risk and performance management projects. A key criticism of risk management disciplines in organisations is that they are completed at an initial phase and then rarely revisited. The prior disciplines employed by both BAA and PSNI involved the manual preparation of risk register data using word processing applications. These were prepared initially and then, unless subject to the agenda of the presiding governance body e.g. the board in the case of BAA and the local command teams of PSNI, the content could not be guaranteed as being up to date. In fact the general consensus was that the risk register exercise formed a bureaucratic necessity with limited real time management use.

The adoption of a modelled solution eliminated this culture from both organisations. The policy which the model embedded was that the data within the model would be deemed to be up to date and risk reports were to be generated "on-demand". There were therefore no standard risk reporting periods as was previously the case. The senior management teams of BAA and PSNI, by virtue of having access to a multi-site model, were now in a position to establish the risk position of all or any organisational elements at any particular time.

5.3.3 Change Control

The theme of change control relates to points made previously relating to documentation communication and in particular its control and publication. The manually documented ERP and AOS projects of BAA failed to sustain reliable process documentation post go-live due to locational variations and changes. The time taken to effect changes to documentation, re-publish and the continual cost considerations associated resulted in the task often not being sustained. Changes to reference documentation were not easily controlled as again the complexities of controlled publication of policy and process template material were such that the task was often not completed. The resultant non-compliance and variation of application resulted in the extension of the programme implementation support beyond that which would have been required had effective change control of business process specification been enabled.

The BAA MATRA risk management project avoided this problem by utilising a software model to record and control all operational risk data and act as the control source for all reporting. All hardcopy documentation was deemed out of date within 24 hours of its generation. This policy protocol placed an inescapable onus on the data owner (departmental head or DCU Commander) to maintain the risk data within the model.

5.3.4 Re-usability

The theme of re-usability continually emerges from the projects concerned. The BAA ERP and AOS projects were limited by the method of documentation employed i.e. manual preparation of activity schedules, transition plans, risk registers, process specifications. These were all re-usable as separate locations were able to re-employ document templates from other locations; however the absence of their presence within an integrated process model restricted the validity of the documentation as a reliably consistent source for programme control.

Re-usablity of documentation and project data is an important concern. Its importance is related to the complexity of the model and the volume of data. The PSNI and Govan Initiative performance models and the PSNI and BAA risk management models illustrate the value of re-usability as provided by software solutions as distinct from the use of manual methods of data and model management. As changes are made to business process specifications, performance management frameworks or risk management frameworks, the documentation and management models must respond to reflect these changes. Within the extents of the cases examined the capacity for the cases which employed software modelling to cope with changes and re-document the outcomes was much greater and achieved the aim with greater efficiency and greater quality than those projects which used manual methods of documentation and communication.

Re-usability, the extent of, forms a measure of the efficiency of the model and also provides a basis for consistency and quality control. The PSNI uniform ordering process employed a structured approach to modelling the supported flow of activities. The arrangement of process data in this way allows for the re-use of object collections for re-design.

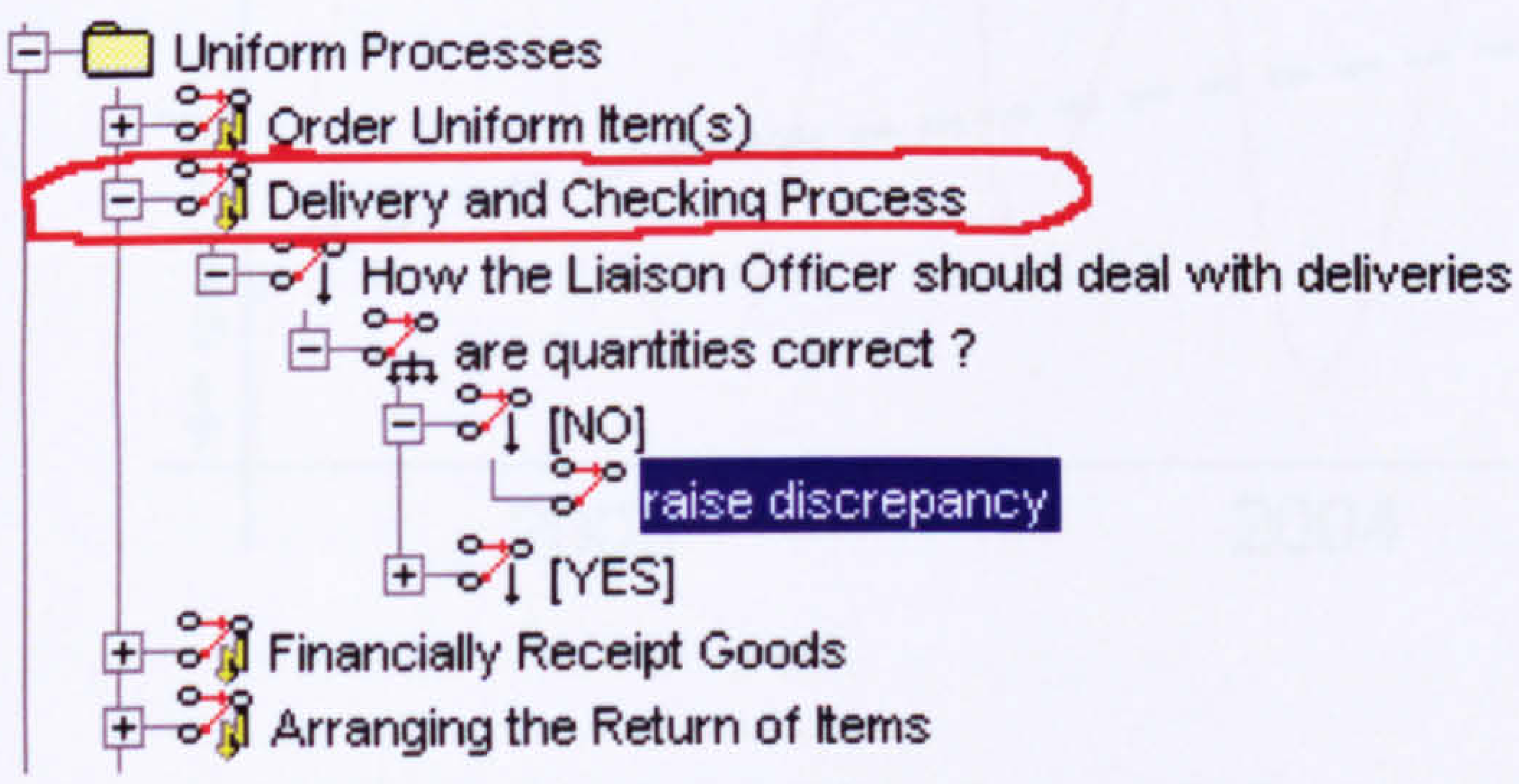


Figure 5.42: PSNI Uniform Ordering Process Software Model - "Delivery and Checking Process"

The above figure illustrates the isolation of an object collection which can be re-engineered separately from the rest of the model or extracted for re-use within another model. The same philosophy can be applied to the re-use of performance or risk management models following changes to either organisational hierarchy or framework alteration.

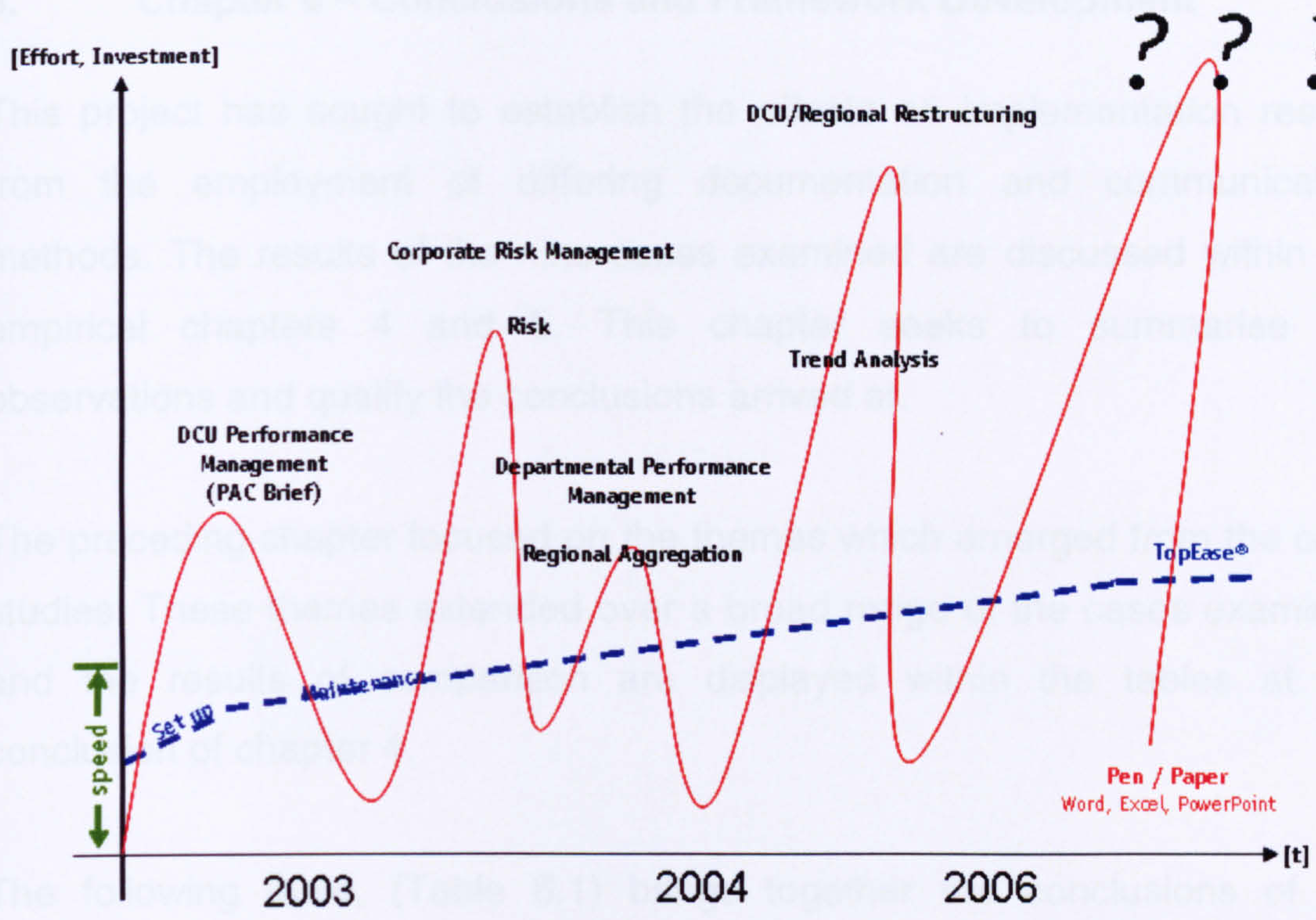


Figure 5.43: Sustainability through Software Modelling

The base PSNI performance management model which contained references to organisational structure, organisational aim, strategies, targets etc. has been continually re-used to address subsequent corporate development challenges. On each occasion the model has been either re-used and extended or used as a template for scenario development and the impact of the change on the resources of the organisation has been smoothed out. The model now forms a basis for accommodating the change specifications emerging from future compliance or internal change related criteria, perhaps as yet of unknown nature.

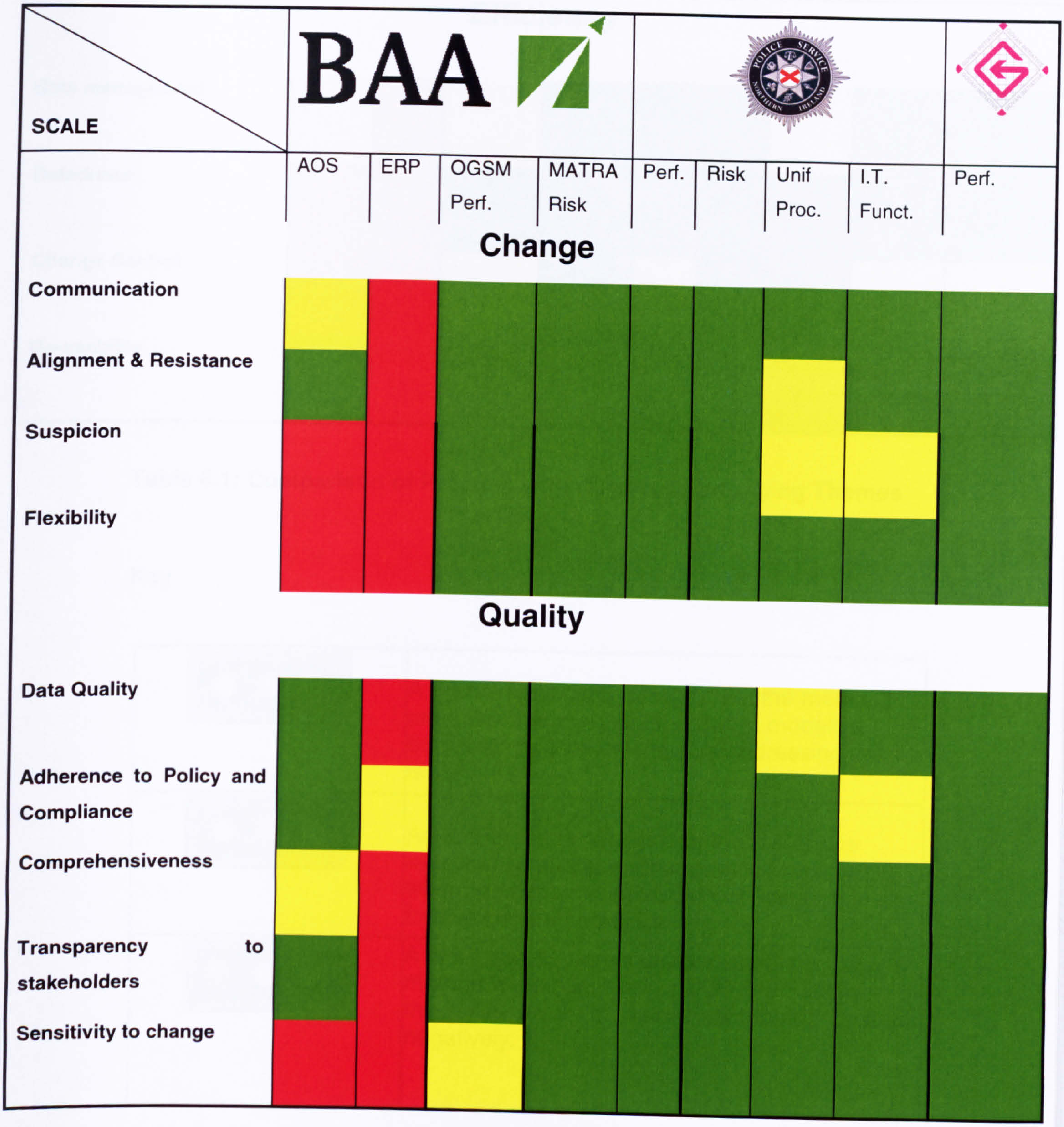
This concept is explained above under section 5.1.4 Flexibility to which it relates closely.

6. Chapter 6 – Conclusions and Framework Development

This project has sought to establish the effects on implementation results from the employment of differing documentation and communication methods. The results of the nine cases examined are discussed within the empirical chapters 4 and 5. This chapter seeks to summarise the observations and qualify the conclusions arrived at.

The preceding chapter focused on the themes which emerged from the case studies. These themes extended over a broad range of the cases examined and the results of comparison are displayed within the tables at the conclusion of chapter 4.

The following table, (Table 6.1) brings together the conclusions of the discussions so far relating to the comparison of project characteristics. Each project is scored using a traffic light for comparison. The table reflects the impact that the method of implementation and supporting documentation forms have made.


SCALE
BAA
AOS
ERP
OGSM Perf.
MATRA Risk
Perf.
Risk
Unif Proc.
I.T. Funct.
Perf.
Change
Communication
Alignment & Resistance
Suspicion
Flexibility
Quality
Data Quality
Adherence to Policy and Compliance
Comprehensiveness
Transparency to stakeholders
Sensitivity to change

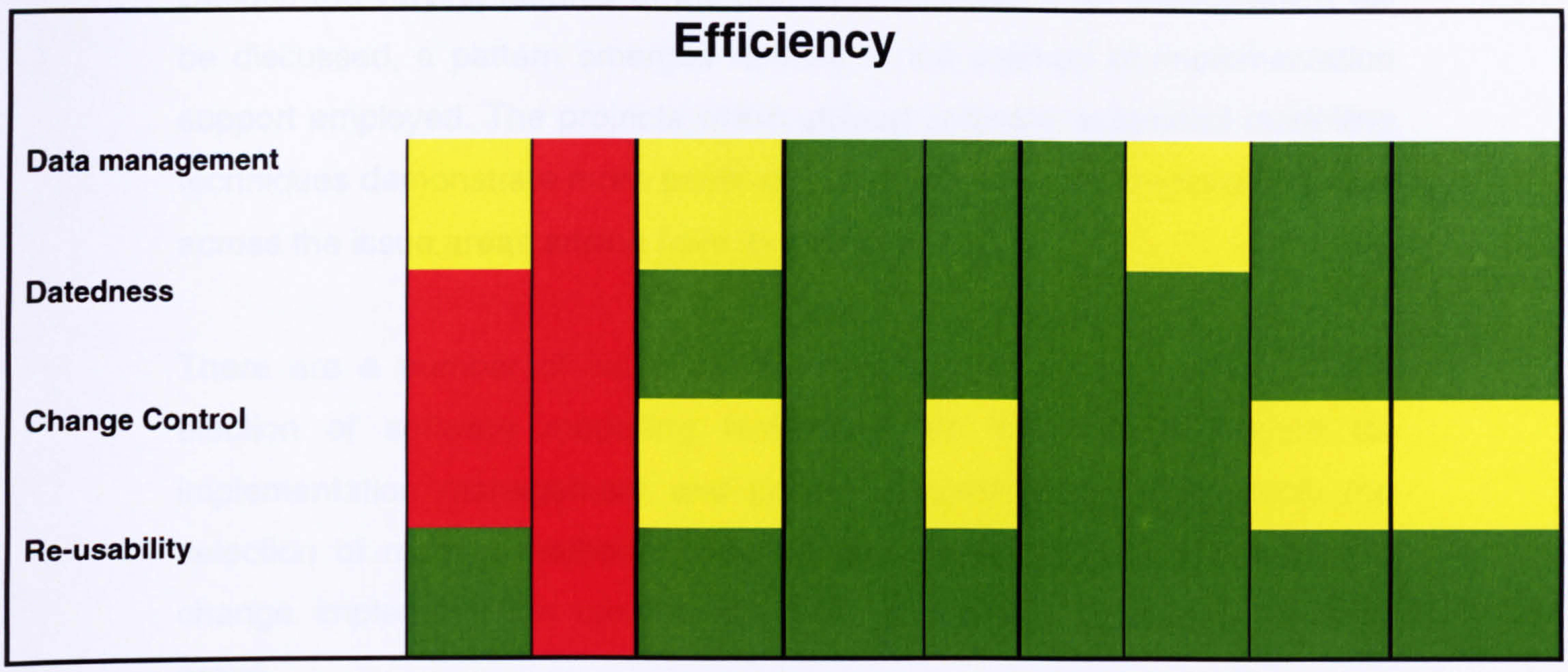
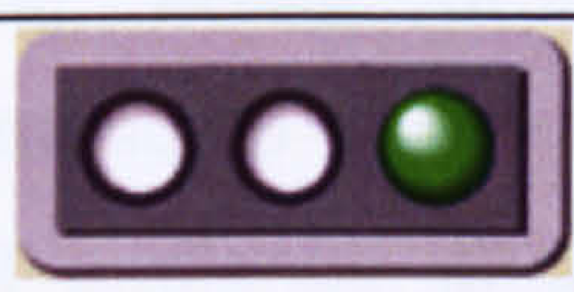
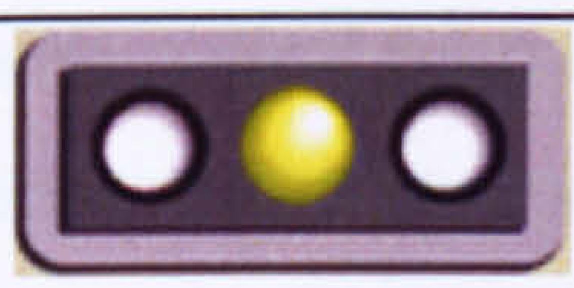
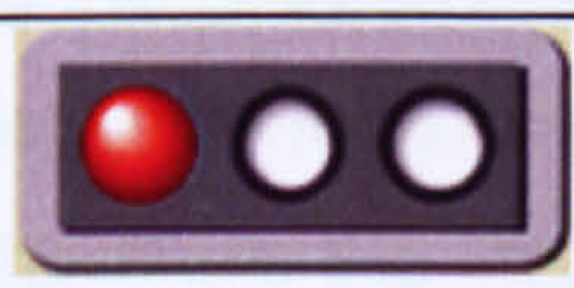


Table 6.1: Comparison of Projects with respect to Emerging Themes

Key

	A green result demonstrates that the methods used whether manual or software modelled contributed positively towards addressing each issue area.
	An amber result reflects that the result was reasonably neutral for that particular issue or where perhaps the issue did not feature heavily for that particular project.
	A red result demonstrates that the chosen method either did not facilitate the mitigation of the issue areas or worse contributed to them negatively.

Despite the varying natures of the projects examined – an aspect which will be discussed, a pattern emerges relating to the method of implementation support employed. The projects which utilised software supported modelling techniques demonstrate more positive results with respect to implementation across the issue areas arising from the themes.

There are a number of issue areas which benefit considerably from the election of software modelling techniques as the chosen method for implementation management and project documentation. Conversely the selection of manual methods, most notably within the BAA ERP process change implementation can be cited as contributing negatively in many areas.

There is considerable evidence provided by the cases that the exploitation of a software model can improve the capacity to communicate effectively throughout the duration of the project. The ability to examine the model to varying levels of granularity enables the implementation team to communicate effectively on the basis of related data sets to the appropriate target audience at the appropriate time. The modelling of dependencies included within the PSNI corporate development model enabled the implementation teams associated with a progression of business changes to demonstrate to the senior team the change requirement and the resourcing implications. This aided alignment of the leadership. Achieving alignment during the BAA ERP implementation was not as easily or quickly achieved as the dependencies relating to process change were not immediately apparent and therefore the impact on resources had to be examined and explained in greater detail through a process of business case development and approval.

Prior to the undertaking of the change process there may be suspicions amongst the stakeholders with respect to the motivations of the organisation. Resistance may emerge as a defence to change until such times as the stakeholders are comfortable with the implications of the change. Such suspicions can be allowed to fester in the absence of a transparent and easily understood footprint for the future of the organisation. This is difficult to convey efficiently using manual methods of documentation as the "Big Picture" is never apparent in a way that also allows scrutiny of the detail. Software modelling allows the information needs of stakeholders to be accommodated throughout the duration of the project such that there is visibility between the compliance conditions e.g. requirements, objectives, legislation etc. the business processes to be employed and the supporting resources landscape which must be maintained.

Throughout the course of a change programme implementation activities are developed around a vision of a new way of working. Invariably conditions impact upon this vision or the vision itself evolves. The changes may be generic or may relate to a localised operation. In order to accommodate such change the methods employed to support the implementation must incorporate scope to quickly and efficiently reflect the change of specification. At the same time the changes must be controlled within the context of the overall programme and the impact on programme and organisational resources reflected. Again, use of manual methods can introduce risks associated with validation of changed processes. The appropriate impact of organisational resources both Human and Technical may not be as easily reflected as when using software supported models. Failure to accurately reflect and accommodate the impacts of changes throughout the course of the implementation expose the organisation to mismatching the process design with the organisation design, not achieving the vision and not realising the business benefits forecast.

Software modelling unsurprisingly presents a more flexible method for the management of data. With regard to change programmes this is also significant. The capacity to manage data sets from other management information sources not only reduces resource impacts but also provides a validated basis for future business process design. The PSNI ICIS, Uniform ordering projects and the Performance and Risk Projects of BAA demonstrate the value of establishing linkage to data sets upon which changes to future specification can be based. This means that specifications are optimised by re-using previous data architectures and therefore accelerate the development process.

The cases were selected for study on the basis of their contrasting ***and*** common parameters. These parameters were identified as significant in that they would enable the comparison of results to establish whether or not they provided a basis for method selection for programme implementation. The variable parameters which the projects display are threefold:

6.1 Complexity, sector and scale.

6.1.1 Complexity

The figure below illustrates the relative position of the projects within a plot of resource intervention i.e. extent of human resource involvement against technical complexity. "Resource Intervention" relates to a measure of the number of people involved within the project implementation as system or process users or as target audiences of the projects. "Technical Complexity" refers to a measure of the extent of technical support required to enable the implementation and the extent of data and information management associated with the implementation. This includes complexity of task completion in addition to the inclusion of IT hardware and applications.

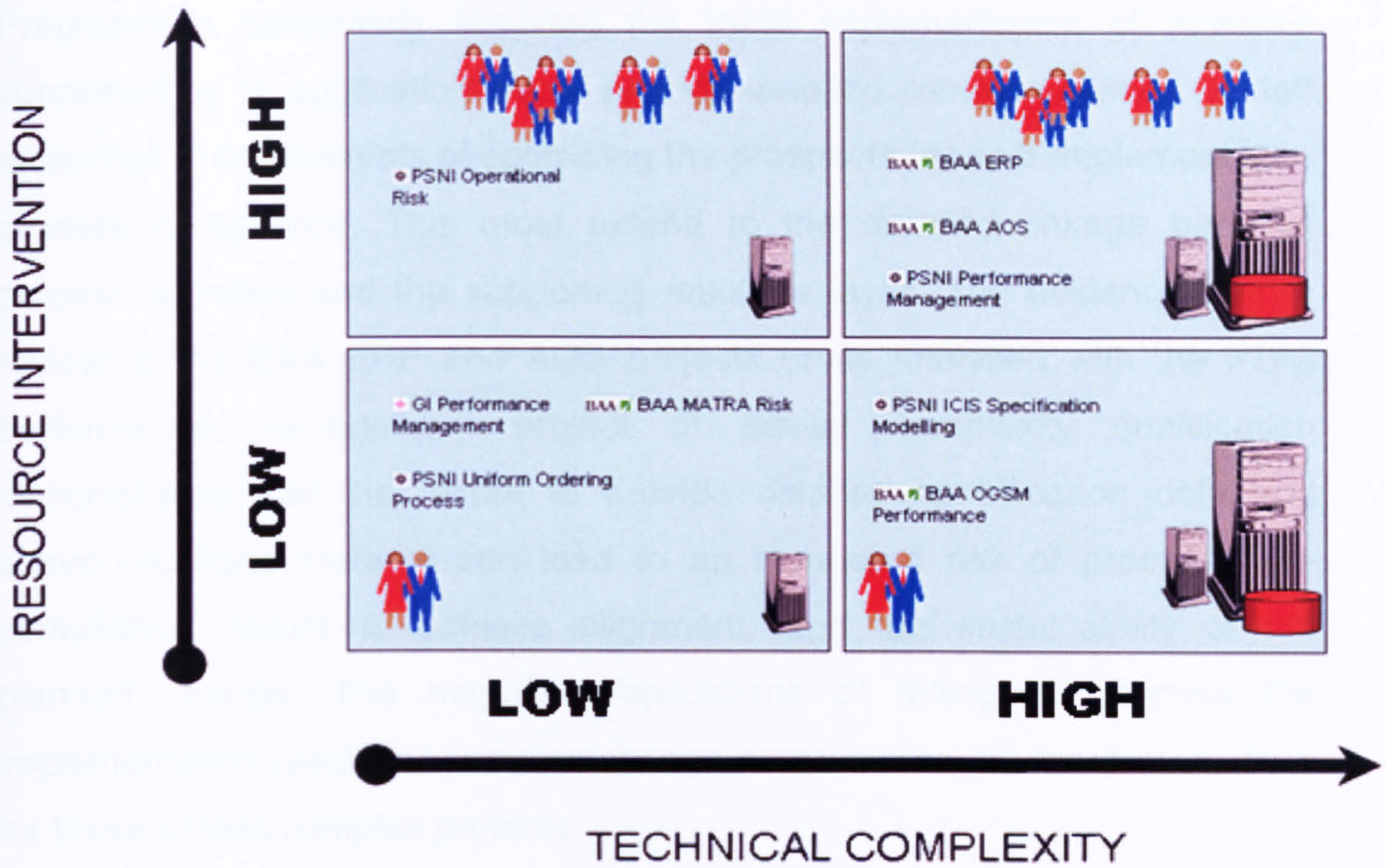


Figure 6.6.1: Distribution Of Case Projects Plotted Against Technical And Resource Complexity

The evidence obtained by this project demonstrates that significant benefit can be achieved by an organisation by documenting object relations via a structured modelling method supported by software. Furthermore the evidence extends to demonstrate that projects of high complexity are likely to benefit most by the adoption of software supported methods. The evidence also demonstrates that projects of high complexity are most at risk from the limitations of manual methods of documentation. Many of the issues detailed within the empirical chapters which emerged during the implementations are attributable to the method of documentation and communication. The challenge faced by large organisations in detailing and communicating the relationships between activities and supporting resources for example is such that a sustainable solution responsive to change is likely to be more conducive to long term implementation success.

Programmes particularly requiring the rapid implementation of activities supported by IT applications must provide detailed communications to staff resources in the interests of optimising the prospects for post-implementation process compliance. This must extend to the detailed linkage between process activities and the supporting resource layer. The evidence from a review of the BAA ERP and AOS projects cross analysed with the PSNI performance management project of similar complexity qualification demonstrates that the failure to provide detailed specification data and communications material can lead to an increased risk of process non-compliance, failure to achieve alignment, and the sustainability of the planned change. The negative implications of failing to optimise the implementation results of complex change programmes are more acute than for those of less complex projects.

The resultant costs in programme delays, forced deferral of business benefits and continual re-documentation and communication of detail to a wide audience are significant in the face of often considerable capital outlay. The initial investment in software model construction and specification of client communication options in real terms merits considerable consideration as a best practice method of mitigation against the risks referred to earlier.

COMPLEXITY	BAA								
	AOS	ERP	OGSM Perf.	MATRA Risk	Perf.	Risk	Unif Proc.	I.T. Funct.	Performance
Technical Complexity	HIGH	HIGH	HIGH	LOW	HIGH	LOW	LOW	HIGH	LOW
Resource Complexity	HIGH	HIGH	LOW	LOW	HIGH	HIGH	LOW	LOW	LOW
Overall Complexity	**H**	**H**	**M**	**L**	**H**	**M**	**L**	**M**	**L**

Table 6.2: Relative Complexity Assessment For Case Projects

There is also evidence within the consideration of the emergent themes which establishes a case for the application of software models for projects of high data complexity regardless of the human interface variable. The ICIS specification project was transformed by the movement from manual documentation methods to software supported methods. The inclusion of data interfaces increased the quality of the specification process and also of the ICIS application development process.

The performance management projects of BAA and PSNI share the characteristics of complexity of numerous target audiences and wide user community. The manual approaches employed originally threatened the sustainability and profile of the performance management frameworks. The implementation of structured models supported by software has enabled the re-generation of the performance frameworks in each organisation as a high profile management tool. The PSNI project in particular evolved to exploit the possibilities of software modelling and extend the reporting portfolio considerably. This has resulted in the embedding of a more highly educated culture of performance management.

6.1.2 Sector

This project also set out to establish the impact of implementation methods on projects of different and similar type undertaken within different organisational type; specifically to establish a comparison between public and private sector. This is the second of the variable properties which can be used to categorise the combination of projects and organizations.

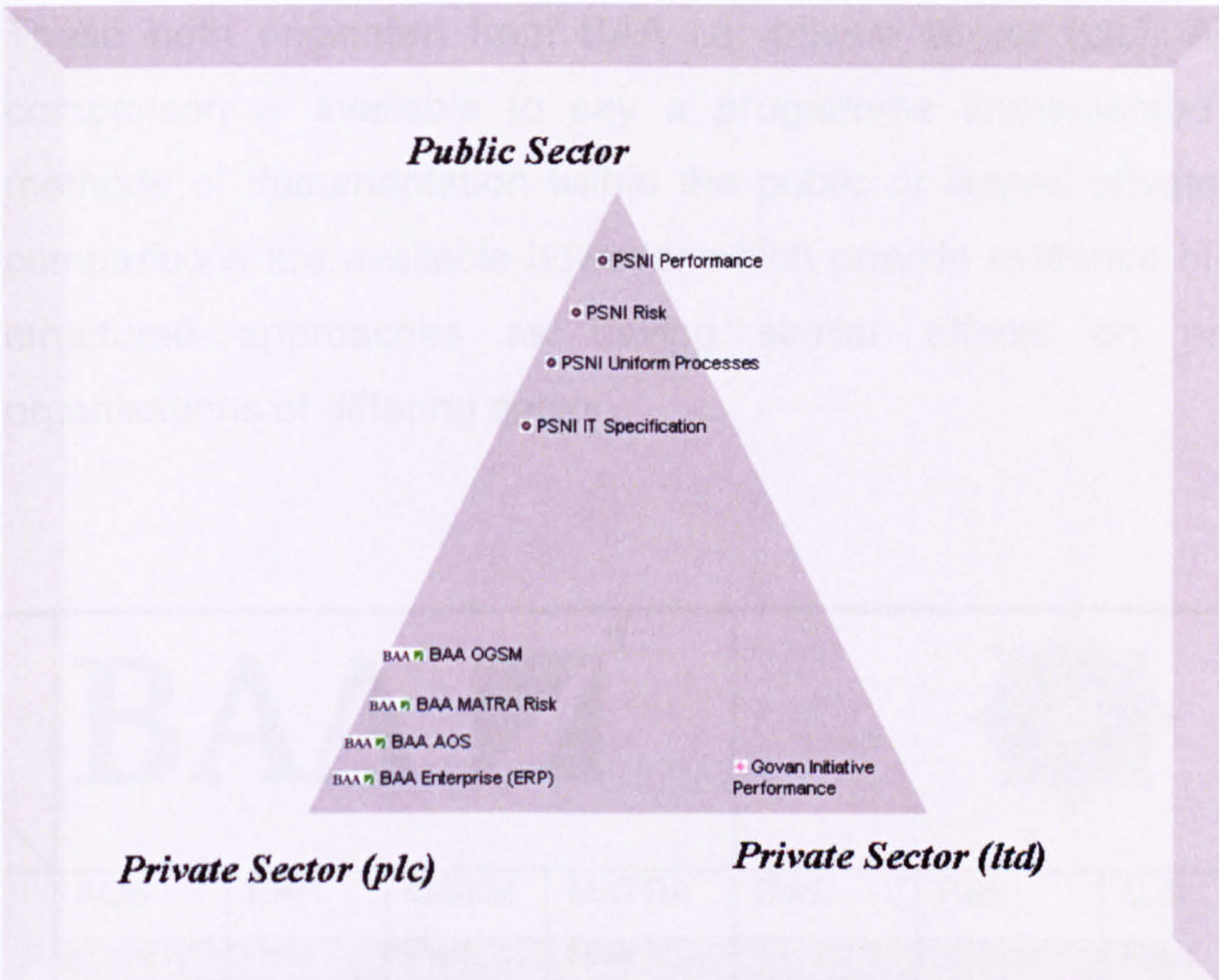


Figure 6.2: Sector Distribution Of Case Projects

The figure above illustrates the sector distribution of the projects examined. The cases analysed provide little evidence that the implications methods of documentation and communication methods employed are influenced by the consideration of sector. The performance management and risk management projects of BAA and PSNI bear direct comparison and demonstrate similar results both before and after the implementation of a modelled solution supported by software. These projects demonstrate significant success in quickly achieving alignment across a wide target audience base and the sustaining of that alignment on the basis of consistent and on-demand communications. What cannot be established by the examination of the case study evidence is the converse condition i.e. what effect does the sector (public or private) have on change programmes which employ manual methods of documentation and communication.

Within the portfolio of projects included within the study were two which employed manual methods of data documentation and communication. These both originated from BAA i.e. private sector (plc). As a result no comparison is available to say a programme implemented with manual methods of documentation within the public or limited private sector. Valid comparisons are available however which provide evidence of the impact of structured approaches as having similar effects on projects within organisations of differing sector.

SCALE	BAA								
	AOS	ERP	OGSM Perf.	MATRA Risk	Perf.	Risk	Unif Proc.	I.T. Funct.	Performance
Sector	Private (plc)				Public				Private (ltd)

Table 6.3: Sector Classification for Case Projects

6.1.3 Scale

The final distinguishing parameter which can be used to qualify the projects undertaken and be used as a consideration for method selection is scale. Used in this context the term relates to the scale of the undertaking generally and includes a consideration of the number of people involved and the also the range, volume and diversity of data which has to be managed during the implementation of the solution.

The figure below illustrates the relative scale of the project and has been derived by the consideration of capital outlay, size of population directly involved and data characteristics.

The table identifies the scale criteria.

SCALE	BAA								
	AOS	ERP	OGSM Perf.	MATRA Risk	Perf.	Risk	Unif Proc.	I.T. Funct.	Performance
Capital Outlay	£0.4 M	£1.2 M	£0.2M	£0.15M	£0.35 M	£0.15 M	£20K	£10K	£20K
Population Involved	400	1200	80	120	350	350	6000	10	300
Data Diversity	LOW	HIGH	HIGH	LOW	HIGH	LOW	LOW	HIGH	HIGH
Data Volume	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	LOW	LOW	HIGH

Table 6.4: ***Relative Scale Indicators For Case Projects***

Notes:

The capital outlay figure quoted relates to local capital expenditure. This is assessed as the best financial indicator of implementation scale.

The population involved is an assessment of the system users and also includes target audiences.

Data Diversity relates to the range and scope of data management features accommodated by the technical solution.

Data Volume relates to the volume of data managed routinely by the technical solution.

In terms of conclusions relating to the impact of project scale on the selection of implementation method it is the writer's view that small projects i.e. those projects which require low capital outlay, for a small population, which requires the management of a low volume of non-diverse data may not benefit as greatly from the application of software supported model techniques for documentation and communication. However none of the cases examined fell into this category. The writer argues that all of the change programmes implemented qualify to lesser and greater extents for the consideration of software supported modelling techniques as a preferred method to manual methods.

The writer concludes that the critical parameters which should be used to determine whether or not a modelled approach merits the investment of time, training and resource allocation are complexity (combined assessment of data technical complexity and resource complexity) and scale (capital outlay, involved population, data diversity and data volume). The extent of capital outlay suggests complexity but does not necessarily result in complexity. The performance management project of Govan Initiative required a solution equally as complex, both in terms of the data management functionality and population characteristics as the PSNI performance management project, yet was delivered for less than 6% of the cost (due to volumes of application software roll-out and server provision). Also the IT functionality (ICIS) project required a solution to handle complex forms of data and was delivered for a relatively low capital outlay and impacted on only 10 staff.

Of the cases examined the most powerful results delivered attributable to the modelled approach employed were the performance management projects of BAA, PSNI and GI. The high data complexity and high volumes involved would not have been sustainably supported by manual documentation methods. The evidence from the BAA ERP project demonstrates the limitations and time constraints associated with manual documentation and communication of object relations (process activity and supporting resources). The resultant frequency of non-compliance of process compared with the uniform ordering process of PSNI illustrates the case for a more detailed, re-usable format for system usage documentation.

6.2 Referring to the Literature

6.2.1 BPR

The literature recognises the existence of a relationship between BPR and IT. IT can be regarded as the driver or the enabler (Sillince and Harindranath 1998) of business process change programmes. "IT induced Business Reconfiguration" (Venkatraman, 1991) and Hammer, 1990 emphasised the centrality of IT whereas the "systems view" expressed by Beer, 1994 advocated the dominance of process. Regardless of the design initiation approach the fact remains that a relationship between the process activities and the supporting IT roles and functionality exists and required to be articulated. IT constitutes an important factor in BPR (Baskerville and Smithson, 1995; Coghlan, 1998; Fiedler et al; 1995; Talwar, 1994) but cannot alone transform a human organization (Baskerville and Smithson, 1995; Willcocks and Smith, 1995). This further confirms the co-dependencies of process and organisational design and IT and as such the requirement for comprehensive documentation in a sustainable format. The existence and importance of the relationship is therefore established. The complexity of the solution for documentation now becomes a consideration of the practitioner and must be based upon an assessment of the complexity of the relationship, the rate of change of process relationship detail which conveys the sustainability challenge and the capacity of the organisation for managing the task.

The criticality of alignment is made by the literature. The unitary perspective (section 2.3.2.6 p. 65) identifies further the importance of establishing an aligned and shared view of post implementation working (Willmott, 1995). The capacity to achieve this will rely on a number of factors including the ability to communicate the specification of the post transformation state to the stakeholders. The significance of communication emerged continuously as a theme from the cases studied. The case is made well therefore for the importance of communication attributes during the selection of implementation methods and supporting tools.

The complexities associated with the establishment of autonomous teams and empowerment also contribute towards the selection criteria consideration for implementation methods. The significant deviation from conventional personnel management practice (Kettinger and Teng, 1998; Armistead and Rowlands, 1996) is confirmed by the findings of the study of BAA's ERP implementation. The failure of the organisation to establish the prescribed organisational design across the organisation for the business planning activities and the subsequent redefinition of the line manager role in the light of the non-compliant activities of the corporate office functions emphasise the case for comprehensive definition and documentation during the pre-implementation communication and training phases. The literature identifies the propensity of practitioners generally to underestimate the challenge of establishing the intellectual rationale for BPR with the organisational resources. The "fad that forgot the people" (Davenport, 1995b) reinforces the repeated failing of BPR projects or at least the identification of the risk posed by the failure to relate the organisation to the process transformation objectives in a sustainable manner. The assumption that IT alone leads to effective information flow is highly questionable (Baruna and Ravindran, 1996) is confirmed by the BAA ERP experience. The arising post-implementation issues were not technical in nature. Pre-Go-Live successfully mitigated these, however as robust as the data flows were at the technical level, BAA failed to establish (initially at least) the appropriate organisation to ensure "effective" data flow. Variances between locations in who was responsible for the completion of which activities exposed the inadequacy of the documentation methodology. The manual documentation of role profiling was proved to be lacking in sufficient detail and when required to be changed, found also to be inflexible, slow to the point of being ineffective and costly. Barua and Ravindran (1996), in recognising the need for alternative facilitating mechanisms that go well beyond the capabilities of technology for effective information sharing and decision making. The exploitation of software during the pre-implementation and process design phases of the BAA AOS programme and the PSNI uniform ordering process project refer to activities just such as those. These two projects demonstrated the added value to be derived from documented processes using software supported graphical means. The uniform ordering process project extended the use of software to the preparation of a model which related not just activities to each other but also specified activity-IT relationships.

BPR is criticised in the literature as if office politics "do not, should not or will not exist in the reengineered organisation" (Grint and Willocks, 1995). The literature also refers to the political influence of IT (Scarborough and Corbett, 1992). This view is supported by the evidence from the BAA ERP implementation. However the projects which employed modelled methods for specification design and documentation did not experience the same levels of implementation resistance and post-implementation organisational complications. The conclusion therefore is that it is not necessarily BPR which glosses over the depth of value placed upon politics but more perhaps the methods of implementation employed, including the methods of documentation and communication.

The literature for BPR includes the advocacy of a systems approach for combing BPR and TQM (Lee and Asllani, 1997). This recognises the prospect for process modification and systems integration on a continual basis. The identification of a requirement to build-in sensitivity to changing circumstances and needs is consistent with the emerging theme of sustainability. Post implementation, there will at some stage be a requirement for the organisation to modify the process system, whether it be functionality, organisation design or process activity. The implementation method therefore must extend beyond the initial transformation and provide a basis for continuous improvement. The PSNI uniform ordering process which employed a software supported solution to model activity-IT relationships demonstrated that this is a feasible and highly effective way to achieve this particular objective. The framework related projects such as the performance management and risk management projects also demonstrated this sustainability advantage. As frameworks have a tendency to change according to circumstances such as evolving targets from one year to the next, the capacity to make subtle, or not so subtle changes to a validated framework structure allows for the rapid refinement of documentation and communication material.

Dutta and Manzoni identified sustainability as a key challenge of BPR projects. The failure of organisations to sustain performance improvement suggests that following implementation one of two things has occurred. Either the organisation is no longer practising the prescribed way of working and as a result is not enjoying the benefits initially achieved, or circumstances have changed. In turn this recognition establishes a case for a focus on implementation methods which can offer the added benefit of supporting sustainability. The BAA ERP project failed to react in both the pre and post implementation phases of the programme to changing circumstances, specifically preferred OD design. The PSNI uniform ordering process in contrast which used a software model for specification and documentation frequently re-specified the planned activity flows, organisation design layer and IT specifications for the project. This allowed the rapid development and implementation of the project.

6.2.2 Managing Change

The sustainability characteristic is also identified within the change management literature. Tushman and Romanelli's (1985) punctuated equilibrium model of change emphasises the discontinuous nature of change. Long periods of small incremental change are interrupted by brief periods of discontinuous, radical change. This observation highlights the continual change in specification of the process/support layer relationship. If the organisation wishes to affect a smooth process of transition then these relationship changes must be effectively identified and communicated on an ongoing basis. As a "business as usual" process in its own right, managing ongoing transformation should employ consistent procedures and supporting tools. Whether the change is incremental, radical or continuous, the organisation requires to document and communicate the relationships between processes and supporting resources and often to other object based model data such as targets, strategies and higher level requirements. There is now a compelling case for organisations to establish a comprehensive best practice framework for process and organisation design relationships, extending to include detail relating to supporting IT functionality. The case is built upon the increased reliance of organisations on IT and the frequency of changing parameters and circumstances such as market priorities and external factors to the point that process change is accepted as a continuous process.

The literature refers to the value to managers of exploring the future by experimenting with a wide variety of low-cost probes (Brown and Eisenhardt, 1997). The manual methods of documentation employed by BAA during the ERP project did not allow for such speculative design. The more detailed flowcharting methods employed during the AOS project increased the flexibility for modelling variations of activity flow but did not extend to the alternative definition of process layer-support layer relationships. The PSNI uniform ordering process project did include and exploited this capability. Changes to organisational design and IT functionality were captured within an integrated software model which allowed for the rapid consideration and re-specification of process. If charismatic and visionary leadership require the articulation of a vision, fostering the acceptance of group goals, and providing individualised support (House, 1995) then it follows that the more effective the method of system modelling and communication the more effective will be the eventual implementation. If effective leaders are challenged with changing the basic values, beliefs, and attitudes of followers (Podsakoff et al. 1996) then it is implied that the leaders must communicate beyond simply a renewed process specification but must integrate this process model within a comprehensive organisational model inclusive of overall objectives and vision. The big picture is required to convey the appropriate breadth of relationships in order to achieve such change of belief. The literature regarding transformational change extends this subject. Ford and Ford (1994) establish that leaders create change by providing a vision that is attractive to followers rather than creating dissatisfaction with the status quo. The practical implications of achieving this however are significant. A variety of new business objects appear now, all of which must be related. At the same time the model must be easy to understand and transparent. The PSNI and GI performance management projects achieved this by building top to bottom integrated software models. The foundation elements emerged from the organisational vision and overarching aims, extended through strategic priorities related to targets and concluded with the mapping of KPI's to measured organisational units. The provision of a validated object related model established the intellectual rationale for all activity and the reference base for all performance data. Without this, as was the case for the AOS and ERP projects undertaken by BAA there is a void of justification which leads to speculation and a divergence of views.. Subsequent failure to align the efforts of constituent parts of the organisation leads to inconsistent implementation and non-compliance of defined process. The capacity of software modelling to reflect possible future scenarios contributes positively to transformational leadership as leaders may not need to create dissatisfaction with the present, but instead provide a vision of a possible future that is attractive and engaging (Kouzes and Posner, 1988). The PSNI uniform ordering process achieved this by allowing the modelling of extensive detail at the planning stage prior to communication to an established audience.

Resistance to change is recognised generally as an important consideration during the implementation of business change programmes and emerged as a theme across the range of cases included within this study. The contrast to resistance of course is apathy i.e. the failure of members of the organisation to challenge process or organisational change either because they are not equipped with the appropriate level of detail or are not motivated to challenge. The former was most definitely a feature of the BAA ERP implementation project. Resistance was most definitely perceived as a negative trait and the opportunity for debate and challenge did not feature as an implementation activity – consistent with Rogers's definition 1995 and Waddell and Sohal 1998. Even if it had been encouraged the level of process and related OD detail was not available and nor was there a centralised flexible model which could readily be adapted to reflect any subsequently prescribed changes. The PSNI Uniform Ordering Process project in contrast positively encouraged the challenging of the modelled process, related organisational design and specification of IT functionality. The availability of an integrated model which could be shared across a wide audience contributed positively to the continual refinement of the detail and the alignment of the stakeholders. This supports the views of Mabin et al. 2001, p. 170. For the uniform process resistance did prove a protective function and promoted additional thought regarding the proposed change (Waddell and Sohal 1998).

In fact the writer believes that there is very real evidence to suggest that the impact on managing resistance goes beyond the positive contribution toward development of the system view. By providing detail as the agenda for the consultation exercise, the software model provides a focus for debate which in its absence may descend into an emotion led vacuum, accommodating knee-jerk fears. As such the projects which presented detailed integrated models mitigated the risk of negative resistance during the solutions development and communication phases of implementation.

There is a considerable issue relating to sustainability which in fact underpins much of the entire debate. This thesis has referred to the significance of sustainability with respect to ever more emerging compliance requirements such as legislation, recommendation, reporting requirements etc. There is in fact a growing emphasis on the requirement for sustainability for all change implementation methodologies independent of the compliance environment. The rapid development of commercially available IT supporting applications with enhanced functionality, more efficient operating platforms, IT security enhancements, more powerful infrastructure and increased integration possibilities means that organisations must manage their changes quickly. The competitive edge is maintained by those who can get products to market early rather than by differentiating. This allows the organisation to establish a market brand and capture market share. Failure to implement the organisational changes quickly enough result in higher costs, loss of revenue and brand. Within the public sector and not for profit organisations, the requirement for enabling change systematically and in a sustainable manner increases with the scrutiny to which they are now subject. The growing number of target audiences, the devolution of government authority and regulation impose an onus on the organisation not only to perform to standards but be able to demonstrate results on demand. This requirement alone implies a change to traditional methods and must be facilitated by resources which are invariably more restricted year by year. For economic and political reasons therefore these organisations must develop efficient methods for change management.

Managing change is now becoming established as a business as usual discipline. Organisations must therefore establish a robust and high quality methodology in exactly the same way as they develop methods for financial management, human resource management, operations management etc.

6.2.3 Performance Measurement

The literature regarding performance measurement establishes the importance of attaining a comprehensive view of performance measures to indicate the overall health of the business, which can then be more fully aligned with business strategy (Nanni et al. 1992). This alignment to strategy and overall objectives is a feature which is often absent from organisational performance measurement frameworks. The lack of transparency and connectivity between KPI's and the strategic plan for the business weakens the rationale for performance measurement, devalues the exercise as a basis for ongoing decision making and compromises the profile of performance measurement as a tool to inform future strategic planning (Wilmott, 1996). This point is reinforced by the performance management projects undertaken and reviewed within this study. The BAA OGSM project utilised a static framework of object relations between Objectives, Goals, Strategies and Measurements. The PSNI performance project model established object relations between Overarching Aims, Targets, Strategies and Performance Indicators and finally the Govan Initiative performance management project established a software model based upon object relations between Goals, Strategic Priorities and tracking/performance/activity indicators. This inclusion of the intellectual framework within the model as a base for data structuring and aggregation etc. recognises the significance of the concept promoted within the literature and provides validation for all performance measurement criteria. The transparency which this provides resultantly aligns the organisation with respect to the performance framework which includes the strategic plan. As many organisations adopt the philosophy of strategy informs process, process informs organisation, a well documented and communicated performance management framework will provide the basis for continuous improvement. The traditional manual methods (Excel spreadsheets) employed by BAA, PSNI and Govan Initiative previously did not provide the connectivity to strategy and therefore did not provide the direct basis for intervention. The absence of operational unit connectivity also eliminated the prospect for horizontal comparison or vertical aggregation of results.

Following the implementation of software model solutions the senior management teams of each organisation aligned themselves with the basic object relations e.g. Objectives, Strategies, Targets, KPI's and continued to record performance data, this time according to a transparent and connected model. The rapid communication of the model output enabled by HTML sharing and pre-defined user reports enhanced the profile of the performance management framework and provided a direct feed for strategic assessment and development. The importance of this connectivity feature within business improvement models such as EFQM and those studied within this thesis is emphasised by Gunasekeran et al. (1996) – business improvement models help develop closer links between performance measurement and strategy. Other contributors such as Letza (1996), Neely et al. (1994) and Fawcett et al. (1997) reinforce the significance of this feature.

The themes of consistency and alignment emerge both within the literature and the cases examined with respect to performance management. Franklin confirms the need for efficient relationships between measurements and strategy within rapid changing environments. Long lead times between decision making and strategic formation will result in outdated information and misguided action Bourne et al. (1996). The inclusion of data interfacing within the PSNI performance management system for the crime and incident database (SATURN) enabled the rapid and on demand generation of performance reporting which included linkage to the strategic framework referred to as the policing plan. The consistency issue referred to by the literature is key to establishing alignment. The modelled performance projects of BAA and PSNI provided a solution to this challenge. BAA, with its 7 operational business units and PSNI with its 29 District Command Units required a common data management and data reporting solution. The employment of a structured software model established the required consistency by operating a standard approved set of fixed format reports. In this way all operational units which were required to report in a particular way were fixed by the constraints of the system. The quality or at least the consistency is "built in".

6.2.4 Risk Management

Pettigrew (1994) noted that political processes operated essentially at the micro level. Within the literature review section of this study the point is made that his advocacy for the inclusion of the spectrum of interested parties is supported by the corporate and operational risk frameworks implemented by BAA and PSNI. The BAA MATRA project sought to devolve risk management responsibility and data management to the local level. The PSNI risk management project sought to devolve the responsibility for risk management to DCU (District Command Unit) level. Glendon and McKenna (1995) highlight the risk of confusion posed by the recursive nature of terms such as "assessment", "analysis", "hazard" etc. In order to avoid this confusion an organisation must establish a standard code of reference; a framework. The framework is a model which defines the parameters and disciplines of the risk management philosophy. It articulates the meanings of terms and the limits for assessment and documentation. BAA and PSNI both developed such frameworks at cost, employing best practice products procured from Deloitte & Touche coincidentally in both cases. The practical implementation of the framework model, in a manner which embedded consistent pan-organisation risk data management and reporting was achieved by a software model. Restricting the data entry and report formats within the confines of a software model, as with performance management frameworks, establishes a quality control mechanism, eliminating sources of variation.

6.3 Software Modelling Considerations

Considerable reference has been made throughout this study to the almost entirely positive impacts of software modelling to the implementation of the project cases examined. This section sets out to identify the challenges associated with this technique and establish the circumstances which may challenge its adoption as a preferred method.

6.3.1 Capital, Revenue and Other Resource Implications

First of all it must be recognised that software modelling comes at a price. There are capital costs associated with software licensing and infrastructure support when shared across users. There are further revenue costs related to user training & software maintenance. Additional costs may be incurred in the area of software engineering as client functionality enhancements and report output modifications are requested. Then there are the hidden costs such as the opportunity costs of staff time as they learn and utilise a new application. These costs may well be significant. The level of cost may be highly variable and will generally depend upon the no. of users involved, the extent of training required (generally dictated by the complexity of the model solution) and the extent of user specific application modification e.g. software rules, specified reports, new functionality.

These costs must be met. Therefore financial, human and technical resources such as network and infrastructure must be available before an organisation can consider adopting a software modelling solution. The cost assessment must be weighed against the anticipated business benefits of the proposed business change programme and the cost of getting it wrong.

"There is never enough time to do a thing properly, but there is always time to do it again."

.... (J. Steinbeck)

Business change programmes vary in scale and so does the appropriate software modelling solution to assist their implementation. The two factors are not necessarily related. It does not stand that a large and complex business change programme necessarily requires a large and costly software modelling solution. The PSNI uniform ordering process impacted on several thousand police officers from all over Northern Ireland. The modelling effort to manage this implementation was completed by a single user employing a single licensed copy of a modelling software application. Conversely the PSNI ICIS specification project served a community of only ten users; however in this instance all ten routinely employed the application as a day to day operational modelling solution. The PSNI risk management solution employed a user within every DCU and department and sub-branch within the organisation (108) whereas BAA, an organisation of almost identical scale in terms of staff numbers employed 8 users in total to manage the risk management project.

6.3.2 Competencies

Software modelling requires certain competencies. First of all there are the technical competencies which organisational resources must be able to provide: staff with a general computer literacy and a capacity to adopt a new intellectual concept. The user(s) and target audiences which may include the wider implementation team must appreciate the purpose of modelling and proactively engage in a structured exercise.

6.3.3 Human Resources

Software modelling for business change consumes human resources to a greater or lesser extent. The HR requirement may be more or less than that required for other methods i.e. manually documented methods, depending on the circumstances. The variable nature of Human Resource input required to support each of the cases examined is explained in the previous section, as is the absence of any predictable relationship between project/organisation type and the level of HR involvement in modelling activity. Nevertheless there must be recognition that competent resources will be required to be dedicated to the tasks associated with the practise of modelling with software applications. Effective and accurate results will only be achieved by the user once they are fully competent in the tasks to be undertaken. Again the assessment of competence relies entirely on the complexity of the modelling challenge. The users involved in the PSNI risk management project each received ½ day training whereas the ICIS functionality specification team each received 6 days training due to the increased complexity of the modelling work required.

6.3.4 Discipline

Given that the integrity of the model data relies very often on the routine data input from users, the organisation must be prepared to respond accordingly, establishing a model management protocol which accommodates the demands of the model. This may vary from an annual rebuild of the PSNI policing plan to an everyday business as usual adoption of software modelling for the purposes of managing the specification for ICIS functionality. The BAA and PSNI risk projects and the BAA and GI performance projects models require manual data entry on a monthly basis whereas the PSNI performance management model imports data automatically each day. The variances identified under the previous headings as being project specific also apply to the area of established model management disciplines.

6.3.5 Leadership & Commitment

Modelling with the use of new software applications may be resisted by members of organisation as a change to established ways of working. Reluctance to learn new skills, failure to recognise the benefits at the outset and fear of the implications are all predictable reactions. The introduction of new ways of working including the adoption of new programme implementation support methods and tools requires leadership from the concerned management and sustained commitment through the initial phases until the method is established as the preferred and business as usual standard for managing business change implementation.

6.3.6 Systematic Process Documentation Management Process

In order for an organisation to maximise its gain from software model development it must commit to establishing a systematic process for documentation of processes. This characteristic encompasses the previous considerations noted above. The re-usability of a software documented process model allows for continuous improvement modelling at the most efficient level. This relies of course on the assumption that all process changes are ultimately captured and modelled as the basis for ongoing business process improvement design. An organisation which fails to establish such a systematic process cannot expect to reap the benefits which a well maintained model can provide. Furthermore a disjointed or half-hearted attempt to maintain model integrity could pose a real risk to the organisation that the documented model does not accurately reflect the actual system. This may result in flawed organisation design or inappropriate IT support specification.

6.4 Revisiting the Research Questions

Q1. To what extent are the reasons for implementation failure provided by the literature related to the implementation methodology?

The reasons for implementation failure provided by the literature have re-emerged as themes within the examination of the case projects. Issues relating to Change, Quality and Efficiency can all be influenced by the selected methodology of implementation. Chapter 5 addresses the specific impacts of software modelling on the emergent themes, supporting the case for a general consideration of software modelling as a preferred method for business change modelling, documentation and communication. The literature identifies several characteristics associated with implementation but does not relate these to the implementation methods selected by organisations. This study provides evidence that implementation methods influence positively and negatively (depending on the chosen approach) on the success of implementation.

Q2. To what extent if any would these reasons or risks of failure have been influenced by use of structured modelling techniques and software support?

Chapters 5 and 6 refer to the impact of software modelling on the case projects concerned with respect to the emerging themes. The overriding conclusion is that software modelling provides significant benefit to the implementation process and in many cases may be the only sustainable solution. The study also establishes the diversity of application of software modelling influenced by scale and complexity. The study did not find any evidence of specific issues relating to organisational sector. Further research in this area may be required in order to be conclusive; the scope of this project was not wide enough upon which firm conclusion could be made. Scale and complexity are of course subjective and relative considerations. What is large for one organisation is not large for another. An undertaking regarded as technically complex for one organisation may be regarded as elementary for another. The same applies to the considerations (section 6.3 above) which organisations must recognise and assess prior to deciding on the preferred implementation support method.

Q3. To what extent does the nature of the organisation e.g. public/private sector, large, small etc. influence either the selection of the implementation methodology or influence the prospects of successful implementation?

The examination of the nine cases included within this study provided no evidence to suggest that the sector of the organisation influenced the implementation outcomes. However, given the limited volume of projects and the diversity of project types no firm conclusion one way or another can be drawn from this. The writer suggests that further research in this area may be required. Further research may also look beyond the sector categorisation to examine cultural norms. The PSNI organisation although public sector retains a culture of established semi-militaristic rank hierarchy and therefore amongst many of the implementation resources a tradition of compliance and obedience prevails and a rapid response to instruction. Levels of resistance to change may vary form other public sector bodies such as local authorities, health & education boards etc.

Q4. What project parameters should be used to determine the selection of implementation method i.e. traditional or software modelled?

The main project parameters which should be used to determine the selection of implementation method are scale and complexity. These parameters are qualified as follows and are referred to earlier in this chapter:

Complexity:-

Technical Complexity
Resource Complexity

Scale:-

Capital Outlay
Population Involved
Data Diversity
Data Volume

The assessment of these parameters as mentioned above is a relative consideration. Therefore no specific prescription or rule set can be established which classifies a project as appropriate for one particular method of implementation support. The largely subjective assessment of the parameters on a project by project basis is required in order for an organisation to establish the most appropriate implementation method. The decision making process must also take into account the limiting considerations identified within section 6.3. i.e. Capital, revenue and Other Resource Implications, Competencies, Human Resources, Discipline, Leadership and Commitment and Systematic Process Documentation Management Process.

Detailed consideration may also be given to the characteristics identified within the emerging theme categories of Change, Quality and Efficiency.

Q5. Can a framework be developed which articulates mandatory change model attributes?

6.5 Framework Development

	BAA								
	AOS	ERP	OGSM Perf.	MATRA Risk	Perf.	Risk	Unif Proc.	I.T. Funct.	Performance
Complexity									
Technical Complexity	HIGH	HIGH	HIGH	LOW	HIGH	LOW	LOW	HIGH	LOW
Resource Complexity	HIGH	HIGH	LOW	LOW	HIGH	HIGH	LOW	LOW	LOW
Overall Complexity	**H**	**H**	**M**	**L**	**H**	**M**	**L**	**M**	**L**
Sector									
	PRIVATE				***PUBLIC***				***Private (ltd)***
Scale									
a) Capital Outlay	£0.4 M	£1.2 M	£0.2M	£0.15M	£0.35 M	£0.15 M	£20K	£10K	£20K
b) Pop. Involved	400	1200	80	120	350	350	6000	10	300
c) Data Diversity	LOW	HIGH	HIGH	LOW	HIGH	LOW	LOW	HIGH	HIGH
d) Data Volume	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	LOW	LOW	HIGH

Overall Scale Assessment	L	H	H	M	H	M	L	L	H

Table 6.5: Parameter Indicators for Case Projects

The table above summarises the parameter characteristics of the projects examined within the study. The assessments are both relative (reflecting the assessment position of each client organisation) and to a degree subjective. The purpose is not to compare one with another but to assess each project individually to identify whether or not there is a compelling case for particular implementation selection. The writer believes this is a significant point and is not globally advocating the use of software modelling without consideration of both project parameters; scale and complexity and also the six modelling considerations (section 6.3).

Selection of implementation method must be done on case by case basis. The Govan Initiative performance project displays starkly contrasting parameter complexity and scale attributes to say that of the BAA AOS project however given the extremely high data management challenge presented by the project the case for adoption of a software model solution was compelling. The six software modelling considerations (section 6.3) were also satisfied and therefore in this instance the organisation was able to employ the method capable of achieving the objectives.

The PSNI ICIS specification project conversely demonstrates low complexity and low scale attributes. In this particular instance when we refer to the six modelling considerations we find that the capital cost consideration is negated as the organisation was exploiting the availability of software already procured centrally. In addition the Human Resource consideration is also negated as the ICIS team members were already engaged in IT specification tasks albeit using manually documented means. On the basis of the assessment above it may well have been unlikely that the organisation would have chosen to adopt a new method of specification documentation and made the significant financial investment required solely for this project.

The PSNI uniform ordering process displays characteristics of low complexity and also low scale with the exception of population involved. The decision to engage a comprehensive model for this project was a reflection of the risk to the project operationally and financially of 6000 officers engaging a poorly designed or supported process. If the procurement process had related to a population of a few dozen displaying the same complexity and other scale attributes there is no question that a quick manual documentation and communication exercise would have been completed and the pain of failure would have been absorbed until such time as rectifications would have been made.

The performance and risk management projects of BAA and PSNI display different attributes within the parameters assessment, regardless of the fact that they are almost identical intellectual compliance framework implementations. These examples confirm the argument for a case by case assessment for implementation method selection.
The identification of these parameters combined with the six identified considerations and the emerging themes from the cases within this study can be referred to as a basis for assessment by practitioners for the selection of implementation methods i.e. traditional manual or software modelling supported.

6.6 Further Research

This research has sought to highlight the impacts of structured, software supported modelling compared with manual methods of documentation and communication for change programme implementation. Further research in this area may enable the further more detailed qualification of the approach as appropriate under different circumstances. A further consideration of industry sector classification for example is appropriate. The research area would benefit from a parallel study of similar implementations of business change within the same organisation employing manual and modelled methods simultaneously, however the prospects for this are likely to be extremely limited except for relatively small scale projects. A detailed consideration of cultural variances may also contribute positively to the further development of the selection framework and also the extension of the study to include business change programmes of different subject focus e.g. business process outsourcing, consultancy led systems integration.

6.7 Reflections

The writer has completed this project during a period of professional and personal change. The subject of research evolved during that period from a pure case study into two specific business change projects to a generic examination of contrasting implementation methods applied to a wider number of projects. The limitation of the research content and activity to a single researcher imposed parameters upon the opportunities for parallel comparison. In attempting a similar exercise in the future the writer would attempt to be able to identify a number of parallel running projects upon which to apply a consistent research method and documentation of results system. The writer feels that such facility would have expedited the research process and improved the robustness of the results as being appropriate for comparison.

The writer found the examination of existing literature a challenging exercise. This was partly due to the volume of writing previously completed in areas such as BPR and Change Management and partly due to the impact on the study of the evolving nature of the research objectives which subsequently extended to include performance management and operational risk management. A clearer and finely defined project scope at the outset would have eased this part of the study however it is difficult to suggest that this issue would necessarily be avoidable as the writer would not wish to restrict the prospect for the evolution of research scope.

As a practising consultant new to the area of academic research at the outset of the project the writer would in hindsight have spent some time in consultation with research specialists in order to develop a better understanding of good research practice and structure. This would have saved some time and perhaps improved the quality of the framework applied to the collection of empirical data and the completion of the project.

Faced with the prospect of doing this or a similar project again the writer would prefer to work within a more fixed delivery structure. The writer accepts that as the research material was gathered from a range of disparate projects that the potential for this was not apparent. However if the luxury could be afforded to select the cases for study then consideration of the parallel running of the projects should be made as this would accelerate the process and improve the quality of the data.

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7. APPENDIX

BAA ERP Post Implementation Review

The following account sets out the results of post implementation reviews carried out with the Scottish Airports Implementation Team (SAIT) steering group and also the results of a group wide project review completed with the Process Implementation Managers and location Implementation Managers. The review was completed by collating views given during post project workshops.

The reviews were held on 22-25 February 2001 following implementation of Enterprise in Scotland. The timing of the review workshop was chosen to enable the capture of key learning points whilst still being in the forefront of everyone's minds.

7.1 The Scotland Implementation

The approach to the workshop was :-

a) two specific questions were asked

- What worked well
- What would we have done better

b) the areas for consideration were:-

- Project Set up
- Project Management and Planning
- Training

- Communications
- Process Implementation Manager (PIM) & Location Implementation Manager (LIM)
- Leadership

7.1.1 Leadership

7.1.1.1 Leadership behaviour ..... bad examples

- Lack of interest by Line managers, particularly early on within the Enterprise programme.
- Lack of commitment from Line staff within departments.
- Doubts should be aired privately by Line managers regarding Enterprise.
- Non attendance of training and critical meetings.
- Failing to seek clarification regarding roles within Enterprise.
- Malicious compliance to process.
- Delegating incorrectly e.g. HR data management.
- Insufficient resource to do the job.
- Fudging the vision.
- Compromising the implementation of Enterprise.
- Signing off gateways etc without realising the consequences - failure to resist pressure to sign off Gateway documentation.
- Information from CTH leadership was sometimes wayward and ambiguous - goalposts moved.
- Create a focus on 5% roles - came to light too late.
- Not making sure people have the right skills e.g. IT skills / programme management skills.
- Wasn't always clear what was required of us e.g. spreadsheets
- Lip service to areas of possible contention - e.g. redeployment

7.1.1.2 Leadership behaviour ..... good examples

- Role Model - leading by example.
- Following process and assisting with the full implementation of Enterprise.
- Fronting training courses and attending training.
- Chairing and having a large involvement in Implementation groups at locations.
- Constructive challenge to the Implementation team.
- Communicating at **ALL** levels.
- Ownership of data (Head of Departments) - HR, Projects and maximo.
- Focus on big picture and benefits in particular.
- Align targets to successful delivery of Enterprise programme.
- Celebrate success!
- Help manage uncertainty - support of staff during most ambiguous times.
- Recognition of a job well done and thanking you.
- Provide support when people are struggling.

7.1.2 Training

7.1.2.1 Training.....Not So Well

- Training documentation was: late, of poor quality, sometimes incomplete and often wrong.
- Technical environment was unrelated at first - staff unable to understand full scope of Enterprise, training environment did not replicate actual live database.
- Gap between training and go-live may have caused anxiety for users - some staff trained in late November early December 2000 but not able to use system until mid February 2001.
- Non systems capabilities were missing e.g. workplace and job skills.
- PDB - training environment poor and quality of trainers occasionally poor.
- Projects - training vague, underestimation of number actually requiring training. Training course not accurate enough and aligned to Project leader and initiator usage.
- Need to follow up quickly - identify training gaps and non attendees.
- Ensure sufficient contingency for trainers e.g. OSSP.
- Don't rely on too few trainers especially Oracle Support e.g. OSSP.
- Ensure proper resourcing in place.
- Ask for help, say if you don't understand.
- No clear training plans in place post go live for managers, promotions or external appointments.
- Some courses were too long - would have been more effective if staff were trained closer to go live.
- Delivery for simpler courses could have been different e.g. RDMP1.

- Length of courses and content unclear right until the last minute (lack of co-ordinators centrally).

7.1.2.2 Training.....Went Well

- Right facility was found despite competing for space with AOS programme.
- Easy access to airport population.
- Well laid out.
- Enough PC work stations.
- Excellent training facilitators
- Training co-ordinators - one person aligning employee training for their location.
- Good relationship with departmental administrators - there was buy-in to training attendance.
- Recording of training was transparent.
- Line Managers introductions to RDMP1 - role modelled by their attendance.
- Operational staff delivered RDMP 1, generated buy-in, sense of empathy
- Training was a complex undertaking, required a lot of co-operation. Planning was sensitive to operational requirements.
- Clear links between 'to be' documentation and training plan.
- Line manager had to approve non attendance at training courses.
- MD at locations taking authority of exemption from training.
- Timing was right , 10 weeks prior to 'Go Live' - although it was over Christmas.
- Training rooms were pleasant environments.
- Good tool for communicating - final piece of the Enterprise jigsaw

- Make a second training session available after go live for further training. Assisting people who may have felt training was too much at that time.

7.1.3 Team Structure

7.1.3.1 Team structure.....not so well

- Next time ensure solid understanding of what is being delivered and when.
- Too many interactions of governance - next time understanding who is core, needs to be involved
- We learnt from early roll-outs through networking rather than formal means - also any official learning were delivered too late.
- Project management training is required to be effective
- Next time position the programme better re ERP, what it is trying to achieve.
- Structure of Scottish Airports Implementation Team meeting changed - responsibilities were unclear leading to constantly checking understanding and reporting
- Initially PIM/LIM role was unclear -often blamed later when misunderstandings occurred.
- Need a process for managing exits / entry to the team
- Didn't get the benefit of LGW learning

7.1.3.2 Team structure.....went well

- Local change management groups - helped local ownership, assisted in achieving attendance of the correct managers at each meeting.
- Reporting of Risks and issues and resolutions worked well.
- Steering group working well is a key enabler to the Implementation of Enterprise.

- Establishing LIM as early as possible assisted in achieving a role profile and smoother final transition into Enterprise.
- Made it clear from the start the high level of commitment required for a full implementation.

7.1.4 Project Planning

7.1.4.1 Project Planning.....not so well

- Clash of business priorities due to central milestones. Initial plans developed without consideration of the locations e.g. AOS.
- Too many plans - too difficult to track.
- Co-ordination of Implementation plan came too late.
- Capability of project management and Microsoft project was patchy.
- Link inter-dependency of plans electronically and have paper change control process.
- Baseline all plans, ability to monitor actual against deliverables.
- Plans were an over complicated means of delivery.
- Detailed plan was 'false' reassurance?
- 'Rules' about how plans would be used were unclear.
- Competence issue around project planning - this can actually be done well and be helpful e.g. AOS

7.1.4.2 Project Planning.....went well

- Learnt more by creating plan ' myself' and owning it instead of inheriting previous rollout plan
- We did manage to go live! Milestones more useful in later months - focused the mind

7.1.5 Communication

7.1.5.1 Communication..... Went well

- Good infrastructure for communication but in the early days of the programme there was no content to communicate
- Later in the programme we filtered information quite well - co-ordination at centre of site is key to reduce over communicating.
- Process education, count down to go live events, formal pieces were excellent because:- face to face and interactive.
- Training was an implementation communications tool - finally we saw what it was all about.
- Have one individual responsible worked well, locations had to select what was right for them, local communication person necessary.
- Communicating through line managers was right and worked well.
- Took every opportunity to communicate relevant information using all available forums.
- 'Off the wall' roadshow worked.
- Videos were a good medium.
- Make stakeholders responsible for communication.
- Don't communicate too early, timely communication achieved.

7.1.5.2 Communication.....not so well

- Poster campaign started too early - messages were too vague – not sufficient role detail.
- Leaflets too high level?
- Central team need to be sensitive to local programme requirements and local support structures.
- Comms need to articulate specifics of process application
- Too much information, too often, not generally appropriate to Scotland for example
- Same information sent out from several sources - overloaded during previous location rollouts, R1 and R2 – no relationship to implementation state.
- Communication required a bigger effort In specifics than we initially realised.
- 10 Weeks prior to 'Go Live' most intense activity for communications.
- Clarify the before and after - what's the difference!? Great tool to use in the future (virtual form burning!!) – swimlane diagramming (AOS)
- Consider the people who are <u>not</u> affected.
- What do they need to know and when?
- Didn't communicate well enough to suppliers / external stakeholders e.g. airlines especially afterwards supplier felt they have been treated badly.
- Need to issue process timelines – duration of payment timescales etc for suppliers.

7.2 Group-wide Implementation Review (February 2001)

7.2.1 Executive Summary

Enterprise was a complex programme requiring an immense magnitude of change to business processes and organisational design, a complexity of design and development of software applications, a single implementation phase and involving large numbers of staff, both BAA, supplier and contracting.

As the Design phase neared completion, it was necessary to conduct an Interim Review to confirm the scope and requirements included within the Design which had significantly increased the forecast Programme costs from the original business case. Despite the review and the associated revision of implementation strategy, Enterprise has been successful in terms of programme management, development and implementation to tight timescales and was completed earlier than originally scheduled.

BAA's implementation of Enterprise realised its primary goal : that of placing its critical back office systems and processes in one coherent framework, providing a platform for future benefits to be realised. This, together with the organisational change that has been achieved, including the successful establishment of the Business Support Centre (BSC) and the removal of the finance transactional processing function from locations, is a transformational change achievement for BAA.

Enterprise has reinforced the critical requirement for the adoption of strong Programme Management practices with sufficient flexibility to cater for the variable nature of large complex programmes. Although there was a defocusing on the change aspects over the original concept, Enterprise as implemented provides BAA with a mature process and applications system platform to cater for continued organisational design, change and business requirements transformations.

In common with every Enterprise Resource Programme, the Enterprise Programme has been a journey towards a destination that was always going to be difficult to define. At the outset "we did not know what we did not know". Much was learned as the programme progressed.

However, the Design, Development and Implementation Phases were extremely successful. Locations went live on due dates, culminating in successful End of financial Year processing at the BSC. There remains much to be done, particularly in the areas of embedding of processes and adherence. These will form two of the key initiatives for the next programme phase - Enterprise Way Forward.

7.2.2 Introduction

The Enterprise Development and Implementation Phase was successfully completed in February 2001 with the implementation into Scottish Airports, followed by the successful completion of the Financial Year End at the Business Support Centre in April 2001.

The programme was originally initiated during 1996 as an enabler for the Freedom to Manage initiative. It has incorporated the re-design of BAA's business processes, the introduction of three revised Processes - "Acquire and Maintain Assets", "Plan and Develop the Business" and "Resource, Develop, Motivate and People", the development and enhancement of the supporting Oracle business applications software, the transition of financial transactional processing from Airports to the BSC and the implementation of Processes and Applications into Corporate Office, the BSC and all seven BAA UK airports.

The programme, with management structures at Programme, Process, BSC and Location levels is judged as being successful when considering the immense magnitude of change involved, the complexity of development, the numbers of staff, both BAA, Oracle and other suppliers and the introduction of the financial transactional services moving to the BSC..

This part of the study draws together the learnings from the various Post Implementation Reports produced at the locations, the change team, the post implementation workshop to produce the key Lessons Learned and Recommendations, whilst also providing the necessary summaries of programme background and history.

7.2.3 Source Material

This document has been formulated from an assessment of the lessons learnt documentation carried out by each location as part of their Gateway C sign off, programme learning reviews carried out in August 2000 and February 2001, learning captured by specific teams, such as the Change team, as well as additional interviews with specific individuals associated with the project. Access to this material is available from the Enterprise archive.

7.2.4 Background

7.2.4.1 Programme Initiation

The Enterprise Programme, initially set up as a Project, was established to enable a step change in performance for BAA and to create a sound basis for growth of the business. It sought to harness the potential of I.T. to act as a catalyst for substantial change, performance improvement, re-engineering of processes to drive out non-value-added activities and by providing the business with effective management information.

The potential scale of change that Enterprise could deliver, both in terms of benefits and challenges, was recognised at the outset coupled with the radical change to processes, jobs, methods of working and organisational structures.

Enterprise was initiated with three principles:

- An enabler of Freedom to Manage through devolution of responsibility to the line,
- Simplification of business processes,
- Consistency of business processes across all locations.

Enterprise was designed to introduce four processes:

- FCD - Fulfil Customer Demand - the marketing and provision of facilities and ongoing delivery of customer services to BAA's occupying customers.
- AMA - Acquire and Maintain Assets - the acquisition, development, enhancement and maintenance of physical assets.
- PDB - Plan and Develop Business - the development and maintenance of business unit business plans.
- RDMP - Resource, Develop and Motivate People - the sourcing, development and rewarding of a skilled workforce motivated to meet the needs of the business.

7.2.4.2 Enterprise Strategy

BAA's initial options for Enterprise were :

- Do nothing

- Minimum systems developments required to continue trading over 5-10 years,
- Project Enterprise with Oracle in 3 stages
- Project Enterprise in some different format.

There was no feasible Do nothing option since replacement of the fifteen year-old Procurement systems had already been approved by the Management Committee. The HR and Finance systems also needed replacing. The HR system was expensive to maintain and was not supporting the business. The financial systems were seven years old, not millennium proof and the supplier (D&B Software) faced an uncertain future.

The minimum systems developments required implementation of 'best of breed' systems, though represented a continuation of the haphazard approach to software applications with a lack of complete integration, and denied the opportunity to radically change support processes on a cross-functional basis.

Enterprise with Oracle sought to provide new processes to enable Freedom to Manage, pursued significant performance improvement, and support by integrated systems. This approach minimised the technical support required, and instead focused business effort on improving processes.

The final option covered a variety of alternatives for Enterprise:

- faster implementation,
- systems-only implementation,
- potential third party funding and risk/benefit sharing,

All of which were ruled out. Faster implementation could buy-out millennium costs, though was considered very risky due to the level of parallel process re-engineering, disruption to the business and lack of time. An alternative considered was systems-only without process change. However, since the purpose of the project was primarily process and performance improvement this route would delay achievement of benefits and increase the risk that they were neither pursued nor achieved.

The agreed strategy was to undertake Enterprise in 3 stages across all 7 U.K. airports and Corporate Office in the following 'support' process areas:

- Finance & Project Accounting,
- Procurement,
- HR

The BSC's was scheduled to be operational by end March 2000. Gatwick was selected as the pilot location with an April 2000 implementation date to be followed by:

Scotland	October 2000
Stansted and Corporate	January 2001
Heathrow	April 2001
Southampton	May 2001

7.2.4.3 Strategy Revision

In November 1998, it was decided that since the FCD process would require such an in-depth involvement with Operations and significantly increase costs, it would not be pursued as a Process. The significant interfaces into the Process were incorporated into the AMA and PDB Processes, however, this ultimately did lead to some Process disconnects. It was also agreed that all core application software would be introduced in one single issue.

In May 1999, as the Design Phase neared completion, a Review Group was formed to review the findings of the phase. As part of those findings, the

Review Group recommended a revised strategy into three stages for the Enterprise Programme:

- Stage 0 - Getting fit for Enterprise - embracing implementation of some of the new processes which did not rely on the availability of the full set of new software. This would occur during the period before August 2000 and would include, for example, a new approach to business planning in the Autumn that year and implementation of web requisitioning early in 2000.

- Stage 1 - concentrating on using the new software and processes to deliver the benefits identified in the Enterprise business case.

- Stage 2 - to be the subject of a further business case and which would be aimed at driving further as yet unquantified benefits. The evidence from all other Enterprise Resource Programmes is that this is the stage where the really substantial improvements are made as users get used to the power of the new technology and start using it to drive forward business performance.

The case for the BSC was reviewed and it was proposed and agreed that there would not be dual locations for the BSC but that a single location in Scotland would be introduced. The timescales were reviewed and it was agreed that the implementation timescales be reduced from 15 months to six, commencing in August 2000 and finishing in February 2001. The revised order of location implementation was agreed as:

BSC/Gatwick and Corporate Office	August 2000
Heathrow/Stansted and Southampton	November 2000
Scotland	February 2001

A Business Intelligence System had been included in the Design Phase but had not been foreseen and therefore not included in the original business case. It was removed from the Enterprise scope after the May 1999 review.

7.2.5 Programme History

7.2.5.1 Key Milestones

The key milestones for the Enterprise programme were:

Enterprise Task Force set up	June 1996
Oracle selected as Supplier	November 1996
Initial Project Team Established	January 1997
Business Case submitted	March 1997
Steering Committee reformed	July 1997
Implementation Strategy revised to 1 release	April 1998
Gatwick selected as Pilot location	April 1998
Programme Board Convened	May 1998
Dual BSC/Data Centre decision	October 1998
Location Team set up commenced	May 1999
Interim Review initiated	May 1999
Interim Review completed	August 1999
Single BSC in Scotland decision agreed	August 1999

Corporate Office implementation strategy agreed September 1999

Organisational Design Model approved	November 1999
Core Application System Test Complete	June 2000
Payroll Parallel Run complete	June 2000
Production Environment available	June 2000
User Acceptance Tests signed off	July 2000
BSC Operational	August 2000
Gatwick/Corporate Office Live	August 2000
Heathrow/Stansted/Southampton live	November 2000
Scottish Airports Live	February 2001

7.2.6 Financial Outcome

7.2.6.1 Enterprise Costs

The projected Enterprise costs from the original Business Case (£41.9M), the projected costs including all options from the Design Phase (£73.4M) and the final project costs post the May 1999 Review (£59.7M) are detailed below:

Enterprise Financial Analysis by Cost Category
All figures in £000

Cost Category	Original Business Case	May Proposal	July Proposal	Contingency %	Contingency Absolute	Grand Total

Development Staff Costs						
Common Coding		£179	£77			£77
Internal Oracle Team		£524	£1,609	10%	£143	£1,752
Gaps		£4,482	£3,070	20%	£469	£3,959
Additional Allowance					£420	
Business Intelligence		£6,081	£2,688	25%	£426	£3,114
Programme Support Office	£2,767	£5,046	£4,343	10%	£190	£4,533
Functional Team	£6,234	£10,621	£9,344	10%	£311	£9,655
Interfaces and Data Conversion	£9,761	£9,131	£10,480	20%	£1,813	£12,293
Testing	£2,291	£3,103	£2,764	20%	£492	£3,256
Migration	£2,049	£2,613	£2,189	25%	£543	£2,732
Technical Services	£1,353	£4,088	£2,170	10%	£177	£2,347
Total (Development Staff)	£24,455	£45,868	£38,734		£4,983	£43,717
Other Development Costs						

Software Licences and Maint	£7,669	£8,517	£7,264	10%	£290	£7,554
Hardware and Maintenance	£2,042	£4,039	£2,191	10%	£36	£2,227
Telecommunications	£500	£223	£211			£211
Other External and Expenses	£4,142	£2,962	£2,277			£2,277
Total (Development Other)	£14,353	£15,741	£11,943		£326	£12,269

Development Total	£38,808	£61,609	£50,677		£5,309	£55,986
Change Management, Training and Education	£3,145	£8,725	£5,747	20%	£881	£6,628
Implementation Support	£0	£3,110	£2,419	20%	£471	£2,890
Business Support Centre Setup	£0	£0	£850	20%	£170	£1,020
Grand Total	£41,953	£73,444	£59,693		£6,830	£66,523

7.2.6.2 Enterprise Actual Spend

The actual spend to 31st March 2001 was £57.1M. Current forecast to programme completion is £59.1M showing currently a forecast underspend of £600K. However, the start up of the next programme phase - Enterprise Way Forward - is not yet completed and it is anticipated that the final elements of implementation will increase the forecast spend to completion close to £59.7M.

Information source: BAA Enterprise Programme April 2001 Status Report Executive Summary

7.2.6.3 Financial Appraisal

The following assumptions were used for the financial appraisals:

Assumptions	Base 1997	1999 Review
Test Discount Rate	12.5%	11.0%
Inflation rate	• 1998/99 - 1999/00 3.5% • 2000/01 onwards 3.0%	• 1998/99 3.0% • 1999/00 - 2000/01 2.5% • 2001/02 inwards 3.0%
Corporation tax	33%	30%
Project life	7 years from 01-Jan-2001 - this following the 'average go-live' date of 01-Nov-2000, 11 years overall	
Capital tax allowances	Plant - 25% per annum declining balance	

A comparison of the two financial business cases shows:

	Original Case	May 1999
Cost	£41.9M	£66.5M
Net Benefits	£57.1M	£88.2M
NPV	£4.3M	£3.8M
IRR	8.8%	10.4%

7.2.6.4 May 1999 Review

7.2.6.5 Background

In May 1999, the Enterprise Programme reached the stage when there was sufficient clarity about the design of the new processes and supporting organisational changes to estimate both the cost of developing the application software to support the new ways of working and the associated cost of change management, training and education. The initial estimates of future costs suggested that without changes the total cost of the Programme would significantly exceed the business case of £42m.

A Review Group was formed to test the work done to date against the original key objectives, to revisit the anticipated benefits and challenge the scope of the programme. The scope had been extended during the early stage of the Programme to investigate, without commitment, software enhancements for:

- bridging gaps

- producing a business intelligence system that would provide an ability to link data in various separate databases

7.2.6.6 Review Group Findings

The Review Group quickly concluded that the objectives of the programme remained as valid in May 1999 as they were in 1997, and that it was essential to the airports business that the programme should be implemented.

The cost estimates assumed that software gaps(i.e. instances where the standard Oracle application software did not fully support the operation of the new processes that had been approved by the Process Owners) would need to be covered through the development of further software. In a number of cases, the Review Group recommended that the cost of these software developments should be avoided and that:

- the process should be changed to eliminate gaps, or
- Oracle should be asked to supply the software enhancement as part of the standard functionality of their product, or
- alternative ways of bridging gaps should be found.

The previous decision to have dual locations for the BSC was challenged and was subsequently rescinded in favour of a single location in Scotland which would permit a more economic operation of the Centre.

The review of benefits identified an additional £6m of annual benefits that could not have been recognised for the original business case, but which emanated from the detailed process design work that had been done. The increase arose largely in the procurement area.

In reviewing the work done so far, it was believed that the steps that were taken were the right ones, although with the benefit of hindsight we would have improved the process. In particular, a review such as the one that was requested by the Programme team should have been built in to the Programme. As all large scale change/IT programmes share some similar characteristics such an in-depth review should be made mandatory at this stage of future IT projects.

The Review Group recommended that a sub-committee of the Airports Board be formed to ensure that all critical decisions could be made in a timely manner.

7.2.6.7 Conclusions

The main conclusions of the Review Group were:

- The decision to embark on the enterprise programme was the right decision.
- The emphasis should continue to be placed on the change nature, not the IT foundation of the programme.
- The ultimate success of the programme would be measured by the benefits delivered and this would be closely linked to the insistence by line management on compliance - "there will be only one way of doing things".

7.3 Lessons Learned/Recommendations

This section records the lessons learnt from implementing the Enterprise programme in BAA and documents these under six sections :

- Leadership
- Structure and governance
- Vision and scope
- Methodology and reporting
- Relationships with consultants
- On going and realised organisational learning

7.3.1 Leadership

7.3.1.1 Strategic leadership of the project vision and overall deliverables

At the outset of the programme, there was strong intuitive and conceptual understanding amongst the original senior architects of the programme as to the organisational benefits that could be realised from implementing an Enterprise Resource Planning approach in BAA, given the clear realisation that BAA's disconnected and uncoordinated framework of internal back office processes and support systems could no longer support BAA's business strategy. This provided significant momentum in the early stages of the programme towards engaging the thinking of the senior BAA team and culminated in business case approval to proceed and the appointment of Oracle and an internal team to lead the implementation.

Three factors would become critical in shaping the future enrolment of BAA's leadership in committing to the Enterprise: firstly, a grounding of the Enterprise vision with both the CX and the Management Committee, to build the shared, clear benefits that could be realised : secondly, ensuring the leadership of BAA were comfortable with working with conceptual level understanding whilst the full scope was gradually developed : and thirdly, ensuring the programme governance could recognise and adopt the leadership needed to drive the vision, both in terms of working with BAA's culture, and in terms of the methodology and resources needed.

In hindsight, the Enterprise leadership achieved all of the above, but, in terms of organisational learning, lessons are to be learnt in all three areas.

A lack of strong conceptual understanding hindered the businesses alignment with its full scope and potential benefits for much of its life and led many in the business to perceive Enterprise as a systems replacement programme only, rather than an organisational change programme. Comments such as "what will Enterprise do for my operation ? " illustrated the size of the gap that existed across the business as to the conceptual purpose of Enterprise.

Enterprise was also just one of a number of business improvement programmes being developed for implementation across the Group. BAA has now adopted the infrastructure, in terms of the Organisation Effectiveness Review Group, to debate and review the overall change agenda for the business and to identify the respective synergies. This infrastructure had however been missing for much of the life of the Enterprise programme, which led to a quite often beguiling and disconnected range of business initiatives being taken, which in themselves, were complimentary, but which were insufficiently connected to the overall business agenda, the subject of separate, and often competing resources, and unconnected or confused in the minds of the business customer.

7.3.1.1.1 Lessons learnt

The investment needed at the outset in educating the business leadership in the conceptual benefits and in demonstrating, where possible, how the organisation can realise such a breakthroughs by a continuous, reinforcing programme of learning and coaching for the senior team is paramount. The business leadership has to be continuously aligned around the vision and objectives: one off or periodic events to build that alignment are not enough.

The engagement of the Chief Executive, as overall business sponsor is critical and has to be maintained throughout the programmes life, but particularly in the design stage of the programme.

There needs to be a clear, unequivocal assessment of the implications that the proposed working methodology will have on the resources the business can make available to support the project across its life.

BAA has now established the framework and governance for coordinating strategic business improvement programmes : the OERG, and this should avoid the organisational confusion which was sometimes apparent in the interface between Enterprise and other programmes.

Nonetheless, in spite of all of the above, BAA's implementation of Enterprise realised its primary goal : that of placing its critical back office systems and processes in one coherent framework, providing a platform for future benefits to be realised. This, together with the organisational change that has been achieved, including the establishment of the BSC, is a transformational change achievement for BAA.

7.3.1.1.2 Recommendations

- The Leadership Alignment for major programmes should include continuous alignment for business leadership around vision and objectives
- For major programmes, it is critical that the most Senior Executive, appropriate to the programme objectives, be engaged as business sponsor
- The Organisation Effectiveness Review Group should be involved with all business improvement programmes

7.3.1.2 Process Leadership

The introduction of the Process Manager role in all processes and the development of the process governance arrangements were critical in developing the work planning and programme management that the Enterprise programme needed to achieve its objectives and timetable. Sub Process ownership drove accountability through the *process organisation*, and the introduction of location based Process Implementation managers gave the process vision and strategies high visibility across the airports.

However, there were often frustrations evident in relationships between the component elements of the programme, where the process manager role was neither sufficiently empowered or expected to make decisions on behalf of their process owners that the central programme implementation team would often expect. The delays in programme and the tightness of timescales only increased this tension, which, in some cases, became a fundamental point of frustration that seriously impacted relationships.

The appointment of Process Managers and PIM's in the locations also led to the perception, particularly by the airport implementation teams, that some Process Owners became increasingly invisible from the programme of change they were leading and in some cases, often disengaged or withdrew far too prematurely.

7.3.1.2.1 Lessons learnt

Process leadership is a capability that needs to be built, reinforced and supported throughout the programme's life : leaving it to chance only exposes the individuals unnecessarily and does very little for the programmes credibility with the airport business leadership

The roles and responsibilities of the Process Owners, Process Managers and PIM's were well defined : however the expectations that each party to the implementation programme had of each other were often left unstated. The formalisation of roles and accountabilities need to be regularly reinforced by the maintenance of relationships which prevent issues of frustration over slow decision making from hindering the effectiveness of the implementation.

7.3.1.2.2 Recommendations

- Leadership in new business areas should be built, reinforced and supported throughout the programme life.
- The formalisation of roles and accountabilities should be regularly reinforced

7.3.1.3 Business leadership

At the outset of the programme, the decision to involve representatives from the airport businesses in the visioning and design of the processes and the accompanying organisational models was a critically important step in building the credibility of the programme for change. It ensured that the process visions were rooted in the thinking and experience of the airport business and built a cadre of disciples who, when subsequently involved in the implementation of the programme, had already built up considerable conceptual understanding of the rationale for change.

However, participation in the process design and visioning did not always mean endorsement by the location from which the representatives came from, and as such, despite widespread participation from representatives from the airport business at the outset, the business leadership was not widely exposed or engaged in the building of the Enterprise vision, and were often ignorant of the rationale or intent. It led to a belief amongst the airport business leadership that Enterprise was as such only a systems replacement programme: once the full implications of Enterprise as an organisational change programme became evident, it led, in some cases, to a perception that this was imposed change, from the Corporate Office Process leadership, which was resented, and until understood, resisted.

Business leadership was strongest and most effective where the rationale for Enterprise became a key element of the location or departmental business and change agenda. Business leaders, particularly MD's, had a critical role to play in linking the Enterprise programme to high level performance milestones and its overall business impact. SAL, for example, positioned the Enterprise objectives against its business balanced scorecard, such that the deliverables were clearly aligned with its overall business strategy.

The governance structure, pre and post the May 1999 review of the programme, was a critical factor in the effectiveness of the shared business leadership of Enterprise. Effective local business leadership only seemed to really get underway once a more effective governance structure had been put in place.

Once the local implementation teams had been established and a local plan put in plan, leadership of the programme locally became very much driven by the local governance structure put in place. This was effective in driving through the programme at each location : however, the local structure in itself also partially disenfranchised local leadership from full participation : the establishment of the DIM or EDM role focussed real attention on the impact of Enterprise on each department, yet it created the potential to by pass the Head of Department who could, if they chose to, remain largely involved. Location learning has highlighted some excellent examples of local leadership taking responsibility for role modelling the Enterprise way of working and leading the implementation, particularly in the run up to go -live, with the full participation of most Heads of Departments in the training, or actively leading awareness raising exercises with their teams. However, in most cases, this needed to have happened a lot earlier in the programmes implementation.

7.3.1.3.1 Lessons learnt

The enrolment of the business leadership, as customers of the change being implemented, needs to be continuously reviewed and managed throughout the programme's life. The changes in the governance structure post the May 1999 review brought about far more effective engagement with the key business leaders, but in hindsight, more effective enrolment activity needed to be have been happening much earlier, such that informed debate within each location could take place, and the benefits to be realised from Enterprise positioned clearly as part of the location business strategy and their balanced scorecard KPI's.

The engagement of managers to participate in the visioning of the processes was a real win for BAA : however BAA would need to ensure in future that the ground rules for endorsement by the locations from whence the participation came from were fully clear and stated.

Locally the role of Heads of Department in understanding, committing to, and then motivating their teams to take on board the changes envisaged through Enterprise has been critical. We should ensure in future that local enrolment occurs much earlier in the change process and avoid the potential disenfranchisement of local leadership by putting in place a governance structure which could be excluding.

7.3.1.3.2 Recommendations

- The enrolment of the business leadership, as customers of the change being implemented, should be continuously reviewed and managed throughout the programme's life
- The ground rules i.e. responsibilities, accountabilities and approval levels, for

endorsement by the participating location managers should be clear and stated.

- Local enrolment of senior managers should occur as early in the change process as possible

7.3.1.4 Implementation leadership

"Undoubtedly the excellent relationship between the MD, the Sponsoring Director and the Local Implementation Manager was the most critically important factor in getting us to go-live" – Location Implementation Manager.

Once the May 1999 review was underway and the recognition of more local focus being needed, the Enterprise programme leadership coordinated the establishment of local implementation teams at each airport, and within Corporate Office, to ensure the effectiveness of implementation within that site. The role of the Local Implementation Manager, in leading the implementation, became a critical factor in the success of the programme, and in determining their effectiveness, four criteria have since been consistently referred to :

- the experience of the LIM in planning and running programmes
- the ability of the LIM to build and lead effective teams
- the LIM's self confidence, resilience and strong self management
- their sound conceptual understanding of what the Enterprise programme was trying to achieve.

The central programme team in Central House have been seen as very strong in adopting an issues based approach to managing the programme, once the local governance structure had been put in place, reinforced by rigour in milestone reporting and the RAG status concept. Undoubtedly, as the go-live timetable loomed nearer, the inherent tensions between the programme team and the local implementation teams were often inevitable. Effective planning became absolutely essential to success : the root cause of much of the tension in the programme was the absence of or deterioration of effective planning or understanding of dependencies between different programme elements . The programme team implemented a 24 hour rule to cut through prevarication in decision making : it was deemed essential in order to keep the programme on track, yet in reality it was rarely used.

Effective implementation leadership also dictated that for critically important roles on the programme, the individuals fulfilling those roles were fully effective and fully supported in what they were doing. Consistent in the feedback from the location post implementation reviews is the observation that BAA allowed key posts to remain unfilled for too long, at critically important stages in the programmes life, and did also not acknowledge that key individuals were not performing effectively and allowed this low performance to linger on too long. Visible poor performance seemed to go unchecked and the absence of key people in some roles seemed to be unquestioned. Whilst undoubtedly individual cases were being reviewed, there does remain a perception that in certain areas of individual effectiveness, BAA's leadership of unsatisfactory performance was poor.

Programme and local implementation leadership also ensured however that success was recognised. Each location's go-live milestone was celebrated, performance bonuses to key individuals recognised their contribution, and most location post implementation reviews acknowledged the significant supportive behaviour that LIM's and the teams drew on in the lead up to go-live from their local business and from the CTH team. Whilst the disengagement process for some individuals has been difficult and the process not always obvious, the support to individuals at the most stressful time of the implementation has been *consistently* acknowledged as very high.

7.3.1.4.1 Lessons learnt

Planning and programme management is a critical capability that, when absent, or deteriorates, can severely test or damage previously effective relationships. The implementation of Enterprise required robust planning and reporting and regular acknowledgement of all dependencies. As the programme timescales became squeezed, the understanding and realisation of all programme dependencies became critical . Where these were acknowledged, we got breakthrough : where they were missed or not understood, the implementation leadership became seriously ineffective, requiring very effective relationship management behaviours to keep the programme going forward.

Understanding the underlying capabilities expected of the implementation leaders is critical, and supporting the individuals in building and reinforcing those capabilities where they are not developed is essential.

Leaving key personnel in important jobs where they are consistently underperforming is not an option.

Recognition of effort and achievement is an essential ingredient to securing an effective and motivated team .

7.3.1.4.2 Recommendations

- Planning and programme management is a critical capability

- The implementation leadership should establish very effective relationship management behaviours to keep the programme going forward.

- Individuals should be supported in building and reinforcing underlying implementation capabilities where they are not developed

- Underperforming key personnel in important jobs should be removed

- Effort and achievement at individual and team level should be recognised

7.3.2 Structure and Governance

7.3.2.1 Programme governance

The May 1999 Review of the Enterprise programme resulted in revised governance arrangements being put in place with more definite responsibilities. The previous governance arrangements that drove programme leadership were considered far too unwieldy:

"I had no sense that the 22 people who sat on the Enterprise Steering Group saw that shared leadership of the project was their responsibility "

The impact of such a large governance group was felt most on the Central House programme management team, where ever increasing amounts of time and effort spent on trying to build alignment and engagement were not always rewarded with honest debate or feedback - it "felt like pats on the head".

The EPE that replaced it focussed on the critical elements of programme, process and business leadership that were absolutely necessary to have aligned in readiness for the August 2000 and subsequent go-live dates. It resulted it far more streamlined management of the governance team, and for the first time, seriously and regularly engaged the CX in the leadership of the programme.

7.3.2.1.1 Lesson learnt :

Effective governance of major change projects cannot be run by large committees whose accountabilities for the leadership of the programme are unclear.

7.3.2.1.2 Recommendations

- Accountabilities for the Governance of the programme should be clearly stated.

7.3.2.2 Process governance

Prior to the May 1999 Review, Process governance was not sufficiently robustly established, and did not reinforce confidence in process leadership :

"when I wanted to learn about the vision for the process from the process leader, I was sent to talk to someone in Central House to find out"

Process governance *arrangements* drove the connection between programme (through the Process Owner and Process *Manager), Process* (through the Sub Process Owners and Managers) and location (through the Process Implementation Managers). The PIM, in particular, was a critical element in the change programme, responsible for the education and engagement of the locations. In hindsight, this often demanded a great deal of the individuals who :

- were not always full time and hence had other responsibilities
- would sometimes be covering more than one process, as in the smaller locations
- if not previously involved in the process design and conceptualisation, would struggle to build their own capability fast enough to cope with the demands on them.

Process governance required four elements in place to be effective :

- **clear ownership**, driven by a strength of passion to achieve the vision for change
- **capability** - the key roles in the governance arrangements had to know and be able to interpret the process vision and implement the process change
- **coordination** : with other sub processes within the overall process, and with other Enterprise processes, and the other elements of the implementation programme
- **linkage** : with the business agenda and the location *priorities*

All these elements, if in place, drove effective programme governance : however in reality process governance worked most effectively where the process vision was strong and where the process leadership invested significant passion and energy to lead the change they were owning.

7.3.2.2.1 Lessons learnt

Future business improvement programmes need to ensure that the elements for successful governance are in place. In particular, those invested with the responsibility for local accountability (as in the PIM's) need to have been fully immersed in the programmes development and conceptualisation before being expected to lead it locally.

Managing workload was also often unrealistically estimated and staff whose involvement was not full time were often completely overwhelmed. Dedicated resources there need to be made available to ensure the individuals involved can achieve their responsibilities, and not give an impression that the implementation effort is only being given half hearted consideration by those leading it.

7.3.2.2.2 Recommendations

- Personnel with local responsibilities should be involved in the programme concepts, design and development before being expected to lead it locally

- Dedicated resources should be assigned to major programmes *to* ensure that individuals are not overwhelmed and to ensure that *implementation* effort is not perceived as only being approached half hearted

7.3.2.3 Change governance

The inclusion of location Change Managers to support the implementation of Enterprise locally was recognised as a key element of its success : it resulted in methodology being in put in place, through the To Be, As Is thinking that provided the rigour for local management to begin to understand what was expected of them and reinforced the building of change capability amongst the management team. However, it has been acknowledged in much of the post go-live learning by locations that the change focus at programme level, within the overall governance arrangements, seemed too separate from the rest of the implementation team which resulted in certain perceived disconnects in programme management, particularly with the process leadership, and in programme relationships.

7.3.2.3.1 Lesson learnt :

Future business improvement programmes should recognise the value of building change capability in the location where the change is impacting the end user. However the leadership of the change activity needs to be firmly embedded in terms of accountability and reporting with the overall implementation leadership of the programme.

7.3.2.3.2 Recommendations

- Leadership of change should be represented in the overall programme leadership
- Business improvement programmes should recognise and build change capabilities in all affected locations

7.3.2.4 Business governance

Local governance arrangements were put in place by Gatwick in August 1999 that were then replicated at every other location, with the exception of Scotland, where the regionalised nature of the implementation meant slightly different governance arrangements had to be put in place.

The decision to set up the Departmental implementation role was particularly effective in establishing local focus inside each department, particularly those which were to be heavily impacted by the change in process, systems and organisation. It resulted in each HoD having an on site resource available to them who could coordinate the implementation activity on their behalf.

However the working methodology associated with local implementation often overwhelmed the smaller or less impacted departments and has been described since as being too onerous for the purpose. It placed a huge workload on some DIM's, which in hindsight, did not realise the efforts needed. It also did result, in some cases, of the Head of the department becoming disconnected from the implementation, and, where they chose to, could opt out from becoming involved in leading the implementation in their teams.

Post go-live learning from each location has also highlighted the critical importance of effective project set up in both determining with clarity, the roles, responsibilities and accountabilities of each element of the governance structure, but then in also putting significant emphasis on building the relationships within and between the various elements of the governance arrangement that ensured that subsequent tensions could be managed. Almost universally, those individuals in the governance arrangements who reported after go -live to feeling not fully engaged with the location implementation acknowledged that they had not been sufficiently enrolled in the team in the first place.

The early appointment of the Local Implementation manager was also a critical factor in this : in Scotland, the LIM (Programme Manager) had been appointed 18 months before go-live : whilst the individual changed, the establishment of the role early meant that much of the relationship building could be put in place and linkage built with the overall SAL business agenda. In contrast the late appointment of the LIM role in Corporate Office meant that much of the essential relationship building and business alignment was rushed or did not take place.

The representation of the Central House team on each of the location Steering Groups was implemented to ensure that the location and programme implementation teams could remain in touch with each other and manage issues before they could escalate. As a principle, this seems to have been accepted : yet in reality this was not always welcomed by the location, particularly earlier on in its establishment, and appeared an indicator of lack of trust. In hindsight, such a move needed to have been accompanied by a reinforcement of informal relationship building with both groups that maintained mutually effective networking. Post go-live perception would indicate that a key issue in the governance arrangements between programme, process and location was insufficient efforts being made to reinforce informal relationships. This led to an over-reliance on formal structures, were then, as in the case of the ICW, sometimes described by *all* parties as ineffective .

7.3.2.4.1 Lessons learnt

Local governance arrangements, whilst needing consistency to report progress, need to reflect the business environment and structure of the location in their establishment and need not be the same in all locations

Appointing local champions in the form of departmental implementation managers created real local focus. However it should not disenfranchise the Head of Department from their leadership role.

Early appointment of local implementation managers is essential

Governance arrangements need to be rooted in effective informal as well as formal relationships. Building effective relationships with this level of change is essential and the impact is all too evident when they break down.

" *when you can't see* what you are implementing, you have to rely on relationships and trust to help you *overcome that*".

7.3.2.4.2 Recommendations

- Governance structures should involve all levels of local senior management particularly Heads of Departments.
- Local implementation managers should be appointed at the earliest opportunity
- Governance arrangements should recognise the need to establish informal and formal relationships.

7.3.3 Vision and Scope

Post project learning has consistently acknowledged that the initial vision and scope for Enterprise was intuitively understood but the implications grasped only at conceptual level at best by most of the senior management team. The articulated impact on the business in terms of organisation, culture, infrastructure, leadership and capability was not fully appreciated. However, what was acknowledged was the following:

- :a need to reinforce previous continuous improvement programmes, including Freedom to Manage, with a breakthrough in process and systems thinking that created a platform for sustainable change
- :an acknowledged need to reduce cost and increase effectiveness by simplifying and eradicating unnecessary variations in support processes across the airport business that could not be commercially justified
- :that there would be some organisational change and rationalisation needed to reinforce this and realise the benefit.

In hindsight, it can be seen that insufficient emphasis was placed on engaging and enrolling the leadership teams in BAA's airport business around the organisation and business impact of implementing an Enterprise resource planning system. Nonetheless, the realisation of the vision, in terms of changing BAA's complete back office systems and processes, redesigning its Maintenance, Supply Chain, Finance and HR functions around new processes, and creating a separate Business Support Centre is a massive change by BAA's standards and was achieved . The lesson however for BAA in its implementation of Enterprise lies in its ability to be comfortable with conceptual only thinking whilst the detail is gradually created. The lack of detail was not easily lived with, creating calls for simplification of the programmes intent that in some cases led to a knock on perception of the vision being "dumbed down" and the lack of appreciation of how the process framework was an integrated whole piece, rather than a series of unconnected support processes.

However much of the pain of the implementation programme was caused by the fact that some parts of the business were both designing change in their internal processes and their organisation at the same time. The HR function's organisational change programme meant that the function itself was putting in place new organisational structures whilst at the same time educating the business in the use of new processes and products that were of themselves new.

The review in May 1999 succeeded in re-scoping the programmes objectives and forcing alignment within the leadership team as to what would be realised by when. It was acknowledged that the review created a new focus for the programme and provided a sense of business imperative. It rationalised the go-live milestone timetable and created the momentum for change. It has however been commented that in doing so, it focussed undue emphasis on the go-live milestone as the implementation date, thus creating the sense that Enterprise was finished once go-live had occurred.

7.3.3.1.1 Lessons learnt

A capability assessment piece at the outset as to the extent of BAA's readiness to change in accordance with the desired vision could have helped indicate the issues that were realised subsequently . It would have indicated the leadership capabilities needed to drive the change through the business and indicated the areas where focus in terms of change management were going to be essential.

The pace of implementation and the slow connection between process and organisational change resulted in the organisational changes in the support functions happening at the same time as many of the new processes and all the new systems were being implemented.

The value of the May 1999 review as a stock take against programme deliverables and scope cannot be underestimated.

Continuous, on going leadership enrolment and alignment is essential in a programme of this magnitude and timescale to ensure appropriate positioning of the change with the local business agenda and individual reinforcement of desired leadership behaviours.

Implementing process, system and organisation change together needs to recognise the importance of milestones, but in the context of the overall programme of change. The August/November/February go-live milestones became ends in themselves, after which the local implementation teams quickly disengaged.

7.3.3.1.2 Recommendations

- The leadership capabilities needed to drive through change should be formally assessed in the early part of the programme
- For major programmes, interim programme checkpoint reviews should be scheduled to confirm scope and direction
- Continuous, on going leadership enrolment and alignment should be an essential element of the programme

- Local implementation teams should not disengage until all key programme milestones have been met.

7.3.4 Methodology and reporting

In implementing Enterprise, BAA had to learn a whole new capability in managing programmes, utilising project management methodologies, and reporting progress against agreed milestones. At the outset, it was acknowledged that this capability was poor, both in designing the processes for change, and then in subsequently implementing them. However the implementation of Enterprise has resulted in a much increased capability across the business in planning and managing programmes of work . It has helped shift the mentality towards the importance of rigour and robustness in scoping and progressing work. However its impact on BAA's culture cannot be underestimated:

"the rigour and discipline involved finally helped us see the economic madness of doing things differently at each location and helped us see the value of end to end process thinking".

Enterprise has created a language of programme management that was not evident before in BAA and as such has demonstrated significant organisation learning.

This learning was not without its difficulties :

- the reporting process and RAG status was essential in keeping the programme on track and invoking discipline where it was needed. The introduction of the 24hour rule for decision making was implemented because of the danger that slow response times to decisions needed would seriously jeopardise programme timescales.

- strong planning forced resolutions : those parts of the programme where planning capability was weakest often had the greatest struggles to realise all the dependencies and the impact one decision had on the other. It created tension in already often strained relationships and led to much rework at programme or location level where work had just been missed or was incomplete or incorrectly progressed :

  " key areas of performance did not appear on the radar screen quickly *enough*"

- the Oracle working methodology seemed to frustrate BAA : it required ever increasing levels of depth and detail, which were not appreciated nor found comfortable :

  "some people seemed to want all the answers without doing the necessary detail of work"

At programme level, this led to a perception that every new level of detail provided individuals with an opportunity to change the previous level. Adherence to fixity seemed very difficult to achieve, coupled with what was perceived as an ever increasing desire to customise products to meet requirements that appeared to often change. Whilst this became a central source of debate and confusion, it undoubtedly resulted in a perception by the location that they were never really sure of what they were implementing:

- The overall holistic working methodology, in linking process and system change to organisational development and change, that could then be implemented in BAA's location based structure did not arrive early enough in the life of the implementation. The Deloitte methodology chosen was effectively only implemented nine months from go-live : when implemented it forced rigour and understanding of the connection between process and organisation .

- locally, most locations have since reported in the post implementation reviews that there should have been both a single, unifying programme plan, reinforced by a single local plan, rather than a series of plans, and that the dependencies be electronically connected at one source.

- the Gateway processes chosen to reach sign off were seen by some as very effective on focussing everyone's attention on the key deliverables needed at each stage : the requirement for physical sign off's were seen as critically important in reinforcing commitment, however it is also reported by some locations that this philosophy was counterproductive as location management teams perceived failure to sign off even for legitimate reasons as a possible poor reflection of their capacity to implement.

7.3.4.1.1 Lessons learnt

The rigour in planning, progressing and reporting progress cannot be underestimated as a critical factor in BAA's success in realising its go-live milestones. It has built a language and capability across the business not evident previously

Such an approach needed greater education in its implementation that ensured all parties to the implementation effort understood the working methodology, what it would require, how it impacted resource planning and how dependencies between activities were so critical. Senior management education in this area would have been particularly useful.

Implementing a business improvement programme of this scale requires the change methodology that links process and organisational change to be in place, up front at the outset.

Gateway type events, at specific milestones, are critically important in focussing attention on the key deliverables and evaluating progress.

7.3.4.1.2 Recommendations

- The rigour in planning, progressing and reporting progress should be a critical factor in BAA's programmes in realising its go-live milestones.
- Common working methodologies and their associated requirements should be used for all locations.
- The change methodology linking process and organisational change should be established as part of programme set up.
- Gateway type events, at specific milestones, should be scheduled as they are critically

important in focussing attention on the key deliverables and evaluating progress.

7.3.5 Relationships with Suppliers

At the outset, the relationship BAA chose to have with its leading partner in the implementation of Enterprise, Oracle, was going to be a very important factor in the overall implementation leadership. In addition, BAA worked with a number of other consulting companies during the implementation life of *Enterprise* : comments received on all these relationships are detailed below:

7.3.5.1 Oracle

BAA's relationship with Oracle undoubtedly worked most effectively at programme level, within the Central House organisation. The inclusion of an Oracle senior executive on the programme Executive and management team was seen as a master stroke : it allowed Oracle to be viewed as a real partner to the programme at the highest level, did much to build an effective relationship with both the programme implementation team and BAA's I.T. team, and supported BAA's senior managers who were involved in the implementation. It also ensured that Oracle was not unfairly blamed for shortcomings in the programme implementation by simply not being present or represented in the governance structure.

Within the CTH organisation, Oracle staff were virtually indistinguishable from BAA staff, and this climate was encouraged. It succeeded in creating a one team focus in CTH which would become essential as the pressures on implementation began to accelerate.

Outside the CTH organisation *however, the business* relationships with Oracle were less developed or understood and their working methodologies not always appreciated.

Oracle had acknowledged early in the programme life that in certain areas, particularly in project management, it would need to reinforce BAA managers with Oracle consultants to supply the expertise needed, whilst the accountability for decisions would rest with BAA. At times, it was acknowledged that this did result in some tension between both parties where direction was not clear or where individual BAA employees' shortcomings in capability or experience caused frustration on both sides.

7.3.5.2 Kinsley Lord

Chosen originally as the consultants to support the change element of the programme, Kinsley Lord's relationship with BAA on Enterprise was relatively short lived. They were not able to demonstrate sufficient underlying methodology to their approach to change management which was needed in a programme of Enterprise size.

7.3.5.3 Deloitte Consulting

Deloitte's change leadership methodology was adopted by BAA and much of the change strategy to wards organisation design, communications, leadership alignment and effective teams used Deloitte`s approach. It did enable the programme to finally decide the way forward on the organisational implications of Enterprise and supplied a methodology to implement it, though the short timescales meant that the tools and techniques needed were often being developed in parallel with when they were actually required

The involvement of Deloitte`s was also built on the basis that capability would be clearly transferred to BAA and this was an important part of the agreement reached with them.

7.3.5.4 Lessons learnt

Supplier partners chosen for their expertise need to be made to feel like partners. The inclusion of Oracle in the governance arrangements in this programme, at every level, reinforced the desired relationship BAA wished to have with them and was *accompanied* by a contractual set of arrangements which were regarded, and subsequently evaluated, as being sound and very effective.

Building a seamless team with the chosen supplier partner has been BAA's approach in supplier arrangements, and, whilst used extensively in the construction business in BAA, was reinforced with Oracle on Enterprise.

The working methodologies and approach to be used by supplier partners need to be fully understood and realised by all parties in the implementation programme.

Capability transfer should be regarded as a critical component of the relationship agreed with the supplier, such that the expertise of the supplier is not lost when the contractual relationship ends.

7.3.5.5 Recommendations

- Supplier partners chosen for their expertise should be made to feel like partners
- Building a seamless team with the chosen supplier partner should continue to be BAA's approach
- The working methodologies and approach to be used by supplier partners should be fully understood and realised by all parties in the implementation programme
- Capability transfer should be regarded as a critical component of the relationship agreed with the supplier

7.3.6 Ongoing Learning

For a programme of this scale and complexity to succeed requires significant capability on the part of all involved to learn from success and failure as the implementation programme rolled forward. There are numerous illustrations of learning taking place throughout the life of this programme, but of most significance, the following have been consistently identified as areas where learning allowed breakthroughs to be made in implementation planning :

7.3.6.1 Training

The delay and de-scoping of the training programme envisaged to support the go-live implementation of the new systems led to the inevitable realisation that without other interventions, too much reliance would be placed on the systems and process training as the only vehicles for employees to understand the rationale and implications of the changes being made. Whilst the August go-live sites were largely unable to rectify this in time, the decision to introduce process awareness workshops, reinforced by operational staff briefings and desk top scenarios for departments most affected, significantly helped the November and February go-live sites gain the maximum benefit from the training that was held.

Additionally the November go-live sites reported considerable learning from Gatwick and Corporate Office's implementation in terms of the organisation and scheduling of the training, with resources from one site actively leant to the others in order to spread the learning on the ground and reinforce that provided from Oracle.

7.3.6.2 Data migration

For a variety of reasons, issues associated with the migration of the existing legacy systems and the organisation hierarchy build became a central feature of much of the frustration associated with the go-live milestone of the August 2000 sites . However, the learning realised from this was significant : the November and February sites had proportionately far less reports of incorrect hierarchies at go-live .

7.3.6.3 Learning transfer

The emphasis and efforts *placed on* post August go-live learning were considerable and illustrate a desire in BAA to collaborate across business units to realise improved performance based on shared learning. Instances of this include :

- the Heathrow workshops for line managers in September where Gatwick and Corporate teams debriefed the Heathrow managers
- the Programme workshop held at Pease Pottage in August to debrief all Implementation teams on the August go-live
- SAL workshops for their implementation teams where Gatwick and Corporate teams debriefed the SAL implementation management team
- SAL communication workshops attended by members of the CTH and Heathrow implementation teams in the run up to their February go-live
- meetings with the HAL and STAL senior teams and programme management from CTH, based on a successful format used for Gatwick.

7.3.6.4 Capability development

Whilst too broad to do more than make casual reference to it in this report, the implementation of Enterprise has undoubtedly increased the organisational capability of BAA in certain areas:

Programme management :

Enterprise has helped build a capability around programme management . Those areas of the business regularly exposed to Enterprise implementation had to become familiar with a language and a series of processes for scoping and documenting work, project planning, resource planning and reporting progress. It has encouraged a rigour in BAA's approach to project management nowhere near evident before.

Change management

Enterprise helped build an increased change capability in BAA. It became a vehicle to develop change processes and approach in both HR and in the line business. The methodology and approach inherited from Deloitte Consulting has become embedded in the working methodologies now used elsewhere in BAA.

Capability transfer

One of the principal yardsticks of the change programme was to ensure that capability transfer arrangements could be put in place to ensure learning realised from Enterprise, particularly from working with the supplier partners, could be maximised. Ultimately the mechanism for this to take place, that of individual capability transfer contracts, was only used within the Change team and its relationship with Deloitte Consulting: nonetheless the principle has been established and where applied, proved very effective.

7.3.6.5 Lessons learnt

BAA's propensity to learn from itself is considerable and was undoubtedly a critical element of successful go-live milestones being reached. Future business improvement programmes need to capitalise on Enterprise learning, but more importantly, acknowledge the critical importance of putting in place both the formal learning mechanisms that allow organisational learning to take place, as well as acknowledge the need for the informal mechanisms which allow it to flourish.

At an individual level, BAA has seen the benefits of formally putting in place individual capability transfer contracts which define the learning expected to be realised and transferred from one party to another. This should not be lost in future change programmes.

7.3.6.6 Recommendations

- Formal learning mechanisms that allow organisational learning to take place, should be established and the need for the informal mechanisms which allow it to flourish should be acknowledged.
- Individual capability transfer contracts should be established

7.4 Summary of Recommendations

This section incorporates the recommendations from Section 7 to categorise them under the following headings:

- Programme Management
- Change Management
- Resource Management
- Supplier Management
- Financial Management

7.4.1 Programme Management

The following recommendations from Section 7 relate to Programme Management

- For major programmes, it is critical that the most Senior Executive, appropriate to the programme objectives, be engaged as business sponsor
- The formalisation of roles and accountabilities should be regularly reinforced
- Planning and programme management is a critical capability
- The implementation leadership should establish very effective relationship management behaviours to keep the programme going forward.
- Accountabilities for the Governance of the programme should be clear.
- Leadership of change should be represented in the overall programme leadership
- Governance structures should involve all levels of local senior management particularly Heads of Departments.
- Governance arrangements should recognise the need to establish informal and formal relationships.
- For major programmes, interim programme checkpoint reviews should be scheduled to confirm scope and direction
- Local implementation teams *should not disengage* until all key programme milestones have been met.

- The rigour in planning, progressing and reporting progress should be a critical factor in BAA's programmes in realising its go-live milestones.

- Common working methodologies and their associated requirements should be used for all locations.

- Gateway type events, at specific milestones, are critically important in focussing attention on the key deliverables and evaluating progress.

7.4.2 Change Management

The following recommendations from Section 7 relate to Change Management

- The Leadership Alignment for major programmes should include continuous alignment for business leadership around vision and objectives

- Leadership in new business areas should be built, reinforced and supported throughout the programme life.

- The enrolment of the business leadership, as customers of the change being implemented, should be continuously reviewed and managed throughout the programme's life

- The Organisation Effectiveness Review Group should be involved with all business improvement programmes

- Business improvement programmes should recognise and build change capabilities in affected locations

- The leadership capabilities needed to drive through change should be formally assessed in the early part of the programme

- Continuous, on going leadership enrolment and alignment should be an essential element of the programme

- The change methodology *linking process* and organisational change should be established as part of programme set up.

- Formal learning mechanisms that allow organisational learning to take place, should be established and the need for the informal mechanisms which allow it to flourish should be acknowledged.

7.4.3 Resource Management

The following recommendations from Section 7 relate to Resource Management

- The ground rules for endorsement by the participating location managers should be fully clear and stated.

- Local enrolment should occur as early in the change process as possible

- Individuals should be supported in building and reinforcing underlying implementation capabilities where they are not developed

- Underperforming key personnel in important jobs should be removed

- Effort and achievement at individual and team level should be recognised

- Personnel with local responsibilities should be involved in the programme concepts, design and *development* before being expected to lead it locally

- Dedicated resources should be assigned to major programmes to ensure that individuals are not overwhelmed and to ensure that implementation effort is not perceived as only being approached half hearted

- Local implementation managers should be appointed at the earliest opportunity

7.4.4 Supplier Management

The following recommendations from Section 7 relate to Supplier Management

- Supplier partners chosen for their expertise should be made to feel like partners

- Building a seamless team with the chosen supplier partner should continue to be BAA's approach

- The working methodologies and approach to be used by supplier partners should be fully understood and realised by all parties in the implementation programme

- Capability transfer should be regarded as a critical component of the relationship agreed with the supplier

- Individual capability transfer contracts should be established