An Empirical Investigation on the Balanced Scorecard in the Context of Analytical Applications.

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Declaration

This dissertation is submitted in partial fulfilment of the requirements for the degree of MSc in the Strathclyde Business School.

I declare that, in accordance with University Regulation 20.1.20, this dissertation embodies the results of my own work and that it has been composed by myself. Following normal academic conventions, I have made due acknowledgement to the work of others.

I give permission to the University of Strathclyde, Department of Information Science, to provide copies of the dissertation, at cost, to those who may in the future request a copy of the dissertation for private study or research.

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Abstract

For an organisation to achieve its goals in today's digital global economy, the network is what is relied upon to deliver. Computers and applications once provided the back office support for a company, however now they contain the lifeblood of the whole organisation, the most precious of strategic resources- information.

Traditionally networks were separate entities, supporting individual processes or tasks. Today the network is an integration of several different applications all joined together to provide a single accessible architecture. Thus realising huge cost savings to the organisation.

However this was not enough, flexibility to change to meet the demands placed upon it in a changing environment became an essential attribute. To achieve competitive advantage in this respect, applications and networks have to be intelligent, carrying out several analytical functions with minimal instruction. Activity Based Costing/Management applications in networks are examples of this.

Add to this then the presence of balanced scorecard applications and you have an integrated network that not only tells you how a particular organisational strategy is progressing but also how and where it is failing to achieve its goals. Using this as an analogy to the concept of analytical applications, it was discovered that the very analytical applications that support the balanced scorecard solutions, are themselves becoming solutions. These solutions are given the handle of the balanced scorecard, while in fact they represent very little of the scorecard techniques. The research shows that finding an alternative 'balanced' solution afforded by the technology, separates organisations from paying additional royalties to the balanced scorecard creators. Thus showing that the technology of the applications themselves is indeed changing what is essentially a balanced scorecard of information.

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1 Introduction

1.1 The Balanced Scorecard

The Balanced Scorecard is a corporate performance measurement system introduced by Kaplan and Norton in the early 1990s, covering balanced presentation of financial and non-financial measures:

- **Financial**. Budgeting consolidation and financial forecasting.
- **Customer**. Customer churn analysis, cross selling, and market optimisation.
- **Internal business processes**. Procurement optimisation, supplier performance analysis, or quality control.
- **Learning and growth**. Workforce optimisation, skills inventory management.

Each measures a particular aspect of a company's performance. A more detailed example of this can be seen in appendix 4. Consequently it can be seen to incorporate ideas in both strategic management accounting (SMA) and management control systems (MCS). The literature used in this thesis shows how the balanced scorecard retains the financial importance of management accounting as well as the MCS necessary for a successful strategic implementation. Also the researcher has shown that it is this combination of applications or systems and the strategy they support, which provides the foundation for the scorecard's success now and in the future.

As this paper progresses it can be clearly seen that, because of the importance of internal business processes and learning and growth perspectives, employee innovation and flexibility must be accounted for. However it is crucial that newly created processes remain within clearly defined limits so as to ensure the growth of the organisation. It is at this instance that the MCS and analytical applications become vitally important. While the majority of systems and applications are

created to control and restrict, within the confines of the scorecard the systems are built upon. It specifies the outcomes and the methods necessary to achieve them.[1]

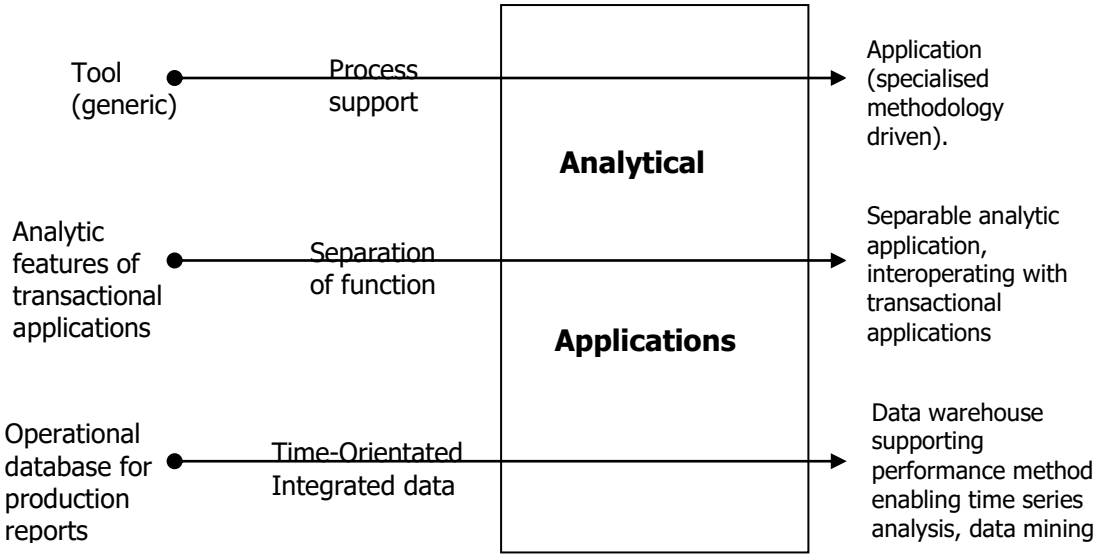
It was emphasised that the application of the balanced scorecard is far from simple and requires a comprehensive understanding of the principles involved and significant commitment towards accepting the new philosophy and implementing the necessary change. This background is provided in the literature review, to a point where the next section of analytical applications that provide for the balanced scorecard is discussed in greater detail.

1.2 Analytical Applications

Within the marketplace for applications, the International Data Corporation (IDC)[2] has considered that to be defined as 'analytical applications', the following criteria must be adhered to:

- Process Support. Packaged application software that structures and automates a group of tasks pertaining to the review and optimisation of business operations (i.e. control) or the discovery and development of new business (opportunity), or the measurement and ongoing evaluation of the goals of a business strategy.
- Separation of Function. Can function independently of an organisation's core transactional applications. Yet can exchange data with the core applications when necessary.
- Time-oriented, integrated data from multiple sources. Here data is extracted, transformed, and integrated (internal and external to the business). This data then supports a time-based dimension for analysis of past and future trends, or accesses such a database[3].

Figure 1.1



Source: International Data Corporation (IDC), 1997[4].

Figure 1.1 further illustrates the dimensions of analytical applications as put forward by the IDC. Taken together these criteria for the applications differ from sole transaction processors and also from general purpose business intelligence tools. These points are examined further in the literature review.

1.3 Company Reviewed

The company examined in this report is an organisation within the telecommunications sector in Ireland, which is in the process of implementing balanced scorecard technologies. There are several levels of integration with analytical applications present in the organisation, as can be seen at a later stage. The overwhelming outcome of the case study is a prime example that the balanced scorecard implementation is strategy led and that the scorecard applications are individual to the organisation in their set-up. That integration with other analytical applications is carried out from the bottom-up. And finally that the most

comprehensive way for balanced scorecard integration is through a policy of build, buy, and integrate.

1.4 Research Objective

The framework derived in chapter 3 is used to guide the research through the data gathering and analysing process and the primary objective was to develop and evolve a framework into a theoretical model through which the balanced scorecard in the context of analytical applications can be examined. The researcher has also discussed the application and managerial standards required to build successful models, which satisfy the information and analytical needs of business users. The main thrust of this research arose from a gap in the research, thus inviting the researcher to investigate the important factors and issues involved in the area at the present time. A clear unambiguous statement of the research objective is necessary to enable the selection of an appropriate research methodology, which in turn is critical to the ensuring that the research will contribute to the body of knowledge in IS. Thus, the research objective could be formally expressed as the following:

An in-depth investigation of the emergence and increasing importance of the once, custom built analytic systems, to the purchased, packaged suites for integration and whether these are leading the development or demise of the Balanced Scorecard as we know it.

2 Strategic Management accounting

2.1 Management accounting

Management accounting first arose in the industrial revolution in the 19th century, its main objective was to support management decision making and control. As a result the number of tools to analyse and guide management also increased. In 1987 Johnson and Kaplan put forward that the management accounting used in the 1980's had in fact, already been in use for decades. In effect management accounting as an organisational tool had reached a standstill in relation to manufacturing and other aspects which continued to progress.

During the 1980's Kaplan[5,6,7] vehemently criticised the then state of literature from which management accounting acted. He criticised the lack of correlation between manufacturing and management techniques for profit maximisation. Next he lay siege to the fact that management accounting was secondary to financial accounting, which he adjudged, led to an over reliance on historical information. The academic management accountants were accused of limiting their research and being very much removed from actual accounting practice. This set of criticisms led to the development of techniques such as activity based costing (ABC) and just in time (JIT) stocks.

There were those who did not agree however, that the management accounting techniques as they knew it were redundant but instead were in need of improvement. For example Bromwich[8], felt that while the management accounting techniques were satisfactory without major changes, he did agree that it may have to change costing systems, using JIT as an example. JIT is used here as it aligns the traditional financial measures used for internal processes with the production procedures of an organisation. Hence creating an initial step towards the integration of financial and non-financial measures.

From here the next step was the creation of strategic management accounting, in an attempt to externalise management accounting[9]. This allowed the organisation to develop a longer-term view, which was previously absent with the financial accounting reports[10,11].

SMA was categorised by further dividing accounting for strategic positioning into ABC, SMA and accounting for advanced manufacturing technology. This entailed providing a range of management accounting techniques with more accurate cost information and the emergence of a number of frameworks designed to develop an overall management process. According to Innes and Mitchell[12] the introduction of total quality management (TQM), total relationship management (TRM) and JIT provided for another the in the evolution of accounting systems. Mosad Zineldin[13] in telling us that companies operate and compete in a highly and aggressive global market, highlights the role of TQM and TRM.

TRM focuses on all integrated internal and external activities. Even though the article was written with marketing in mind it is easy to see that the techniques can be and are applied throughout other strategic management issues within an organisation. Next we see how TQM focuses on the integration and co-ordination, as well as on the continuous improvement of activities and processes. In a period starting from the 1980s to the early 1990s managers began to reject financial measures as adequate for overall performance measurement and were searching for new methods of doing so. Around the same time, many managers in Europe and the USA became exposed to the concept of total quality management (TQM). The rise of the TQM movement drew the attention of managers to the importance of focusing on the customer and to providing quality products and services as a means of maintaining competitive advantage. The combination of these factors evoked a call for "new" methods of assessing performance. Kaplan and Norton seemed to answer that call when they published their research on the balanced scorecard.[14] Before this occurred, however there emerged a successor to the concept of ABC. This was activity based management.

Activity based management replaced activity based costing as it was seen to provide both financial and non-financial information, which can allow for a company to focus processes on profitable activities and get rid of the wasteful ones. Cooper and Kaplan[15] stated that ABM systems provide companies with management information- not standard accounting information. All of this was seen as the necessary process by which a more comprehensive view of the organisation could be delivered.

At this point the appearance of the concept of control finally arises in the area of strategic management accounting. In order for a company to achieve a competitive advantage, it had to have internal control mechanisms in place to direct operations successfully and efficiently.[16] This management control, allowed the organisation to realise its strategy more effectively than before. The following section shows the influence of management control systems (MCS).

2.2 Management Control Systems

Management control systems were defined by Anthony in 1965[17], as "the process by which managers ensure that resources are obtained and used effectively and efficiently in the accomplishment of the organisational objectives". In other words issues relating to objectives, strategies and plans for their attainment, target-setting, incentive and reward structures and information feedback loops. Their central focus is on the management of organisation performance. Because the framework has been inductively developed, its application is tested against 3 major systems of organisational control, namely budgeting, economic value added and the balanced scorecard. In each case, neglected areas of development are exposed and fruitful topics for research identified. From this it is believed that a framework such as this can usefully be developed further by its use in analysing other instances of management control systems practice, and that case-based, longitudinal studies provide the best route to this end[18].

Merchant[19] led the way for empirical research in this field. Although his work may not have become the foundations for later studies, it served to highlight the need for empirical research.

Abernethy & Brownwell[20] conducted an empirical study to examine the role of accounting and non-accounting controls in a research and development setting. The study draws on Perrow's[21] model of technology and structure to explore how an organisation carries out certain processes and measure the effectiveness of accounting, behaviour, and personnel forms of control. Perrow defines his model of technology and structure as knowledge, tools, techniques, and activities used to transform organisational inputs into outputs. From here he stated that the technology used is significant as it has a direct effect on the organisational structure.

The main contribution of the study is the finding that non-accounting controls, especially personnel forms of control, contribute to organisation effectiveness, particularly where task characteristics are not well suited to the use of accounting-based controls. In addition, the research had two dimensions: analysability and number of exceptions. The results suggest that of the two dimensions examined, the latter proves to have the more significant influence on the suitability of the controls. "Programmed" types of controls (such as either accounting or behaviour controls) appear unsuitable where the number of exceptions is high.

Where exceptions are commonplace, organisational learning plays a key role in the strategy, which will be adopted. Organisational learning is the process of changing the organisation to fit the changed environment, and may be either adaptive or generative. Management control systems may help or hinder organisational change. Basic management control and budgeting systems are designed to ensure that problems or errors of environmental fit are detected. If the correction of these problems results in fundamental changes, generative learning will take place. There are 4 major constructs associated with organisational

learning: 1. Knowledge acquisition, 2. Information distribution, 3. Information interpretation, and 4. Organisational memory.

Management control system design may include features, which fit each of these constructs, and appropriate system design can assist organisations to learn and survive during periods of change. Within the article by Kloot[22] links between management control and organisation learning, which take account of the above four constructs were highlighted. Following this, a different approach was used to address common environmental change. This highlighted that different levels of organisational learning related to different management control system characteristics.

The purpose of Slagmulder's study is to gain better insights into the control strategies of firms with regard to strategic investments in manufacturing plant and equipment. More specifically, the research set out to examine how management control systems (MCS) are designed and used in an organisation to help align strategic investment decisions (SID) with the firm's strategy. A field research design was used combining exploratory and explanatory case studies. Data about SID processes and associated MCSs was gathered from field interviews and company documents at 10 research sites[23].

Data analysis is based upon a coding scheme designed to help generate theory from field research. The grounded theory that emerges is one of dynamic adaptation of MCSs triggered by changes in environmental conditions in order to help achieve strategic alignment of SIDs[24]. This furthers the importance of organisational learning and the need for integrating MCSs with it.

Continuing with this area of discussion there was another paper that reviews research surrounding studies on the relationship between management control systems (MCS) and business strategy. Empirical research studies that use contingency approaches and case study applications were examined focusing on

specific aspects of MCS and their relationship with strategy. In greater detail then, these aspects include cost control orientation, performance evaluation and reward systems, the effect of resource sharing, the role of MCS in influencing strategic change and the choice of interactive and diagnostic controls. The latter two being echoed by the previously mentioned Slagmulder research[25].

More contemporary approaches to the relationship between performance measurement systems were also considered. From this it is concluded that the knowledge of the relationship between MCS and strategy is limited, providing considerable scope for further research[26].

This further research came under the category of Performance Measurement Systems (PMS). Performance measurement systems are an integral part of management control systems. Performance measurements reflect organisational culture and philosophy and describe how well work is done in terms of cost, time, and quality. They help set standards and targets, track progress, motivate, communicate organisational strategic intent, and influence behaviour modification. To be effective, performance measures need to reflect the changes in competitiveness, but traditional performance measurement systems are criticised for being obsolete, irrelevant to managerial decision making, unrelated to strategic objectives, too late, too aggregated, and detrimental to organisational improvements.[27] This is discussed in more detail in the following section.

2.3 Performance Measurement systems

A high level of competition and increasingly innovative technology are the driving factors, which are leading performance systems away from the traditionally financial to a more balanced view of both financial and non-financial measures. James and Hoque[28] tell us that firms have in the past, lost out on customer satisfaction and process flexibility because of this un-balanced view. Performance measurement systems, especially effective ones, are found in the management ranks much more frequently than in the boardroom. Furthermore those analysts who rely more on the

non-financial measures are producing more accurate earnings forecasts. Only with a substantive process in place can shareholders be comfortable that a group of strong directors is acting in a truly fiduciary fashion.[29] Below is a figure showing how a performance measurement system may appear.

Figure 2.1

Source: a performance measurement system[30]

The nature of operational research and its interactions with performance measurement and strategy were the next areas to be explored. It was argued that operational research (OR) is well fitted to handle strategic issues as the modelling approach of OR facilitates understanding and learning, and the evaluation of strategies prior to action. The development of problem structuring methods is also a key aid to strategy and policy formulation. OR is also beginning to play a role in

performance measurement and there is an opportunity for OR to lead in the improvement of performance measurement systems.[31]

A major challenge for strategic human resource management research in the next decade will be to establish a clear, coherent and consistent construct for organisational performance. Rogers and Wright[32] describe the variety of measures used in contemporary empirical research linking human resource management and organisational performance. Implications for future research are discussed amidst the challenges of construct definition, divergent stakeholder criteria and the temporal dynamics of performance. These challenges are addressed in this article by the concept of performance information markets, it is then proposed as a framework for the application of multi-dimensional weighted performance measurement systems. Performance information markets, in this case are where several performance measurement systems are integrated to achieve a strategic goal [33].

From another point of view, senior human resource executives today have a leadership opportunity that results from a pervasive problem: the troubled status of performance measurement systems. The article by Van-Weegen and Hitchcock[34] shows a possible response to senior HR executives who were seeking context and guidance on the creation of performance measurement systems. It details the study by A.T. Kearney and 'The conference Board' of the strategic measurement systems and best practices in 113 corporations world-wide. The findings highlighted in the article from the survey were that there are three key reasons why it is so common for a company's performance system to obstruct its strategy:

1. Lack of focus on the critical dimensions of the strategy.
2. Lack of linkage between strategy and execution.
3. Lack of insight into true competitive and business performance.

Also in this article the four best practices from the research were examined:

1. A rigorous and multi-faceted analytical approach.
2. Strategic maps and value maps.
3. Seamless link with individual performance and compensation programs.
4. Robust information architecture[35].

It the ability to achieve these best practices that help to create a successful scorecard within the context of analytical applications.

This also has repercussions for the creation of knowledge in an organisation. Although maintaining a high-level capacity to share knowledge increases the cost of doing business, investing in knowledge management is widely touted as critical to improving organisational performance in a global business environment. But if organisations neglect to refine their performance measurement systems to consider the impact of knowledge transfer on employees, they will find their investment negated and the benefits of knowledge management vastly diluted. With proper planning, however, this knowledge management paradox can be avoided[36].

Many companies are undergoing organisational changes encompassing innovative approaches to organising production processes, restructuring work practices and developing new planning and control mechanisms.[37]

A successful organisation must have all of its structures, systems, policies, procedures, and people aiming in the same direction if organisational goals and objectives are to be achieved efficiently and effectively. All employees need to understand how their jobs contribute to the pursuit of sales and service excellence. Effectively written, customer-focused job descriptions can help clarify this for employees. Instead of controlling and directing their staff, managers need to focus on coaching and developing employees to unlock their potential and empower them

to succeed on their own. Relevant performance measurement systems and tools must be established to support organisational objectives. Providing recognition and rewards for consistent and superior results is a vital supporting element of a successful sales and service culture[38].

Most organisations today use some type of strategic planning to identify objectives or initiatives. Linking the objectives to the organisational vision and the daily activities within the company is often difficult to achieve. An effective measurement system enables the managers of an organisation to determine if the activities are supporting the objectives, and whether these objectives move the organisation closer to the stated vision. What is missing from most strategic management systems is not however the planning aspect, but the implementation aspect. Several measurement concepts should be considered as the measurement system is designed; this is in essence a balanced scorecard with dynamic links to applications to effect change if necessary.[39]

3 The Evolution of the Balanced Scorecard

The concept of the balanced scorecard was first developed by Dr. Robert Kaplan and Dr. David Norton in 1990. From this starting point it has gone on to become one of the most prevalent forms of management accounting in the world. The Gartner Group[40], in a study of management practices, predicted "At least 40% of Fortune 1000 companies will implement a new management philosophy- the Balanced Scorecard- by the year 2000."

"If you cannot measure it, you cannot manage it"[41]. This statement pertains to the issues of tacit information being lost due to the lack of adequate measures and how organisational measurement systems mentioned earlier in chapter 2 affect the people in the organisation as well. Employee performance and behaviour can alter dramatically. It does not however, draw conclusions to a discussion on 'hard versus

soft systems' as both hard and soft measures are accounted for by the balanced scorecard. If an organisation is to grow it needs to be able to measure and manage all aspects of the key success factors. An example of the measures used in a balanced scorecard within an organisation can be seen in appendix 4. These were selected in association with the Global Auditing Information Network (GAIN)[42]. As mentioned, traditional systems were financially grounded, this narrow view was seen as outdated up to 20 years ago and as such, needed to be expanded upon with non-financial measures. With this in mind organisations are seeking a system which is well balanced with financial and non-financial attributes. "The BSC compliments financial measures of past performance with measures of the drivers of future performance"[43]

This balance of finding forward looking, long range competitive capabilities and the reliance on historical financial accounting measures led to the creation of the balanced scorecard. Robert Kaplan and David Norton provided the research by which the balanced scorecard was created in the early 1990s. In facing complex and competitive business conditions, the focus for management is on long term success.[44] It has been acknowledged for some time that relying upon a single performance measure for commercial success is a recipe for disaster. Thus relying solely on financial measures encourages a historical and unbalanced view.[45]

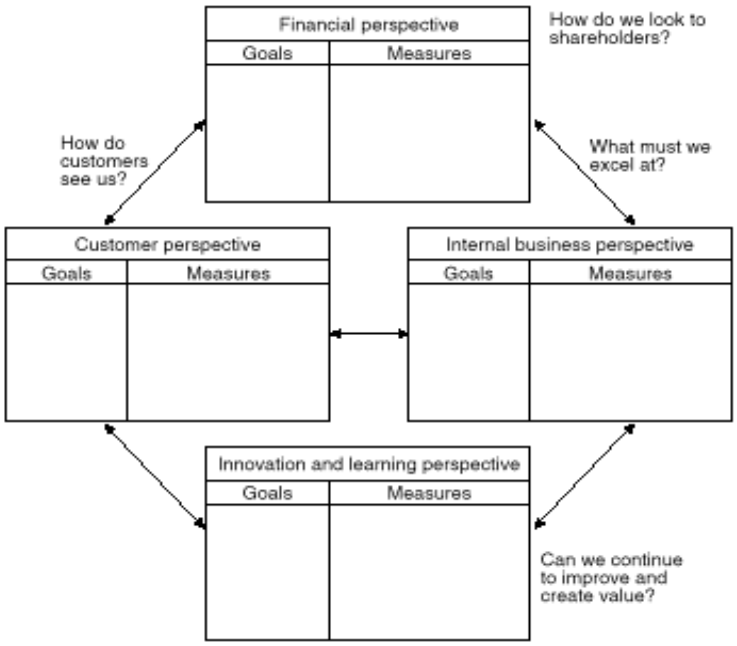
The balanced scorecard covers four distinct, but interrelated perspectives: financial, customer, internal process and innovation and learning. However they do not exist as a singular solution to the problem of organisational strategy. In the context of applications, for example, three integrated levels of applications exist, within which the four perspectives of the above scorecard are concentrated in the middle, process-specific level. This level is supported by the lower foundational level and supports the higher strategic level, where the balanced scorecard applications lie. It is the balance of measures across each level and perspective that affords the scorecard its name. For the remainder of this section the research will concentrate upon the four sections of the balanced scorecard, after which the analytical applications context will be discussed in the next section.

The balanced scorecard allows managers to look at the business from four important perspectives. It provides the answer to four basic questions:

- Customer Perspective. How do customers see us?
- Internal Perspective. What must we excel at?
- Innovation and Learning Perspective. Can we continue to improve and create value?
- Financial Perspective. How do we look to shareholders?

While giving senior managers information from four different perspectives, the balanced scorecard minimises information overload by limiting the number of measures used. Figure 3.1 is an example of how the different segments of the balanced scorecard would appear with these additional questions[46]:

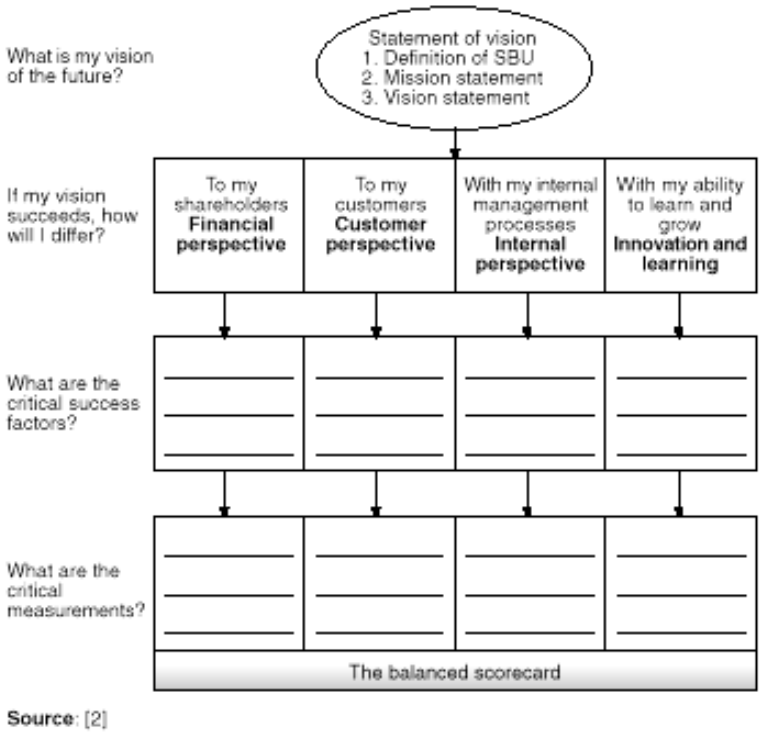
Figure 3.1



Source: Letza, S. R. The design and implementation of the balanced business scorecard. An analysis of three companies in practice*. Business Process Re-engineering & Management Journal* 2 (3) 1996. P54-76.

Since an organisation's strategic measures provide the basis from which the scorecard works, there is the ability to 'drill down' or further specify the indicators within each of the perspectives, for greater focus on a particular strategy. This, as has already been mentioned is made possible by dividing each perspective into levels according to the application levels above. In other words, the objectives that drive the strategy can be defined by the areas they affect and are supported by those applications to track performance in the area. A template of how this could appear can be seen in figure 3.2.

Figure 3.2



Source: Letza, S. R. The design and implementation of the balanced business scorecard. An analysis of three companies in practice*. Business Process Re-engineering & Management Journal.* 2 (3) 1996. p54-76.

Kaplan and Norton[47] show the reader the intricacies involved in the scorecard from its theoretical beginnings, to the influence of strategic management system. This book furthers the evolution of the scorecard by providing a detailed methodological structure for an organisation to construct its own unique scorecard as to its business

requirements. This structure is fully substantiated, as a best of practice analysis is provided through empirical research (case studies).

To fully understand the working of the balanced scorecard, each of the four sections mentioned earlier is examined in greater detail. The first of these will be the customer perspective, this perspective details the aspects of an organisation which are particularly prevalent for the relationship with its customers. The internal business processes perspective details how best to avail of the opportunities for competitive advantage presented within the organisation and also how they can be measured. The next perspective deals with the subject of innovation and learning within the organisation, this is a vital aspect of gaining competitive advantage over rival organisations. The fourth perspective considers the financial aspects, the continued financial well being of the organisation and how best to allocate finances for the future.

3.1 The Four Perspectives of the Balanced Scorecard

3.1.1 The Customer Perspective

The main thrust of business practise used to be that, to minimise the costs and maximise the technology associated with the internal business processes were the keys to achieving maximum return on investment and greatest competitive advantage in an industry. In today's marketplace, however the rules have changed, the rules and actions of the past twenty years are no longer applicable. Customer needs must be satisfied, external aspects of business processes must involve customer preferences[48]. In doing this an organisation must adhere to their customer preferences as much as possible, if this approach is not taken then the needs of the consumer may prove to be better satisfied by competitors resulting in a loss of business[49].

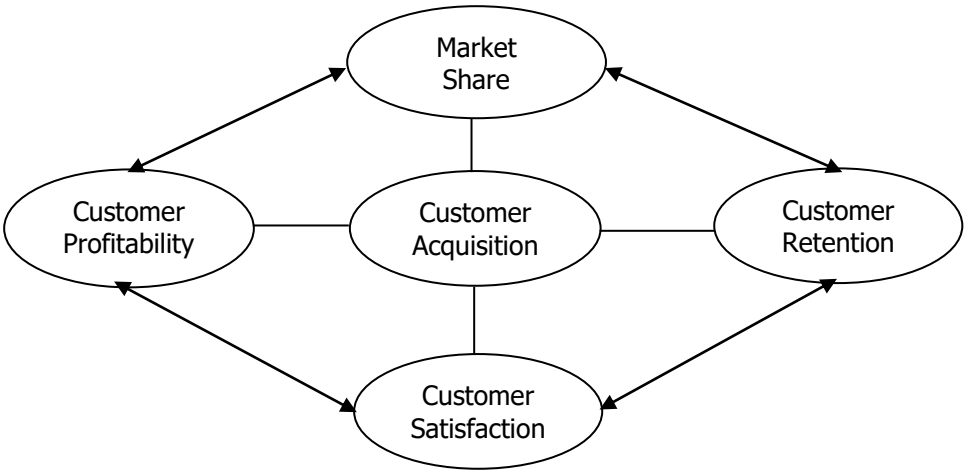
This perspective forces an organisation to examine its relationships with its customers. The customers' requirements and expectations have to be identified to adequately achieve this perspective of the scorecard. This echoes the newly established strategy of mass customisation.

Throughout the 1980s mass production, focus and differentiation were the main strategies, however, mass customisation is now emerging as the new strategy with regard to customer satisfaction. Mass customisation allows producers to enjoy the scale economies of mass production, while producing a good that appears individual[50]. As a result, organisations are increasing their product base while the time to live[1] of most of the products is getting shorter Quality, time-till-delivery[2], cost and service are constantly reaching new levels in industry. It is this very change in production practises that highlights the contemporary importance of the customer to the firm's survival.

Using the issues of quality, time, service and cost as scorecard objectives, the corresponding measures to fulfil these targets can, according to Kaplan and Norton[51], include acquisition, satisfaction, loyalty, retention and profitability. By adhering to these, the organisation can gain a more comprehensive understanding of what customer behaviour means to it. The following figure shows how these suggested measures are interlinked.

[1] Time to live of a product, is essentially the life span of a product; the time taken before the product incurs a loss to the organisation.
[2] Time till delivery, this is the time taken form the moment the order is made to the moment it reaches its destination.

Figure 3.3



Market Share:	reflects the proportion of sales in a given market segment.
Customer Acquisition:	measures the rate at which a business attracts new customers.
Customer Retention:	measures the rate at which a business retains on going relationships with customers.
Customer Satisfaction:	assess the level of satisfaction of customers.
Customer Profitability:	measures the net worth of a customer.

Source: Kaplan, R. S. and Norton, D. P. Putting the Balanced Scorecard to Work*. Harvard Business School Press.* Boston. 1996.

The most essential of these measures is the one of customer profitability, without which the others would never become realised in the organisation. From here, the organisation must decide how to best act on the information obtained from the customer based perspective. By focusing on the customers; how the business has attracted them, and by "carefully re-appraising the organisational philosophy and incorporating this into the performance measurement system, a company can build a BSC which acts as an effective means of communicating the strategy of the company throughout the whole organisation"[52]. Hence the next perspective of internal business processes

3.1.2 The Internal Business Process Perspective

This perspective deals with how the daily running of the organisation can be monitored, and altered if necessary. Goals are set and measures developed which allow an organisation to successfully do this. This will in turn have a knock-on effect for the customer based perspective, examples of the affected areas are; cycle time, cost and quality[53]. Therefore this perspective sets out the internal processes and objectives that can bring about the realisation of customer and shareholder objectives[54]. The evolution of this perspective is akin to the customer perspective in that they both have progressed to their current status from a traditionally secondary role to the financial measures. Contemporary business analysis techniques focus on improving all aspects of business processes.

The balanced scorecard holds within its capabilities, innovation, which may result in internal processes considered as being more strategically focused than they have been in the past[55]. One possible alteration to internal processes by which the balanced scorecard could prove useful can be seen in the example of Hewlett-Packard whereby a performance method was developed, namely 'break even time' or BET. This can be defined as the length of time from the beginning of product development to the point where the original investment has been covered by net revenue generated.

Iansiti and McCormack[56] have managed to take process development research to an even greater height by describing how a selection of companies have created a product development process whereby process designers are able to alter the product even after the process has been implemented. The flexibility gained by this innovative method allows the commitment to a final design to be held until the latest possible point. Moreover the concept development phase and the implementation phase are concurrent instead of following sequentially. The result of this is that companies such as Netscape have progressed from a system of improving upon existing processes to the more up to date method of building flexibility into its product development cycle to respond to market and technological trends. The biggest difference to be seen between the traditional and contemporary

internal business processes is where customer needs and alternative technical solutions are integrated into the evolving product design. "the key to mass customising effectively is postponing the task of differentiating a product for a specific customer until the last possible moment"[57]. This leads the way for a discussion on analytical applications in internal business processes, however this will be dealt with in section 3.2 entitled Analytical applications.

Compaq, the computer company, can be used at this point to highlight mass customisation as described by Riley[58]. While dealing with retail outlets, the main drive of the organisation is to deal direct with the consumer. Thus only producing computers to specification, which have already been paid for. The Swatch organisation take another approach to mass customisation by producing a standard watch, but also at the same time producing a variety of designs quarter yearly[59].

Both of these examples illustrate how internal business processes can be improved by organisations when they integrate internal with external processes and become more innovative. Again the question of technology and applications changes arises at this point and will be dealt with later, more specifically, the automation of data gathering from such processes and the need for compatibility with a strategic tool such as the balanced scorecard. Closer examination of the perspective of innovation and learning in the next section will allow for a better understanding of the area.

3.1.3 The Innovation and Learning Perspective

As a phenomenon spawned by systems thinking, organisational learning is a most noteworthy example of systems thinking in action[60]. Organisations facing dynamic competitive environments are finding that the ability to learn is vital to their own survival. Nonaka[61] stressed the value of knowledge as the "one source of lasting competitive advantage" in an uncertain economy. It has also been argued that organisational survival and competitive advantage are one and the same thing. With this in mind, if we can accept change in behaviour as a critical component of

learning, it opens the way for acceptance of the proposition here that organisational learning and consequent change are essential to organisational longevity.[62]

This perspective attempts to provide measures that can identify how well an organisation can learn and innovate, yet it is possibly the most difficult of the four perspectives to create measures for. The necessary measures must have the ability to focus on how change is integrated into the organisation and whether or not it can deliver new ways of production and more successful products. In relying upon purely financial measures to assess the success of a product, a shorter term view with regard to investment recovery becomes the dominant motivation. Whereas, it is often the case with new products that the remuneration process becomes a longer term issue by enhancing systems processes and employee capabilities[63]. The perpetual race for competitive advantage over other organisations that exists in contemporary business is driving companies to more long term solutions allowing for greater innovation and learning.

Kaplan and Norton have divided this perspective into three sections:

- Employee capabilities.
- Information systems capabilities.
- Motivation, empowerment and alignment.

Taking the first section of employee capabilities, three measurements combine to produce the main required information, these are satisfaction, retention and productivity levels of employees. The raison d'être of these is to ensure that employee morale is and remains at a high level to encourage productivity. These issues are similar to those raised by the perceptual balanced scorecard with regard to employees. The perceptual scorecard deals with how employees see how and where they fit into the chain of production, their satisfaction with their position and how individual innovation can benefit the organisation. However the researcher

feels that to further discuss the perceptual scorecard is outwith the boundaries of this research into the analytical applications and the balanced scorecard.

If an organisation and more specifically, the employees are to be truly effective, a large amount of relevant information on all aspects related to business must be made accessible to them. As a result the information systems must be in place to provide for such a situation allowing employees to exploit the most current information in their endeavours.

The final point covering the issues of motivation, empowerment and alignment, as mentioned with regards to the perceptual balanced scorecard, can be accounted for by the previously discussed management control systems (MSC). It is for this reason that MSCs are a vital component in an organisation with regards to the balanced scorecard.

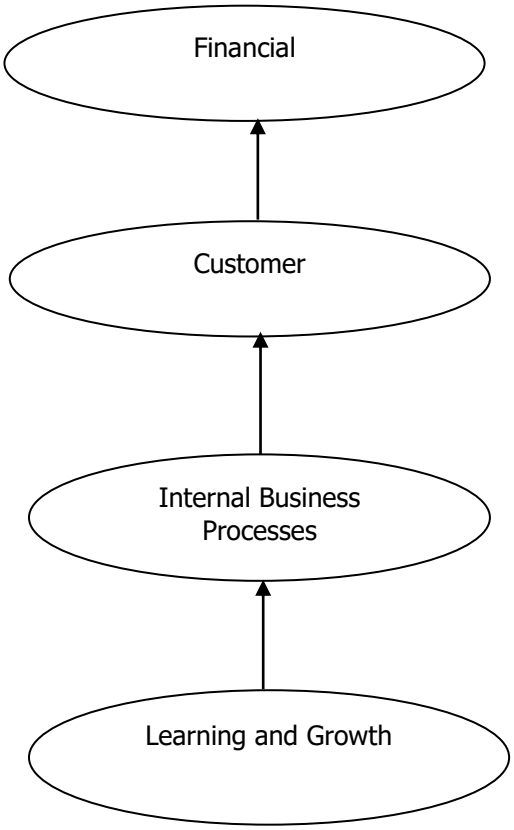
The innovative processes must then be linked to the bottom line or financial measures. Kaplan and Norton explain to us that the real challenge is not just developing the new innovations but also the organisation must learn how to explicitly link business operations and finance. In fact the importance of innovation and learning as a hand in hand team cannot be underestimated, Morgan[64] underlined the importance of innovation and learning when he outlined how the creation of a flexible innovative culture within a company is a prerequisite for success.

It is essential for an organisation to realise how these previous perspectives will effect the financial performance of that organisation, as this is ultimately the foundation for an evaluation of a company's overall performance.

3.1.4 The Financial Perspective

The perspective here is the focus of all the previous perspectives; it is the ultimate measure of business performance. However, the balanced scorecard is not the same as other PMSs in this respect, in that it contains outcome measures and performance drivers of these outcomes linked together in cause and effect relationships. Below is a figure, which shows this relationship between these perspectives, and how they feed into the financial perspective according to Kaplan and Norton[65].

Figure 3.4



Source: Cause and effect relationship[66]

Traditionally budgeting and forecasting processes have not been linked to strategic planning or performance measurement. This according to Lazere[67]is due to the fact that organisations keep the procedures involved totally separate as budget figures have little or nothing to do with organisational strategic financial targets.

The balanced scorecard overcomes this separation by almost forcing companies to integrate these measures. Both the forecasting and budgeting processes are integrated as under the workings of the scorecard, improving any measure also have implications for the allocation of resources.

ABC is particularly popular for this purpose of linking strategy with budgeting processes; here costs are linked to the product in a more precise way. In contemporary business there is a wide range of products being produced by most organisations. ABC attempts to allocate costs individually to avoid any inaccuracies caused by badly weighted traditional costing methods[68]. ABC and TQM combined together can provide an even better solution, perhaps highlighting the need for amore comprehensive approach. However, neither can account for non-financial measures as the balanced scorecard does.

This does not take from the importance of the financial indicator as a measure of a company's performance. The non-financial measures should be seen as a means of improving the financial performance of an organisation and not as a replacement. The financial measures are inherently historical and short term, while the introduction of operational measures highlighted in the previous perspectives serves to add a forward reaching facility to the performance of the balanced scorecard.

In conclusion, the reviewed body of literature supports the theory that the balanced scorecard offers a means of delivering a strategic vision while providing an evaluation system. The balanced scorecard can prove useful at all management levels if managers have a firm understanding of how the concept operates. What is required to ensure the maximum benefit is achieved is an awareness of how the four perspectives are interrelated and interdependent, and that they should not be considered in isolation. It is also critical that managers should be empowered to utilise the information to support decisions at their level.

Although in theory, the scorecard may be used as a paper based system, it is almost without compromise that the scorecard may only be implemented with information technology (IT) support[69]. With this in mind the researcher moves to the next section of analytical applications. In brief, this view of balanced scorecard operations is to provide four IT cornerstones, namely:

- adequate viewer technology so that staff can access data by whatever means they choose.
- A data warehouse to collate information across different platforms.
- Online analytical processing tools to drill down into indices.
- And data analysis software to detect patterns and suggest what questions an organisation should be raising about its own performance.

In response then, to the huge demand for the strategic advantages brought about by the balanced scorecard, IT vendors are currently creating and upgrading the analytical application software to support executive decision making, using a balanced scorecard methodology.

3.2 Analytical Applications

Analytical Applications as mentioned in the general introduction must have the following criteria: they must be time orientated, supportive of the internal and external business processes and be capable of existing separate of the core business transaction applications. Analytical Applications represent a convergence of several major forces in the software marketplace[70]:

- **Extending the business processes, supported by established methodologies**:

The definition of best practices for business functions is associated with the well-documented business process reengineering movement. These processes however,

fall short if they do not enable ongoing measurement against goals to support process improvement.

Organisations will look to extend business processes to support analytical activities such as forecasting and optimisation. Today this is an effort that often lags behind the implementation of enterprise application packages. Increasingly the definition of processes that span transactional and analytical applications will be part of the initial effort to implement enterprise applications.

Activities such as those above are becoming more formalised by the adoption of analytical methodologies such as Kaplan and Norton's Balanced Scorecard that emphasise business performance improvement using financial, customer and employee based measures. The analytical applications used here help to automate the collection and use of these and other business measures.

- **Buying versus Building applications**:

Continuing from the previous point we are led to the decision whether to buy or build the applications necessary for the analysis. The packaged enterprise applications market consists of software that is primarily transactional and written to capture transactions during the course of a business's operations. Analytical functions, such as market segmentation and forecasting examine the information collected by these transactional systems. The wave to buy rather than build (packaged rather than wholly custom) is now impacting the delivery of analytic applications[71].

Process workers, who perform day-to-day operations, traditionally use online transaction processing (OLTP) systems to support their efforts. OLTP systems are characterised by many users creating, updating, or retrieving individual records in a real-time environment. Data warehouses and analytical applications support knowledge workers. OLTP databases are optimised for transaction updating. For

knowledge workers, database content and structure tend to be more generalised. The data retention period for the knowledge worker's use is longer, often measured in years. The level of detail may be at a much higher level of aggregation. Online analytical processing (OLAP) brings to the knowledge worker an improved ability to visualise yesterday and anticipate tomorrow faster and easier than ever before. Knowledge workers cannot be concerned about how data is stored or where it is physically. OLAP systems must offer the ability to create ad hoc queries to support an intuitive style of problem solving. OLAP applications include: 1. Sales performance, 2. Budgeting and planning, and 3. Customer and product profitability.[72]

Analytical business applications help analyse and interpret business data, which, in turn, help businesses make decisions. The differences between operational and analytical applications become important when designing a data architecture to support business-analysis applications. In designing analytical systems, a more denormalised data model provides better performance and a more intuitive data structure for users to navigate. The 2 primary components of denormalised data models are facts and dimensions. Facts are the data elements of interest contained in the result set returned by a query. Dimensions define the constraints used to select the facts. Defining the dimensionality of data requires balancing user-access requirements, storage constraints, data availability, and database functionality. Designing a logical data model is probably the single most important step in implementing business-analysis applications. It can also be an invaluable aid in the product selection process. [73]

More companies are using data mining as the foundation for strategies that help them outsmart competitors, identify new customers, and lower costs. Data mining uses mathematical algorithms to search for patterns within large volumes of data that are related to business issues. Data mining is often used with other types of analytical applications, but its approach is somewhat different. Data mining helps you discover hypotheses as opposed to verifying them. Data mining can also be used to red-flag information in business data that could be costing a company

money. Vendors are working to make data mining tools available to more types of business users. In August 1999, SAS began offering Enterprise Miner 3.0, an upgrade with features that let business users collaborate with specialists in quantitative analysis on data mining projects. IBM is beta testing a new version of Intelligent Miner, and is packaging the software for vertical markets. The first of these offerings is Decision Edge for Relationship Marketing, Insurance. The suite includes a central repository for insurance data based on a model IBM developed with more than 100 insurance companies.[74]

Analytical applications also come in packaged form. One of the most popular forms of packaged applications in the AS/400 market is the enterprise resource planning solution, despite recent hits that many ERP vendors have taken during the first quarter of 1999. Informatica Corp. has released a number of products designed to speed and simplify the process of moving data from corporate operation systems - like ERP - into analytical applications. Included among Informatica's line of products providing analytic application empowerment are PowerConnect for SAP R/3 and PowerConnect for PeopleSoft, both of which extend the company's PowerCenter enterprise data integration software[75]. What should be clarified at his stage is that ERP is not itself an analytical application, but a selection of applications to provide a business solution.

Financial services firms, particularly insurance companies, have been slow to embrace enterprise resource planning. Until recently, ERP providers did not offer industry-specific solutions to persuade insurers they need to scrap their current systems for new, costly ones that require major cultural changes in the way business is done. But that is changing. ERP leaders like PeopleSoft Inc. and SAP are fine-tuning insurance-specific packages. Insurers are primed for the enterprise market - especially if ERP providers deliver integrated systems linking back-office and front-end operations, including customer information, product development and analytical applications. [76]

The top-tier enterprise resource planning (ERP) vendors are crafting major business-intelligence initiatives. In the last 2 months, PeopleSoft and Oracle began shipping analytical applications that help companies sift through and analyse the data their ERP systems generate; SAP is readying betas of several analytical applications it will ship later in 1999. Detroit Edison Co. is testing PeopleSoft's Activity-Based Management. Compaq is testing SAP's Business Information Warehouse. ERP vendors say they will eventually make their warehouses as open as possible so companies can cull data from any number of sources.[77]

3.3 Balanced Scorecards as analytical applications

The increasing popularity of bought rather than built applications systems has had knock on effects for balanced scorecard applications. The international Data Corporation (IDC) estimates the market for packaged analytical applications software to be at around $2 billion in 1999[78]. For the last two years, ready to install, packaged balanced scorecard applications have come on the market form a variety of sources: ERP vendors, consultancies and analytic application specialists.[79] When deciding on a particular applications suite, the criteria mentioned in the general introduction should be considered in this context[80]. Namely:

- Process support: the balanced scorecard allows the organisation to measure and evaluate how a particular business strategy is progressing. Instead of a series of reports the application should provide the users with the means of analysis. Through this the strategy can be defined, tracked and translated into measurable goals.
- Separation of function. It is essential that the balanced scorecard applications are kept as a separate entity of those running the core processes, for example customer support. The balanced scorecard depends on these separate system applications to provide the raw data that the scorecard applications use to create the information for business managers.
- Time-orientated, integrated data from multiple sources. Maintaining a "time orientated view of data is at the heart of any true analytic system"[81]. The

operational systems regularly update records by way of OLTP or OLAP. This often then destroys what came before it providing a window in time view-point. Yet this practice continues, thus preventing trend analysis on a greater scale. The balanced scorecard provides a multidimensional model that allows for further examination of key measures by key business dimensions. This essential time based view of information must be preserved as the operational/ financial system alone would not be able to provide such a perspective.

4 Research Methodology

It must be assumed that no one approach to IS research can provide the richness required for the discipline to advance the particular paradigm chosen for any study must be driven by the questions being investigated. That is, questions of epistemology, ontology and methodology must be understood and answered in a way that they are appropriate to the research objective. This process should guide the researcher towards the most accurate approach to answer the research questions. Therefore the nature of epistemology, ontology and methodology are now considered

The epistemological question determines the nature of the relationship between the would be knower and what can be known[82]. Ontology is concerned with the nature of the world, especially the particular piece of reality the researcher chooses to address.[83] The ontological question determines the form and nature of the question and what can be known about it.

The methodological question determines how the inquirer goes about finding out whatever it is believed can be known. Research methods used must be fitted to a predetermined methodology[84]. Which methodology is most valuable depends on the state of knowledge of the phenomenon of interest. Thus the best methodology is determined in the context of the research objective, thereby requiring an

understanding of all available methodologies[85]. This research has considered both the epistemological and ontological standing and in light of the subjective and contextual nature of the research objective, it is considered that an interpretative methodology is the most appropriate given the advanced state of knowledge in the area.

4.1 The selected research approach

Continuing then from the brief discussion on the questions of epistemology, ontology and methodology. After the most appropriate has been chosen, which in this case was methodology, the nature of the information systems and the objective of the research effort within the IS field must be reflected upon. Within the focus of this particular research objective, solidified in the research questions, the role of social factors is explicitly recognised, and the research approach taken needs to address this before meaningful explanations can be offered in the findings. IT is increasingly interpreted in terms of social action and means, including problems related to social organisational and conceptual aspects of information systems[86]. This has the chance to lead the researcher once again to extend the research to include the perceptual balanced scorecard, however it remains outside the boundaries of this research. Concentrating on the area of research, the questions for fulfilling the necessary requirements are in the following section.

4.1.1 Research Questions

The requirements of the organisation's need for a balanced scorecard, lead to an altered IT architecture. The reason for this alteration arises from the fact that, these requirements are defined by the flows needed to monitor the critical success factors that are derived from the objectives of the organisation, which allow it to attain its vision[87]. Hence the need for a formal mechanism for structuring information in order to make those requirements explicit. This mechanism can essentially lead to the development of a knowledge management culture within an organisation and as such, both the IT architecture and the systems required can become altered.

The following were the routes followed by the researcher in his task of fulfilling the research objective. Question 1 was used as a means of mapping out a structure through a literature review, which allows for a clearer, deeper research into IT and strategic requirements of an organisation. Question 2 looks at how this technology exists as analytical applications to be used for the balanced scorecard within an organisation. Question 3 assesses whether or not the balanced scorecard is being altered by constantly changing applications technology. Finally then question 4 looks at the need for standards within the balanced scorecard and the analytical application that provide for it.

- Question 1. Determine the role of performance measurements in the balanced scorecard.

Here the main focus is the applicability of performance measurement systems to the balanced scorecard. As shown in the literature review a performance measurement system is the appropriate mechanism to manage and control the organisation around its critical success factors. More specifically the critical success factors (CSF's) form the basis for an organisation's information requirements. The performance measures themselves in the context of the balanced scorecard may well hold the key to establishing flexible information requirements. However due to the fact that organisations on the whole are hierarchical, and the performance measures are also hierarchical, the ability of the system to transmit changes in business understanding, within the balanced scorecard were examined from both a top-down and bottom-up perspective. The extent to which the scorecard structure provides for analytical processing is determined with the following questions.

- Question 2. Determine how technology exists in the form of analytical applications for a balanced scorecard of information within an organisation.

Using the information gained from question 1 the analytical applications can be examined in their respective strategic and technological effects that exist within an organisation to influence the balanced scorecard. The balanced scorecard, as

mentioned, has implications for both top down and bottom up strategies, even though it is known as a top down strategic approach to process engineering. From here the question pinpoints the subject of the applications and how they exist within the organisation to provide the necessary information from the different levels of the business processes to the top end strategic applications represented in this case by the balanced scorecard. Highlighting this is an examination of how Eircom are implementing the scorecard within the organisation.

- Question 3. Determine whether the scorecard is being altered by the technology available.

Again this question leads on from the previous one. Once the background work on how the scorecard exists has been prepared, a more refined examination on whether or not the technologies used are constraining or altering the scorecard in any way was carried out. This is a topic which is gaining momentum very quickly in business today as more and more organisations are adopting the balanced scorecard and finding that the issue of standards is indeed very prevalent. What is also acknowledged at this point is the existence of any partnerships between balanced scorecard solution providers and the providers of the analytical applications technology. After this has been established, the next thing to be considered is the need for standards in this area, which is dealt with in the following question.

- Question 4. Determine the need for standards in both the implementations of the scorecard and the analytical applications on which it depends for its success.

Exploring the requirement of standards in this area has not effectively been acknowledged according to the researcher. While analysts in the past have stated that indeed there should be balanced scorecard functional standards and analytical application standards to ensure maximum integration with the least complications, there are little or no case studies to support assumptions for one set of standards or another. This question attempts to use the information gathered to empirically assess the urgent need for such standards in this area.

4.2 The Research Design

Having decided the object of study at the beginning of the dissertation, the mode of the study was then clarified. The research design defines the scope of the data capture, analysis and findings steps and involves the selection of research procedures and units of analysis. This section outlines the type of research used and the tools used to complete it.

Qualitative research as a mode of enquiry was used for the greater part of this research. The difficulty in carrying out experimental research on such innovative and up to date systems as demanded by the analytical applications for the balanced scorecard, and the need to delve in–depth into the complexities and processes presented requires the qualitative approach. This next section describes how a single in-depth case study can be used to explore issues, thereby providing a basis from which the identified issues can be expanded upon and refined empirically.

4.2.1 Single case study method

Based on Jenkins[88], the case study is a suitable method for researching the social context and depth of information, which would be required to understand the Balanced Scorecard concept and identify key analytical applications. Marshall and Rossman[89] outline methods, which are most appropriate for the particular objectives of a research effort, and agree that the case study is useful for exploratory, descriptive, and explanatory research efforts. Since natural cases exist independent of the researcher and his purposes, it is difficult to separate the effects of the field of interest from the effects of many other variables in that field. To this end then the case study allows the researcher the depth, breadth and freedom to investigate the many variables in the iterative and dialectical way typical of the qualitative approach. The primary strength of the qualitative approach is this inherent flexibility in data collection, which allows exploration, discovery and creativity[90].

Given the appreciative system or cognitive filter of the researcher, the case study should fall within the interpretivist approach[91]. A case was observed to capture and communicate the reality of a particular situation at a particular point in time. The case study allowed the investigation to retain holistic and meaningful characteristics of real-life events, including managerial and organisational processes. Case studies also tend to be used more for hypothesis generation rather than for hypothesis testing. It must be remembered that the case study is not a methodological choice but a choice of object to be studied, defined by interest in individual cases[92].

There is a weakness to the single case study, in its restriction to a single event/organisation, however the single case study is helpful in developing and refining generalisable concepts and frames of reference. According to Yin[93] an exploratory case study such as the one used for this research, can be used formatively to develop relevant lines of questions as well as for conceptual clarification. Thus a form of in-depth singular case study is proposed to tease out the issues raised in the literature review.

A holistic view of a single case study must also examine the complexities of the subsections of that case. This leads to the requirement to make an explicit choice regarding a suitable unit of analysis for the case study method. The definition of a unit of analysis is related to the definition of the research questions[94]. These questions in this research effort relate to the balanced scorecard and analytical applications, which has been found to be a method for accurately and regularly achieving competitive advantage and strategic goals.

Therefore the unit of analysis is taken as any effort directed towards achieving these goals through analytical applications and the balanced scorecard. This can be translated as the results of the process within an organisation by which such a system is introduced and executed. The presence of units in this sense allows for the collection of information on how the scorecard and applications exist in practice.

The single case study was chosen because it satisfied all of the sampling strategies outlined in figure 4.1, with the exception of 'maximum variation' and 'combination/mixed'. However the triangulation purpose in the latter of the exceptions was still utilised. The case for the study arose as it was in the process in implementing a balanced scorecard into the organisation, thus providing the ideal example from which to work. The implementation process highlights the organisations need to address the questions such as, the flexibility of the scorecard top end solution. Also, the compatibility of the existing analytical applications with the scorecard technology is vital, and the need for standards in both the implementations of the scorecard and the analytical applications on which it depends for its success.

Figure 4.1

Type of Sampling	Purpose
Maximum Variation	Helps Identify Important Cases
Critical Case	For Logical generalisation and max application to other cases
Theory Based	To elaborate on a case that exemplifies a theoretical construct
Conforming & Disconfirming Cases	To elaborate on initial analysis, seeking exemptions and variations
Typical Case	Highlights what is normal or average.
Intensity	Identify information rich cases that manifest a phenomenon
Stratified purposeful	Illustrates subgroups and facilitates comparisons
Criterion	Chose case based upon some criteria which is used for quality assurance
Opportunistic	Allows the researcher to follow new leads and take advantage of the unexpected
Combination/mixed	To meet multiple interests and needs, because of its flexibility and use of triangulation.
Convenience	Saves time, money and effort, but at the expense of information and credibility.

Source: Jenkins, A. M. Research Methodologies and MIS research. In Mumford et al. Eds. *Research Methods in Information Systems*. North- Holland: Elsevier Science Publishers, 1985. p103-117.

This, the researcher describes a typical example of issues encountered by an organisation. Furthermore the research was carried out with this company (Eircom),

to expose the underlying issues mentioned above, with the aim of getting a deeper understanding of the research questions over the research period.

4.3 Limitations of the research.

The research was limited by a selection of factors not least the singular case study. The single case study method was chosen for the following reasons: the time period for the completion of the research led to the narrowing of the research field and within this, the proximity of organisations using balanced scorecard technology in Ireland was prohibitive to multiple case studies being examined. However the richness of data collected from concentrating on this one organisation was what was required to fulfil the questions asked. The questions bore significance to the balanced scorecard and analytical applications in general, with researched empirical evidence of the situations present in a contemporary business. This is not the same issue as the implementation process itself that differs from firm to firm. The results of the research cannot be denied, even if not immediately representative of the entire global business population. The individual case serves to highlight how the balanced scorecard exists in the context of analytical applications and the necessary coming together of organisations to create standards.

Another limiting factor of the research is the time frame available to the researcher. The time allowed for this dissertation severely curtailed the amount of research that could be achieved, thus providing a brief dissertation where more time would have allowed for more qualitative research into the area.

A third limiting factor was the issue of researcher bias. This could not be escaped as the interpretation of interviews and literature was of a subjective nature. The researcher, however attempted to maintain a minimum of bias by supporting all statements with references or quotes from other experts in the field of both research and business analysis.

5 Case Study and Findings

Through this next chapter a triangulation of all information gathered was presented to conclude this body of research. The triangulation of information as previously referred to in table 4.1, occurs when the researcher takes information from a literature review, combines this with the information gained from interviews or other primary research and arrives at a unique, supported, conclusion. Firstly a description of the organisation in question and the current state of the scorecard within is provided. Using this information and that gathered in the literature review a presentation of the findings of this dissertation with regards to the questions asked, is made.

At this stage the researcher found it prevalent to briefly reiterate the research questions to create a closer link with questions and answers both on the page and in the mind of the reader:

- Question 1. Determine the role of performance measurements in the balanced scorecard.
- Question 2. Determine how technology exists in the form of analytical applications for a balanced scorecard of information within an organisation.
- Question 3. Determine whether the scorecard is being altered by the technology available.
- Question 4. Determine the need for standards in both the implementations of the scorecard and the analytical applications on which it depends for its success.

5.1 Eircom

5.1.1 Corporate Profile

The organisation was established in January 1984 as Telecom Eireann. It is Ireland's largest communications company and is the main provider of fixed and

mobile telecommunications services in Ireland. At a glance the company's revenue was IR£1,995 of year ended April 2000. The organisation was floated on stock exchanges around the world on the 8th of July 1999 and changed its name to Eircom on the 6th of September 1999.

The company believes that the technologically advanced telecommunications network that is in place at the moment should allow it to increase its competitive advantage in a cost-effective manner.

Eircom's strategic objective is seen as the following, it wishes to strengthen its position as the principle provider of communications services in Ireland and become a recognised provider in the extended market of Great Britain and Northern Ireland[95]. In point form, the key elements of Eircom's strategy are the following:

- Reinforcement of the market position and improved productivity.
- Identify and exploit growth opportunities.
- Extend the existing customer base.
- Increase services provided.

To achieve these in such a competitive environment, the approach outlined in the following section was taken.

5.1.2 Plan, Manage, Measure and Analyse

The researcher will now attempt to use one of the performance measurement systems mentioned in the literature review to briefly analyse the organisation in question.

- plan

The planning for the scorecard began when an employee in the human resources department, who had previously carried out research on the scorecard, initially

introduced the notion of the scorecard within Eircom. This was then put before the Director of Finance, Mr. Martin Keating. He believed that the scorecard could provide the perfect platform for the enormous transformation program, which is outlined at a later stage in this section. Senior management then discussed this scorecard approach and analysed it in terms of other companies such as British Telecom, with a view to its viability for Eircom. It was presented to the board of directors in November 1999. The presentation used the possibilities of the SAP systems in place at the time and coupled them to a basic outline of the scorecard.[96]

The development of the scorecard within Eircom, began in earnest in January 2000. What makes the Eircom scorecard unique is the fact that they have customised the perspectives to a certain extent. Eircom renamed two of the four perspectives. According to Ms. Creevey this was done to tailor the scorecard to what was seen as "the company's internal language". This aided in the completion of the scorecard template (appendix 2) that was circulated initially.

Before the researcher progressed he felt it necessary to describe the enormous transformation program, which eventually led to the emergence of the scorecard in the organisation. This he believed is where, the planning for the scorecard began. In 1997 Eircom set in motion an enormous transformation program which is still in existence today. The program was intended to strengthen the organisation's competitive advantage. There were two main phases used for this[97]. In phase one CMG installed a SAP R/3 HR system to replace an in-house developed HR solution. CMG plc is a leading European IT services group, providing business information solutions through consultancy, systems development, software applications and managed services. Established in 1964, CMG operates internationally from its bases in the UK[98]. The SAP R/3 HR system was delivered in just nine months by June 1998. Initially Eircom's strengths were used as the basis for the transformation, they built a customised system with the help of CMG. This led to them becoming customer focused and market driven, while at the same time creating a strong link with employee by establishing an ESOP (employee share ownership plan). This it was felt would reduce costs and improve efficiency.

For the second phase CMG have worked with Eircom to develop IT functionality using the SAP HR system to support the above programs. Jim Maguire, Eircom's HR systems manager commented in 1999 that the new system in place delivers a single source of employee data, doing away with "the separate islands of information"[99]. This was seen as one of the critical aspects enabling Eircom to restructure itself, and manage all aspects of the overall SAP implementation project to the required standards. In appendix 3 an example of the SAP templates of balanced scorecard contributing applications can be seen. The example is taken from a pharmaceutical organisation but the principle of the technologies used and how the information is presented is the same.

All of this eventually led to the emergence of the balanced scorecard in Eircom. With this in mind the following paragraphs deal with an interview with Ms. Jennifer Creevey in the Department of Management Accounting within Eircom. It details some of the information listed above, yet providing a greater, more up to date insight into the organisation.

- Manage

In the recent past Eircom has progressed through an enormous transformation, not least the transition from public to private. This period of change resulted in the search for a more comprehensive means to report the company's performance in a cohesive manner. Ms. Creevey shares the fact that they have in the region of 15 to 20 measures coming directly from the individual departments within Eircom, and that this also happened to be the average for most corporate scorecards.

More specifically all of the departments within Eircom were given a blank version of the template shown in appendix 2. The employees were then asked to fill in what they saw as the necessary measures relevant to their departments, which could lead to an improvement of their functions. The measures used were defined as anything that provided information relevant to the perspective is supported. These can be seen in appendix 2, where they are presented within their relevant

perspectives within Eircom. She states further that the executive level had heard about the scorecard and how it was a great way to motivate employees and promote the organisation. This was also taken into account when a balanced scorecard approach was decided upon.

This organisation-wide scorecard is acting as an event horizon for Eircom, causing even greater continuous change. However, before the decision to implement such a wide ranging policy, there already existed a so called 'internal balanced scorecard' in the area of customer service. One of the sub units in this area had previously developed a 'scorecard', and by using the intranet, had used it to monitor their customer and internal processes. It was called a scorecard even though it did not use the four perspectives. This is exactly what the researcher means when he states that the technology allows for certain activities to take place under the guise of a balanced scorecard without the presence of an actual scorecard. The providing of analytical applications for identification of information for key performance indicators in a somewhat 'balanced' fashion does not mean that a balanced scorecard as described by Kaplan and Norton exists.

- Measure

Moving on, the Eircom (Ireland) scorecard will be at corporate and business level. The future tense is used here to acknowledge that it is not yet fully operational within the organisation. While Eircom have a set of measures to fulfil the needs of the scorecard, the 'top end' integration of Hyperion and CorVu technologies is yet to be achieved. An example of how the scorecard appears can be seen in appendix 2. Although there is a degree of uncertainty as to whether or not the scorecard will be intranet based, research is taking place at the moment to see if there are systems which can draw information together. The reasons for the hesitance in this area spring from the wish for an Intranet based system but the security issues faced are preventing further progress. There is a very strong link between the IT and other departments in Eircom, who are aware of the project and are attempting to develop a type of EIS. Hyperion, Corvu are to provide the top-end solution to the balanced

scorecard. It will be a basic dashboard approach based on red, orange and green indicators of performance, using the existing SAP technologies or analytical applications to drill down. Eircom are working on a centralised IT architecture. There exist some legacy systems such as the old payroll system and SAP is being used to deal with this.

- Analyse

In finding out how technology was used and data processed within Eircom, in order to implement a balanced scorecard, flexibility was a key issue that was addressed. Discussions with systems managers overwhelmingly brought to the fore that the provisions for the balanced scorecard must allow it to become flexible when necessary. There was no point in having a system of analytical applications, which was so hard to change that it becomes useless and the scorecard must alter to suit it. The power of the balanced scorecard is that it must be able to change as the business changes.

Moving the concentration from Eircom to a more general view of the findings, it was possible to categorise the analysis into the following sections. Within this chapter the analytical applications themselves were examined in detail. They were segregated according to what level of the organisational hierarchy they affected. Also references were made to Eircom within the sections in relation to the research questions, when appropriate. It was found that this was the most comprehensive way of approaching the task at hand. To simply answer the research questions one after the other would have led to a sidelining of a lot of important information on how the applications exist within the organisational hierarchy. The result of which would be a gap in the research completed by this thesis with regards to question 2.

5.2 The Balanced Scorecard in the Context of Analytical Applications.

For many reasons, such as those mentioned in the literature review, the balanced scorecard has quickly become one of the main methods for aligning culture and measuring true enterprise performance. With this, the demand for tools or analytical applications to achieve this is also growing almost exponentially.

Vendors are pushing their wares upon industries in an attempt to show their competence in the area and there are many sources of information available. However this information is all from biased sources within the different vendor organisations, leading to a possibly ill advised decision by a potential customer who is led by the hype. In situations like this the organisations should, in the researcher's opinion seek external assistance, to avoid creating a scorecardesque solution, which could prove inaccurate. In simple terms, "there is no silver bullet"[100]. An organisation's ability to successfully and correctly implement applications for the scorecard, depends on many variables, such as executive commitment, potential users of the scorecard, data collection methods, systems architecture and financial, cultural and training aspects. This can be evidenced in the Eircom study above.

In general, organisations were seen to have the following options:[101]

- They could purchase the necessary analytical applications from vendors such as CorVu. Eircom, while relying upon SAP technology for lower level analytical applications are looking towards CorVu and Hyperion to provide the top level graphical interface.
- Build the system in house using the applications and software available to the organisation. After which integration with the purchased applications is necessary.
- Just recently a new type of vendor has emerged. Here companies are offered the opportunity to 'rent' an analytical application from the vendor using the Internet. This is similar to time sharing and in the researcher's opinion is not a

satisfactory method as security issues, like the theft of sensitive information through the link created with the vendor is too great.

The above information on the different ways to approach the topic, when the constantly evolving technology available is added to the ever changing vendor market, only leads to further questions

The development of software enabled balanced scorecards is leading to the implementation of an increasing number of scorecards throughout the world. Vendors of certain similar types of solutions are jumping on the balanced scorecard bandwagon as a way of capturing their own share of what is proving to be a very lucrative market. In facilitating and controlling this growth in a consistent and appropriate way, the need arises for a standardisation of the methodology first created by Kaplan and Norton[102].

There is a need for standardisation of the methodology used, relating to the management of the scorecard. This does not include system scalability, flexibility or integration. If an organisation were to consider the factors mentioned in this paragraph in the need for the development of the desired solution the researcher believed, that like Eircom proper steps should be taken to plan and evaluate a scorecard model. The model that the researcher found most comprehensive, is one which accounts for both the management and the application issues involved. It was presented in a white paper for Ian Alliot Inc. and is as follows[103]:

1. "Develop a generalised project plan for assessment and to cover steps 2-8.
2. Assign a cross functional evaluation team (business unit and information technology).
3. Clarify and validate corporate, executive level, and management commitment to the balanced scorecard.
4. Identify and categorise the potential users (number and type).

5. Document the functional software requirements as dictated by Kaplan and Norton's balanced scorecard strategic model[104].
6. Determine appropriate platform(intranet, client/server, hosted application combination)
7. Inventory data systems capabilities, data sources, and internal resources available to work on the project.

8. Evaluate the build versus buy decision; if

8.1. Build decision

8.1.1. Develop a detailed project plan identifying the project scope, timelines and critical dates, roles and responsibilities, risk factors budget and human resources, quality assurance plan, etc.

8.1.2. Identify cross functional development team

8.1.3. Map functional requirements to systems capabilities and perform gap analysis (what is missing); can we use tools we own already?

8.1.4. Design user interface specifications, database and system architectures.

8.1.5. Develop applications and implement testing procedure.

8.1.6. Implement pilot solution.

8.1.7. Determine training requirements.

8.1.8. Plan roll out.

8.2. Buy decision

8.2.1. Develop a detailed project plan identifying the project scope, timelines and critical dates, roles and responsibilities, risk factors budget and human resources, quality assurance plan, etc.

8.2.2. Identify potential vendors.

8.2.3. Conduct formal evaluation including RFP, demonstrations, pilots, and proposals.

8.2.4. Narrow vendors to three and request formal demonstrations with your agenda

8.2.5. Determine training requirements.

8.2.6. Implement pilot solution.

8.2.7. Plan roll out."

Once a set of standards such as the above is achieved then a baseline is achieved, from which variations can be drawn for individual organisational needs. If this need is not addressed then the true meaning of the balanced scorecard may be lost. With this in mind, applications that are thought to be adequate and, which support a convoluted form of the scorecard may prove to become something other than a balanced scorecard, even proving inaccurate in function.

The performance measurement applications such as those provided by SAP and PeopleSoft and the necessary top level solutions provided in the case study by Hyperion and CorVu, are in essence the evolution of executive information systems (EIS). Both internal and external information is provided by the scorecard applications as with an EIS. To justify their labelling as applications rather than simply information tools, specific indicators or business measures are integrated in the models. Also those that use the application will be of a larger range within the organisation than for the EIS[105]. To be of greatest value to an organisation, the balanced scorecard must be incorporate a hierarchy of analytical applications: strategic, process specific and foundational.

5.3 Strategic Analytical Applications

At the top level of the hierarchy are strategic analytical applications, of which the most common example is the balanced scorecard. Here the balanced scorecard enables the creation and implementation of a company strategy, as well as the linking of the particular strategy to visible performance measures for goal

achievement. Its range is throughout the organisation, including those areas most prevalent to the future financial well being of the company. The data model relating to this is broad, however it is not very deep. Thus a balanced scorecard in this respect is not enough and can result in inaccuracies, misleading the analyst for the following reasons[106]:

- No link to process-specific, operational analytical applications: A balanced scorecard without the support of process specific analytical applications is likely to fail at its expressed goal; enabling the translation of strategy into action.
- No link to foundational, ABC/ABM analytical applications. A balanced scorecard without the assistance of activity based models can be seen to rely on error-prone allocations based on general ledger categories. Without consistent and accurate models as a foundation, the balanced scorecard can lead strategists to unfounded certainty on the way to maximising profits and value. The following sections expand on these assumptions.

5.4 Process-specific Analytical Applications: Operational Improvement.

The overall performance of an organisation is seen as the end result of several decisions, each of which effect, in some way the main processes of the organisation. The majority of analytical applications can be seen at this level: financial planning, workforce optimisation and product profitability analysis to name but a few.

The data model for these must be able to support the strategic balanced scorecard[107]. In other words, the measures associated with a balanced scorecard may reveal a sudden increase in employee attrition. To translate this high level measure into appropriate action, there is the need to find the underlying causes for this change. It should then be possible to achieve through time, a closer monitored workforce management application, designed to focus on the issues of talent

retention and learning issues. The goal in this case would be to evaluate the bearing of alternative actions to solve the problem.

A process-specific application such as employee management must be linked to the balanced scorecard – depending on the same data about employee behaviour, but with the capability to create a much more detailed report, for instance, the rate of employee retention.

These process-specific applications show more detail than a broad scorecard application, thus revealing the underlying cause of why actions taken are out of line with the pre-established targets. Dealing with these results and the causes that they highlight supports the existence of a program for perpetual business process improvement. However here what is implied is that one can navigate in both a top-down and bottom-up manner through the hierarchy of analytic applications. "This presents a significant challenge"[108].

It is difficult for organisations to integrate independent data marts, when each was designed to support a specific application, in order to move to an organisational architecture. Even so there are organisations that are going through this change. The joining of process-specific, foundational and strategic applications is the application view of the same issue. I have found that organisations in this situation, taking on this task of balanced scorecard application implementation, will face this difficulty in their future, even if the implications of purchasing domain-specific analytic applications are not understood at the beginning. Their goal if they are to achieve, will be to support both top-down and bottom-up analysis throughout the range of performance management applications, including the balanced scorecard, in the organisation.

For example, Eircom, the telecommunications company. Their introduction of the balanced scorecard at present is primarily strategy led, with the emphasis on the

introduction of SAP systems at a later date for the purpose of interlinking the process specific analytic applications.

5.5 Foundational Analytic Applications: Activity Based Management, Value Based Management.

At the very lowest level of performance management systems are the analytic applications such as activity based management (ABM) and value based management (VBM). What these systems determine is done so in a constant manner. In other words it is the same across all of the process specific applications and the organisation wide balanced scorecard applications. ABM and ABC support each major area of the balanced scorecard, providing a constant from which it can operate. This ensures greater cost efficiency and creativity while minimising the depreciation of value.

ABM is in itself an analytic application. It builds a model of activities within a business process in order to develop a complex model for relating costs to costed objects such as customers and products. What results from this then can be used for the process applications like product profitability and customer valuation.

Balanced scorecards differ from ABM/ABC as they take a top-down approach, starting from a high level business strategy and translating these into assessable indicators of business performance. Consistency is the key to success for the organisations, otherwise differences appear between the project level and the organisation level views, based on how the specific business measures are evolved.

Hence, using Eircom as an example, it can be seen that with their separate balanced scorecard and ABC initiatives will mean that they too will come to see this relationship of interdependence. In fact it is this very dependence that provides the grounds for alliances between the ABC software vendors and the balanced

scorecard vendors. In Eircom's case it is ABC technologies (ABC/ABM) with SAP Institute (balanced scorecard) and feeding a top level Hyperion/CorVu solution.

5.6 Conclusions

From the beginning it is important to remember that the balanced scorecard in the context of analytical applications represents significantly more than presenting key measures to the user. The balanced scorecard is a reflection of strategy and it should present strategic information such as cause and effect bindings between measures, goals, objectives and business perspectives. Without acknowledging the relationships between the measures, it becomes very difficult to determine just exactly what needs to be managed. So an automated solution through the use of analytical applications, should present the user with more than a report of the information and at least it should show the following set of capabilities:

- Clear communication of goals and their links to the performance indicators.
- Presentation of benchmarks and targets.
- Direct connection to data sources allowing for drill-down capabilities.
- Automated, flexible data collection.
- The scorecard must be available to all in an organisation, through hierarchical levels and format differences.

The analytical applications that directly support this set of capabilities are known as balanced scorecard products. However, as the research has shown analytical reporting, decision support and production reporting applications need not necessarily *be* called a balanced scorecard. While the resulting information may appear to be balanced, the functionality of the structure of the system in place will differ greatly form that of the balanced scorecard. Also, the support for functionality of the scorecard applications may need adjustment and customisation to the specific organisational needs before it becomes efficient.

Several vendors such as SAP in appendix 3, promote the dashboard presentation of key performance indicators. These are made up of gauges, tables and graphs. It focuses the user on measures deemed important to the organisation. This does not present, however the strategic aspects of the scorecard and so, as in the case of Eircom, a top level solution must also be sought.

5.6.1 Implications for the Future

Implications are, if the current trends of purchased suites continue, that the balanced scorecard will replace the executive information systems of present. This will in turn lead to a not so much generic analytical applications suite, but instead to a more individualised package due to the differing requirements of every organisation. Thus a policy of build, buy, and integrate with applications to provide a balanced view will prevail for business in the future, such is the popularity of balanced scorecard methodology. What must be acknowledged is that the researcher found that by achieving an alternative 'balanced' solution afforded by the technology, the organisation is separated from paying additional royalties to the balanced scorecard creators[3]. Thus showing that the technology of the applications themselves is indeed changing what is essentially a balanced scorecard of information.

Analytical applications have the potential to span from the very top (strategic) of an organisation to the very lowest level (foundational)[109]:

- **"Strategic**. This is where the balanced scorecard is found. It supports how corporate strategy is decided and its realisation into a visible goal.
- **Process-specific**. Each of the main areas of the balanced scorecard can be found in smaller, more detailed applications, specific to each process. For example
    - **Financial**. Budgeting consolidation and financial forecasting.

[3] This however was not the case for Eircom who are indeed paying for the privilege of using the balanced scorecard, even though it has been customised to a great extent for the organisation.

- **Customer**. Customer churn analysis, cross-selling, and market optimisation.
- **Internal business processes**. Procurement optimisation, supplier performance analysis, or quality control.
- **Learning and growth**. Workforce optimisation, skills inventory management.

- **Foundational**. Activity based costing (ABC) provides ways of relating costs to the objects of the costs. Hence providing a basis for customer, product or channel profitability."

The direction of the packaged applications business, which is at the moment primarily transactional rather than analytical, has shown that the most prevalent suppliers are the ones with the broadest ranging application suites. For example SAP, Oracle, PeopleSoft and J.D. Edwards. Nonetheless, the need for applications for specific processes has created new opportunities in the marketplace for best-of-breed suppliers also.

Within the market for organisational applications the process specific applications comprise of almost three times the current earnings by the application suites. The International Data Corporation, from previous research, believes that "the analytical applications market will display a similar pattern."[110] This will act as a barrier to market domination by a single vendor or vendors.

What can also be seen happening is that the most successful companies in the market will be those offering suites of integrated applications. The resulting effect on organisations will be the development of a build, buy, and integrate environment to analytical applications and the balanced scorecard. Software technology, features and functions are changing quickly.

The best way to approach this as seen by the researcher is to view the software applications just at the point when ready to buy or implement. If this is done too early decisions made about functionality at that time are likely to change when the time comes to implement. From a vendor point of view, the economics determine that a suite should be developed on the basis of a proprietary data model. However in reality the every organisation will have differing needs and different moments in time and so buyers have a need for flexible technology as is the case with Eircom.

Within Eircom, integration is happening one step at a time, as the co-operation of relevant industry organisations with regards to flexibility, is a lengthy process. With the increasing presence of XML for relating applications such as customer valuation, product profitability and financials, a good place to start on analytical application integration would be to support the linking of balanced scorecards with activity based costing (ABC/ABM).

It is crucial for balanced scorecards to have a source of accurate, timely data in an area such as profitability. "It must be seen that the BSC remains a means of effectively measuring strategy rather than a means of deciding strategy"[111] (McAdam and O'Neill, 1999). ABC meets this requirement, providing a bottom-up, foundational view. Without these analytical applications for ABC, a balanced scorecard would be left to rely upon perhaps misleading data from other core financial systems. Leading to actions which could potentially harm a business. ABC software existed before the current analytical application developments and in that respect could with relative ease be integrated into a balanced scorecard application. So there is no need to try to meet the needs of a new ABC/ABM module. From here major suppliers of ABC/ABM and balanced scorecard applications could agree on how best to create an XML document to transport the data between the applications. Thus highlighting the need for ABC/ABM and balanced scorecard alignment.

6 Appendices

6.1 Appendix 1

The AT&T balanced scorecard conformed very closely to the model envisaged by Kaplan and Norton. The four-sectioned template was adopted and appropriate key performance measures were generated under each of the four "perspectives".

Perspective	Strategic Objectives to Make the Vision a Reality
1. Financial	-Pursue economic value added opportunities -Improve gross margin profit -Reduce manufacturing and purcase costs
2. Customer	-Develop customer partnerships based on trust, professionalism, and shared values -Become prefered supplier -Outperform other best supplier -Improve responsiveness and reliabiliy in supply of products and services
3. Internal Processes	-Increase effectiveness of salesforce -Improve delivery performance -Improve responsiveness to opportunities in the marketplace -Build technological capabillities close to the customer
4. Growth and Innovation	-Build skills and offer a portfolio for creative solutions -Enter CATV mobile and LD markets -Create customer and project focused teams -Build capability to differentiate on software and service provision

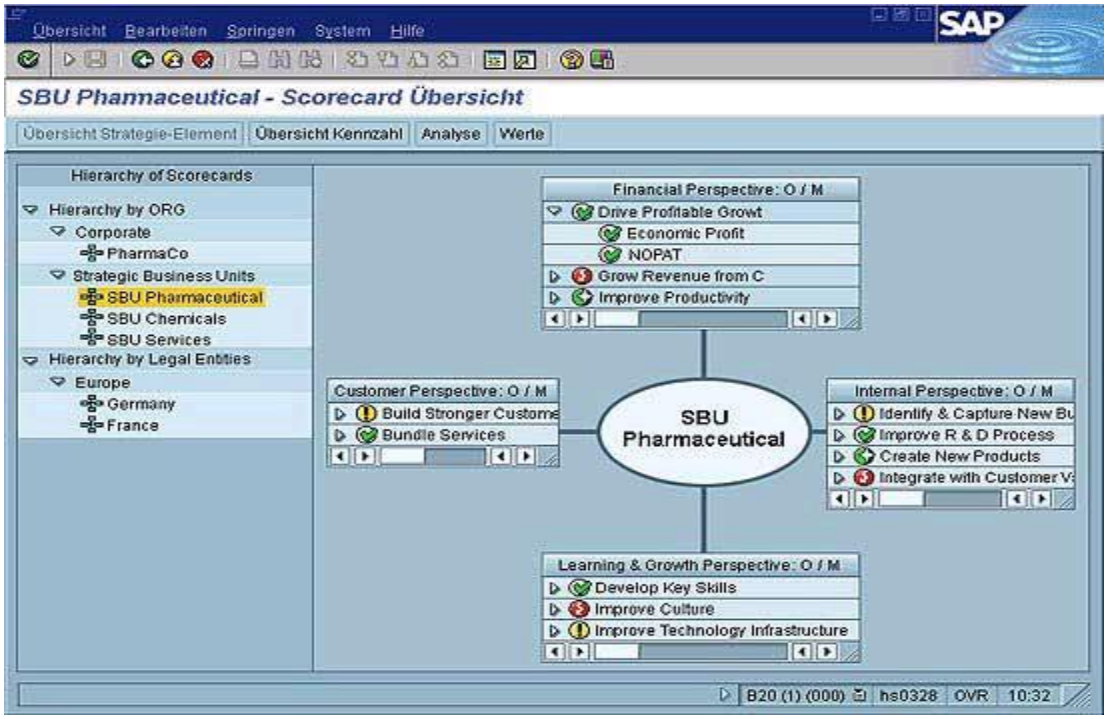
Source: Letza, S. R. The design and implementation of the balanced business scorecard, An analysis of three companies in practice*. Business Process Re-engineering & Management Journal* 2 (3) 1996. P54-76

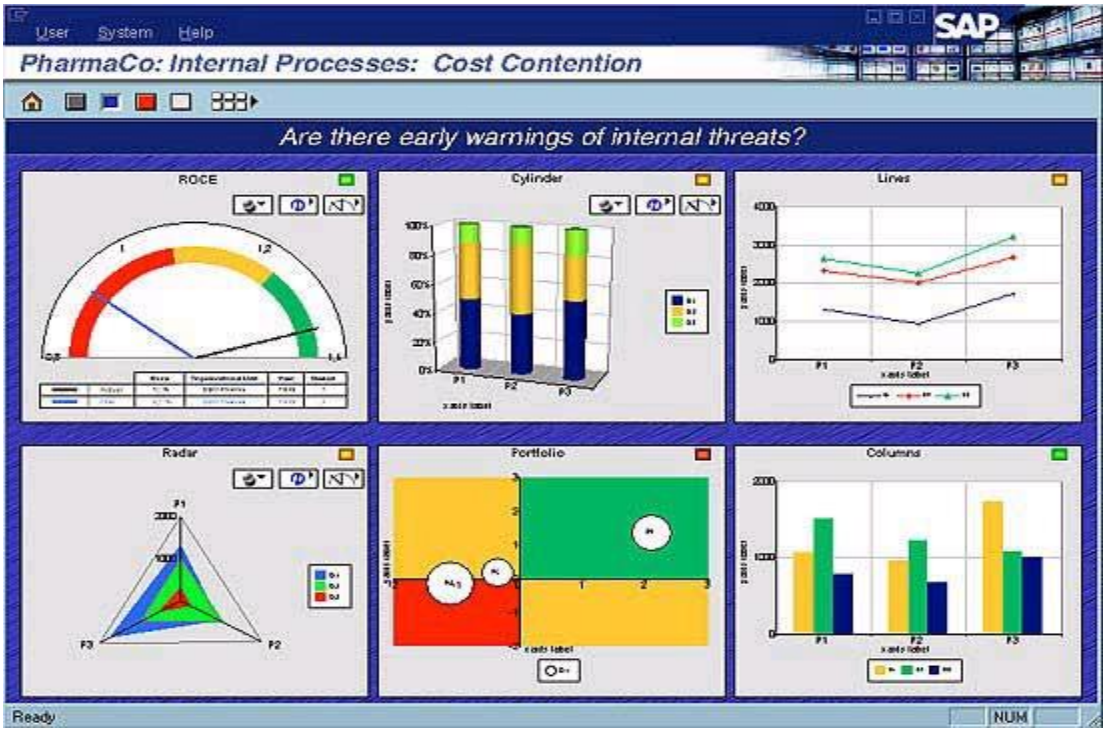
6.2 Appendix 2

STRATEGIC OBJECTIVES	STRATEGIC MEASUREMENTS	
	LAG INDICATORS	LEAD INDICATORS
Financial -Improve revenue -Reduce cost structure	-ROI -Revenue Growth	- % Mix of Revenue
Customer -Increase customer satisfaction -Retain existing customers	-Customer Retention Metrics -Market Share	-Satisfaction Survey
Efficiency -Create innovative services / products	-Service Error Rate -Order Response Time -Unit Cost	-Product Development Cycle
People -Develop strategic awareness	-Employee Satisfaction -Revenue per Employee -Employee Retention	-Personal Goal Alignment

Source: http://www.gentia.com
http://www.eircom.ie

6.3 Appendix 3





Source: http://www.sap.com[112]

6.4 Appendix 4

Possible performance measures classified by "Balanced Scorecard" perspective

Financial perspective – "To succeed financially how should we appear to our stakeholders?"

Possible performance measures:
CAE reporting relationships – functional
CAE meets privately with audit committee
Role of internal auditing, as viewed by the audit committee
Total costs per auditor – Travel included
Total costs per auditor – Travel excluded
Salaries as a percent of total costs
Travel as a percent of total costs
Training as a percent of total costs
Other costs as a percent of total costs

Customer perspective – "To achieve our vision, how should we appear to our customers?"

Possible performance measures:
Customer satisfaction survey results
Role of internal auditing, as viewed by the auditee
Management expectations of internal auditing
Number of management requests
Number of complaints about audit

Learning and growth perspective – "To achieve our vision, how will we sustain our ability to change and improve?"

Possible performance measures:
Auditor education levels
Staff turnover rate
Percent of certified staff
Average years of audit experience
Training hours per internal auditor
Internal auditor training by type
Internal training as percent of total training

Internal business review perspective – "To satisfy our stakeholders and customers what business processes must we excel at?"

Possible performance measures:
Types of audit reviews
External quality assurance review
Actual hours versus budgeted hours
Completed versus planned audits
Number of major audit findings/recommendations
Number of process improvements
Number of audit reports issued
Completed audits per auditor
Distribution of audit comments by type
Importance of audit issue
Percent of audit recommendations implemented
Amount of audit savings
Average response time – Management requests
Cost savings as a percent of total budget
Days from end of field work to report issuance
Target completion dates on management action plans

Source: Table I. Developing an internal auditing department balanced scorecard. *Managerial Auditing Journal*. 15/1/2 [2000] 12 (19). p15 [113]

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