

Prioritising IT Applications' Readiness using Balanced Scorecards in Saudi Arabia

PhD Thesis

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Abstract:

Defining a realistic strategy, that directs employees to achieve the organisation's strategic goals, is an important step towards achieving an organisation's objectives. Balanced Scorecards are one of the most useful tools and management systems to measure an organisation's performance against defined targets. In many instances the use of Information Technology within the organisation is essential to achieve a satisfying degree of the strategic objectives due to the IT readiness within the organisation.

IT readiness of an organisation can be defined as the degree of the software applications can provide the desired functionality and operations required by departments and sections within the organisation in order to achieve the strategic goals.

This research shows how Balanced Scorecards can be used to identify and priorities process requirements for IT readiness to align within organisation business strategy. Four main research questions were formulated here: how to determine projects priorities in adopting targets and weight and importance for each application, how algorithms and metrics used to measure the importance of needed applications can be developed and then how to assess their readiness. Finally, what are the methodologies used to develop a framework to priorities applications in terms of their readiness to achieve the strategic objectives.

The framework used to priorities applications have been developed and tested in this research. This implementation was based on a mathematical model used to calculate the importance and the readiness of each application in public organisation in Saudi Arabia. Moreover, a comparison between the percentages of the expected achieved targets with prioritizing application readiness and the current achievements was provided.

Declaration

I declare that the work described in this thesis is original work which has been undertaken by me for the degree of Doctor of Philosophy, at the Software Research Laboratory (STRL), at De Montfort University, United Kingdom.

No part of the material described in this thesis has been submitted previously for any award in any other degree.

This thesis is written by me.

Sameer Abdullah Nooh

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(H1)	Training and workshops
(H2)	Check updates on new software
(H3)	Employee understanding of the organisation's strategy
(H4)	Employee assessment and stimulation
(H5)	Annual survey work to enhance strategies
(H6)	The use of weights to determine the importance of strategic applications
(H7)	Priority applications

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List of Abbreviations

Automatic Vehicle Location	(AVL)
Balanced Scorecard	(BSC)
Chief Executive Officer	(CEO)
Chief Information Officer	(CIO)
Computer Aided Design	(CAD)
Computer Aided Manufacturing	(CAM)
Customer Relationship Management	(CRM)
Customer Relationship Management	(CRM)
Enterprise Resource Planning	(ERP)
General Motors	(GM)
Geographic Information Systems	(GIS)
Information Capital	(IC)
Information Capital Readiness	(ICR)
Information Technology	(IT)
IT Job Family	(ITJF)
Key Performance Indicators	(KPI)
Management of the Cleaning Department	(MCD)
Manufacturing Requirements Planning	(MRP)
Objectives Weight To Strategy	(OWTS)

Return On Assets	(ROA)
Return On Equity	(ROE)
Supply-Chain Management	(SCM)
Task Management System	(TMS)

CHAPTER 1

Introduction

- **Overview**
- **Research Motivation**
- **The gap between information technology and business**
- **Research Objectives**
- **Research Question**
- **Research Contribution**
- **Thesis Structure**

1.1 Overview

This chapter begins with a detailed description of the motivation behind the research and following that, discusses the gaps which currently exist between information technology and business. The chapter also explains the objectives of the research and provides an illustration of the different issues and problems which were identified that need to be solved, all of which are addressed in the research questions. Finally, the significance of the study will be discussed.

1.2 Research Motivation

The growth and advancement of Information Technology (IT) services has enabled IT models to be designed specifically to help to improve management in business. Many businesses across the world are investing heavily in IT to acquire solutions in management activities to increase the efficiency of carrying out a range of businesses operations. To meet the growing demand, IT companies are investing in research to better their services. Information technology development in business operation is increasing and businesses are becoming more dependent on the services and products of IT to progress.

IT service providers should develop applications which are efficient and effective. The IT developers should also ensure they deliver their services and products on time to their employees and customers. The speed of the evolution taking place in business today places an added pressure on IT departments which necessitates good levels of planning and strategies to be in place.

Business reengineering, reusing software and installing new programs are seen as mere slogans if the software does not help meet the needs of the business. The growing requirement of businesses generates new opportunities for the creation of more advanced IT technologies; on the other hand however, the advancement of technology in turn presents new models for business management. In a balanced scorecard, IT readiness and its changes provide success to business organisations (Saghaei and Ghasemi 2009).

The gap between IT departments in organisations and business occurs as a result of misalignment between them. The success of utilizing IT in business operations has improved in recent years due to the establishment of organisational structures that are new and current. Over time, the use of IT on a large scale has not only changed organisational structures but it has also changed the manner in which they are affected by external changes in meeting their set goals. In order to remain up to date with the advancement and development of technology in organisations, as well as being able to meet the increasing demands of their employees, many organisations have set up centralized IT departments which are situated on their premises (Frank et al. 2004).

Practitioners and researchers acknowledge the importance of aligning IT and business. Although achieving alignment is difficult, organisations are working towards developing alignment processes that are effective to help in achieving both business objectives and technological needs. Most of the researchers have used survey instruments and models to determine the alignment between IT and business. Developments in IT require that the advancement is able to adapt to both old and new systems. This not only reduces challenges faced by the businesses but also helps improve the effectiveness, efficiency and reliability of the organisation (Hu and Huang 2005).

The Balanced Scorecard is a strategy for performance management; a strategic management and planning management system which is used extensively in business and societies for aligning business activities with the vision and strategy of the organisation, in order to improve the organisational performance for targeted goals. Balanced scorecards include financial and non-financial metrics which depict the results decisions and actions. Along with this, the balanced scorecard correlates the financial measures with operational measures such as customer satisfaction, an organisations innovation and growth, internal processes and improvement actions in order to determine the future financial performance of the organisation (Kaplan and Norton, 1992).

Implementation of a balanced scorecard is technical as well as managerial in nature and requires a clear understanding of an organisation's vision, mission and strategy.

Symmetric information received from all corners of an organisation ought to be the basis of the vision and strategy of the organisation (Virtanen 2009).

The original Balance Scorecard developed by Kaplan and Norton was based on four perspectives: financial, customer, internal business process and learning and growth. The Balance Scorecard was upgraded to address the information technology issues which surfaced in mid 1990s and renamed as the Information Technology Balanced Scorecard. The Information Technology Balanced Scorecard focused on challenges posed by IT systems. The potential benefits of the IT Scorecard were the aim behind the development of a new Scorecard. Primarily the IT scorecard was derived from the Kaplan and Norton Balanced Scorecard and was formed using the same technique including the aforementioned four perspectives. Kaplan and Norton thought about the development of the strategic maps based on the Balanced Scorecard, one of which tasks strategic goals, analysis and readiness (Kaplan, R. and Norton, D (1992)).

The IT readiness of an organisation can be defined as the degree to which the software applications can provide the desired functionality and operations required by the individual departments and sections within the organisation in order to achieve the strategic goals. This research shows how Balanced Scorecards can be used to identify and prioritise process requirements for IT readiness to align with an organisations business strategy, so the readiness between IT and business is always the source of a gap which many organisations put a lot of efforts in trying to bridge

A framework to facilitate an organisation's understanding of a beneficial integrated system is essential. The approach of IT readiness helps in understanding the causes of the observed gap and offers a framework that assists in reducing the overall gap. The approach also helps to estimate the rate at which businesses are evolving and its IT readiness. Business strategic plans fail because little attention has been given to information technology applications. Unclear specification of what the employees are expected to do in the work place and poor training further deteriorates the failure in the system. With these faults and oversights it becomes hard for the business to achieve its strategic objectives. The interest of the researcher is to ensure employees understand the IT applications and their respective priorities. This will help the employees rearrange

and complete foibles in order of importance and this will directly impact on the productivity of an organisation, thus enabling it to achieve its strategic goals.

As a result of these observations, four main research questions were formulated to determine the following:

- a) How to identify a project's priorities in adopting targets and strategic weight and the importance of each application;
- b) How algorithms and metrics are used to measure the importance of required applications and how these can be developed;
- c) How to assess the readiness of each application; and
- d) What are the methodologies used to develop a framework to prioritise applications in terms of their readiness to achieve the strategic objectives?

The framework used to prioritise applications has been developed and tested in this research. This implementation was based on a mathematical model used to calculate the importance and the readiness of each application in public organisations in Saudi Arabia. Moreover, a comparison between the percentages of the expected achieved targets with prioritising application readiness and the current achievements was provided.

1.3 The gap between information technology and business

The process of measuring the profitability and non-profitability of an organisation is usually carried out by determining the extent and spread of its market. The success is achieved when the organisation is able to meet the needs of its customers in time and to budget. Changing systems within an organisation can be considered as one of the factors that facilitate the failure of most businesses. To correct mistakes that could be ruining the success of an organisation, employers are ensuring that they keep their employees updated with the advancements taking place within their organisation. This can include giving them incentives and offering staff training and staff development opportunities. It is widely known that products and services offered to organisations by IT departments and companies affects its management and also influences the success of the organisation. Businesses that have already embraced the use of IT in their activities have improved their sales and efficiency in marketing more than those businesses that are minimally utilizing the technology (Frank et al. 2004).

The addition of IT to the business management alone will not necessarily make the business have the competitive advantage it desires. Success will be achieved by making some changes to the business management that will support good integration of IT in its operation. Readiness of both IT and business management impacts the success of business; though readiness of both occurs rarely, their evolution is very different. Most of the time there is an increased development in businesses management which rarely matches with IT development which remains intact and this causes the misalignment.

Alignment actually refers to the process of comparing two entities or systems. Effective alignment influences effective IT and this in turn leads to higher performance in businesses. If one entity evolves and does not reference a change to another system, this will cause a disturbance in the alignment. The resulting misalignment influences the system which depends on the balance of the two entities.

Misalignment between IT and business induces frustration in employees which influences their performance and this in turn leads to poor performance of the whole business entity. Losses will be attained by the business due to the misalignment which

could result in customers choosing to move to other companies for more convenient, better and quicker services. In organisations that have a good alignment between IT and business, the organisation's goals will be achieved more effectively in a collaborative and timely manner.

Organisations have the ability to measure alignment because it is measurable. Alignment between IT and business has been and remains of major importance and this has been recognized over a long period of time. Alignment is crucial if IT service and systems are to work and to prove it is essential to help achieve an organisations strategic operations which impact on profitability. Alignment occurs as a consequence of interaction between IT and business. The automation of processes in an organisation depends solely on IT. Business requirements are rapidly changing and this demands that businesses develop strategies that support the IT function to ensure effective business management. Evolution in both supporting technology and business management should be handled in a way that ensures that alignment gaps between the two domains are kept to a minimum. Minimizing the gap between IT and the business leads to an effective alignment which helps improve business performance.

Efficient and effective decision making in an organisation results from good alignment between IT and business. Disturbance between information technology and business commonly occurs due to language differences between the domains which lead to miscommunication and this affects the alignment. Failure occurs if the two entities are not aligned and do not therefore help in achieving the overall objectives of the business. Therefore, it is important that effective alignment is maintained between IT and the business. A modification in either of the two entities could lead to positive improvement in business activities. A change in either of the entities (IT or business) influences each other irrespective of the objects or processes that were modified. Most of the time many systems have defects associated with technological advancements that are not introduced in time. The efficiency of the system is measured through various applications that determine defects as well as bugs.

1.4 Research Objectives

The major purpose and impact of this research is to develop an advanced understanding of information technology and business readiness in embracing the introduced applications and to reduce the gap between IT and business through a developed framework.

The main goals of the research will be achieved by meeting the objectives stated below:

1. To determine the application's readiness to achieve the strategic goals based on these measures.
2. To determine application priorities in adopting targets and the application's strategic weight and importance for each project.
3. To develop algorithms and metrics to measure the importance of the applications needed to implement strategic objectives.

The researches main focus is on the relationship and readiness of all multi-levels in an organisation's environment. It is the researcher's hope that the framework will help to develop an understanding of an application's readiness at both the application and strategic level, which are well integrated to one another. Comprehension of basic requirements for these advancements is not easy. The framework provided will help create an understanding of the readiness of information technology and business in pursuing the success of an organisation. The adaptation of strategies at higher levels is thought to help organisations achieve their desired results but this does not always happen. This framework will boost an organisation's decision making at all levels with the appropriate priorities. Evaluation of the framework has been carried out successfully through the use of a case study that looked at readiness of IT in different levels within the organisation.

1.5 Research Questions

The fundamental question posed by this research is:

Is there a scientific or systematic theory for IT readiness that can be used in discovering an efficient/novel technique of reducing the gap between information technology and business?

The sub-questions that arise from this are as follows:

Is there a relationship between strategic management objectives and IT readiness?

What are the impacts of integrated organisational environments on the readiness of applications between IT and business?

Is the linkage between information technology and business effective?

The answers to these sub-questions help in discovering the overall goal of the research.

1.6 Research Contribution

Critically analyse the application of BSC to find an IT application's readiness to achieve strategic objectives.

Identify the factors that lead to the success or failure of implementing the strategy (strategic impact).

Determine strategic weights influence on the success of strategic plans of BSC factors.

These contributions are provided in this research, which used the scientific methodologies to get the best results that can be achieved through the selection of important factors can be very heavily influenced by and directly in the strategic goals will make it and prove that information technology contributes to the success of strategic plans and information technology not supportive only but a partner effectively to the success of the plans and achieve strategic goals, in chapter 4 will be explain the

basic framework with initial explain to development framework in chapter 5 development framework and matrix that have been used to contribute the development of the framework.

1.7 Thesis Structure

In this research begin with the Chapter 1 which illustrates the research motivation, research objectives, the gap between information technology and business and the research questions of the study.

Chapter 2 presents a literature review of the Balanced Scorecard Framework, previous generations and historical developments, clarifies and translates the vision and also reviews related work.

Chapter 3 provides a review of the research methodology, proposed approach and relevant information.

Chapter 4 looks at information technology with a Balanced Scorecard and discusses the alignment of the Balanced Scorecard with strategic management processes and hypothesis and looks at the relationship between cause and effect.

Chapter 5 describes information capital readiness and project prioritization in IT. It also discusses portfolio and alignment of business policy and information technology policy. Finally it describes in detail Information capital readiness, information capital application and technology infrastructure.

Chapter 6 provides a case study and an evaluation of implementing application readiness.

Chapter 7 concludes the study and describes future work.

Following the completion of the chapters for this research and after the development of the framework of the strategic map, based on the Balanced Scorecard strategies, it could be concluded that this approach proved successful in achieving the necessary goals, as mentioned previously; namely:

Critically analyse the application system(s) to find IT application readiness to achieve strategic objectives.

Identify the factors of a very impressive it is used in the system lead to the success or failure the implementation of the strategy (strategic impact).

Rearrange and determine the importance of Influencing applications to the success of strategic plans by weights to solve it.

Contributed significantly to the increase in the proportion of the success and achieve the strategic objectives.

CHAPTER 2

Literature Review

- **Introduction**
- **Balanced Scorecard Definition**
- **Balance Scorecard Generations**
- **Clarify and Translate Vision**
- **Balanced Scorecard Benefits**
- **Proactive Approach**
- **Multi-dimensional Tool**
- **Balanced Scorecard Limitations**
- **Related Work**
- **Summary**

2.1 Introduction

This chapter provides a review and description of the Balanced Scorecard Framework. It looks at previous generations and historical developments of the Scorecard, the Clarify and Translate Vision when creating axes on which a Balanced Scorecard depends to aid their foundation and construction. The chapter aims to provide an understanding of the starter measurement strategies which have been effectively applied in many public and private sector organisations with a high proven rate of success. The significant results of using the Balanced Scorecard has led to many governments and small business owners opting to apply assumptions of cause and effect for the success of running their business and this chapter will explore the idea of the balanced Scorecard and related strategic business measurements.

2.2 Balanced Scorecard Definition

The Balanced Scorecard is strategy for performance management, strategic management and is a planning management system which is used extensively in business and societies for aligning business activities with the vision and strategy of the organisation in order to improve the organisational performance against targeted goals (Kaplan, R. and Norton, D (1992)). The idea of the Balanced Scorecard was first initiated by Robert Kaplan and David Norton in 1992. David Norton and Robert Kaplan conducted extensive research with 12 companies and devised a Balanced Scorecard for measuring performance, which gives a comprehensive view of the business. The Balanced Scorecard includes financial metrics which depict the results of financial decisions and actions. Along with this, the Balanced Scorecard correlates the financial measures with operational measures such as customer satisfaction, organisational innovation, internal process and improvement actions in order to determine the future financial performance of the organisation (Kaplan and Norton 1996b).

A large number of companies have already started to rely on the Balanced Scorecard as it meets various managerial requirements. Some advantages of using a Balanced Scorecard include amalgamation of multiple indicators such as customer orientation,

quality improvement, team work, customer response time and long-term future plans in a single performance metric (Kaplan and Norton 1996b). Moreover, a Balanced Scorecard provides a comprehensive view of operational measures and limits the probability of sub-optimization. The Balanced Scorecard prevents achieving one objective at the cost of another. For example, it is possible that a new product launch may increase the customer response time, however, by using a Balanced Scorecard, this would ensure that this does not happen (Kaplan and Norton 2001a).

Companies are competing in complex environments with scarce resources. It is of utmost importance that companies have an accurate and thorough understanding of their objectives and the method to achieve the goals (Gochhait 2011). The Balanced Scorecard is a tool which translates the mission and strategy into wide-ranging performance measures and establishes the framework of strategic management and an effective management system. The core emphasis of the Balanced Scorecard is on achieving financial objectives; however, it keeps an aligned view on other business perspective such as internal business processes, learning and growth and customers' perspectives (Kaplan and Norton 2001a)

The last few decades have brought immense technological and environmental changes. The success of the companies that survived during this era was due to the fact that they were fully conversant with how to achieve benefit from economies of scale and economies of scope (Kefi and Kalika 2005). During the industrial age, companies such as DuPont, General Motors and General Electric put their efforts into the efficient allocation of assets and capitals. New measures such as return on capital employed served as indicators of both internal capital growth and external measures such as shareholder wealth formed the basis of the development of the Balanced Scorecard. Later the information era placed a strong emphasis on the need of acquiring and retaining information as intangible assets (Kaplan, R. and Norton, D (1992)).

2.3 Balanced Scorecard Generations

Kaplan and Norton first introduced the Balanced Scorecard in 1992 for measuring the performance of a company and its employees on multiple strategic objectives. Since then, the Balanced Scorecard has evolved and developed and its focus has broadened. The Balanced Scorecard has improved from a simple control system to a comprehensive strategy for implementing change and monitoring change across an organisation. The first model floated by Kaplan and Norton in 1992 may be considered as the first generation Balanced Scorecard as it was simple and could work only as a control system(Kaplan and Norton 1996b)

2.3.1 First Generation

The first generation Balanced Scorecard was designed for performance measurement vides for four perspectives. Many earlier Balanced Scorecards in an organisation failed as the organisation were unable to select the correct measures for the four mentioned perspectives, namely the financial perspective, internal processes, the customer perspective and learning and growth. The initial process of implementing the first generation Balanced Scorecard was nevertheless tough as fitting the Balanced Scorecard in the organisation al framework of the performance measurement with accurate measures was a critical job (Kaplan, R. and Norton, D (1992)).

Later in the 1990s a new approach was selected to design the Balanced Scorecard for the organisation. In the newly selected approach, Balanced Scorecards were designed with high-level objectives with measures to be chosen from each objective as part of a second design step (Kaplan and Norton 1996a). The first generation Balanced Scorecard was aimed to resolve the issue of control and gripping the organisation's fundamentals. The first generation Balanced Scorecards served well for measuring operational performance but lacked the ability to describe the strategy and change. The Balanced Scorecards were actually not "balanced"; rather they were overwhelmed by

the static measures instead of performance drivers. First generation Balanced Scorecards are optimal tools for operational performance and may be called 'operational Scorecards' (Kaplan, R. and Norton, D (1992)).

According to Neely, first generation performance measurement metrics is statics. Working along the same lines Marrand Neely suggested improvements in performance management systems through an evolutionary system. This updating of the first generation Balanced Scorecard includes the introduction of new measures, modification of existing ones and deletion of obsolete measures. The second generation Balanced Scorecard may be taken as resultant of the improvements made to the first generation Scorecard (Marr and Neely 2003).

2.3.2 Second Generation

The second generation Balanced Scorecard was a blend of dynamic and static performance measurement tools. The second generation Scorecard came up with strategy maps. Strategy maps were a technique designed by Kaplan and Norton to map retained strategic moves. The mapping is nowadays an important tool in IT industry and IT planning (Kaplan and Norton 2004a).

The second generation Balanced Scorecard focuses on drivers of performance. The focus is unique and strives to develop a set of indicators which may make a difference in measuring performance. Key Performance Indicators (KPIs) may be considered as an output of second generation Balanced Scorecards. The second generation model depends on the relationship between cause and effect and tends to develop objectives before measures are developed. The model is performance driven and the tool aims to measure the impact of operational changes in the performance of the organisation and its employees. When compared to the first generation, the second generation Balanced Scorecard is more particular in its choice of measure (Ketelhöhn 1998; Kaplan and Norton 2001a).

2.3.3 Third Generation

This generation of Balanced Scorecards is more systematic in nature and proposes a methodological implementation of strategy. The Balanced Scorecards are focused on strategy which is a vital pillar of the third generation. Third generation Balanced Scorecards comes up with the following views:

Norton and Kaplan emphasized the articulation of strategy through a strategy map. Along with this, the latest generation emphasis is on the role of office strategy management and on strategy execution. Kaplan and Norton also took strategy execution as core, upgrading this from generation two to generation three (Kaplan and Norton 2006).

According Neely further brought improvements to third generation Balanced Scorecards. Their balance score emphasis is on destination statements and addresses the problem of asymmetric information whilst setting objectives and implementation strategies (Neely 2008).

Third generation Balanced Scorecards, as suggested by Norton and Kaplan are composed of multiple components including the following:

2.3.3.1 Destination Statement

The Destination Statement is the future overview of the organisation, i.e. where the organisation sees itself in future if its current strategy is successfully executed. The future description is segmented into multiple perspectives such as stakeholder perspective, customer perspective, cultural aspects and the internal processes of the organisation (Kaplan and Norton 2006).

2.3.3.2 Strategic Linkage Model

Adopted the strategy to map the techniques of the second generation Balanced Scorecard and developed a more comprehensive strategy map called the Strategic Linkage Model. The model contains variety of strategic objectives in coherence with the destination statement (Lawrie and Cobbold 2004).

2.3.3.3 Standard of Objectives

The Balanced Scorecard clearly mentions what an objective means to stakeholders and customers etc. The objectives are decided upon and are unanimously agreed (Lawrie and Cobbold 2004).

2.3.3.4 Standard of Measure

In the same way as objectives are standardized, the measures are also clearly explained in order to monitor the strategic objectives and desired targets (Lawrie and Cobbold 2004).

2.4 Clarify and Translate Vision

The Balanced Scorecard process begins at a senior level where senior management work to translate the business strategy into specific objectives. The financial as well as other objectives are set up by keeping in view the organisation's and industry specific conditions such as cash flows, market growth and market demand etc. Once an organisation is clear about its financial and customer's objectives, the next step is to define the business processes which can help in attaining the defined objectives. The Balanced Scorecard blends with the traditional measures of success such as cost saving, high quality and customer response time with the strategic objectives for achieving breakthrough performance across all departments of the organisation through effective business process. As opposed to traditional measures of performance, the Balanced

Scorecard incorporates the learning and growth objectives in the overall vision of the company. The learning and growth objectives reveal the rationale for significant investment in upgrading the skills of employees and the organisation's information technology procedures. Learning and growth is also in strong coherence with the internal processes of the organisation (Kaplan et al. 1996a).

2.4.1 BSC Perspectives

As discussed above, the Balanced Scorecard serves as a complier between an organisation's mission and objectives. The strategy is organised into four perspectives which are mapped on a framework provided by the Balanced Scorecard. As the name reveals, the Balanced Scorecard balances between multiple perspectives. Niven released an interesting fact that the Balanced Scorecard was developed by Kaplan who was an accountant by profession in coordination with Norton, a consultant by profession. This implies that the Balanced Scorecard is a fine attempt to draw a balance between accounting measures and managerial measures (Niven 2011a). By focusing on cost-cutting which is an accounting measure, this may compel the company to compromise on quality, whereas merely focusing on managerial parameters such as employee knowledge, may prove to be expensive for the organisation. Thus the Balanced Scorecard has its roots in keeping a balance between multiple perspectives; i.e. financial, customer, internal processes and learning and growth (Kaplan, R. and Norton, D (1992)).

The development of the Balanced Scorecard with four perspectives which are described as a basic framework, are represented below (Figure 1).

Balanced Scorecard Framework*

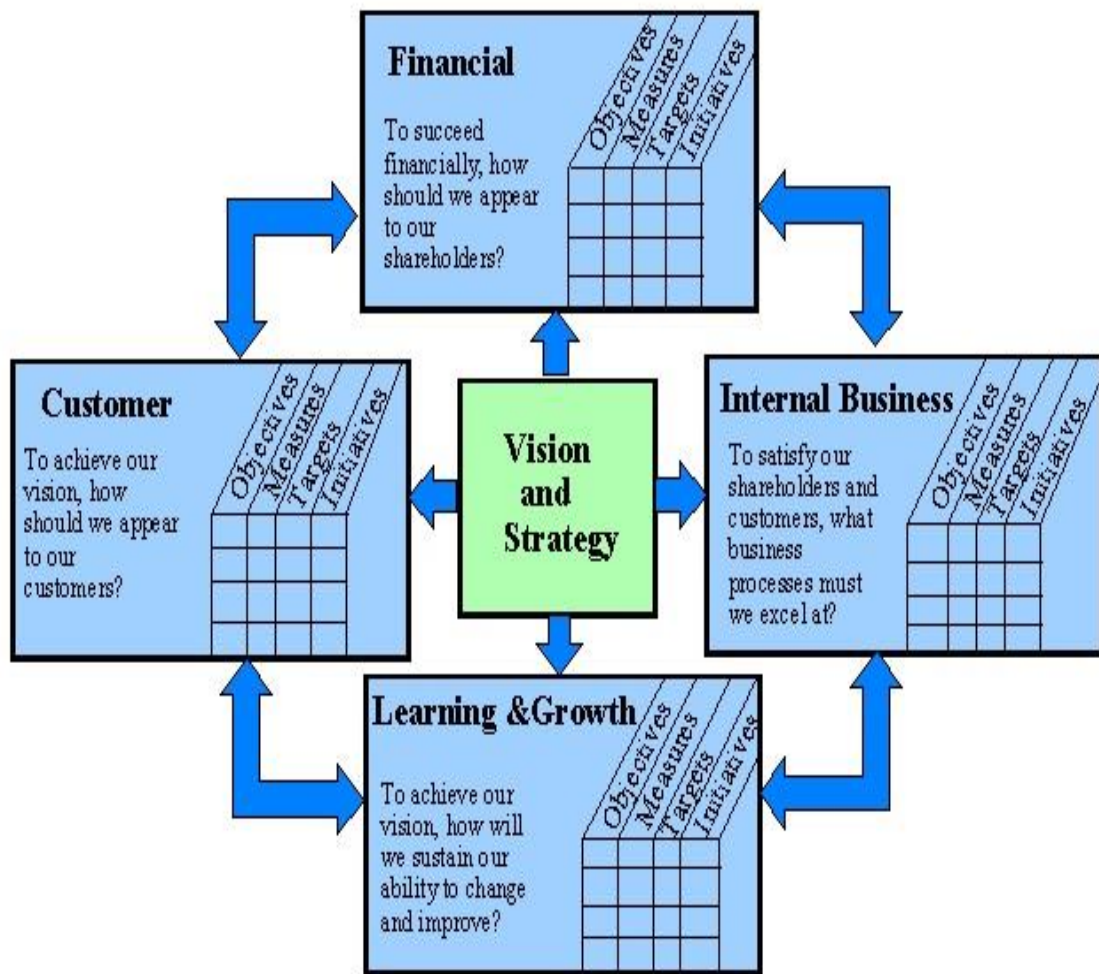


Figure 1: Adapted from Kaplan & Norton (Kaplan, R. and Norton, D (1992))

2.4.2 Financial Perspectives

The financial perspective is the most important aspect of the strategy map. In profit oriented domains, the financial perspective represents the ultimate aim of the strategy and presents goals such as increasing shareholder wealth, increasing revenue and lowering cost. The financial perspective is directly associated with financial measures and undoubtedly financial success as the first line of define of any organisation or

management. The financial perspective measures the economic consequences of the action already taken. Financial measures compute whether a company plan of action has worked the way it was planned and if its strategy has achieved the targeted objectives. The measures may be concrete such as return on sales, return on capital employees, net profit margin or economic value added (Kaplan, R. and Norton, D (1992)).

Apart from the above mentioned objectives, the financial perspective may draw on measures such as cash flow, income generated by each employee or more subjective measures of financial gains such as residual income etc (Kaplan et al. 1996a). There are different schools of thoughts on including financial perspective in the Balanced Scorecard. As Niven suggested, financial measures may be excluded from performance measurement parameters as in today's world, information technology and the use of information has become more important. The important aspects in today's current world are customer response time, quality, employee motivation, cycle time and customer satisfaction, as compared to return on equity and return on income etc (Niven 2011a).

According to this approach, financial measures are the result of quality measures and if quality measures improve, financial results will also improve. On the other hand, (Kaplan and Norton 1996c) in their earlier Balanced Scorecard opposed the idea and gave a significant place to financial measures in performance management. It is not necessarily true that a firm operating well on quality measures is also producing remarkable financial results (Kaplan et al. 1996a).

The firm may be achieving a high quality on the return of shareholder investment, thus the Balanced Scorecard has distinguish focus on measuring financial performance. As well as this, periodic financial statements and financial reviews help to monitor quality and customer satisfaction (Kaplan et al. 1996a). The quality measures may not be attractive for stakeholders if they are not successfully translated into financial results. The financial indicators specifically indicate whether the firm is successfully implementing its strategy for improving its financial condition or not and present real examples of this by looking at General Motors (GM). GM invested a huge amount of capital in advanced manufacturing technologies and research and development. The weak financial results of the company indicated that their strategy had not been implemented correctly (Kaplan, R. and Norton, D (1992)).

2.4.3 Customer Perspective

Customer perspective deals with the customer and the segments of markets in which companies want to operate. The customers are the sources through which the financial objectives are set and under which the financial perspective will be achieved. Customer perspective serves as a tool for creating coherence between customer outcome measures and customer demands. In the main, the customer perspective deals with three questions (Niven 2011b):

1. Who are the target customers?
2. What is the organisation's value proposition in serving its customers?
3. What does the customer demand from the organisation?

(Niven 2011b) asserts that this appears simple; however, this is not the case. The three questions broadly cover the entire marketing dynamic of any organisation and also question the operational and technical excellence of the company. It is a common practice that companies begin with a niche class of customer but they subsequently amalgamate all customers together in order to increase the revenue. The "all things to all customers" is revealed by the actions and marketing campaigns of companies which tarnish their customer perspective specifications.

According to Speed, Michael Porter was more concerned about (Atkinson 2006) differentiation which, in turn, is customer perspective suggested that selecting the right value proposition is even more challenging (Speed 1989). As suggested (Treacy and Wiersema 1997), a firm can achieve market leadership by adopting either of disciplines mentioned below.

2.4.4 Operational Excellence

Operational excellence is an attempt to become leaders by adopting a market penetration strategy. Under this discipline, companies offer lower prices, convenience and adopt a 'no frills' strategy. Wal-Mart may be quoted as an excellent example of operational excellence.

2.4.5 Product Leadership

As suggested (PORTER 1979), companies may achieve excellence by way of differentiation. (Treacy and Wiersema 1997) consider differentiation as product leadership which can be attributed to a set of unique product characteristics. The company attempts to produce the best product in the market, Harley Davidson is a good example of product leadership.

2.4.6 Customer Intimacy

(Treacy and Wiersema 1997) emphasize building long-term relationships with the customers through consistent performance and focus on customer needs and demands. Companies may adopt a leadership strategy by way of building a good and solid long-term relationship with the customer.

Regardless of the market discipline adopted, customer perspective remains tied to the measures of customer satisfaction, customer loyalty and customer acquisition (Niven 2011a). Here the Balance Scorecard comes into play. (Kaplan, R. and Norton, D (1992)) urge that the general mission statement of customer service be translated into specific goals as this is fundamentally what matters to its customers. Kaplan and Norton Sub divided customers concerns into four main categories, namely time, performance and service, quality and cost. Lead-time is considered as a reliable measure; i.e. the time the product takes to reach the market. Quality is the quantification of customer demand or simply the number of defect levels in incoming products. Quality may be measured through time delivery or the accuracy of delivery forecasts. The amalgamation of quality and service measures depicts the value proposition offered to customer from the company (Kaplan, R. and Norton, D (1992)).

In order to quantify the value proposition to the customer, the Balanced Scorecard incorporates goals for time, quality, service and performance and ultimately translates the goals into specific measures. Along with the measures of time, quality, performance and service, companies need to put a strong emphasis on the cost of their product tool for customers with price being one component of the cost. Thus the cost becomes more important for the supplier. A supplier may control several measures and offer a low cost

product to the customer thereby increasing its premium of price. The source of the customer data also varies from company to company and industry to industry. Highlighted that possible evaluation sources may include customer surveys, evaluation feedbacks and trends in product sales etc. (Kaplan, R. and Norton, D (1992)).

2.4.7 Internal Business Process Perspective

The customer and financial perspectives deal with 'what to achieve' in the short and long term. Analysing critically, both are silent on any plans of action and acquisition of resources for achieving financial excellence and an increase in the customer count. The internal business perspective is the plan of action of achieving financial excellence and obtaining improved customer service measures. In respect of the internal business perspective, the key processes of the firm for attaining the financial excellence are planned and designed. The task of the internal business perspective is to identify and develop the best possible objectives and measures for tracking improvements in the internal business processes of the company (Kaplan et al. 1996a).

The results of any company are the outcomes of the decisions, process and action taken during the performance review period. Managers need to place a critical focus on the internal operations that lead to customer satisfaction such as the IT operations of the company, supply chain systems, inventory management practices, delivery mechanism and product shelving etc. It is pertinent to observe that a Balanced Scorecard for the internal process must stem from the processes that have a direct impact on customer satisfaction. The factors, as discussed in the customer perspective, include quality, time, employee skills, customer response time, cycle time and employee productivity etc (Kaplan et al. 1996a).

In the modern world scenario, information technology and its allied processes have a direct impact on the manufacturing abilities of the companies. Operational measures for processes such as design productivity, manufacturing excellence and new product introduction are also critical internal business processes. To achieve the desired results, (Kaplan, R. and Norton, D (1992)) suggest the decomposition of quality, product, cycle time and cost measures into numerous objectives at departmental level. The decomposition of larger goals into small achievable objectives links the individual

actions to corporate objectives. The linkage ensures that grass root level employees have a clear and comprehensive understanding of the decisions, actions and planned activity of the top management which will ultimately improve the organisations performance.

(Bose and Thomas 2007) consider an organisational internal processes as part of its intellectual capital. According to (Bose and Thomas 2007), internal business processes are the unique aspect of any organisation, i.e. the way of conducting operations and these can serve as core competences of the organisation. The Balanced Scorecard is a practical framework for dealing with intangible assets, processes and knowledge and is a way of ensuring that internal processes serve as catalyst for improving financial results and increasing the customer response. Internal business process can never work in isolation; rather they need to be tied up with customer needs and demand, business process and operational efficiencies.

(Bose and Thomas 2007) developed a strategy map for linking customer perspective with the internal business processes, which shows that internal businesses processes are a way to achieve customer satisfaction, as exhibited in Figure 2 below.

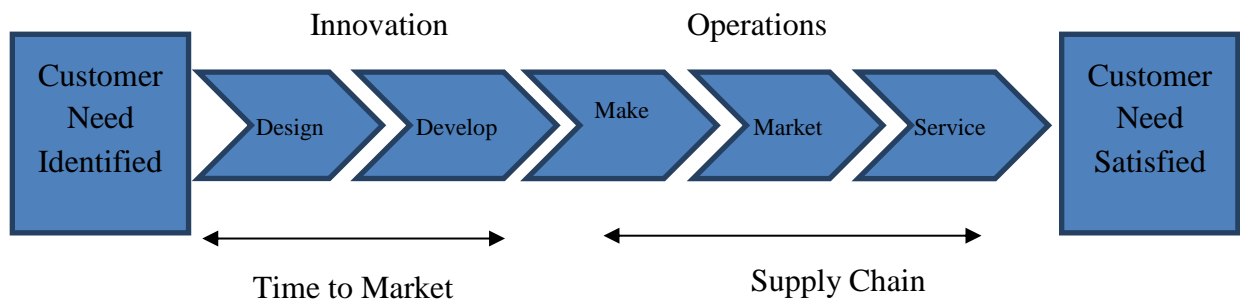


Figure 2: linking customer perspectives (Bose and Thomas 2007)

2.4.8 Learning and Growth Perspective

Customer perspective, internal business process and financial perspective are tied to the company's competitive success; however, the targets for success keep on changing. The

companies experienced a time when suppliers were at the centre of the marketing loop and all forces were served for resource acquisition; however, as the time changed the customer became the queen of the market and all marketing efforts were diverted toward the customers (Spencer-Matthews and Lawley 2006).

The change of dimension gives a clear indication that a company's success parameters keep on changing and companies with a high level of adaptability and flexibility can survive in the long run. Companies are required to upgrade and improve in terms of their operations and business processes and need to have the ability to expand the existing product and introduce new products in the market. The innovation ability of the company is directly dependent upon the human resources of the company. Companies with ability to launch new products, create added value for the customer and enhance operating efficiencies can penetrate new markets and sustain their existing shares (Kaplan, R. and Norton, D (1992)).

The learning and growth measures of the Balanced Scorecard measure the company's ability to learn innovation and improvement. The learning and growth metric is designed to measure the company's performance and ability to rapidly deliver the product to the market and tailor the customer's need into their products. The goals of sustainable manufacturing and continuous improvement are positioned in the learning and growth perspective (Kaplan, R. and Norton, D (1992)). Taking it simply, the learning and growth perspective is the enabler of the other three perspectives and serves as a foundation upon which the Scorecard is developed. Once the customer's goals are identified, internal processes are established and financial excellence is targeted. A company can identify the gap between existing employee skills, information systems and environment and the targeted framework. Internal growth and learning perspectives help the company to bridge this gap and allow it to attain sustainability in the long run (TURNER 2000). Employee learning and growth perspectives may be measured through employee satisfaction, availability of information, soundness of information systems and its integration with the system.

The learning and growth perspective is equally important as all other perspectives. It is observed that financial perspectives and customer perspectives are largely focused on by companies as they are directly linked with their short term success. Innovation and learning, however, is more associated with the long term survival of a company (Niven 2011a). By amalgamating all four perspectives and their respective parameters, the Balance Scorecard developed by Kaplan and Norton may be observed as presented in Figure 3.

Goals	Measures
Survive	Cash Flow
Succeed	Sales growth and return on operations
Prosper	Increase in market share and ROE

Goals	Measures
Technology Capability	Manufacturing Geometry Vs Competition
Manufacturing excellence	Cycle time Unit cost Yield
Design productivity	Engineering efficiency
New product innovation	Actual introduction schedule Vs plan

Goals	Measures
News Products	Sales from new products Sales from existing products
Responsive supply	On time delivery
Preferred supplier	Share of key account purchases
Customer partnership	Cooperative engineering effort count

Goals	Measures
Technology Leadership	Time to develop next generation
Manufacturing Learning	Process time to maturity
Product focus	% of product that equal 80% sales
Time to market	New product Vs competition

Figure 3: four perspectives (Niven 2011a)

2.5 Balanced Scorecard Benefits

2.5.1 Balanced Approach

The Balanced Scorecard has the core advantage of being ‘balanced’. The Balanced Scorecard does not focus on any single measure of performance but rather puts an equal focus on multiple perspectives; i.e. the customer perspective, financial perspective, learning and growth and internal business processes. Like other performance measures such as residual income, return on capital employees and the increase in shareholder wealth of market share etc. only measures a specific domain of performance. The Balanced Scorecard, on the other hand, is capable to give a weighted average to all components that are critical for business success (Kaplan and Norton 1996c).

As well as this the Balanced Scorecard limits the possibility of trade-off between multiple parameters. By using a Balanced Scorecard, the probability of sacrificing one area for attaining excellence in another largely reduces. If companies attain internal process efficiency at a high cost, the same will be revealed in the cost measure of the financial perspective. Similarly, achieving a higher number of sales of a new product by sacrificing the sales of existing or old products may also be revealed when a Balanced Scorecard is implemented in the organisation (Kaplan and Norton 2000).

2.5.2 Decomposition of Strategy Measures

All organisations have a mission, vision and strategic objectives; the development of which is usually made at the level of senior management within the organisation. The vision and mission of the organisation may be wide and include priorities such as improving performance and increasing productivity by at least 5%, with the aim of becoming one of the leading organisations in the industry (Kaplan and Norton 1996c). Senior management must clarify the vision and mission for all its employees at all levels from department heads to the factory floor. One way of implementing this is through workshops and short courses aimed at educating, clarifying and defining the vision and mission of the organisation, a process designed to increase productivity at all levels (Huang 2009a).

The Balanced Scorecard, with the help of strategy maps, allows companies to break down the strategy into small and attainable objectives at departmental level. With the breakdown of productivity measures into small granular levels, every member of the organisation gets a clear understanding of his or her targets and the level of support he or she will receive to enable them to achieve their overall objectives (Niven 2011a).

2.5.3 Innovation and Change

Traditionally the core focus of change within an organisation was market expansion and increasing the market share instead of experimenting with new markets and new products. Ultimately, after maturity of the product life cycle, companies also went through survival problems. The Balanced Scorecard regards survival as a specific issue in its framework and allocates a specific place for innovation and change which is vital for long-term survival of the company. The Balanced Scorecard does not allow companies to suffer from the myopia of ignoring the long-term objectives of innovation or the anticipation of the changing customer needs and requirements (Kaplan and Norton 2001a).

2.5.4 Employee Focus

The Balanced Scorecard dedicates **25%** of total performance measurement to employee growth, employee learning and skills. Metric measures the employee growth and development, which ultimately affects the employee retention and business productivity. The measures broadly may include succession planning efforts, development of employee skills inventory and developing knowledge management services etc. Thus employees are never ignored in the overall organisations success (Kaplan et al. 1996a).

2.5.5 Climate to Support Strategic Changes

The Balanced Scorecard provides the climate for strategic changes in the organisation. The strategic change is supported by the strategic awareness of every employee of the organisation and the alignment of individual goals with that of the organisation. Moreover, the progressive move from strategy to objectives and ultimately to mission allows linking employee incentives with the strategic goal. The employees are awarded with work based incentives and the merit culture is widely promoted which ultimately help the company to achieve low levels of employee turnover and improved employee productivity along with superior financial results (Pangarkar and Kirkwood 2008).

2.6 Proactive Approach

The Balance Scorecard represents the shift of an organisation from reactive mode to proactive mode. A good Scorecard not only focuses on current performance but also emphasizes future performance metrics and observes changing customer requirements. Due to this, managers get an insight into anticipated future problems and can devise an appropriate plan of action for future strategic moves (Wiesenfelder 2014).

2.7 Multi-dimensional Tool

The Balanced Scorecard is a multi-dimensional tool which initiates strategic focus and leadership in an organisation. The framework allows leaders to think strategically. First of all the leaders are motivated to develop the company vision and create accountability measures. The change is widely demanded across the organisation on the basis of its vision. The next step is to translation the vision in strategy and this task may be done through the strategy map and by taking rationing strategic initiatives (Cobbold et al. 2002).

The Balance Scorecard's strategic direction requires alignment of the strategic business unit's strategy with the corporate strategy and alignment of external linkages such as customers and suppliers with the internal business strategy. Since the objectives are developed using the management consensus, the leadership motivates through

communication and personal development as envisaged in the learning and growth perspective. To quantify the change acceptance the Balanced Scorecard relies on actual data such as periodic strategic reviews and computation of measures such as return on equity etc., as envisaged in the financial perspective (Kaplan and Norton 2001a).

2.8 Balanced Scorecard Limitations

The Balanced Scorecard has proved to be an outstanding tool for blending strategy with the actions of all employees of the firms and for assessing performance on all dimensions of the company. However, like all other parameters, the tools inherit a few disadvantages and limitations. Provided an overview of the Balanced Scorecard can be implemented, nevertheless there are few areas in which their study is limited and pose certain risks of implementation, as discussed later in the chapter (Kaplan, R. and Norton, D (1992)).

2.9 Related Work

Management practitioners and business consultants warmly welcomed the Balanced Scorecard after its introduction by Kaplan and Norton. A large number of researchers explored the Balanced Scorecard measures and techniques (Kaplan, R. and Norton, D (1992)).

The concept of the Balanced Scorecard is based on the idea of strategy, introduced by Michael Porter. Porter argued that the essence of developing competitive strategy in industry is entirely dependent upon the ability to link the competitive forces of the industry with those of the company. The Balanced Scorecard has the ability to translate the vision and strategy of a business into its objectives and measures in multiple areas (PORTER 1979).

Porter further asserted that strategy sets the hypothesis of the cause and effect phenomenon. He suggested that the measurement system adopted by any company ought to be capable of linking the hypothesis with the objectives (measures) in multiple perspectives so the measures may later be validated and managed (Kaplan et al. 1996b).

The cause and effect relationship should be reflected in all measures and employees should know that their action can impact any specific measure of performance of the company, the Balanced Scorecard developed by Kaplan and Norton represents a typical cause and effect relationship. The ultimate aim of the company is to attain a higher Return on Equity (ROE) (Neely, A., Kennerley, M., and Martinez, M. (2000)).

Neely consider an enhanced ROE as the effect, the cause of which can be increased sales or enhanced customer loyalty. Another cause which can increase customer loyalty is consultancy, which can ultimately increase the financial performance of the company. The customer perspective of the company will measure how much consultancy has been provided (Neely, A., Kennerley, M., and Martinez, M. (2000)).

Another interlinked process is implementation of consultancy services within the company, i.e. which internal processes can cause improved consultancy. Development of new consultancy processes for the company may be a result of continued learning and growth of employees. Experienced consultants and trained employees for consultancy will serve as cause for an efficient consulting system. They suggest that one cause and effect relationship prevails in an entire organisation and this is a link chain process where one cause can serve as the effect in interlinked relationships (Kaplan and Norton 2001b). In Figure 4 the entire cause and effect relationship can be mapped as a vertical vector for the four perspectives of the Balanced Scorecard.

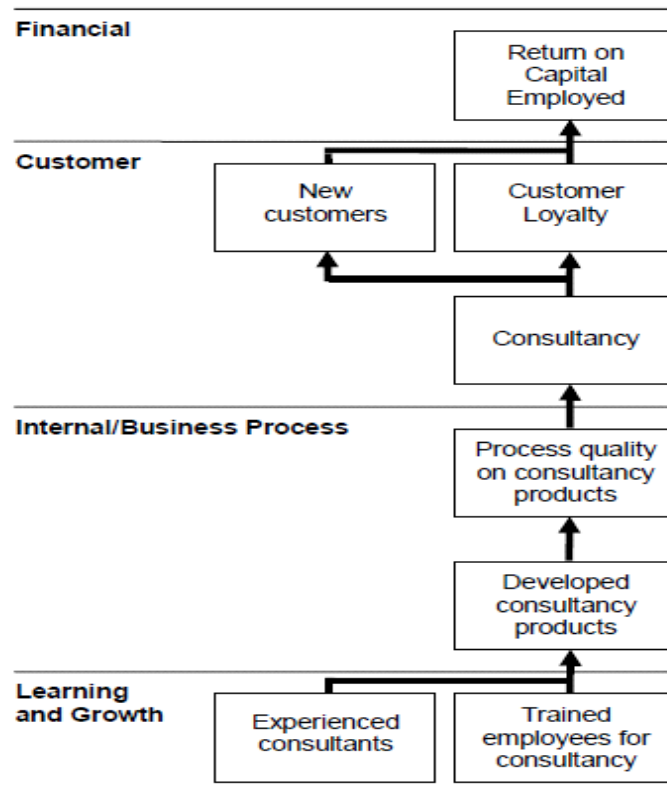


Figure 4: cause and effect relationship (Kaplan and Norton 1996)

Parmenter identified that key performance indicators can be leading or lagging. Leading indicators measure the activities that may have an effect on future performance, as compared to this, lagging activities may include non-financial metrics i.e. measures, which are the output of past activity (Parmenter 2010). According to Chan, leading indicators are powerful measures as they are linked with the past whereas lagging indicators provides a trend derived from the past, due to the flexibility of measures and the customization of matrices (Chan and Chan 2004). Kaplan suggested that the Balanced Scorecard could work better for smaller companies where there is usually no performance measurement system. In some organisations there are appraisal systems such as bell curves etc.; however these are found to be less effective, biased and non-transparent had a different view regarding company size and Balanced Scorecard implementation (Kaplan and Norton 1998).

Greiling suggested there is a significant association between the size of company with respect to labour force and usage of the Balanced Scorecard. Larger companies are more likely to implement the Balanced Scorecard as they have a competitive advantage of a dedicated human resource system, which can implement the performance appraisal system of the Balanced Scorecard (Greiling 2010).

Sousa presented the argument of the implementation of the Balanced Scorecard in smaller companies appears to be an overestimation of its benefits or an underestimation of the cost associated with it (Sousa et al. 2006).

Molleman's study found an empirical way to identify whether the Balanced Scorecard works efficiently with small companies, 50% of the examined portfolio suggested that small companies work with the first generation of Balanced Scorecard whereas 21% work with second generation of the Balanced Scorecard and 29% work with third generation (Molleman 2007).

The Balanced Scorecard is in position to fully benefit the organisation only when the gap between strategic plans and real objectives is minimized, as identified earlier type I Balanced Scorecard only combines financial and non-financial strategic measures whereas type 2/generation 2 additionally describes the strategy of using cause and effect relationships. The third generation Balanced Scorecard is the advanced form and has the capacity to fully benefit the organisation by defining objectives, action plans and ultimately connecting incentives with the Balanced Scorecard.

This empirically identifies larger companies which are using third generation Balanced Scorecards are using it efficiently by linking the strategy with the objectives and vision of the company and its reward system (Molleman 2007). According to Malmi, these companies are more concerned with the cause and effect relationship, linking reward systems with the organisations objective is comparatively less important than steering the cause and effect relationship (Malmi 2001).

Lawrie said more concerned, with the development of the Balanced Scorecard in cohesion with organisations progressive approach. Organisations that have developed a modern Balanced Scorecard of the third generation are more satisfied when compared to the organisations with a less progressive approach and less developed balanced

score(Lawrie et al. 2004). Speckbacher took the choice of Balanced Scorecard implementation as subjective one and suggested specific criteria for choosing and implementing a Balanced Scorecard with model for implementation of a Balanced Scorecard entails less freedom when compared to the one suggested (Speckbacher et al. 2003).

The model of Kaplan and Norton allows companies to modify strategies which alternatively allow them to change the measures in the Balanced Scorecard. with Critically observing the model view that frequently changing parameters of performance may create an uncertain environment in the company resulting in substantial uncertainty margins regarding the usefulness of the specified indicator (Norreklit 2000). The dynamic environment comes up with new experiences and companies usually are unable to establish performance measures for activities with which it has little or no experience, therefore, it is difficult for companies to implement the Balanced Scorecard in a dynamic environment. Amalgamating the model of Kaplan and Norton with Norreklit and comparing it with Speckbacher evident that flexible approach for Balanced Scorecard may not prove to be fruitful for an organisation as constantly changing performance measures may distract the employees as well as management (Speckbacher et al. 2003).

Kaplan and Norton (1996) identified various problems and obstacles experienced in implementation the Balanced Scorecard although these obstacles were identified over a period of time. Kaplan and Norton (1996) identified that a Balanced Scorecard may not be implemented properly if it has too few measures per perspective. (Malmi 2001) adopted the idea of Kaplan and Norton in respect of building a mix of leading and lagging indicators, with good Balanced Scorecard ought to have an appropriate mix of outcomes (lagging indicators) and performance driver's i.e. leading indicators. If an organisation has too few measures, it may not be able to maintain a balance between financial and non-financial indicators(Malmi 2001).

Malmi (2001) places emphasis on developing a Scorecard which has a blend of leading and lagging indicators so each performance measure is effectively measured (Malmi 2001). Kaplan and Norton (1996), however, restrain from adopting too many indicators as the organisation may lose focus and will be able to develop a cause and effect

relationship between the indicators. Kaplan and Norton (2001) suggest choosing indicators that are critical for an organisation's success and which has clear cause and effect relationships. It is also possible that an organisation could attempt to build a Scorecard which takes into account all the key performance indicators instead of selecting one which are directly linked with the strategy. Doing so may result in a Scorecard, which does not reflect the organisations strategy and vision (Kaplan and Norton 2001c).

Schneiderman on the basis of Kaplan and Norton suggested the balance between leading and lagging indicators, however, he suggested avoiding having a quantitative link between non-financial leading indicators and expected financial results. According to Schneiderman, financial measures are usually dependent on lagging indicators and since it is not possible to nullify the impact of other variables in a dynamic environment of an organisation, it is practically inefficient to develop a quantifiable link between lagging indicators and future expected results. In real time environments of organisations, it is not possible to map the success with any one lagging indicator only and practicing so will result in an impractical future forecast of financial results (Schneiderman (1999)).

Braam and Nijssen relied on Schneiderman's study for implementation analysis of a Balanced Scorecard. Braam and Nijssen began with avoiding the quantitative link between lagging indicators and expected financial results and concluded that a major obstacle in the implementation of a Balanced Scorecard is the lack of commitment from senior management (Braam and Nijssen 2004). The Balanced Scorecard formulation and implementation is retained at the top level due to which middle management is unable to fully understand the requisite and outcomes of the performance measurement system. Kaplan and Norton placed emphasis on teamwork and delegation of projects to middle management. . Braam and Nijssen's conclusions are fundamentally derived from Kaplan and Norton however, with a better and enhanced scope.

Andersen also prioritised the Balanced Scorecard and suggested introducing it on the top level of management and then subsequently sharing it with every employee of the organisation. He felt that the inability of involving the whole organisation in the implementation process fails to generate the bottom line results (Andersen et al. 2001). Braam and Nijssen criticized the (Andersen et al. 2001) approach of involving whole

organisation in the implementation process as involvement of too many people may extend the length of the process of implementation and could distract the organisation from its strategy(Braam and Nijssen 2004).

(Braam and Nijssen 2004) suggest keeping the deployment process short so the major indicators remain effective throughout implementation. (Kaplan and Norton 2001c) also warn companies against using the Balanced Scorecard merely for compensation purposes. The compensation system should work as part of the process of strategy in the organisation instead of the whole strategy of the organisation. The Balanced Scorecard, as suggested by (Kaplan and Norton 2001c), is to be placed in between the mission, core values, vision, strategy and strategic initiatives, as illustrated in Figure 5.

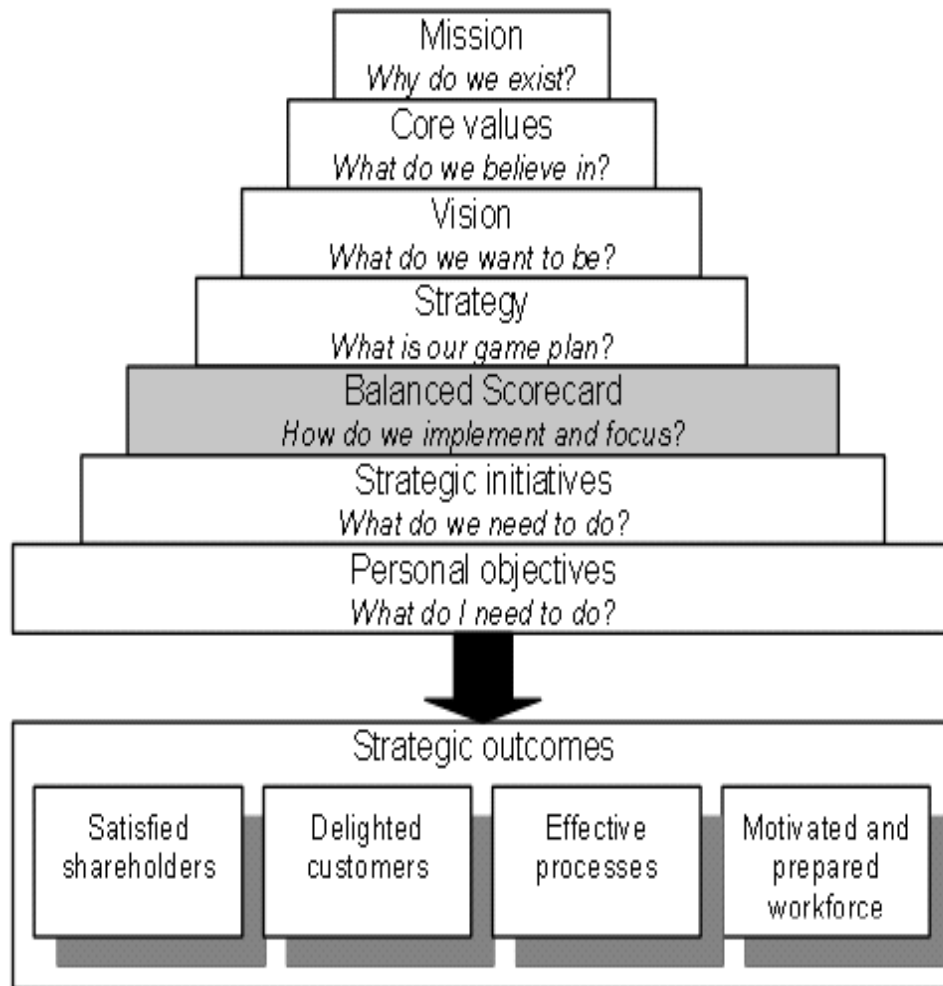


Figure 5: Implementation process (Kaplan and Norton 2001)

(Kaplan and Norton 2001c) assert that Balanced Scorecard measures should be SMART i.e. specific as Figure 6 measureable, achievable, realisable and time bound.

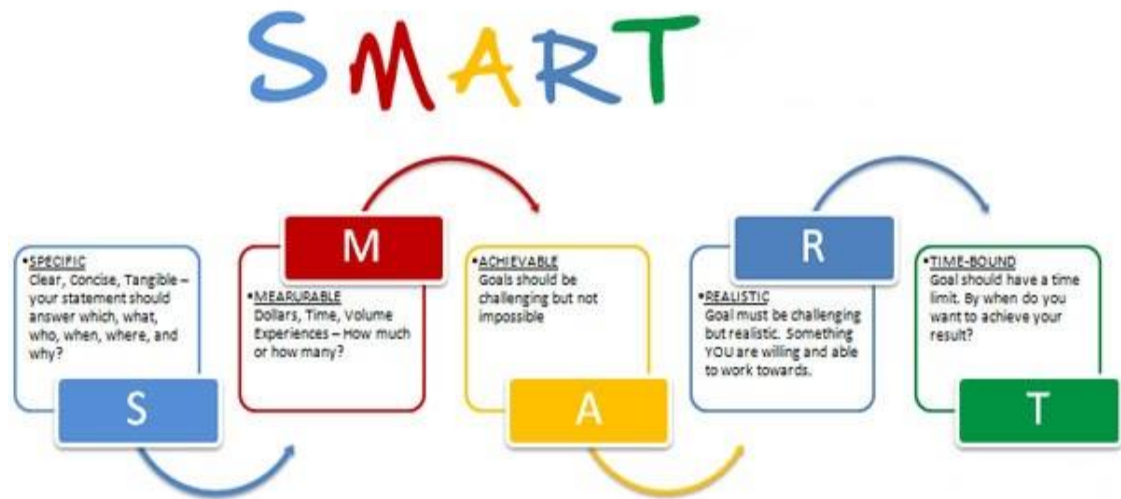


Figure 6: objectives specified (Kaplan and Norton 2001c)

The Balanced Scorecard is a tool to test the smartness of objectives specified by top management however, the scope of the Scorecard is not only limited to test the strategic and goes beyond this. The Balanced Scorecard is designed to test whether the strategic goals are turned into actions or not (Kaplan and Norton 1996b). Though (Kaplan and Norton 2001c) suggest remaining focused on relevant performance indicators in spite of relevant key performance indicators being different from critical success factors (Bullen and Rockart 1981) as identified earlier by (Kaplan and Norton 2001c) as well as (Norreklit 2000), the Balanced Scorecard is not a strategic control task, and rather, it is part of a system which contains the possibility of strategic control. (Neely, A., Kennerley, M., and Martinez, M. (2000)) are more concerned with the workings of the Balanced Scorecard rather than its implementation details. They still believe that empirical evidence in respect of Balanced Scorecard performance is still not available. The Balanced Scorecard makes the performance system more general (Franco, M. and Bourne, M.C.S. (2003)).

Before the Balanced Scorecard was introduced there was a wake of criticism on the performance measurement system (Hayes and Abernathy 1980). There was an immense

need for an analysis of the performance measurement system. To compensate the needs, approximately 30% to 60% of the companies re-engineered their performance management systems (Frigo and Krumwiede 1999). Evidence suggested that until the year 2000, 44% of the companies around the world had been shifted to Balanced Scorecards whereas the number had risen to 85% by 2004 (Marr and Adams 2004) nevertheless, a number of companies rejected to adopt the Balanced Scorecard as they could not see any advantage or positive impact of the Balanced Scorecard (Speckbacher et al. 2003).

Combining the previous thoughts on the Balanced Scorecard and the problems faced with implementation, it can be concluded that even with those companies which have implemented the Balanced Scorecard successfully, there is still a possibility that it does not work in an effective manner. It is still under study as to whether the Balanced Scorecard actually works (Franco, M. and Bourne, M.C.S. (2003)). (Kaplan and Norton 2000) Approach is more theoretical in nature and in spite of this they have made some efforts to demonstrate the impact of the Balanced Scorecard. Their approach is primarily dependent upon anecdotal cases (Ittner and Larcker 2003). Ittner and Larcker are more concerned about the empirical results of Balanced Scorecard implementation such as an increase in return on equity (ROE) or increase in Return on Assets (ROA) (Ittner and Larcker 2003).

Surveys suggest that only 23% of companies which have implemented a Balanced Scorecard attained minor increases in return on assets and return on equity (Ittner and Larcker 2003).

(Lingle and Schiemann 1996) suggested that companies need to rely extensively on financial and non-financial measures which link strategic measures to operational parameters. They conclude that organisations relying on financial and non-financial measures combined attained higher stock market returns when compared to other companies. (Lawson et al. 2003) presented empirical evidence that the use of performance management systems in selected portfolios of companies led them to control their overhead costs by 25% with simultaneous increases in profits and sales. Though (De Waal 2003) and (Sandt et al. 2001) largely disagreed with achievement of tangible benefits nevertheless, they agree on the fact that the use of a Balanced

Scorecard performance measurement system improves the decision making of managers and employees. (Ketelhöhn 1998) presented the evidence that proper implementation of a Balanced Scorecard and selection of the correct indicators increases the acceptability of business strategy in stakeholders. Not only this, an intangible benefit is increased employee communication and collaboration which is achieved from feedback on measures of performance (Salvador et al. 2001).

Kaplan and Norton's studies are comprehensive and paved the way for the further development of Balanced Scorecard studies. After Kaplan and Norton, multiple researches were conducted in respect of Balanced Scorecards from various perspectives and in different disciplinary backgrounds. At large, Balanced Scorecard research is focused on three demands of the performance management systems, namely benefits/efficiency of the performance measurement choice, strategy map and legitimacy of institutional pressure (Kaplan and Norton 2000).

So far, it has been well understood that the Balanced Scorecard is a useful tool for managing strategy and measuring the performance of an organisation. (Huang 2009b) linked the Balanced Scorecard with automated strategic planning by using the analytical hierarchy process method. The intellectual balance score was developed by (Huang 2009b) and was proven to be a blend of traditional Balanced Scorecard and IT Balanced Scorecard. The IT Balanced Scorecard was implemented using the database management system and design management system whereas the knowledge base was linked to the original four perspectives of the Balanced Scorecard (Niven 2011a).

In order to implement the Balanced Scorecard at organisational level, measuring organisation readiness is necessary. Organisation readiness involves measuring the critical dimension within a company and how comfortable a company with its IT portfolio. Measuring readiness helps to identify the area where the IT portfolio can create value for the organisation. Moreover, it helps the organisation to expand its IT portfolio in the future. An organisation may have a defined IT strategy but a low budget and vice versa. Readiness assessment entails various aspects such as measuring the IT plan and principals, IT governance structure, project prioritization process, IT discovery and strategic plan fit, enterprise architecture, service catalogue operational processes and technology and support (Handler and Maizlish 2005).

IT portfolio management allows an organisation to reap the benefits of elementary portfolios and allows prioritization of its IT applications for optimal benefits. Readiness assessment and IT portfolio management for adopting the Balanced Scorecard may be done in five steps, detailed below, which may lead an organisation toward gradual progress in terms of information technology.

- At Level Zero, a theoretical ground is developed in which the benefits of applying portfolio management to an IT Scorecard are estimated.
- At Level One, communication is channelled which ensures that people, processes and policies are fully aligned and that people are well aware of the common practices.
- At Level Two, IT governance is conducted which ensures that metrics are accurate with respect to quantitative parameters.
- At Level Three, portfolios are linked to one another and the operational system is set up to enable sense and response.
- At Level Four, portfolios are updated based on the initial theorized metrics and targeted benefits.

The step-by-step IT portfolio management in an organisation may be depicted as in Figure 7(Maizlish and Handler 2010).

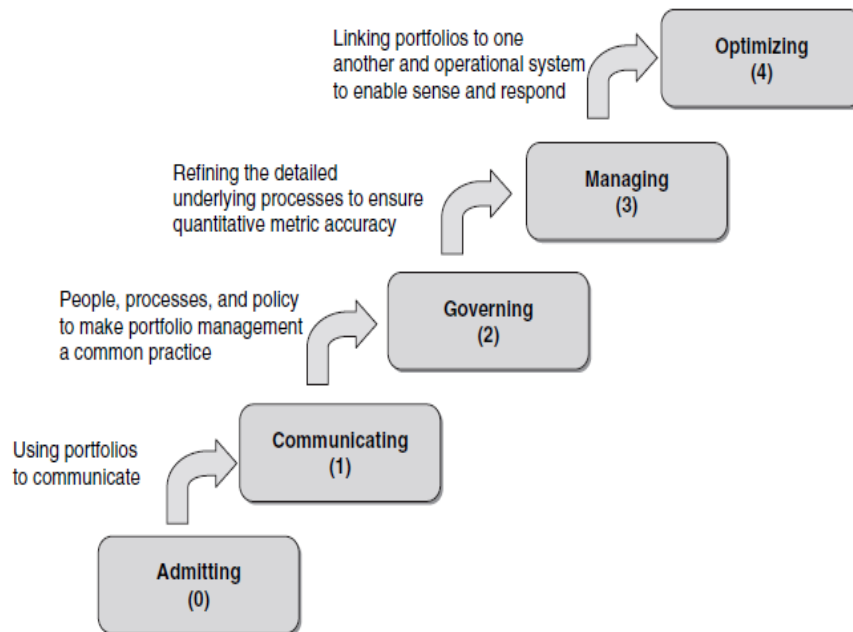


Figure 7: step-by-step IT portfolios (Maizlish and Handler 2010)

The working Council for Chief Information Officers conducted a study for aligning IT to the organisation strategy by use of a Balanced Scorecard. While discussing the Balanced Scorecard, it has been found that the Balanced Scorecard is preferred in organisations as it is simple and poses an explicit relationship between IT strategy and performance measures. Moreover, the IT Balanced Scorecard emphasizes developing standardized metrics for enterprise. The study also attempted to transform the traditional Balanced Scorecard for information technology. The perspective of user orientation is taken as an end user view and its mission is defined as delivering value and adding products and services to final users. The objective of user orientation is to establish and maintain a sound reputation with end users and exploiting IT opportunities. The business view is also the management view and its submission is to contribute to the value of the business (Maizlish and Handler 2010).

The internal processes are operational level strategies and are aimed to deliver efficient and effective IT products. The innovation and growth perspective is dynamically

viewed from future readiness perspective for an IT Balanced Scorecard. The aim is to attain continuous development and preparation for future challenges (Maizlish and Handler 2010).The IT Scorecard tracks the metrics in five key areas including the following:

(A)Financial performance

Financial performance is associated with the IT spending for maintaining project progress and improving service levels. Sample metrics for financial performance may include the cost of data communication per seat or relative spending per portfolio category.

(B)Project Performance

The project performance is associated with research and development and the performance of projects for new revenues. Some sample metrics may be a percentage of new development investments generating new revenue streams and IT investment bringing improvements in IT services.

(C) Operational performance

As compared to traditional Scorecards the IT Balanced Scorecard is concentrated on customer focused views of IT operations. Possible metrics may include peak time availability and critical process uptime.

(D) Talent Management

This metric is related to management of IT human capital. Metrics may include staff satisfaction, staff retention and the attractiveness of the IT department for external stakeholders. Metrics include retention rates and the external demand of the IT department.

(E)User Satisfaction

Any organisation is always interested in providing products and services to users in a simple way. They want to gain the loyalty of users and consumers and these organisations – be they profit or not -for-profit - found that, to provide services in any organisation user satisfaction is important and depends largely on executive feedback and user feedback (Maizlish and Handler 2010).

2.10 Measurement Concept

Measurements can be applied in many different areas and for many different reasons. Measurements which are used in business will be recorded to be used to assess performance and to confirm if targets have been reached and objectives met. These measurement results are also known as key performance indicators (KPIs) (Parmenter 2010).

There are reliability or asset performance management measures that many companies also gather and routinely report on. Three important questions need to be asked prior to embarking on gathering data; namely: what do want to measure? Why do want to measure it? And where will find the information? (Etim and Agara 2011).

The answers to these questions are essential in order to find the foundation required to develop an appropriate and relevant strategy to assess performance management. If a company wants to measure the success of their performance in specific areas to ensure they are adequately aligned to its objectives it would normally have some form of key performance indicators in place to measure this. Before any such strategy can be constructed the business objectives, vision and mission must also be understood at all levels, from senior management to the shop floor (Beck and Oliver 2004).

However, in some cases businesses collect information just for the sake of gathering statistics and not necessarily to drive improvements or change or to flag up failing objectives or missions. This type of information gathering is not particularly effective

in supporting an organisation and driving it to better its performance and gain better results. Consider the basic closed-loop approach shown in Figure 8 to align KPIs with corporate visions and strategies (Beck and Oliver 2004).

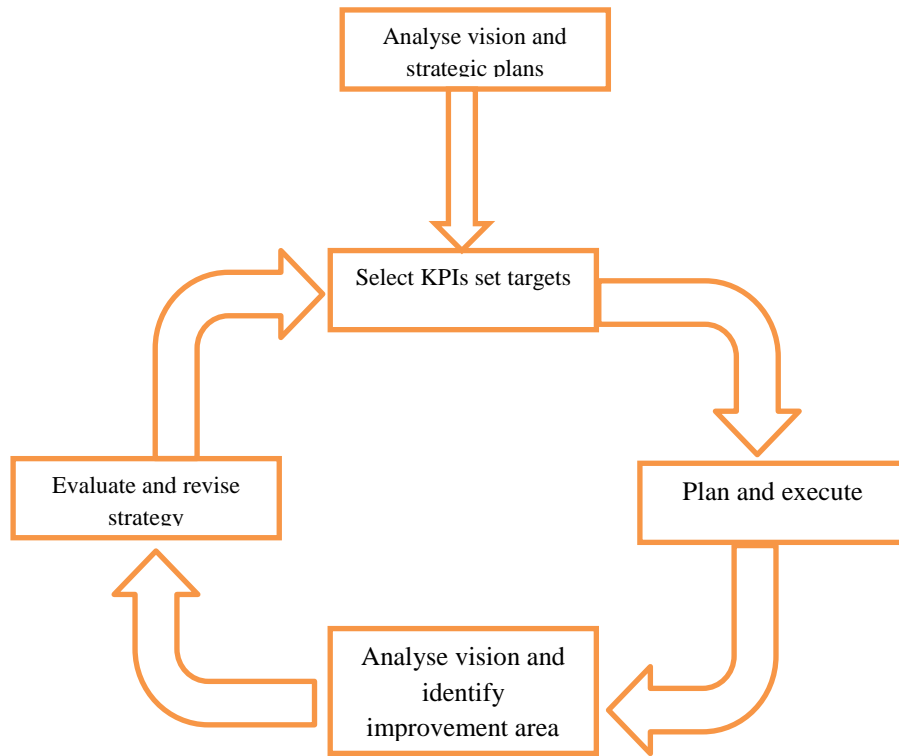


Figure 8: KPI basic closed-loops (Beck and Oliver 2004)

The three primary elements of this process are perspectives, objectives and measures and strategy map.

The strategy is normally broken down into four main areas, namely: corporate, equipment, process, and learning. These perspectives represent sets of viewpoints about the strategy. Each organisation has specific objectives which need to be met and the KPIs contain the specific objectives and measures which are aligned to these objectives,

or targets. Each of these measures or KPIs should be items that are tradable, observable, reliable, measurable and specific (Beck and Oliver 2004).

2.11 Summary

This chapter presented the background to the term Balanced Scorecard, its principles, historical information and some other definitions related to it. After this the three generations of Balanced Scorecards available can be examined along with the process of implementing this within organisations.

The chapter started by give full information of balanced scorecard and viewing the benefits and the limitations of the Balanced Scorecard and the related work explains the differences between the generations and why some of companies did not successfully implement the Balanced Scorecard which was mainly due the readiness of the organisations strategy and ends by the measurement concept.

The next chapter will discuss the Methodology and also give an introduction to Research Design and Research Methodology. Some other additional concept tools will also be seen in the next chapter.

CHAPTER 3

Research Methodology

- **Research Design and Research Methodology**
Concept
- **Quantitative and Qualitative Methodologies**
- **Data Collection Techniques**
- **Information Technology Readiness Approach**
- **Case Study Approach**
- **Summary**

3.1 Research Design and Research Methodology Concept

“Research design” and “research methodology” are two terms that are often used. It is crucial to differentiate between the two terms in order to generate a clear understanding of their differences. According to Yin, research design is a plan that assists any researcher to develop answers to solvable problems. Research design guides one in doing a research (Yin 2009). In order for one to analyse, collect and interpret the results of a research, he or she requires research design (Gill, J. and Johnson, P. (2010)). The relevant data, study questions, type of data to collect and how to analyse results are the four problems that research design deals with (Yin 2009). Research design looks into some strategic conclusions which pertain to methods of data collection. Data analysis, scaling procedures, samples and questionnaires are examples of the tactical issues that research design looks into (Hallebone and Priest 2009).

Research methodology is a combination of actions and rules that gives the researcher directions against what it claims (Robson 2002a). Notably, Hallebone together with Priest, indicate that data collection, sampling design, data analysis and limitations should be included in research methodology. Several issues are considered when selecting the right research methodology; these include the type of information required, study objectives, manipulation of independent variables, characteristics of the interviewees, ability of the researcher to manipulate the case of study, the problems of money and time. Not one single methodology alone can be considered to be the best. What the researcher is expected to do is to pick on the method he or she prefers or which they consider to be the best (Hallebone and Priest 2009).

In conclusion, research design deals with the structure of the research. On the other hand, research methodology deals with the tools which are put in place to attain each

objective as outlined. It constitutes a plan that gives direction on data analysis as well as data collection. Importantly, research design is more concrete and it constitutes research methodology. This is because it combines crucial strategic issues.

Personal interviews are one of the best types of data collection through which a lot of detailed information can be obtained. The interviews contain specific questions and can be structured in a number of different ways to ensure the researcher receives correct and accurate information. In this instance the researcher has used the interview method of data collection and carried out personal interviews with managers, executives, heads of departments and employees within the specified organisation. The outcome of these interviews revealed information about the problems that existed within the information systems and computer applications and also identified specific problems faced by the employees. By using this method to obtain specific information, this contributed to the research strategy and provided ideas in respect of solving the problems identified.

3.2 Quantitative and Qualitative Methodologies

3.2.1 Qualitative Data Analysis

This methodology is used in the collection of data as well as its analysis, which is then used to build descriptions and form the basis for testing theories, (Van Maanen 1979). The method emphasizes more on experimental details which gives a deeper understanding of phenomena that are complex after analysing the perspectives of the locals in a particular area (Miles and Huberman 1994). Qualitative methodology transcends disciplines, has in-depth inquiry and characterizes fields as well as subject matter. Qualitative researchers use things that are found in their natural set up. They make sense out of the study, after interpretations of different phenomenon, depending on the initial meaning placed on them by others. Qualitative data encompasses non-numeric data which includes images, sounds and words, to name a few. The data found in company documents, diaries, interview tapes and in developers websites models all make up the main sources of data and evidence, which is generated in philosophy and the research action, or generated in case studies. Qualitative researchers take a

naturalistic approach in aligning the techniques with the perceived environment instead of vice versa,(Guba and Lincoln 1994).

Cited in (Wesley 2009)found that the flexibility of qualitative researchers was high when it came to recording their collected data. The researchers got varying meanings from one observer to another or from one observation to the other. To give room for these variations, data collection should be inclusive in nature. Therefore, qualitative analysts use interviews, coding techniques and open-ended questionnaires.

For qualitative researchers an approach that is more naturalistic is adopted which helps their technique to effectively adapt to the environment, and vice versa. Qualitative studies on the other hand, improve the understanding of a phenomenon in a specific context.

3.2.2 Quantitative Data Analysis

According to quantitative scholars, reality can be configured and measured. To provide reasoning or findings, the observations of the real world are initially converted to numerical forms before they are finally manipulated statistically. Quantitative researchers carry out an analysis that gives results that are applicable universally. Quantitative research is based, in the main, on questionnaires and surveys. It outlines data in terms of size, other than its subjectivity (Gill, J. and Johnson, P. (2010)). The quantitative research method outlines situations and events in regard to their effect and cause (Eldabi et al. 2002). The facts in this type of research are understood objectively (Hallebone and Priest 2009) unlike the qualitative research method, in a quantitative method there is flexibility in how data is handled. This is in respect of comparative Analyses, data collection, repeatability and statistical analysis (Partington 2002). The ability to generalize, objectivity, and reliability are what quantitative research considers most (Collis et al. 2003a). One important factor of quantitative research is that it gives reliable and truthful data. This data can be generalized to some populations table 1 show us that.

Quantitative Mode	Qualitative Mode
Assumptions	
Social facts have an objective reality Primacy of method Variables can be identified and relationships measured Etic (outsider's point of view)	Reality is socially constructed Primacy of subject matter Variables are complex, interwoven, and difficult to measure Emic (insider's point of view)
Purpose	
Ability to generalize Prediction Causal explanations	Contextualisation Interpretation Understanding actors' perspectives
Approach	
Begins with hypotheses and theories Manipulation and control Uses formal instruments Experimentation Deductive Component analysis Seeks consensus, the norm Reduces data to numerical indices Abstract language in write-up	Ends with hypotheses and grounded theory Emergence and portrayal Researcher as instrument Naturalistic Inductive Searches for patterns Seeks pluralism, complexity Makes minor use of numerical indices Descriptive write-up
Researcher Role	
Detachment and impartiality Objective portrayal	Personal involvement and partiality Empathic understanding

Table 1: Different between Quantitative and Qualitative (Partington 2002)

3.3 Data Collection Techniques

The research was based on two different data collection methods within the Jeddah Municipality departments. The two methods used were questionnaires that were distributed amongst the employees and interviews with the head of departments.

3.3.1 Interview Techniques

The interview technique is commonly made use of in qualitative researches because it gathers a detailed and rich set of data (Saunders et al. 2011). According to (Punch 2009) an interview is a combination of two parties and the two parties have personal contact. The interviewer is the researcher while the interviewee is the respondent. When the interviews are being conducted the researcher aims to ask open-ended questions that will give detailed responses rather than closed questions that only involve 'yes' and 'no' answers. The researcher encourages the respondent to produce the information he or she has in regard to the subject matter.

(Collis et al. 2003b) Note that just like surveys, interviews can be the primary approach in a research. Notably, interviews are best utilized where they are combined with other methods of research. The interviewer should ensure that the respondent participates fully, explaining questions exclusively to the interviewer, responding to questions asked by the respondent and requesting that the respondent clarifies any issues which are unclear or requires further explanation. The main purpose that interviews are used is to be in a position to find out what direct observation has failed to clarify by using questions designed to give accurate answers. Several disadvantages are attributed to this method of research. One is that it is delay receives answers and some lose papers; two is that the interviewer can directly influence the respondent and this creates bias on the research. One other disadvantage of this method is that the interviewer may be unable to keep secret the identity of his or her respondents, which is crucially important, in particular when highly sensitive or personal matters are being discussed. Importantly, this method is far better than the use of questionnaires because the participation of the respondent can be enhanced, questions can be well guided, employee questions are responded to immediately and the researcher can ask the respondent to clarify a certain issue.

(Punch 2009; Collis et al. 2003b) Notably, the researcher can expound to the respondent the objectives of the research and always remain in complete control of the interview. Conducting an interview gives the respondent the opportunity to provide more information as the interviewer can ask for clarification and for more information where needed. This could not happen in a situation where a questionnaire has been used.

Conducting interviews can be very time consuming, they also run the risk of revealing the identity of the respondent and in some cases a high cost can be associated with carrying out research. There is also the risk of a lack of comparability with some of the respondents, all of which are some of the disadvantages of the interview method (Robson 2002b). Interviews are divided into three categories which are the structured, semi-structured and unstructured interview. (David and Chava 1981) note that structured interviews are closed-ended and the format of the questions are the same in every interview.

The objectives of a structured interview are very inflexible but the objectives are easy to scrutinize and get the answer by many ways of questions. Open-ended questions characterize the unstructured interviews. This type of interview unlike the structured one is easy to Analyse, it is flexible and therefore it gives well-detailed responses. This disregards the fact that it is more time consuming and that it requires more effort. The semi-structured interview outshines both the structured and the unstructured questions since it has both the characteristics of unstructured and structured interviews. The semi-structured interviews incorporate both the close and open-ended questions.

3.3.2 Questionnaire Techniques

The questionnaire is best placed to gather information where confidentiality is inevitable and it gives the respondents humble time to give their views so it is the best way of obtaining responses before a quantitative analysis is carried out (Collis et al. 2003b). The questionnaire technique is a fast technique of obtaining information. Essentially it is due to this advantage that this researcher decided to make use of the questionnaire method, bearing in mind the time allocated for the fieldwork was minimized. The main reason why it was made use of is that it would give an opportunity

to reflect on personal opinions and attitudes as it pertains to fundamental success factor for knowledge management strategies. On top of this, it would cover a large area.

The questionnaire was the most crucial instrument to be utilized to obtain the answers to the study questions. This owes to the rapid turn-around time and that it is cheaper compared to other methods of study. Defining as well as describing the situation clearly is the initial step in designing the questionnaire. This helps to make out the concept to be determined or measured (Punch 2009).

Three attributes should be considered when designing a questionnaire (Collis et al. 2003b). Simple and clear questions should be made use of, questions should not be long enough, and that the questions should focus more on the topic being researched on. According to (Collis et al. 2003b), the objectives of the research should be met when formulating a questionnaire. This only means that the researcher should work towards obtaining the most accurate information with the resources he or she has and within the shortest time possible.

A great questionnaire is the one that provides the required information and where the coding, editing as well as data processing necessities are well built up. The response should also be well fitting. Simplicity and wording clarity of the questionnaire was taken into consideration when designing the questionnaire.

Some of the design issues had already been catered for. This includes the cover page that outlines the purpose and the importance of the research. Instructions were clearly laid out such as that answers were to be given by ticking in the provided boxes (Gillham 2000). The first questions were easy and very interesting. They were short and very purposeful. Notably, double-edged and negative questions were avoided.

3.3.3 Sample Population

Sample selection is a crucial element of a quantitative study. For this case study the Municipality employees were the target population of the research. Time could not allow for the whole population to contribute and hence 50 Municipal of Jeddah workers were invited to take part in the research. The entire population was not assessed because of the following reasons.

- a) The resources available were limited for the research of the whole population.
- b) It would be impractical to have the not contribution of every member.

Notably, sampling would assist with saving some of the unlimited time available. It was also inevitable to work with categorical data to compliment the variable population. The researcher is more than ready to bear the risk that the true margin of error may exceed the acceptable margin of error. To help on this the researcher uses Cochran's sample size determination table for categorical data (Kotrlík, Joe W Kotrlík Joe W and Higgins, Chadwick C Higgins Chadwick C 2001). The size of the sample for the total number of the municipal workers was made up of 50 candidates. After the researcher formulated the survey questions, the researcher took them by himself to the Municipality. Researcher got 36 answers from 50.

Researcher began to apply the practical work in the field survey, which wanted him to get the results that prove the hypotheses and contribute to the researcher in this area.

Researcher decided to work on the collection of data to one of the most important methods of data collection, a personal interview, which rely on dialogue and the question of access to the best answers and the exact results that give great benefit of data collection and reach the goals of the research.

Began researcher sample selection is a critical component of the study, both quantitative and qualitative. For this case study were the municipal employees of the target population of the research. Time cannot allow all people to contribute and therefore invited 50 workers from Jeddah Municipality to participate in the search.

The entire population could not be evaluated for the following reasons:

a) The limited resources available to the search of the total population.

b) It would be impractical to have no contribution of each member.

In particular, the sampling help save some time unlimited available. It was also inevitable to work with categorical data to complement the population variable. Researcher is more than willing to bear the risk that the real margin of error may exceed an acceptable margin of error. To help the researcher uses a sample size table report Cochran for categorical data. The sample size for a number of municipal workers is made up of 50 candidates. After the researcher has formulated the survey questions, the researcher took them himself to the municipality. Researcher received 36 responses from 50 and that for the time critical and sometimes also non-existence of some of them to the nature of their work between the administrative and business inspection field. Researcher tried to coordinate with them, but the nature of their work and the lack of time allowed this number only. Researcher had hoped a larger number but this number has proven to contribute to excellent results and hypotheses.

3.4 Information Technology Readiness Approach

In this research, the readiness of information technology applications will be looked at in line with strategic management using the system of the Balanced Scorecard. The study aims to investigate how the readiness of information technology applications influences the strategic development of an organisation. Also, it will focus on the ability of information technology readiness to partner with business for strategic management purposes by using one of the most important things; a strategy that assesses the weight of strategic applications. The Saudi Arabian Public Sector will be used as the basis of the study which will examine the practice of information technology and strategic management.

3.5 Case Study Approach

(Yin 2009) identifies a case study as an inquiry that empirically investigates a contemporary phenomenon, existing in the context of real life by the use of evidence from multiple sources. A real life situation is looked at practically to understand

interactions of different events or variables that help obtain a clear picture in philosophy. Generalization of an individual case is not possible according to some people, but this depends on how the case was selected. Case studies provide complete, rich and in-depth details.

A case study helps in understanding different phenomena in organisations with regard to their origin and the extent to which they influence the operation of the organisation. Combination of factors is what a case study looks at when trying to understand a situation. The case study method helps to understand qualities and properties in specific instances that may be useful in determining the gap between IT and business. Different studies can be done using the case study method and there are three methods which are most commonly used.

One form of case study, the intrinsic case study, is a study which is carried out on a specific case to gain a better understanding of it. This type of study is important, especially when one wants to understand a specific phenomenon in a given environment. In this case can looking at IT applications in order to assess an organisation's IT readiness in order for it to achieve its strategic goals.

Another type of case study is called an instrumental case study and this is used to examine a general theory in a more refined way. The final type is a collective case study, and this is concerned with studying and analysing different cases studies to understand additional specific conditions or phenomena, (Noor 2008).

The first type of case study, the intrinsic case study, is the type which was selected for this research, the reason being that the aim of this study is to generally understand whether an application of IT is effective in enabling an organisation in achieving its strategic goals(Yin 2003).

A case study approach in this research study is very important because it will help the researcher to get closer to the identified organisation and have a clear insight of the organisation as a whole.

The extensive scope offered by the case study allows the researcher to study closely the readiness of the individuals as well as conducting in-depth studies at different levels

within the identified organisation. It also allows a better understanding of other phenomena in the organisation such as communication between employees, workflows and characteristics of the internal environment. The approach of multiple researches is what will be used to collect data, (Burgelman 1994).

This approach has the advantage of being able to collect data from a variety of sources such as observations, surveys and interviews.

Observation methods allow the researcher to directly observe the phenomenon in organisation as work flows. The survey method is widely used when the respondents to the questions of the study are busy or are dispersed over a wide area. Clarification of information from respondents is possible when the interview method is used to collect data. This method also reduces ambiguity. From the three methods, observation gives the most reliable results because the researcher gets first-hand information.

3.6 Hypothesis Research

3.6.1 (H1) Training and workshops

One of the most important things to be taken into account is the employees who will require continuous training on the new IT installations. Staff development workshops will be needed to train employees on the new applications and it will be the responsibility of either the organisation's own in-house Training & Development Officer or an external trainer brought in by the company, to train its employees on how to use the new information technology systems correctly. Failure to do so could potentially cause damage to the organisation due to the lack of up to date skills and knowledge of their staff. Workshops will be necessary for all employees at all levels from the shop floor to top management to ensure that every member of staff can manage the systems efficiently and effectively.

3.6.2 (H2) Check updates on new software

One of the responsibilities of the Director of Information Technology will be to be aware and up to date with new developments to ensure that the organisation has the most current IT programs and systems necessary to determine the strategic plans of the

organisation. It will be necessary for the IT department to update and develop the software systems needed by the organisation to comply with the requirements of the internal processes that directly affect the productivity of all areas of the business. The speed in the implementation of applications and linkage between departments is also of paramount importance. The cost of the new software is also an important factor which will need to be considered as this cost will ultimately have an impact on consumer satisfaction.

3.6.3 (H3) Employee understanding of the organisation's strategy

As already identified, the IT Department is very important within an organisation as it needs to be robust enough to provide the information infrastructure and an enabling environment for the implementation of the necessary products and services to enable the organisation to fulfil its strategy and reach its goals. However, it is also very important for each employee to know and understand the strategy of the organisation. Knowing this will assist them in accomplishing their work more effectively as they will have a clearer understanding of their personal goals as well as the overall goal of the organisation. This is an area where many companies fail their employees as they do not place enough importance on this.

3.6.4 (H4) Employee assessment and stimulation

The evaluation and stimulation of the employees within an organisation is an important factor in assessing the level of equality amongst staff. Ensuring staff members are treated equally with the same rights and rewards will increase staff morale which, in turn, will increase their productivity. Employee evaluation and moral support serves to motivate the employees which is another very important factor. Awarding a staff bonus for successfully completing the assessment will also act as an incentive for them to work more efficiently in order to receive their bonus.

3.6.5 (H5) Annual survey work to enhance strategies

Organisation should endeavor to carry out an annual survey of their employees to assess how well the overall strategy of the organisation has been executed. This survey should not only highlight any shortcomings of the organisation as a whole, but also highlight any problems encountered by the staff. In the process of carrying out this study the researcher reviewed the annual survey which was carried out by the Department of Information Technology in one organisation, to look at the problems faced by the staff when utilizing the new software and other applications. It was evident that the cooperation of the staff in the IT department in supporting the staff through this process was critical, as well as ensuring the robustness of the installations of the new technical infrastructure. The survey highlighted that this process needs to be as seamless as possible as the upgrade of systems needs to ensure a more effective performance of the organisation to ultimately achieve its strategic objectives and goals.

3.6.6 (H6) The use of weights to determine the importance of strategic applications

With the transformation of the world from a technological point of view, the development of information technology has become the vertical backbone of organisations worldwide, enabling them to efficiently and effectively carry out their business functions and implement their organisational strategies. The most important points that need to be taken into account to enable an organisation to reach its strategic goals are to ensure that new systems and applications are integrated in a timely manner. Installation delays, faulty applications and the lack of adequate systems will present the biggest obstacles in preventing an organisation reaching its strategic goals and objectives.

The strategic use of weights and measurements for the applications will ensure that these applications are ready to implement the strategies which are the most important in order to ensure that the infrastructure readiness is ready and integrated applications are adequate for the organisation to reach its strategic goals.

3.6.7 (H7) Priority applications

The priorities of each application is very important as these provide the functions required to repair the problems that have been discovered and identified as preventing the organisation from fulfilling its strategy. As stated in hypothesis 6 above, a weights strategy is used to find the importance of the applications and the applications that affect them. Once this has been achieved the role of establishing the priority applications that need to be repaired follows so that the strategy can be applied effectively after using weights to measure its readiness. For example, high -weight applications and applications which need to be modified will have a high priority and also applications that need a reform strategy will have a detrimental effect and as such, will become an important priority.

Summary

This chapter presented the Methodology to give an introduction to the research design and research methodology concept with explain for each one after that get explain quantitative and qualitative methodologies with explains for both of them and find the difference between them to determined which type you will used, depend on the methodology used there you can use data collection and there is good explain for the techniques, following by information technology readiness approach give us information about readiness, case study approach gives us meaning of case study and understand qualities and properties, Finley hypothesis research describe in details suggested hypothesis to archives strategic goals.

CHAPTER 4

Strategy and IT Balanced Scorecard

- **Strategic Management**
- **Strategic Planning**
- **Measure strategic performance**
- **IT Balanced Scorecard**
- **The Balanced Scorecard Strategic System**
- **The Process of Implementing the Balanced**
- **Scorecard (BSC) System**
- **Communicate and Link Strategic Objectives**
- **Plan, Set Targets and Align Strategic Initiatives**
- **Enhancing Strategic Feedback**
- **Cause and Effect Relationship with Respect to Time**

Overview

This chapter will focus on some important matters relating to strategy, strategic planning and performance measurement. It will also look at the Balanced Scorecard tool and how this is balanced and aligned with IT systems to support effective strategic management. As previously explained in Chapter 2 the Balanced Scorecard has four main perspectives (financial, internal processes, the customer and learning and growth); this chapter will look at this in more detail to explain and translate the strategy. It will also focus on system integration, communication and linking strategic objectives, as well as a selection of indicators to demonstrate the cause and effect.

4.1 Strategic Management

Strategic management is the process an organisation takes to execute its strategic objectives. In order to effectively apply its business strategy throughout the organisation, strategy managers will carry out a thorough audit of the activities and processes it follows to synchronize with its resources, its mission and the vision of the organisation and develop a strategic plan. Following this thorough analysis the coordinated activities are then progressed from a management plan which outlines the organisations, vision, mission and objectives into an operational system. At this stage programmer, projects and departments will be designed. Implementing the strategic plan is where the strategic performance of the organisation as a whole and the strategic objectives of its staff are effectively measured on an on-going basis. The plan can be constantly monitored and updated as a result of mitigating circumstances and developments as they occur.

4.2 Strategic Planning

Strategic planning is the process an organisation uses to define its purpose and objectives, to determine the direction it wishes to take and how it proposes to get there. This will include ensuring that it has clear and defined goals and has the necessary resources it requires to fulfil its objectives. Key consideration will be given to key points such as what is the organisation key USP, and what it needs to do to excel within its particular field or industry. It also needs to ensure that all interested parties such as its staff, investors and key stakeholders are also aware of and are striving to the same end.

As part of the strategic planning process managers need to have a clear and defined focus on where they wish to be in the future, taking into account external influences which may have an impact on their progress. It will need to consider the products and services it needs and the needs of its staff to ensure they have the necessary skills to deliver the company's objectives. Part of the strategic planning process is the ability to measure whether the company is being successful and is travelling in the correct direction, as well as effectively measuring whether the strategies and objectives are being effectively implemented and whether the plan has been successful. Also having contingency plans in place to deal with any problems which may come up along the way.

4.3 Measure strategic performance

It is critical for charities and not-for-profit organisations to effectively measure their performance as they are accountable to and seek the continued support from external sources, such as public and private donations and government funding. Not-for-profit organisations and charities' main drivers and functions are financial and their goals are around making and saving money. Therefore, the public performance reports and internal measures focus on the effectiveness of these types of organisation from a financial perspective. However, the effectiveness of their performance should also be measured on their overall results; for example, the amount of money raised for their

particular charities or other organisations, by the amounts of monies saved on overheads and staffing costs, or both. These, and similar types of organisations should also measure their effectiveness on whether they have actually achieved what they have set out to accomplish (the reason why they are raising the money in the first place), or have they reached their targets (have they reduced the number of homeless on the streets this week?)

Thus, whilst measuring an organisations performance from a financial point of view gives one result, it cannot alone be used to effectively measure an organisations performance as a whole and give a full picture of whether or not it has been effective in achieving its primary objectives.

Today the Balanced Scorecard has become the best and most effective tool to measure strategic performance and this will be described in more detail in the coming chapter.

4.4 IT Balanced Scorecard

The IT Balanced Scorecard is also broken down into four different perspectives. These are user orientation, operational excellence, future orientation and business contribution. Each of these perspectives performs its own function in the IT Balanced Scorecard and the data collected in each area evaluates and measures the present position. To ensure an organisation can adequately measure its strategic performance the perspectives need to be aligned with its goal, vision and objectives and this will need to be continually assessed.

The user orientation element will ensure that users of the IT systems, i.e. employees, perform assessments and evaluate the IT tools. Operational excellence is in place to develop effective applications which will adequately complete the required functions and ensure there is adequate support for these applications. Future orientation relates to the technology needed and the staff and manpower needed in order for the IT department to provide its services and the business contribution perspective captures the business value created from the IT investments.

The ability to measure cause-and-effect relationships is a fundamental function of the IT Balanced Scorecard. This function identifies connections between the measures to determine two key types of measures: outcome measures and performance drivers.

A well-developed IT scorecard contains a good mix of these two types of measures. Outcome measures such as programmers' productivity (e.g. number of function points per person per month) without performance drivers such as IT staff education (e.g. number of educational days per person per year) do not communicate how the outcomes are to be achieved. And performance drivers without outcome measures may lead to significant investment without a measurement indicating whether the chosen strategy is effective.

The proposed standard IT BSC links with business through the business contribution perspective. The relationship between IT and business can be more explicitly expressed through a cascade of Balanced Scorecards (Van Grembergen and Saull 2001). In Figure 9 the relationship between IT scorecards and the business scorecard is illustrated. The IT development BSC and the IT Operational BSC both are enablers of the IT Strategic BSC that in turn is the enabler of the Business BSC. This cascade of scorecards becomes a linked set of measures that will be instrumental in aligning IT and business strategy and will help to determine how business value is created through information technology.

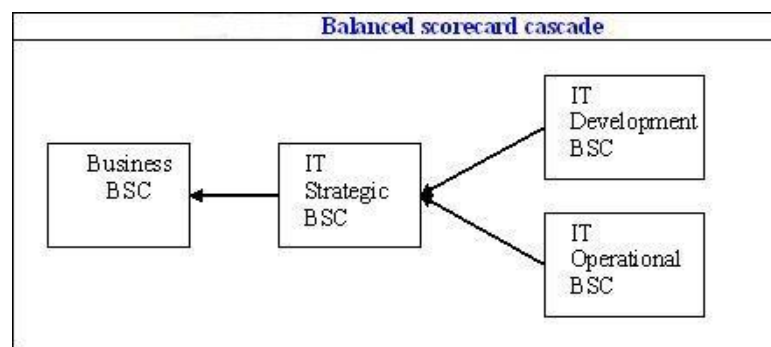


Figure 9: IT balanced scorecards cascade (Van Grembergen and Saull 2001)

4.5 The Balanced Scorecard Strategic System

The Balanced Scorecard is not only a management tool; it is also a comprehensive management and planning set-up for measuring performance. The Balanced Scorecard is a strategic tool for aligning the long-range competitive capabilities and objectives of the financial accounting model. It is an amalgamation of traditional financial measures which depicts the story of a company's internal processes and customer management strategy.

The Balanced Scorecard successfully links the long-term strategic objectives with the short-term strategic actions. The strategy is managed from the four perspectives mentioned above (financial, customer, internal business process and learning and growth). From a strategic management viewpoint, the first new process i.e. translation of vision, helps managers to build unanimity across the organisation's vision and strategy. The broader vision, such as becoming the leading organisation or empowering employees, is translated into defined plan of action for achieving operational results. The vision is presented and an integrated set of objectives and measures, agreed by all senior management of the company, are also floated. The objectives are mainly driven by the long-term drivers of success.

The second process for converting the strategy into action is communication of the strategy and linking it with the departmental and employees' individual objectives. Historically, departments are being evaluated on their financial performance whereas individual objectives are linked up with short-term financial objectives. The Balanced Scorecard is a unique tool that gives managers a way of ascertaining that individual objectives are aligned with those of the organisation at all levels.

The third process, i.e. business planning is the integration of the business and financial plan of companies. Companies nowadays are using a variety of programmers for technology, management, supply chain and human resources etc., and managers find it difficult to achieve unanimous objectives through all of them. All initiatives i.e. managerial, technological or strategic initiatives must be directed to achieve one

objective. Moreover, the allocation of resources and the setting of priorities of integrated objectives provide room for companies to strategically move towards achieving long term strategic objectives.

The fourth process, i.e. feedback and learning, gives companies the ability to apply strategic learning. The feedback and review of growth allows companies to review whether the company and its employees have attained their financial objectives or not. The Balanced Scorecard working in the centre of the organisation provides a system to the company to monitor short terms results from multiple perspectives such as the customer perspective, learning and growth and internal business processes. On the basis of performance results, the companies may review their strategy and design fresh objectives for enhanced performance.

Kaplan and Norton Studied 100 organisations for their study and identified that the Balanced Scorecard provides a strategic framework for management processes. It simultaneously operates as a strategic management planner as well as monitoring multiple processes of an organisation such as departmental and individual goal setting, asset allocation, strategic moves, learning and growth and integration of business planning with all these strategic moves. It was also noted that the Balanced Scorecard works as a strategic integration tool and initiates a change process across the board. The change is the enhancement of simple performance measures to measuring the tendency to meet the strategic goals both in long and short run.

4.6 The Process of Implementing the Balanced Scorecard (BSC) System

The Balanced Scorecard is a comprehensive management system which enables an organisation to translate its vision into action. To make the Balanced Scorecard the central unit of performance management and use it as strategic tool, the right implementation of the Balanced Scorecard is critical.

Implementation of a Balanced Scorecard is technical as well as managerial in nature and requires a clear understanding of an organisation's vision, mission and strategy. Symmetric information received by an organisation from all corners ought to be the basis of the vision and strategy of the organisation. Implementation of a Balanced Scorecard is a distinct management development programme and it must be planned before it is practically implemented. Implementation of a Balanced Scorecard is a five-step process, as discussed below.

4.6.1 Model Synthesis

Model synthesis is the first step towards implementation of a BSC in an organisation. During this phase, an organisation will seek consensus about its vision and strategy and identify the required measures. Two major activities, i.e. strategy synthesis and measure synthesis, are conducted during model synthesis.

During strategy synthesis, the strategy of the organisation is reviewed. A short method of strategy synthesis is conducting interviews with senior managers and the middle management team. On the basis of strategy synthesis, the structure of the Balanced Scorecard is decided.

The next step is to conduct the measure synthesis. During measure synthesis, the strategy of the organisation is quantified to multiple performance measures called Key Performance Indicators. This will be explained in more detail further in the chapter. KPIs can be formed using either strategy maps or critical success factors. Though

strategy maps are effective and work equally as well as the critical success factor approach, which are quite straightforward, strategy maps lack the ability to express the cause and effect relationship amongst different measures and with different perspectives.

4.6.2 Technical Implementation

After forming KPIs on the basis of critical success factors, the next step is to develop a tool similar to a Balanced Scorecard. The logical design of the Balanced Scorecard formed in the model synthesis is implemented by using the same software and computerized tools. Some key steps include developing target levels, alarm levels, calculation formulae, and consolidation of data, mapping graphical properties of data and building the Scorecard.

4.6.3 Organization Integration

A Balanced Scorecard can bring results only when it works as part and parcel of every strategic and managerial function of the organisation. The BSC should be coupled with the organisational process and must be communicated to all stakeholders. The integration phase begins with the assignment of responsibility for collecting and measuring data. The phase further includes a comprehensive communication programme to all the employees of the organisation which is necessary for communicating why the Balanced Scorecard is being implemented and highlighting the objectives of the organisation.

The integration phase also works out the re-engineering strategy process and reporting process, the main emphasis being the generation of management reports such as quarterly reviews or monthly feedback reports. The feedback reports serve the purpose of performance measurement for benefits such as performance bonus and salary bonus etc.

4.6.4 Technical Integration

An effective method to bring coherence between a Balanced Scorecard and an organisations operating system is to integrate the Balanced Scorecard system to the company's operational IT system. Organisation wide IT systems such as enterprise resource planning, customer relationship management systems and supply chain management systems may serve as effective resources for Balanced Scorecard data. The technical integration generally includes identification of the data resources to be used in the Balanced Scorecards, analysis of the data and defining the method for obtaining data from the system.

4.6.5 Operation of the Balanced Scorecard System

While designing the Balanced Scorecard organisations get a deeper understanding of their mission and vision and its business drivers. Prior to this phase the Balanced Scorecard has already been integrated with the management and reporting process during the organisational integration phase. During the operation of the Balanced Scorecard, performance measures are updated, results of the Balanced Scorecard are Analyses and results are reported for further analysis and decision making.

4.7 Communicate and Link Strategic Objectives

The Balanced Scorecard is designed and initiated at the top level and therefore it is extremely essential that it is communicated down the line to every employee of the organisation. The strategic goals incorporated in the Balanced Scorecard measures need to be communicated to all employees in hard form for their reference and performance guidance.

Tools such as regular newsletter, developmental or information videos, personal computers, network sharing and bulletin boards can be used as effective communication tools.

Kaplan and Norton place a strong emphasis on communication to ensure that employees receive the correct signals to understand that these are critical objectives which must be

attained. Once all high level objectives are communicated to the employees, further small steps or objectives can be developed across departments to achieve the larger goals. The Balanced Scorecard is not merely a delivering tool; rather it endorses two-way communications between employees and the board of directors or strategy developers.

4.8 Plan, Set Targets and Align Strategic Initiatives

The Balanced scorecard is an ideal tool for implementing change. Through the Balanced Scorecard the strategic objectives and financial objectives are targeted, keeping in view the type of organisation. The financial objectives need to be concrete and targeted on specific indicators such as share price and return on equity etc. To achieve the financial objectives, managers are required to establish the customer strategy, internal business process efficiency targets and learning and growth objectives which in coherence can help the company to achieve the financial objectives. For instance, if a company wants to double its share price, the company needs to define its objectives for improving customer services, lowering response time, improving employee skill levels and enhancing the efficiency of the organisations processes so that the financial objectives can be achieved amicably.

The Balanced Scorecard provides a comprehensive methodology for implementation of an organisation's vision through multiple strategies. Rather than focusing on fundamental processes only the Balanced Scorecard enables the management to reengineer the processes that are critical for organisational success. Unlike traditional measures of cost cutting for improving profits, the Balanced Scorecard focuses on reengineering business processes so the business function can be performed at low cost without effecting the quality.

A few measures for improving profits without affecting quality may include shorter time to market, a dramatic reduction in order fulfilment time and in-house product development time.

4.9 Enhancing Strategic Feedback

Enhancing strategic feedback is the final step in the strategic learning framework of the Balanced Scorecard. Enhanced strategic feedback is the terminal activity of a Balanced Scorecard; nevertheless, this is the most innovative and most important aspect of the entire process. The process allows organisation - learning activity at the executive level. The Scorecard serves as a monitoring tool of strategy. The process of learning initiates with the sharing of the vision within the organisation and flourishes with the communication directed to inform all individuals in the organisation. The communication process and parcelling long term objectives in short-term objectives allows employees and management to understand how individual pieces fit together and how their role is interconnected. Unlike traditional methods of learning, the Balanced Scorecard allows double loop learning. Niven asserted that double loop learning is two-way learning and occurs when learners refer back to the underlying assumption. The learning constantly questions whether the underlying facts are still relevant to the current situation, experience or observation. Feedback plays an important role in evaluating the relevancy.

The feedback is also required for evaluating whether the defined strategy is still viable or not. For this evaluation, information from sources such as employees and the organisation's system is required.

A well-defined Balanced Scorecard is derived from the strategy and includes estimates such as impact of measures on an organisations performance. Such Balanced Scorecards also incorporate the organisations theory of business and also include a series of cause and effect relationships. Delivering what is planned in the Balanced Scorecard can list the company in high achievers on multiple dimensions such as improved financial results, higher customer count, skilled employees and improved internal business processes.

4.9.1 Combining Dissimilar Measures

Kaplan and Norton provided certain guidelines on how to implement a Balanced Scorecard in an organisation; however the study does not reveal how multiple dissimilar measures may be combined in order to appraise the performance of a company or its employees. There is no guideline for linking the incentives and HR policy to the Balanced Scorecard. The Balanced Scorecard may be considered mainly as a communication tool across the organisation instead of a tool for mapping performance for deciding compensation.

4.9.2 Selection of Indicators

Kaplan and Norton highlighted multiple indicators of performance measurement such as new product launch time and market segmentation etc. however, the type of industry and industry norms have not been discussed or taken care for while measuring the performance. This makes the Balanced Scorecard a wide tool and which needs special expertise and modification before any organisation implements it for its use.

4.9.3 Correct Indicators

Although Kaplan and Norton have suggested a list of measures, despite this an organisation may not necessarily be able to select the correct indicators in order to correctly assess their performance. An organisation has a variety of measures available but the tendency to choose the ones suggested by Kaplan and Norton are evident, irrespective of the fact of whether they are relevant or not. The measure of change as well as subjective measures may be widely ignored by organisations while designing the performance metrics.

4.9.4 Internal Focus

The Balanced Scorecard is internally focused. It observes the customer's need as well as the desired financial perspective from the organisations view point. Ultimately it attempts to attain the resources and processes for attaining those objectives. The external focus and business environment is largely ignored by the measures. The Balanced Scorecard selectively focuses on shareholders and customers from an internal perspective and does not consider the activities of other stakeholders such as government, competitors and suppliers etc.

4.10 Cause and Effect Relationship

The Balanced Scorecard is considered to be a strong tool for performance measurement as it puts a strong emphasis on cause and effect relationships although Norreklit highlighted that Kaplan and Norton thoroughly discuss the cause and effect relationship. According to Norreklit, the Balance Scorecard described Kaplan and Norton is a static model and it did not ignore the dimension of time and sequential set up of measure. Therefore, the cause and effect relationship follow the logical independence and identifies little evidence of causal connection between two activities, so according our Hypothesis Research cause and effect relationships are considered a key element in the success of these hypotheses, thus reducing the gap between information technology and strategic management. The clarity of the strategic goals and measure organisation applications readiness also considered of the most important factors for the success of strategy will follow applications readiness through in the next chapter.

4.11 Summary

This chapter discussed strategy measurement practices, strategic plan measurement, the card tool balanced and aligned with the BSC system and strategic management. It also looked at how to integrate a Balanced Scorecard with internal systems, the process of implementing it within organisations, communication and linking strategic objectives, planning, setting targets, and aligning strategic initiatives. The chapter explained how to enhance strategic feedback and finally, the chapter ended by viewing cause and effect relationships, in particular with respect to time.

The next chapter will be about application readiness, information capital readiness, strategic maps and how best to effectively implement these into an organisation.

CHAPTER 5

Information Capital Readiness

- **Information Capital Readiness Concept**
- **Strategy Map and Intangible Assets**
- **What is Alignment**
- **Alignment between IT and Business Strategies**
- **Information Capital (IC)**
- **Measure Information Capital Readiness**
- **Theoretical Procedures**
- **Summary**

Overview

This chapter will explain an IT Application's readiness, look at strategy maps and intangible assets and explain how to align these between IT and business strategies. The chapter will also look at strategy maps, as explained by Kaplan and Norton, and Analyses the best ways of implementing these within organisations to measure information capital readiness. This process involves using new methods such as strategic weights and matrices to calculate and determine an application's readiness and find the application's priorities.

5.1 Information Capital Readiness Concept

It is necessary to understand information capital readiness in order to fully understand the objectives of IT readiness in the strategic framework of an organisation. IT cannot create value unless it is fully immersed in an organisation's strategy and its available resources. Many information technology portfolios and management efforts have failed because of improper planning prior to undertaking an IT demonstration.

There are multiple assessments required in order to achieve the optimal benefit from implementing an IT portfolio in an organisation. An organisation is required to assess its readiness for IT portfolio management. Organisation readiness involves an analysis of its capacity to absorb the information technology portfolio. Assessment of an organisation's readiness for a new IT portfolio can provide an estimate as to where information technology can create and add value within an organisation.

Once organisation readiness has been measured, the next step is to assess the maturity of the IT portfolio management process within the organisation. The overall goal of IT portfolio management is to help optimize the allocation of resources and to achieve easy ways to management this with automation. For its financial objectives an organisation needs to review its financial goals, risks, financial tolerance and available resources.

Once the financial objectives are identified, portfolio managers are required to select adequate and appropriate metrics to make rational decision. This may include real time reporting, business analysis software and performance management systems.

There are various obstacles that hinder the strategic fit between an organisation and its IT portfolio. A few of them are listed in the table 2 below (Kaplan and Norton 2004b).

Problem
Lack of infrastructure for real time reporting, business analysis and performance management
Dispersed data management platforms
Inadequate report or lack of performance measurement
Inadequate budget process
IT department failed to increase ROI
Lack of performance planning and unclear strategy
Weak IT vendor performance
Decline in Quality of IT service due to cost pressure

Table 2: problem (Kaplan and Norton 2004)

It could be argued that the IT portfolio is a pre-requisite for a strategic fit between an organisation's objectives and information technology portfolio. If the IT portfolio is flawed it is challenging to blend the both strategy and IT portfolio for value creation. Measurement and assessment of the capabilities of the team responsible for IT portfolio management and mapping of the exact scope of the IT portfolio management efforts is a subsequent step for measuring business perception of information technology value.

5.2 Strategy Map and Intangible Assets

An organisation has a blend of both tangible and intangible assets. It is easier for any organisation to measure the capacity and ability of its tangible assets for new projects and expansion; i.e. whether the existing machinery is capable to undertake the expansion plan or the organisation is required to buy a new one? However, it is challenging to identify whether the existing knowledge management is capable to meet the strategic objectives of the organisation or should the organisation invest in new customer database? Should the organisation invest on improving the skills of all employees or should it focus on finding a few new, key employees? (Kaplan 2004).

Measuring the value of intangibles is equally as important as that of tangible assets. As compared to tangible assets, intangible assets are hard to create and imitate and because of this they can become a sustainable competitive advantage for organisations. It is pertinent to observe that intangible assets may not function properly for the organisation unless they are combined with other assets of the organisation. For instance, a database management system is useless unless an organisation has well trained staffs who knows how to use to system efficiently. Similarly, well trained staff is incomplete without these intangible assets and technologies. This implies that both the IT portfolio and strategy of the organisation are required to be aligned to realize the full potential.

Though intangible assets cannot improve financial performance in isolation, nevertheless, they can work to improve the financial performance through a chain of cause and effect. The training of employees or investment in new projects may be meaningless unless they bring customer satisfaction or improved sales returns for the organisation. The process is slower for intangible assets whereas tangible assets bring immediate results. The financial benefits of newly developed outlets can be calculated easily when compared to the addition of trained employees in the organisation. The value of intangible assets is all about the alignment of the assets with the strategy of the organisation. If an organisation has sound strategies and sufficient intangible assets aligned with the strategy, only then can the assets create value for the organisation, otherwise the intangibles can bring a lower value to the organisation.

In an organisation three types of intangible asset are necessary for implementing the organisational strategy. The assets include human capital, information capital and organisational capital. Human capital is not the personnel; rather, it is comprised of the skills, talent and cumulative knowledge of the organisation's employees. Information capital is an organisation information structure including its database, network and information systems and technology infrastructure. Organisational capital, on the other hand, is the sum of its organisational values, its leadership and alignment of its people with its strategic goals.

Strategy maps are a tool which link up the intangible assets with an organisation's strategy and performance. Strategy maps are a useful tool for outlining the strategy and for enhancing the internal business processes function. Strategy maps may be designed in a top-to-bottom structure starting with long term financial goals and then determining the value proposition that will attain the revenue growth. It is of utmost importance to identify that it is more critical in its creation and delivery of value proposition. Information, human and organisation capital is placed at the bottom of the strategy map to identify the processes required for alignment. Strategy maps work as framework for linking intangible assets with shareholder value through interrelated perspectives of a Balanced Scorecard.

As identified earlier in chapter two, the core emphasis of a Balanced Scorecard is on achieving financial objectives; however, it keeps an aligned view on other business perspectives such as internal business processes, learning and growth and customers' perspectives. The financial perspective describes the tangible outcome of strategies such as return on investment, shareholder value and revenue growth etc. The customer perspective defines the value generated from customers in terms of increased sales and enhanced loyalty. The internal processes perspective identifies the value created from improvement in internal business processes. The learning and growth perspective is placed at the bottom of the strategy map which incorporates the intangible assets that are critical to the strategies. The objective of this perspective is to identify which intangible jobs are required for creating value in internal processes. Creation of alignment between internal processes and these intangible assets is essential for value creation.

A sample strategy map is depicted Figure 10. At the top of the map sustained shareholder value is placed which is the ultimate objective of an organisation's strategies. Intangible assets has been placed at bottom in the learning and growth grid which implies that human capital, information capital and organisational capital need to work in conjunction in order to achieve financial success, customer loyalty and improved internal processes. The other three Balanced Scorecard perspectives - mapped strategic job families, strategic IT portfolio and the organisational change agenda are placed between learning and growth which implies that all three intangible assets need to be in strategic fit with the organisation's strategies to bring sustained shareholder value.

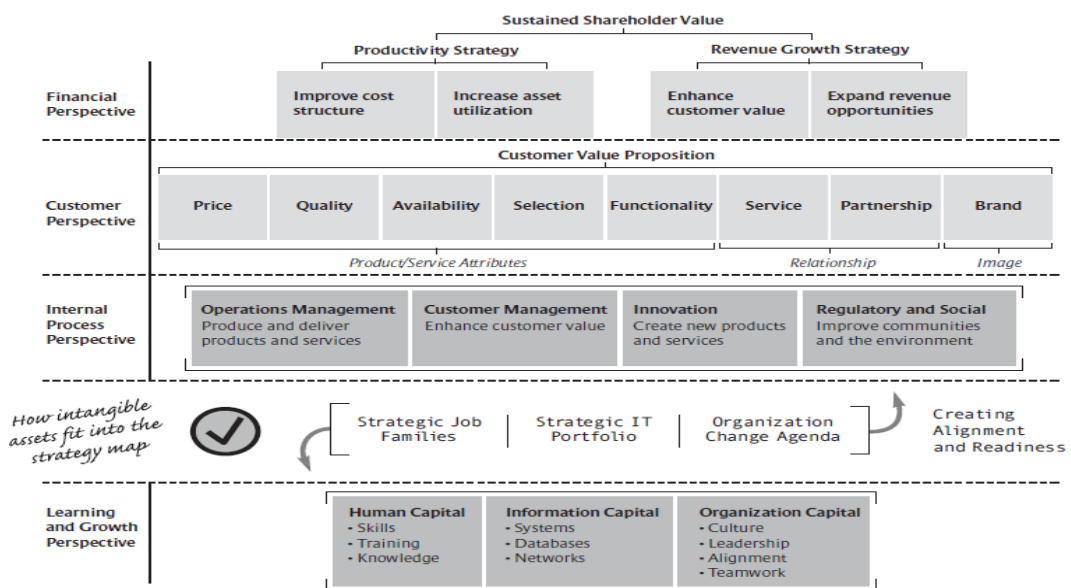


Figure 10: Kaplan and Norton strategy maps (Kaplan and Norton 2004b)

5.3 What is Alignment?

The entire philosophy of a Balanced Scorecard and strategy maps hovers around the alignment between information capital and the strategies of the organisation; therefore, it is necessary to identify what alignment is in terms of a Balanced Scorecard. Alignment of objectives and information capital implies creation of value at the enterprise level. Almost all strategy theories are based on business units and their products, customers, markets, technologies and core competences. The business and corporate strategy defines how the business unit will create products that offer a unique and novel blend of benefits called customer value proposition to the targeted customers. Alignment between strategic assets and an organisation's strategies are required to attain three core results for business units, as follows:

1. Business units which offer products and services in a timely manner and at low cost. The best total cost proposition is the main costing agenda of the business units.
2. Through alignment the organisation gains product leadership. The organisation offers products that expand its existing portfolio and performance boundaries.
3. The organisation is capable of providing a customized mix of services, products and know-how to resolve its customer's problems.

Individual units built strategy maps and Balanced Scorecards in order to adopt a unanimous strategy all across the organisation. The Balanced Scorecard at the strategic level is not only adopted for performance measurement, rather for creating an alignment between objectives across the organisation and for communicating the strategy to all the employees in the organisation. Through the business unit objectives the organisation creates value for its shareholders which are the ultimate goal of the business.

The aim of alignment is the creation of synergy between an organisation's assets and strategies. Synergy is the collective benefit of a strategy and assets which may not be otherwise obtained in case both the assets and strategy are deployed in isolation. For a corporation to add value to its individual business units and share service units, it is required to align strategies with operating and intangible assets to create synergy. If an organisation aligns the activities of its disparate business units and support units, it

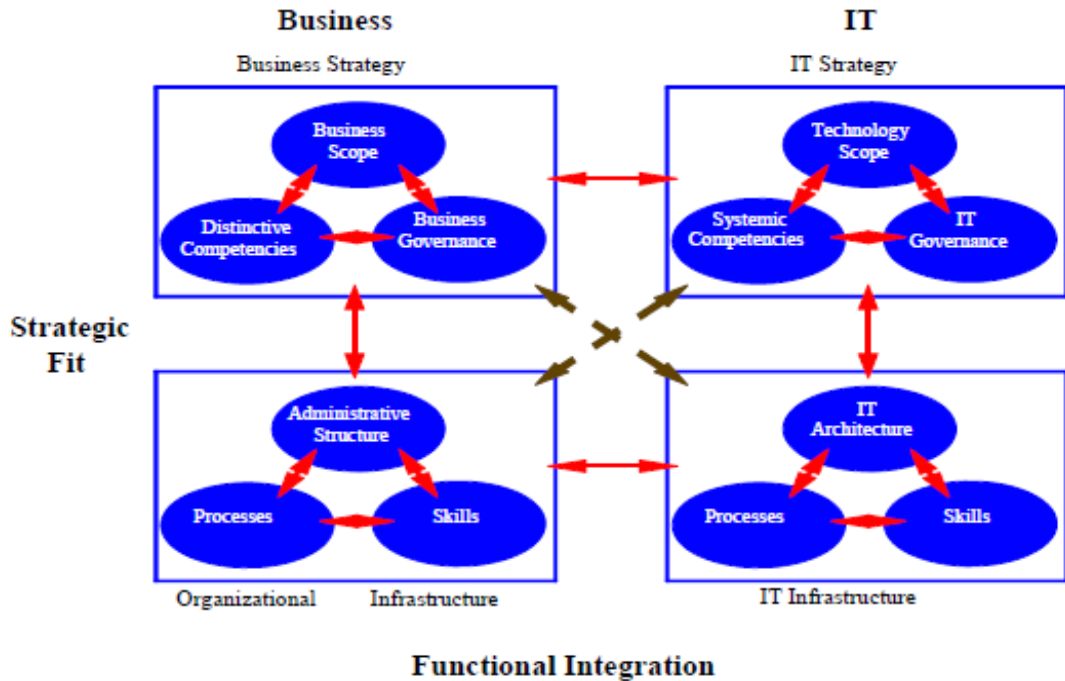
attains the ability to create enterprise derived value. Value creation is the sum of customer derived value and enterprise derived value therefore, value creation strategy is a collective strategy for customer value proposition and enterprise value proposition. Development of intangible assets is a major source of attaining synergy as it is beneficial for long term competitive advantage. Though alignment appears to be a one-step method, nevertheless, the alignment process is actually cyclical and has a top-to-down bias. The targeted corporate strategies are defined at the top and realized in small business units or at a grass roots level. The alignment process is surrounded by multiple processes such as alignment of the Board and shareholders, enterprise value proposition, business units to customer relationships, corporate office to business unit relationships and corporate support.

5.4 Alignment between IT and Business Strategies

The moment that managers started to understand the process of alignment was when they started executing the procedure of alignment in a consistent manner. Through this pattern, managers developed the opinion that four building blocks and two fundamental relationships are needed to establish a strategic alignment between IT and business. These building blocks are in the form of business strategy, IT strategy, organisational infrastructure and processes, and IT infrastructure and processes. The two fundamental relationships are in the form of strategic fit and functional integration.

Strategic fit understands the necessity for every business or IT strategy to handle the area of expertise of every establishment, both internally and externally. This in turn directs the functional merging of how the decisions made in the IT field affects those made in the business circle and vice versa (Henderson and Venkatraman 1993). Stated that on the issue of practitioners having the strategic alignment pattern handy, there should be four alignment ideas with every one of them directed at each of the alignment patterns building blocks. The strategic execution perspective is the idea that every business strategy must be the driving force for the decisions made with regards to organisational design and IT infrastructure. The technology potential perspective targets the strategy used in the development of IT in answer to making clear what business strategy is to be adopted, thus describing what the IT structures and procedures are. On

the other hand, the competitive potential perspective directs its attention to taking advantage of the capabilities of the latest IT as it affects new goods and services. The competitive potential perspective also wields influence on the key elements of the strategy, as well as in the development of new types of relationships, as shown in Figure 11 and table 3. The service level perspective directs its attention to the creation of a very high standard IT service establishment.



Adapted from Henderson & Venkatraman (1990)

Figure 11: IT alignments with Strategic (Henderson and Venkatraman 1993)

Strategic Fit	↕
Functional Integration Fit	↔
Cross Dimension Alignment	↔↕

Table 3: Keys (Henderson and Venkatraman 1993)

5.5 Information Capital (IC)

Information capital is the basic material involved in the development of values in the new areas of economic information capital. These new areas are made up of systems, databases, libraries and networks. They are also responsible for providing information and knowledge to the establishment. However, their values are limited in terms of context. By using an information system specifically geared towards quality, an establishment can always make the highest returns if it pursues a strategy that utilizes total low cost. In this case there should be a good management of its process improvement and workforce productivity information capital in order for all its strategies to be properly aligned. The general framework as shown in Figure12 below must be utilized in order to obtain a substantial capital.

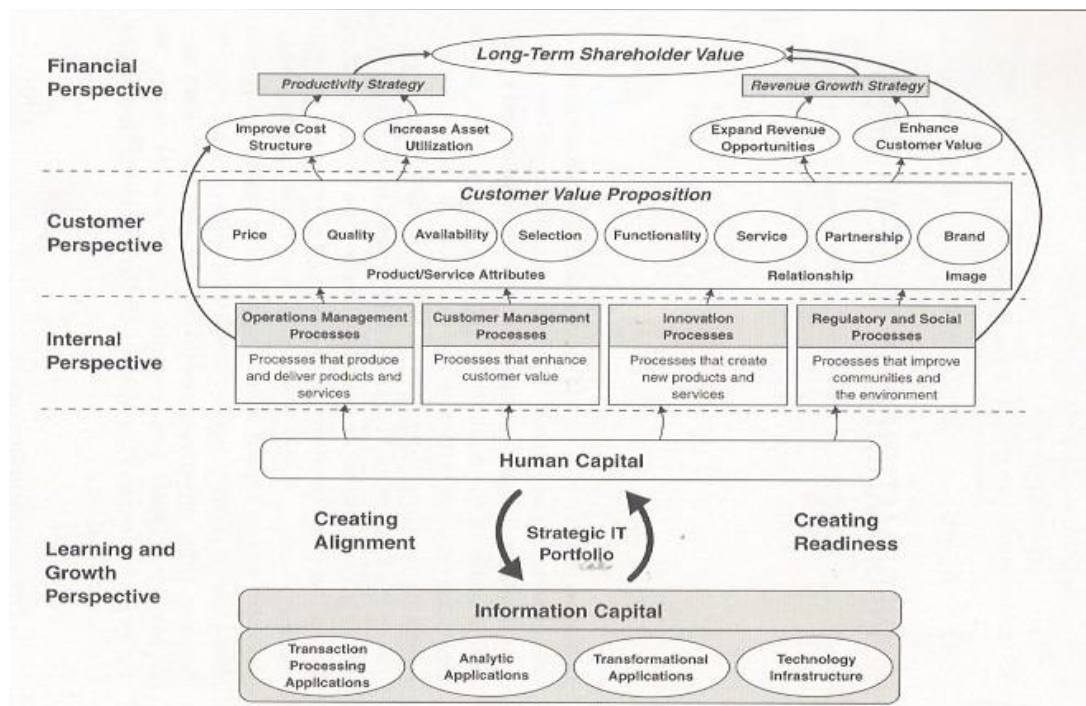


Figure 12: Strategy Maps Framework for IT (Kaplan and Norton 2004)

5.5.1 Explanation of Information Capital (IC)

In the table below the four stages of the framework shown give a very valuable scheme of classification in defining information capital.

Information Capital Category	Description
Transformational Applications	Systems and networks that change the prevailing business model of the enterprise
Analytic Applications	Systems and networks that promote analysis, interpretation, and sharing of information/knowledge
Technology Infrastructure	The shared technology and managerial expertise required to enable effective delivery and use of Information Capital Applications
Transaction Processing Applications	Systems that automate the basic repetitive transactions of the enterprise

Table 4: Strategy Maps describing (Kaplan and Norton 2004)

According (Kaplan and Norton 2004b) Strategy maps consist of two parts, well explain it: technology infrastructure and information capital applications. Technology infrastructure consists of technologies such as central mainframes and communication networks including managerial expertise. It also includes certain set standards such as disaster planning, as well as the required security that guarantees effective delivery systems and the proper utilization of information capital applications as shown in Figure 16. An information capital application and a package of information as well as knowledge and technology are all elements that can be fully utilized when an establishment wants to build upon its technology infrastructure.

Once accomplished, this new technology infrastructure would enable the establishment to create new innovations, together with the customer, operation, regulation and social management in its major internal procedures.

Before starting to solve any problem it must first be analysed and broken down into smaller parts to enable the researcher to find appropriate solutions for each part. It may be that certain parts will be solved quickly whereas long-term solutions may be required for other parts of the problem. In this instance, the Information Capital of the organisation was analysed. This is made up of two parts; the Information Technology infrastructure and capitalism.

The first section of the IT infrastructure technologies contains three sections: (1) a large central component which houses large processors which are used to accommodate and regulate the complex processes; execute commands within the data processor and a storage giant that contains databases and storage spaces for users; (2) communications networks responsible for the delivery of the network to the terminal and to the exits networks via a wired connection (normal - optical fibre) or wireless networks, wireless and network; and (3) security, the third managerial experience responsible for the organisation of administrative work, the introduction of information and research, producing reports and the completion of work and disaster response, as shown in Figure 13.

The second application of information capital consists of two sections; (1) knowledge and care of this section with information systems, training staff on new systems, updating software (including updating staff with full details of the update) and systems to take advantage of the characteristics of the programs. The second technology combines all the elements that can be fully utilized when it wants to create the infrastructure for applications, software engineering and linking applications. With some linking applications rules systems, the World Wide Web and cloud servers, the IT department is the link between software applications and solid parts and networks.

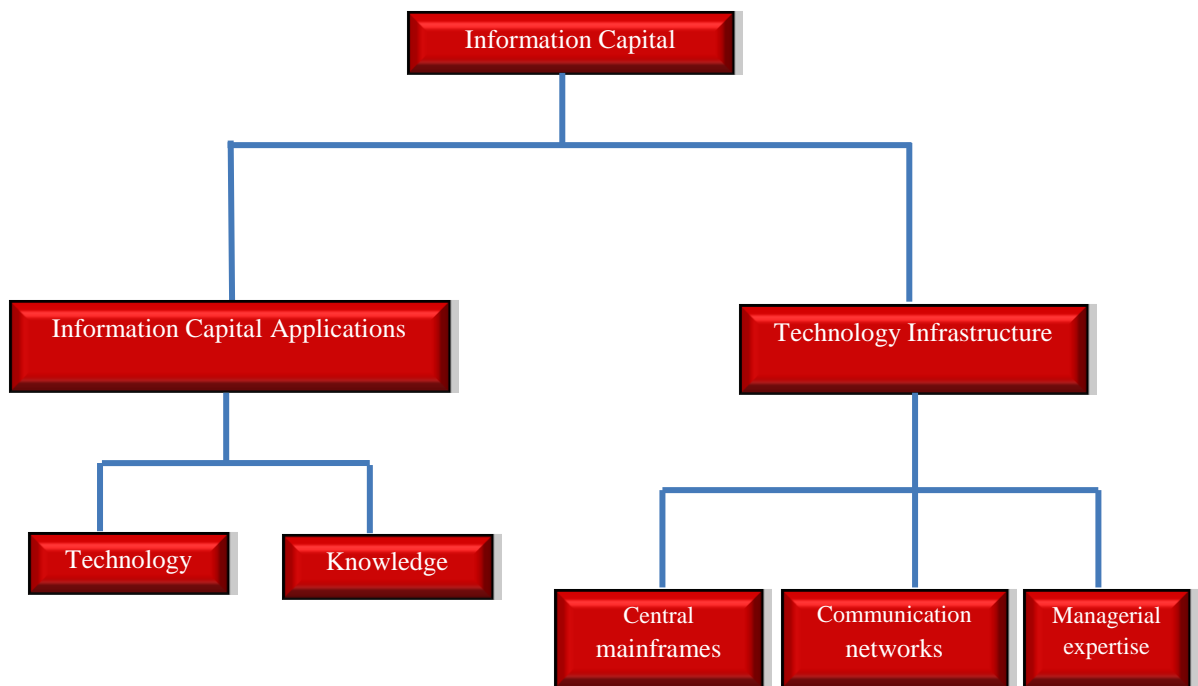


Figure 13: Diagram Information Capital

There are three classifications identified with the information capital applications. The three classifications are:

Transaction processing application - a good example of this is the Enterprise Resource Planning (ERP) system used in automating the basic, routine transactions of the establishment, which are repetitive in nature.

Analytic applications this calls for the promotion of the analysis. It is also utilized in the interpretation as well as in the distribution and sharing of information and knowledge.

Transformational applications these change the current business pattern of the establishment. Transformational applications can be either transactional or analytic. In transactional, they show the interactive nature of the system when dealing with

individual customers whilst in analytic, they exhibit real-time procedures such as those utilized by networks when measuring the e-government system. Transformational applications are also differentiated through their promising effects on the strategic goal of the establishment and the extent of the organisational change for the delivery of the gains to be made in such goals.

Technology infrastructure and information capital applications are two of the components of the information capital portfolio. It is important that company executives understand the strategies of mapping out plans and setting up the priorities required for managing the information capital portfolio needed to back their strategies.

The strategy layout scheme must contain the information capital objectives and reference points. The strategy map gives the definition of distributed technology infrastructure in two forms of physical infrastructure. The internal perspective is responsible for the development of value and management infrastructure learning whilst the growth perspective is responsible for the leadership in asset readiness.

5.5.2 Physical Infrastructure

In Figure 14 explain physical infrastructure there is an internal perspective strategy map which attempts to define what the strategic goals are in terms of innovation and customer and management procedures. The information capital portfolio which lends its support to the innovation processes consists of the following:

Transactional level Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM) as well as product development pipeline management systems.

An analytic level knowledge management system (KMS) is used by product designers to distribute best-practice information between each other. A transformation level interactive system permits customers to directly come up with the designs of their own products. The information capital portfolio which lend its support customer management processes basically commences at the transactional stage of the Customer Relationship Management (CRM) system. CRM software has numerous applications. These applications include sales force automation and order processing as well as and call centre management. The analytic level implementations also give the customer the

opportunity to measure profitability and analysis of data mining capabilities (Kaplan and Norton 2004c). Supply-chain Management (SCM) and manufacturing requirements planning (MRP) are classic examples of the transactional systems which help the operations of management procedures. These applications bring together an array of systems in the nature of inventory control, order processing, purchasing, and capacity planning. Other applications include the analytic level applications that utilizes the system, analyses the product and then goes about to process its quality, activity and costs, as well as lead cycle times and complaint analysis. The system would then integrate all these IT components.

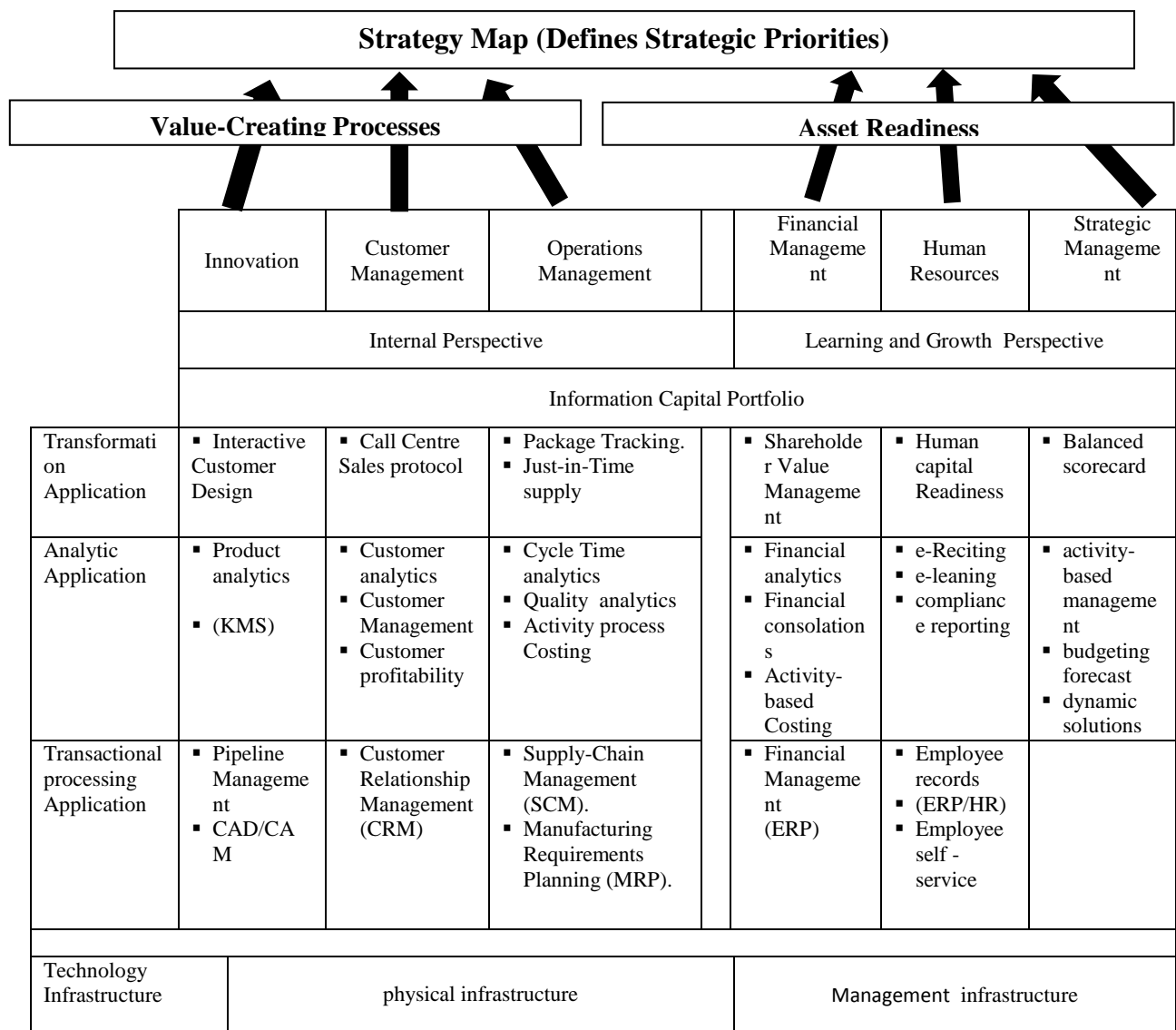


Figure 14: Strategy Maps Infrastructure (Kaplan and Norton 2004)

5.5.3 Management Infrastructure

The learning and growth perspective helps the strategy map to easily spot the organisation's intangible assets. However, the organisation's substantial and other financial assets also require information capital to identify them. These assets are in the form of finance, human resources and strategic planning. However, new stages of promising efficiency have been added to financial management. This addition was introduced in the majority of organisations through the ERP systems. These transaction level systems assist analytic applications and transformational financial management frameworks. The analytic applications are in the form of activity-based costing and financial analysis while the transformational financial management frameworks are in the shareholder value and value-based management. Transformational applications have programmers which can be used to manage human capital readiness while strategic planning processes depend heavily on the transaction systems that emanate from other procedures. These procedures are incorporated through a data warehouse. An array of analytic applications helps in the improvement of the strategic planning processes. These analytic applications are in the form of activity-based management and forecasting models as well as scenario planning and dynamic simulations.

Another innovation which is proving to be transformational today is the Balanced Scorecard software. This software is actually installed in the new management reporting systems. This in turn makes available strategic programmers for strategic management gatherings. Information capital applications can only work when they are fully backed by sound technological infrastructure distributed across multiple applications. Peter Weill and Marianne Broadbent gave ten classifications that an organisation must manage effectively as shown in Table 5 below.

IT Infrastructure	Physical Infrastructure	Management Infrastructure
	Applications Infrastructure	IT Management
	Communications Management	Architecture and Standards
	Data Management	IT Education IT R&D
	Security and Risk	
	Channel Management	
	Facility Management	

Table 5: Weill and Marianne (1999)

Physical Infrastructure:

- The applications infrastructure is used in the sharing and distribution of information such as e-mail, Internet capability and mobile computing.
- Communications management which comes in the form of broadband networks and intranets etc.
- Data management where the data must be stored and managed in centralized data warehouses.
- Security and risk which handles the data and information security of the organisation through security policies as well as being in charge of disaster planning and firewalls.

- Channel management which calls for such management to be accomplished through Websites and call centres.
- Facility management calls for the management of large-scale mainframes, server farms and LANs.

Management Infrastructures:

IT management is utilized for Information system (IS) planning, service-level agreements and supplier negotiations.

Architecture and standards used in the collection of data, in digital communication and technology etc.

IT education is utilized in the training and education of personnel and the management of the entire system.

IT R&D is categorized as evolving technologies.

Niven said about 60% of the IT expenditure of an organisation goes to technology infrastructure investments (Niven 2011b). However, this big spending does not show any visible results or benefit. The actual benefits are realized from such applications placed above the infrastructures. These benefits come in the nature of loss prevention due to theft, unforeseen disasters and other security breaches. IT executives must be abreast with the way infrastructure investments can help prop up IT applications portfolios, as well as the pros and cons of different infrastructures of IT applications regarding the way they can impose restrictions as well as how they can create opportunities.

5.6 Measure Information Capital Readiness

The most essential procedure in assessing the value of an organisation's information capital is by measuring its strategic information capital applications and infrastructure

readiness. Information capital strategic readiness assesses the degree of organisations preparedness in the utilizations of its information capital to back up its strategies.

One can already consider the range of the measurement procedures of the information capital portfolio. The most basic and frequently used procedure is that of the simple numerical indicator that attempts to define the stages of each application. There are six stages of this scheme which are shown in Figure 18. Stages 1 and 2 can be identified by their green colour and are considered normal and in operation. Stages 3 and 4 are depicted by the colour yellow and identifies new applications which are already funded and with actions in progress. Their capabilities are not yet in existence but they have active programmers intended for filling the gap. Stages 5 and 6, identified with the colour red, identify the problem areas. Here the applications are required for support strategy as no since there are no actions yet taken to develop and deliver those capabilities that the red colour identified.

The most essential procedure in assessing the value of an organisations information capital is by measuring its strategic information capital applications and infrastructure readiness. Information capital strategic readiness assesses the degree of organisations preparedness in the utilizations of its information capital to back up its strategies.

One can already consider the range of the measurement procedures of the information capital portfolio. The most basic and frequently used procedure is that of the simple numerical indicator that attempts to define the stages of each application. According to for (Kaplan and Norton, 2004) there are six stages of this scheme which are shown in Figure 15. Stages 1 and 2 (**between 81-100**) can be identified by their green colour that means a good level and are considered normal in operation with no changes required. Stages 3 and 4 (**between 61-80**) are depicted by the colour yellow and identifies new applications which are already funded and with actions in progress. Their capabilities are not yet in existence but they have active programmers intended for filling the gap. Stages 5 and 6 (**between 0-60**) are identified with the colour red which identify the problem areas. Here the applications are required for support strategy as no since there are no actions yet taken to develop and deliver those capabilities that the red colour identified.

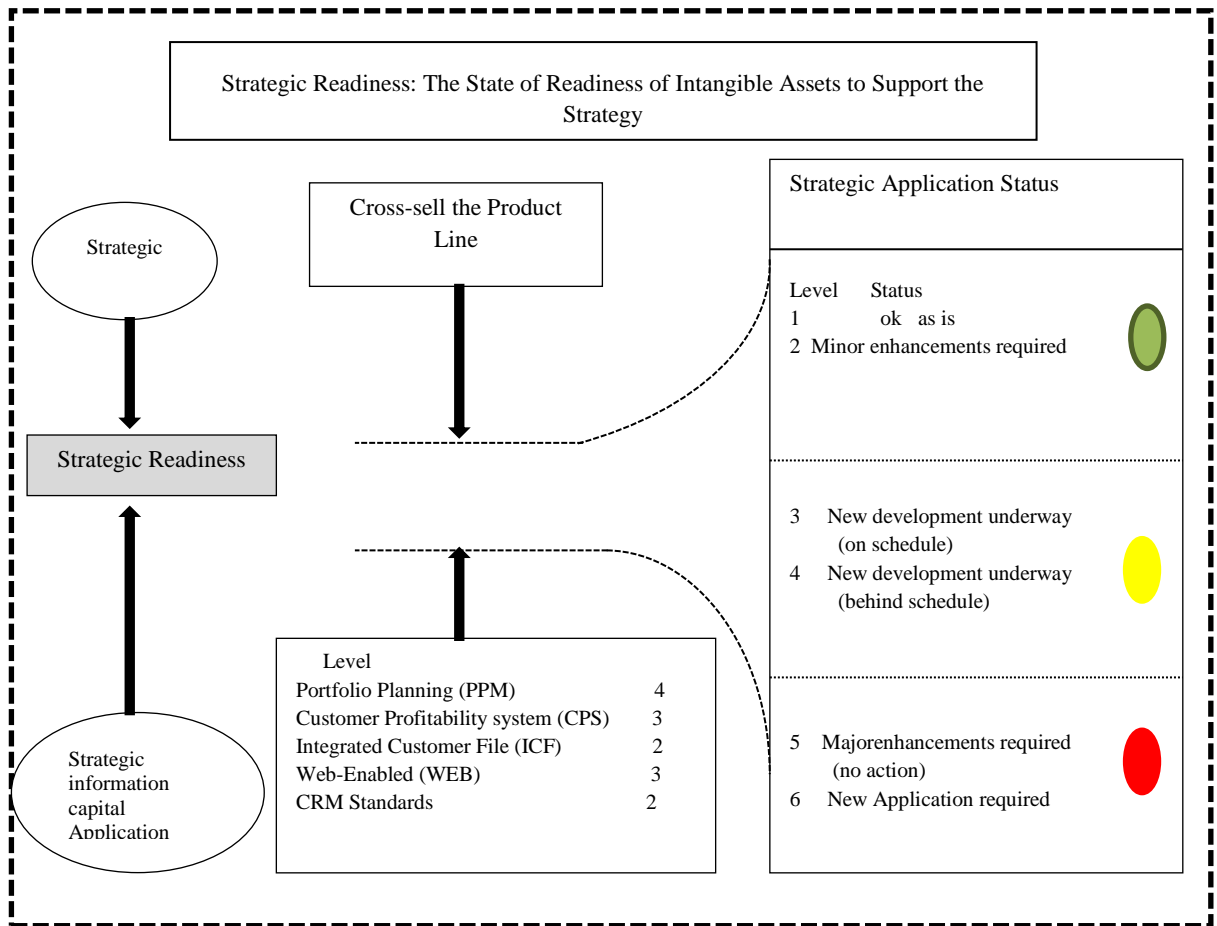


Figure 15: Measure Strategic Readiness (Kaplan and Norton, 2004)

Managers tasked with the duties of overseeing the information capital development programs are responsible for the provision of subjective evaluation of the simple measurement system shown in Figure 15. The Chief Information Officer (CIO) of the organisation must vouch for the correctness of the figures reported. The target of the measurement system is on the development of the procedure to ensure that every effort is exhausted in trying to develop a strategic readiness. Here readiness assesses both individual applications and infrastructure programmers. This is performed at the consumer bank in order to combine them into one component of the portfolio status report. This will enable any manager who reviews such a report to immediately determine, even with just a quick look, the organisation's readiness in terms of information capital and other areas where the organisation should direct more of its

efforts. The report can serve as an excellent mechanism in overseeing the portfolio for programmers of information capital development.

At the other side of the equation, a lot of highly advanced IT organisations utilize objective assessments quite often while evaluating their portfolio applications. Sometime they conduct surveys on the users of their products to help them understand the users' satisfaction regarding each application. They also conduct a financial assessment to find out how much it costs to operate and maintain each application. Some of the organisations even conduct technical audits. These technical audits help them in the examination of the underlying quality code as well as establishing exactly how operable the applications are.

The same goes with documenting the frequency at which each application fails. From the outline, an organisation can develop a strategy with it can utilize in the management of its portfolio containing current information capital assets. This is akin to the management of the portfolio of physical assets such as those involved in automobiles or machineries. Good examples are the streamlining of high level maintenance applications where operating costs can be maximized, and also in scenarios where high level user dissatisfaction applications can be changes. This better and more detailed approach is particularly more effective when used in managing portfolio applications which are currently in operation.

5.7 Theoretical Procedures

The novelty of this research is the procedure followed in this research in order to calculate the priority of each IT application and evaluating it to give the suggested recommendations to increase the level of achieving the strategic goals in Figure 16 will explain novel process.

1- Calculate Objectives Weight to Strategy (OWTS): The senior manager, together with the head of department, are responsible for defining and putting together the basic strategic perspectives of the department such as financial, the customer, learning and growth and internal processes for each perspective. The associated weight must be set as an initial weight for each perspective.

The second step is to define the list of **strategic objectives** within each perspective defined and define the weight for each objective. After this step the Objectives weigh to Strategy (OWTS) can be calculated according to the following flowchart blow in Figure 16:

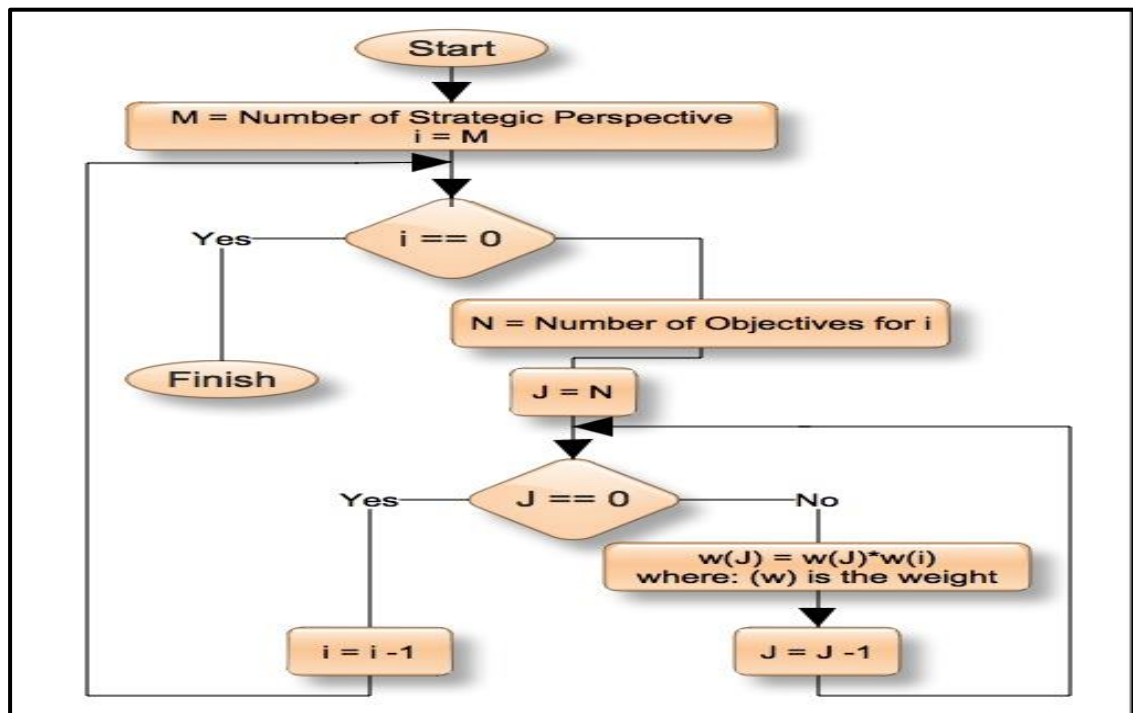


Figure 16: Follow charts calculate (OWTS)

Figure 17 will explain how to calculate job family weights by following this steps:

2- Define IT job family: After calculating the weights for all strategic objectives of the department the head of department will Analyses them and construct the job families.

3- Calculate job family weights: In this step the weights for each job family are calculated by adding the weights calculated in step 1 for each job family defined in step 2.

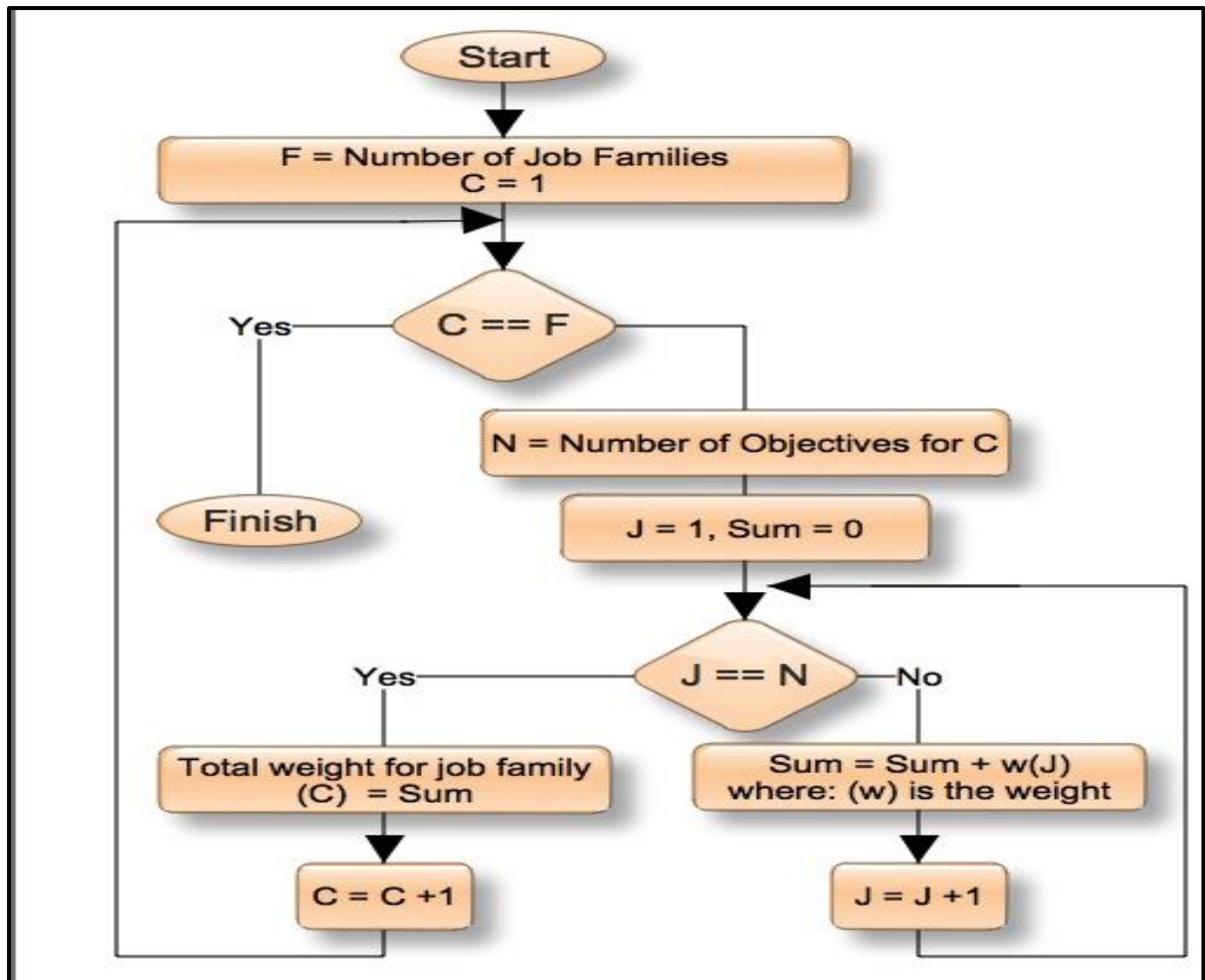


Figure 17: Calculate job family weights

Figure 18 will explain the algorithm used to calculate the application impact by following these steps:

4- List the required applications: For every job family the head of department is responsible for defining a list of the IT applications needed in order to achieve the strategic objectives of this job family and assign weight for each IT application to indicate the percentage of its importance for this particular job family.

5- Calculate the application impact: In this step the application impact is calculated according to the assigned weight for this application and the weight of the job family calculated in step 3 as illustrated in the following code:

```
Application impact = 0;  
FOR X = 1 to Number of Job Families do  
  FOR Y = 1 to IT application do  
    Application impact = Application impact + weight(X) * weight(Y)  
  END  
END
```

Figure 18: Algorithm 1: Calculate application impact

6- Sort the applications: After calculating the application impact for every IT application it is important to sort them in descending order so the most important applications come first then the less important.

Figure 19 will explain the algorithm used to calculate evaluation index by following this steps:

7- Find the evaluation index: Each IT application requires the head of department to determine the application's weight. The researcher will then perform the evaluation according to three basic criteria: (Automation, Training and Usability) with each one having a percentage indicate the weight in the evaluation. For example, let the weight for Automation (a), Training (b) and Usability (c), based on interviews and distributed questionnaires among employees the current values of these percentages will be calculated. The application evaluation index is defined as the following code:

```
AP = Automation Percentage    (a) =Automation weight  
TP = Training Percentage      (b) =Training weight  
UP = Usability Percentage    (c) = Usability weight  
  
    FOR X = 1 to Number of Applications do  
        E_index[X] = AP[X] * (a) + TP[X] * (b) + UP[X] * (c)  
    END  
  
    SUM = 0  
    FOR Y = 1 to Number of Applications do  
        SUM = SUM + E_Index[Y]  
    END  
  
AVG = SUM/Number of Applications
```

Figure 19: Algorithm 2 calculate the evaluation index

8- Define the Actual Application Readiness:

Since the evaluation index calculated in step 7 specifies the current state of this application according to the department employees' opinions and experience, the actual application readiness can be evaluated in Figure 20 by multiplying the evaluation index of the application by its impact value on the strategy which reflects the weight or the importance of the application (Wagner 1982).

$$\mathbf{Application\ Readiness = Application\ Impact * Evaluation\ Index}$$

Figure 21: Equation finds application readiness (Wagner 1982)

In our case not all applications have the same importance or impact so it is better to calculate the weighted mean (Spatz 2007) according to the following formula in Figure 21

$$X = \sum_{i=1}^N W_i * X_i$$

Where W_i is application impact
 X_i is evaluation index

Figure 22: weighted mean formula Equations find application average (Spatz 2007)

9 Analyse and give Suggestions

This is the last and most important step in the research where suggestions are given to enhance the goals and achievements based on the application's importance and the current readiness. The most important thing is trying to increase the application evaluation index and find out the requested percentage in each criteria of the evaluation in order to increase the application evaluation index and the therefore the actual readiness. Detailed explain for steps are shown in case study and the evaluations in Chapter 6.

5.8 Summary

The measurement approaches recommended in this chapter creates a new perspective that should be utilized with the creation and distribution of information capital. There is now a movement away from evaluating information capital performance through the use of costs and reliability towards assessment that anchors on strategic alignment. This is in the form of information capital measurement which aids and adds to the organisation's strategic goals, especially in those detracting areas with discriminating procedures singled out in the internal perspective of the organisation's strategy scheme. Information must be well managed and handled and the assets of an organisation should be well treated. As such its value must be assessed in terms of its contribution in the organisation's strategy in establishing a competitive advantage over others. The portfolio alignment techniques presented in this chapter give a more practical procedure in the alignment of information capital assets which serves as the organisation's strategic goals.

CHAPTER 6

Case Study and Evaluation

- **Learning and Growth Perspective**
- **Jeddah Municipality to Case Study**
- **Implementation of the Readiness Method**
- **Case Study Analysis**

Overview

This chapter describes the methodology used in the case study; the qualitative research method used to implement the strategy map and intangible assets and outlines the alignment between the IT function and an organisation's business strategies. The chapter also looks at the hypothesis research in the case study and how it will successfully integrate IT with an organisation's business strategy.

6.1 Learning and Growth Perspective

The main factor of the research, relates to the employees who deal with the system and applications. It is of paramount importance that the employees understand the strategies which have been approved by senior management so that they can be effectively applied in each section in order for them to be functional and smoothly integrate between the relevant departments. The strategies implemented are designed to be a balance between the goals of the departments and achieve the organisation's vision and to achieve its mission.

The hypothesis research is a measure of the success of the contribution to the basic framework of the Balanced Scorecard, as outlined in the research methodology discussed in Chapter 3. Figure 22 below explains the relationship between information capital, human capital and information and demonstrates how the use of computer applications by employees is directly linked to the success of the organisation.

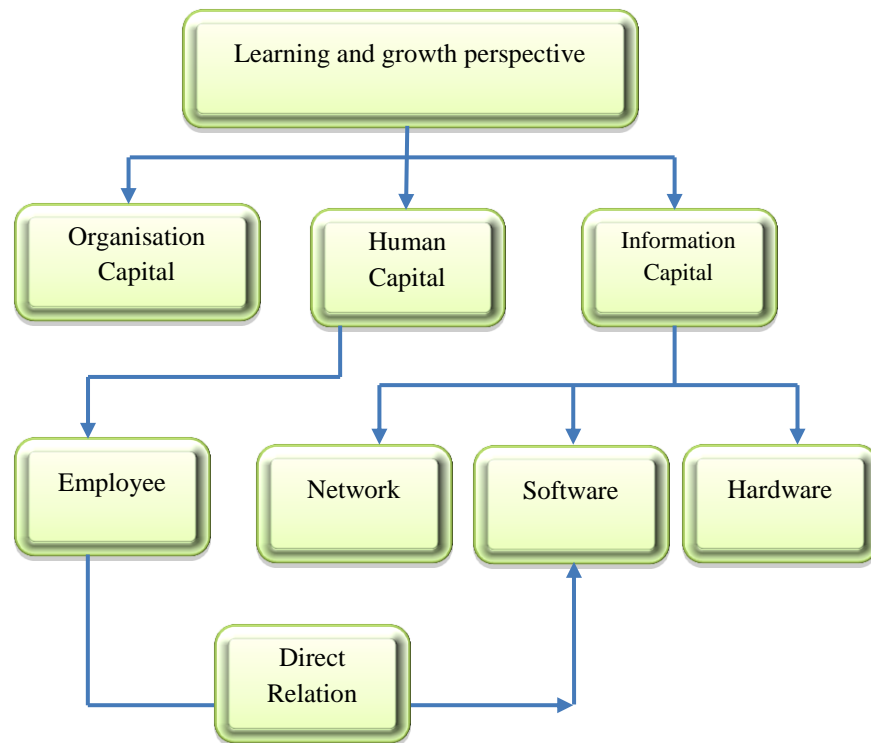


Figure 22: Distribution Learning and growth perspective

It is necessary to make sure that the development of a new measure has a positive effect on organisations business strategies and to show the importance of new applications for the successful implementation of organisations strategies. However, without measuring the organisation's readiness for the implementation of the technical application, the potential success of the strategies and to what degree the new application will affect the outcome of the strategies cannot realistically be known.

This measurement can be applied by the IT manager who fully understands the application's importance and who determines the repair programs necessary to implement the strategies. The IT manager will be responsible for creating the applications required for employees to be able to get their work done to effectively implement the strategies in a timely manner.

The Hypothesis in table 6 will be implemented in the case study later in the chapter.

(H1)	Training and workshops
(H2)	Check updates on new software
(H3)	Employee understanding of the organisation's strategy
(H4)	Employee assessment and stimulation
(H5)	Annual survey work to enhance strategies
(H6)	The use of weights to determine the importance of strategic applications
(H7)	Priority applications

Table 6: Hypothesis Research Plan

The case study's aim is to measure the quality of service that is provided from the IT department with respect to the new application. Employees would be given the opportunity to demonstrate their understanding of the new IT application, the reason why it is being implemented and to see how easy it is to use. It will be the responsibility of the IT staff member to determine which application is the most suitable with the technical systems in place in the organisation.

For this measurement should do something's to get the data that help us to put specific our view and correct for application readiness we use in our case study interview and questioner, will explain below.

6.2 Jeddah Municipality to Case Study

This municipality is located in Jeddah city which is the second largest city in Saudi Arabia after Riyadh, which is the capital city of the Western region. Jeddah municipality is a government institution mandated with the responsibility of developing the city of Jeddah and its surroundings. The municipality involves itself with issues like urban planning, developing the transport sector and especially the roads, lighting services and infrastructure. The municipality is also mandated at beautifying and continuously improving the city in all perspectives.

The main reason why Jeddah was used as a case study is because it was the first municipality to apply a Balanced Scorecard and put in place strategic plans to achieve the goals and objectives they had set. All the departments in Jeddah municipality have a strategic plan. The environmental sector was considered in the study since it concerns itself with protecting Jeddah from pollution as well as degradation. The municipality also harnesses the enthusiasm and the ideas of Jeddah's citizens as well as its leaders (Jeddah Municipality 2014).

6.2.1 Jeddah Strategic Plan to Case Study

Jeddah has a strategic plan that is set for the whole of Jeddah Governorate. The strategic plan gives room for growth and development for a period of not less than 20 years. The plan has objectives and initiatives that will guide decision making in issues such as land-use planning, policy making, infrastructure planning, investment, governance as well as provision of civic facilities.

The plan has now worked for almost ten years. The municipality initiated it in the year 2005. It was developed by quite a number of professionals with the consultation of over 2000 stakeholders. It was not easy to develop the plan. A lot of research was carried which involved a number of background studies and extensive analysis. Best practice examples worldwide were made use of as the most important thing was to explore and develop Jeddah's growth over the next 20 years look at appendix.

The plan will be made use of in quite a number of organisations by a number of individuals. The plan gives the municipality, the community and the private sector a concrete framework for responding to both current and future needs. The long-term approach gives an opportunity for stakeholders to invest with confidence and to take advantage of opportunities to improve the quality of life of all the people living in Jeddah (Jeddah Municipality 2014).

6.2.2 Municipality's governance Framework to Case Study

Jeddah's strategic plan is incorporated in a hierarchy of strategic documents that guides the framework for governance. Figure 26 outlines how the plan fits into the hierarchy which goes from the upper-most strategic level to the fine implementation of the initiative, which will impact greatly on the city and its inhabitants.

The vision that Jeddah has clearly sets the city's destination for its long-term development. It examines how Jeddah can implement initiatives that will be a goal towards achieving the objectives of the city. The vision is divided into several stages:

developing existing assets, cultivating a unique advantage as well as building a solid foundation.

The Balanced Scorecard is the city’s balanced initial performance management tool as well as a measurement tool for Jeddah. The Scorecard constitutes a set of key performance indicators (KPIs). KPIs help to measure progress against the goals set out in the strategic plan and in the vision. It also measures policies, initiatives and rules.

The sectoral surveys in Jeddah gathers together fundamental information that is crucial to understanding Jeddah city. This gives an important resource required for the development of policies and initiatives.

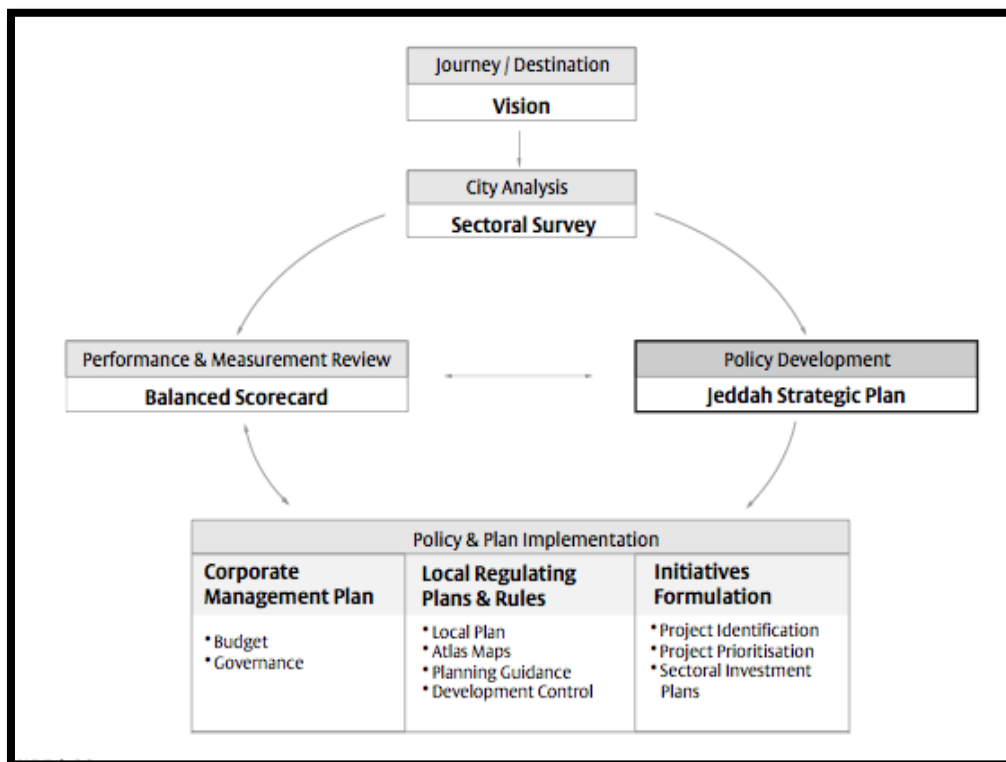


Figure 23: Strategic plan municipality of Jeddah (Jeddah Municipality 2014)

6.2.3 Plan Evaluation to Case Study

The strategic plan gives long-term direction for the municipality. Achieving all that is in the plan may take a long period of time because it is a process and thus may take many years. Jeddah is a dynamic city and thus much is expected to change within that specified time. This can only be achieved if evaluation is continuously done from time to time to determine Jeddah's success. Jeddah municipality is committed to monitoring its objectives regularly.

The Balanced Scorecard is the primary system used to measure and monitor the success of Jeddah in achieving the goals of the strategic plan. The indicators in the Scorecard are articulated with the strategic plan and will give a concrete and a quantitative picture of how the city is progressing. The progress in achieving the strategic goals will also be measured. In every initiative the municipality undertakes, it will develop a plan that will outline a set of expected results. These results must be achieved at the end.

The progress will be measured on a yearly basis. This way the municipality will determine the priority areas when developing the policies, initiatives and programs. The municipality will also be in a better position to review the funding of capital programs. Results obtained from the reviews will be utilized to articulate the objectives, priority budgets and seek further funding. The implementation section contains the municipality's plan for reviewing, reporting and implementing the strategic plan (Jeddah Municipality 2014).

6.3 Implementation of the Readiness Method

This research study will use strategic applications weights to measure an organisation's readiness for the new technical computer applications needed to implement its strategies and achieve its goals. The strategic plans have been developed by the department managers and strategy managers after being approved by the Chief Information Officer (CIO). The technical applications will effectively support the successful delivery of these strategic plans and objectives and enable the organisation to achieve the vision and mission of the organisation by using the scientific research methodology for the Balanced Scorecard. The Scorecard will measure strategies, short and long term objectives with a focus on quality and a style of measurement which claims to help an organisation to achieve to implement any required changes. This is described in detail in the following case study analysis and also detailed in the appendices.

6.4 Case Study Analysis

The case study relates to one particular department of Jeddah municipality which is the cleaning department. The first step required was to analyse the perspectives for strategies and the codes that depend on them. This analysis is of great significance as the known weights are related to the strategic perspective and positioning which have been identified by the heads of departments and the chief executive officer (CEO). This is the first process in the technical analysis, following which was the search for the most appropriate applications to adequately serve the goals of the organisation. If there are targets of the most common application to create its importance, the degree of impact research is the sum for these goals should be 100 % of each perspective.

To carry out an evaluation there are three important things to describe the researcher's contributions in prioritizing an IT application's readiness:

- Application impact on strategy
- Evaluation index
- Application readiness

The methodology used in the case study is the Kaplan and Norton methodology on strategy maps book and improved methodology which combines both qualitative and quantitative analysis and has a proven track record.

The first step was to meet with the strategic managers of the company to discuss, Analyses and digest the organisation’s short and long term strategic plan and to develop an understanding of the mission and vision of the organisation. It was also essential at this stage to establish whether the business strategy and corporate goals had been communicated to all the employees of the organisation to ensure that all departments were working towards the same goal.

At this stage the perspective codes were identified. In all cases, normally either one or two letters were used to represent the perspective code. For example to represent the customer perspective the letter (C) was used; to represent the internal process perspective the letters (IP) were used and for the learning and growth perspective the letters (LG) were used. Finally, for the finance perspective, the letter (F) was used.

Following this the researcher met with the Chief Executive Officer (CEO) of the organisation, the Head of Department of the General Services Agency and the Management of the Cleaning Department (MCD) to identify the perspective for the respective departments. Each department head gave the perspective name and perspective weight which they had allocated to each perspective. This is demonstrated in the table 7 below.

Strategic Perspective				
Perspective code	C	IP	LG	F
Perspective name	Customer	Internal process	Learning and Growth	Finance
Perspective Weigh	45%	25%	10%	20%

Table 7: Strategic Perspective

Table 7 and Figure 24 show us the four perspectives adopting Balanced Scorecard which used municipality of Jeddah this is the first step to start to measure the perspective weight given from the head of department. Here can fund applied the hypothesis (H2).

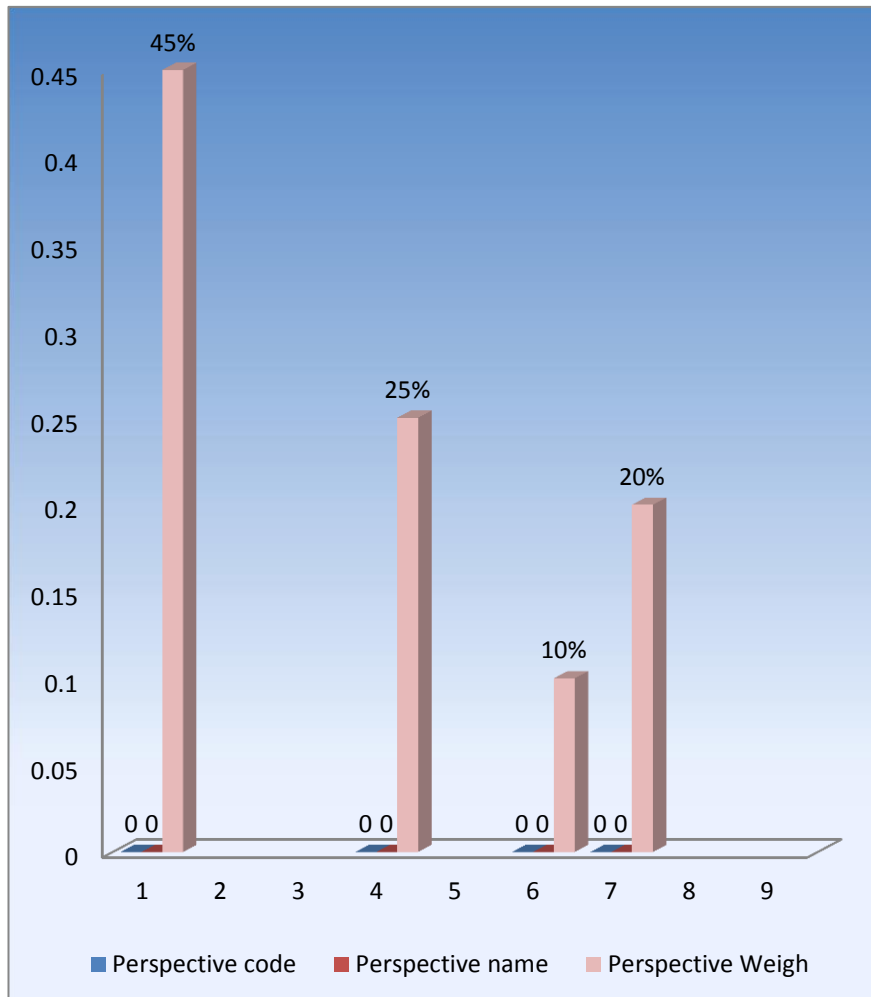


Figure 244: Objectives weigh percentage

This chart clarifies the percentage of each perspective weight for easy determination and analysis of all perspectives.

Table 8 shows the objectives code, objectives for each perspective and the objectives weight to perspective weight to help us find the Objectives Weight to Strategy (OWTS) to move to the strategic job family. The table below show us the objectives weight to perspective weight, it should 100 % in total of each perspective.

Strategic Objectives									
Objectives code	C1	C2	C3	IP1	IP2	LG1, LG2 LG3, LG4 LG5, LG6	F1	F2	F3
Objectives name	Stakeholder satisfaction with the cleanliness	Response speed of the communications	Raise of cleanliness level Jeddah	Implementation programs Effective of hygiene	Activate and control the application of regulations on Irregularities	All HR objective	Development of financial revenue	Collection of financial assets	Development use the assets of Jeddah Municipality
Objectives Weight to Perspective Weight	20%	30%	50%	30%	70%	100%	20%	30%	50%

Table 8: Strategic Objectives

Figure 25 shows the objectives weight percentage of each perspective.

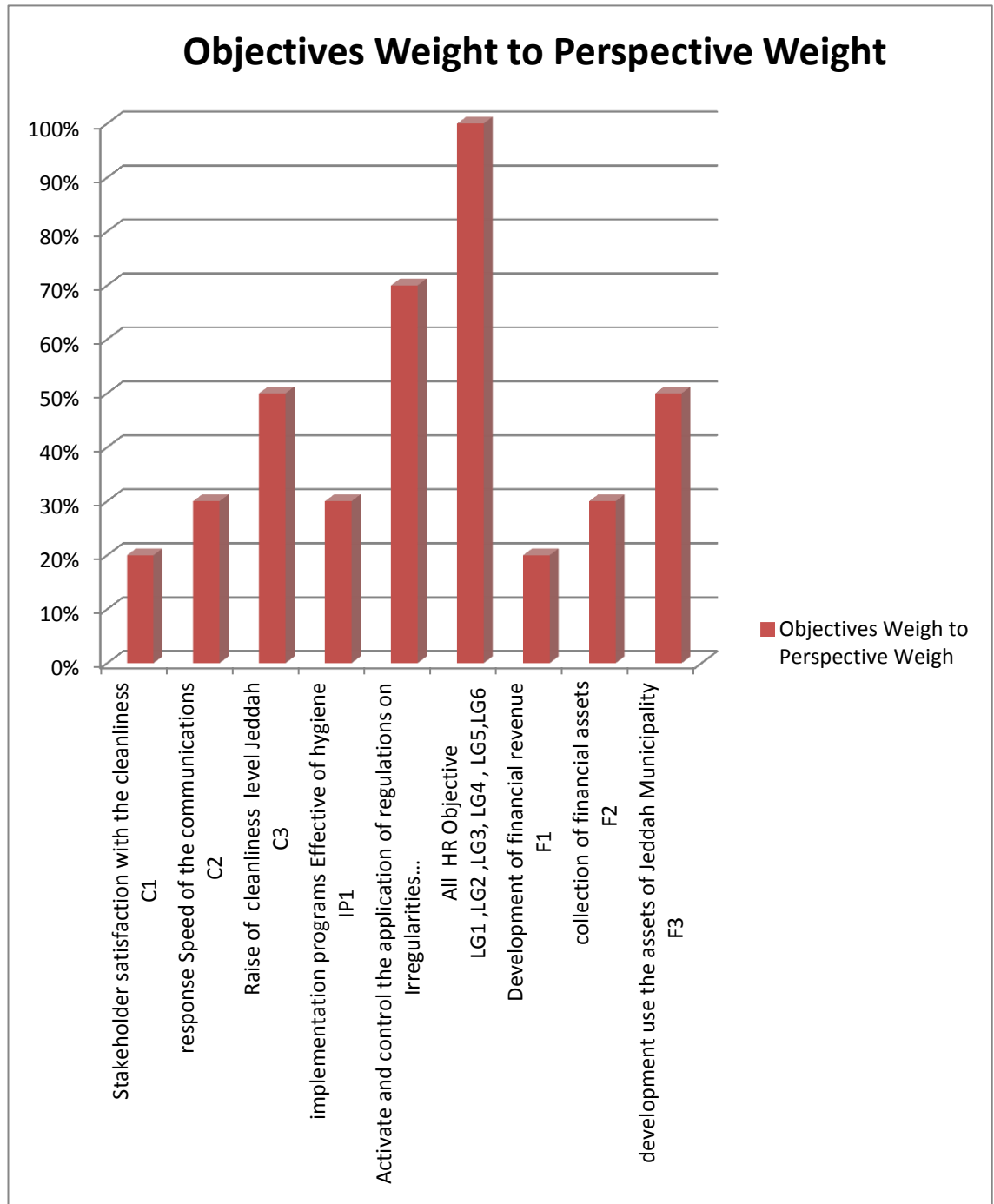


Figure 255: Percentage of each perspective

Table 9 shows the implementation of the matrix in Chapter 5 in Theoretical Procedures to find the Objectives Weight to Strategy (OWTS).

Objectives Weigh to Strategy (OWTS)	9%	14%	23%	8%	18%	10%	4%	6%	10%
-------------------------------------	----	-----	-----	----	-----	-----	----	----	-----

Table 9: Objectives Weight to Strategy

This table shows how to get the Objectives Weight to Strategy (OWTS) and demonstrates the future steps required to effectively implement the applications of the strategy. This table application uses an algorithm and flowchart, as shown in page 99 in Figure 16, and is the result of multiplying the weight of the strategic goal by the weight of the strategic perspective.

In Figure 26 below the chart provides us with the Objectives Weight to Strategy after calculation.

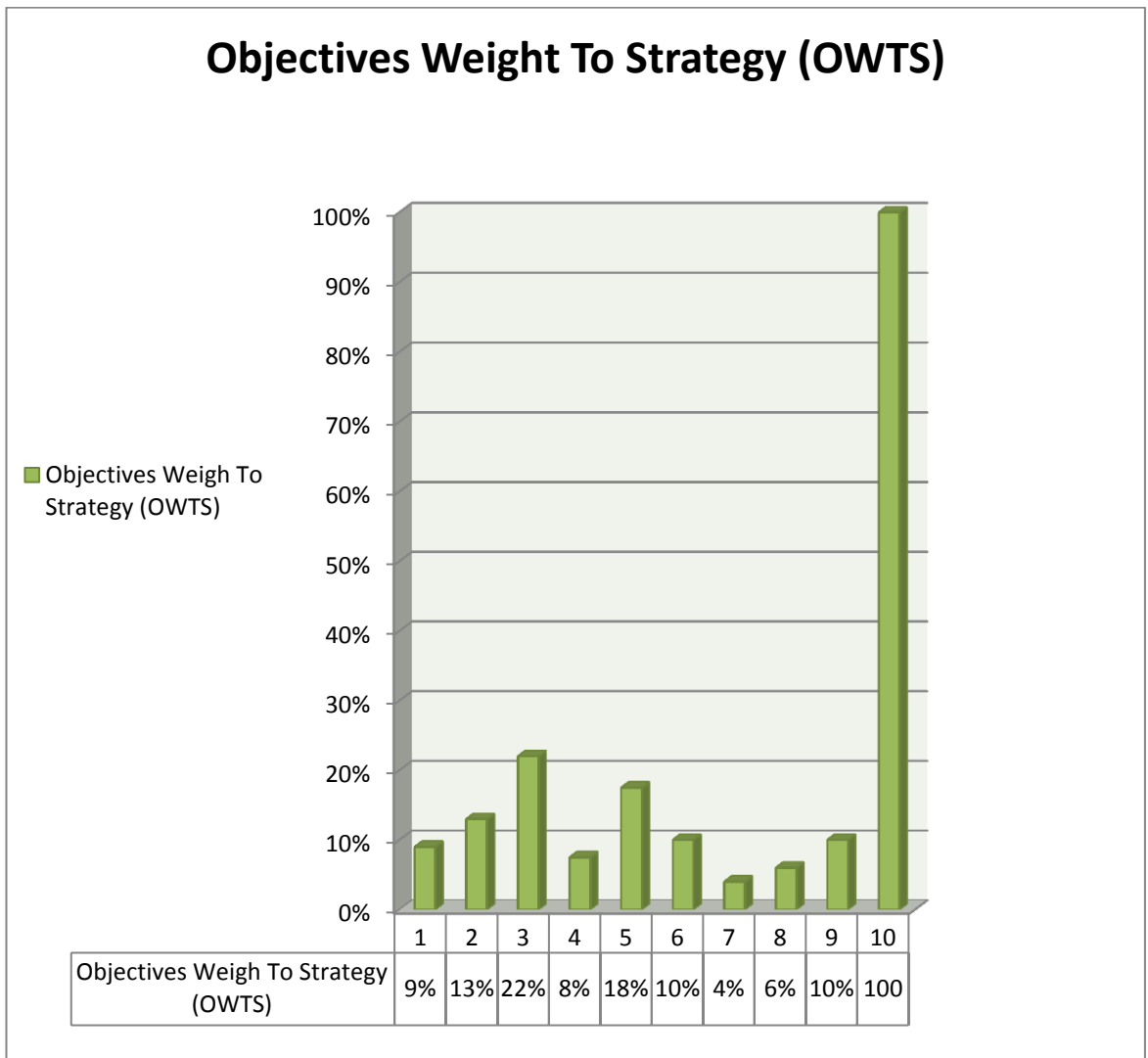


Figure 266: Objectives Weight to Strategy after calculation.

This chart shows the percentage of the weights of the strategic goals that the researcher explains clearly in the previous table and shown in flowchart 16 on page 99.

In this stage can see in table 10 translate strategy to IT Job Family (ITJF) to easy deal with rather than deal with each object, from this point we'll deal with job family that can do analysis for strategic objectives and make classification from this analysis find Job Family Weight which is dependent on the Objectives Weigh to Strategy (OWTS) and should be a total of 100%.In this table the implement the matrix identified in page 100 Figure 17, chapter 5 in the theoretical procedures to find the IT Job Family analysis, should will use the Job Family Weight to find the application impact on strategy.

Objectives code	C1	C2	C3	IP	IP	HR	F1	F2	F3
IT Job Family analysis									
Translate Objectives to IT Job Family	Customer Relationship Management (CRM) System		Monitoring System	Task Management System		HR Management System	Finance Management System		
Job Family Weight	22%		22%	26%		10%	20%		

Table 10: Translate strategy to IT Job Family

In Figure 27, this chart clarifies the percentage of each IT Job Family after calculation and analysis, and shows by an easy way of translating objectives to the IT job family, as explained in the previous Table 10.

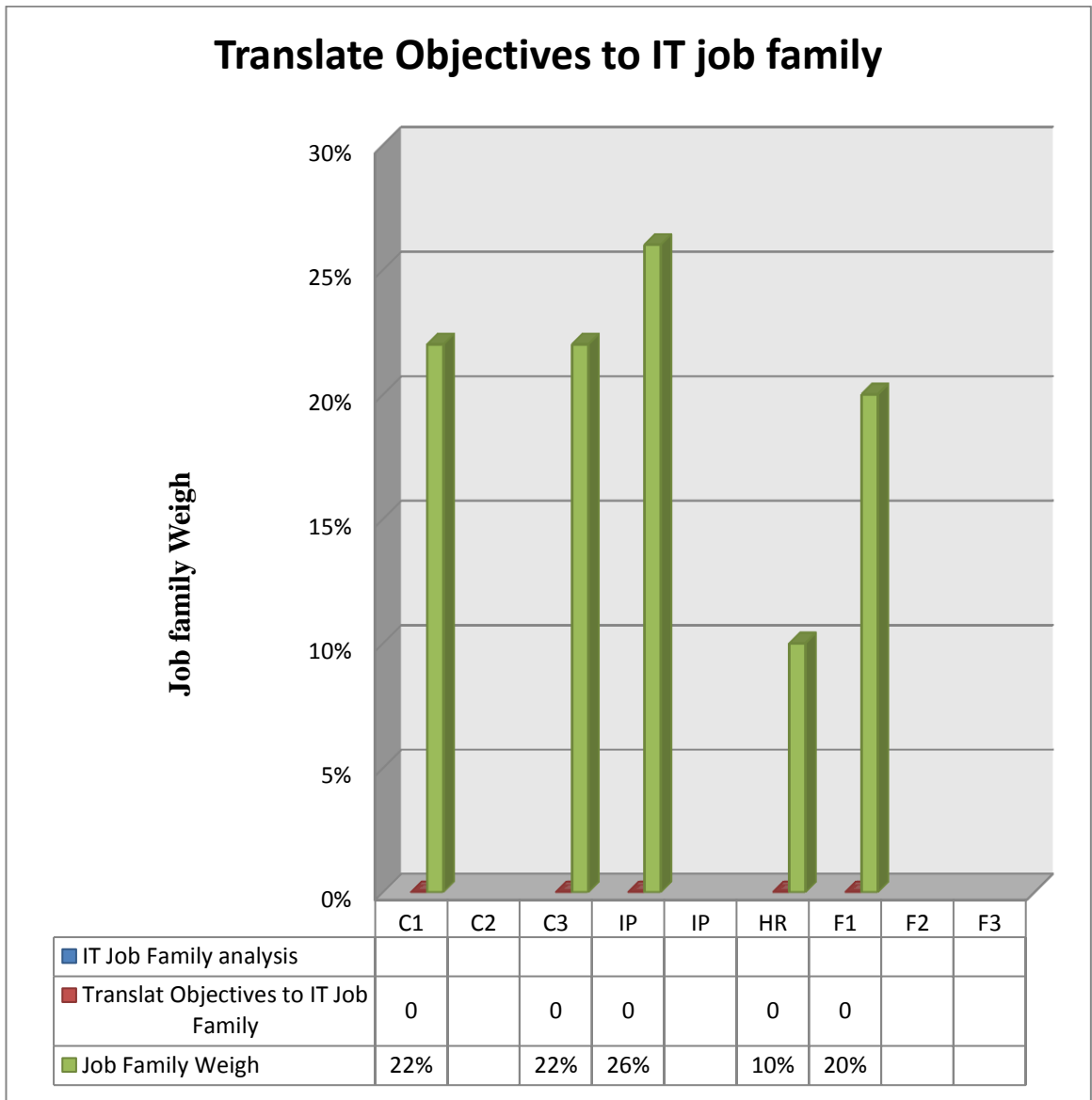


Figure 277: the percentage of each IT Job Family

Table 11 show us the classification of the IT Job Family

Customer Relationship Management (CRM) System	Monitoring System	Task Management System	HR Management System	Finance Management System
E-survey	Field monitoring system BVI 199	Electronic Detection	HR ERP System	Monitoring Finance
Complaints management system	GIS	Task Management	Oracle ERP	Budget Planning
Incidents management system (940)	Tracking Compactors (AVL)	Project Life Cycle		Collection of irregularities
Website				

Table 11: Classification of IT Job Family

After the analysis of all the results, this determined the classification of services which needed to be provided by the General Services Agency / Management of the Cleaning Department (MCD) to take into account the stakeholder satisfaction with cleanliness and response time re speed of internal communications to staff. This then identified the appropriate applications that were needed for each job family, described below.

Customer Relationship Management (CRM) System

The E-survey provided on the Jeddah Municipality site is a public forum for residents, companies, institutions, factories and shops. Individual surveys are available to all and this area of the website also provides a discussion forum. An electronic survey is available which has the aim of identifying the satisfaction levels of stakeholders in several service providers such as cleaning services (cleaning areas of roads, lifting waste and recycling).

The complaints management system provided on Jeddah Municipality site provides an online form where individuals are able to formally complain about any services which are either inadequate or incomplete.

The incidents management system offers a free call service whereby users can dial 940 from any telephone. This service is particularly important as Jeddah Municipality receives emergency communications for customers and the general public, for example waterfall spills, cracking pavements, etc.

Monitoring System

The field monitoring system British Virgin Islands (BVI) 199 is considered as one of the best systems in the world in the field of monitoring cleaning. Jeddah Municipality is looking to become one of the cleanest cities in the world over the next 10 years and for this reason, Jeddah Municipality has purchased this system for monitoring the cleaning of roads, the lifting of waste and recycling.

The Geographic Information Systems (GIS) Centre is one of the key departments of Jeddah Municipality and it provides support and maintenance of the e-government systems and solutions. The GIS Centre is responsible for all geo-spatial projects that belong to Jeddah Municipality. Building a reliable, up-to-date and comprehensive geo-database and delivering e-solutions and geo-services are examples of the main responsibilities of the Centre.

The aim of this website is to present the role of the GIS Centre and give an overview of the resources that are available and the type of solutions and services that are offered. In addition, the website offers Jeddah Explorer which is a window to explore Jeddah maps on the Internet.

Jeddah Municipality has a vehicle tracking system (Automatic Vehicle Location (AVL)) in all its vehicles. This is a special system which enables the company to keep a track of all its vehicles at all times and is built on a geographic information system (GIS).

Task Management System (TMS)

Electronic Detection is a system which identifies any changes which have occurred on the IT systems. In the event of any highlighted mistakes or problems, an appropriate manager will be alerted.

The Task Management System has the job of managing tasks through its life cycle. This involves planning, testing, tracking and scheduled reporting to management by time, date or job.

The Project Life Cycle is the process that all projects follow once they have been identified in the project planning stage. Each Jeddah Municipality project has a step by step process which must be followed and specific guidelines are available to project managers to guide them through the project life cycle.

HR Management System

The Human Resources Department is responsible for all matters relating to personnel from top management to all staff training, vacations, catalysts, etc.

Finance Management System

The Finance Management Department is responsible for all matters relating to monitoring finance, budget planning and collection of irregularities.

In Figure 28 this stage can find the weight of each application which is taken from the cleaning department and must be 100% of each job family. This was used for finding the application impact on the strategy to achieve the strategy by using an algorithm to calculate application's impact, as demonstrated in Figure 18 on Page 101 and identified in chapter 5.

Application weight from IT Job Family

Strategic Job Family	Applications	Application weight
Customer Relationship Management (CRM) System	E-survey	10%
	Complaints management	10%
	Incidents management system (940)	80%
Monitoring System	Field monitoring system BVI 199	50%
	GIS	20%
	Tracking Compactors (AVL)	30%
Task Management System	Electronic Detection	20%
	Task Management	50%
	Project Life Cycle	30%
HR Management System	HR ERB System	100%
Finance Management System	Monitoring Finance	40%
	Budget Planning	40%
	Collection of irregularities	20%

Figure 28: Percentage of each Strategic Job Family

This Figure 29 below shows us chart the percentage of each Strategic Job Family (Customer Relationship, Monitoring System, HR Management System and Finance Management System) in respect of the previous classification of the IT Job Family. As previously demonstrated in Figure 28, this table easily identifies the percentage of each strategic job family.

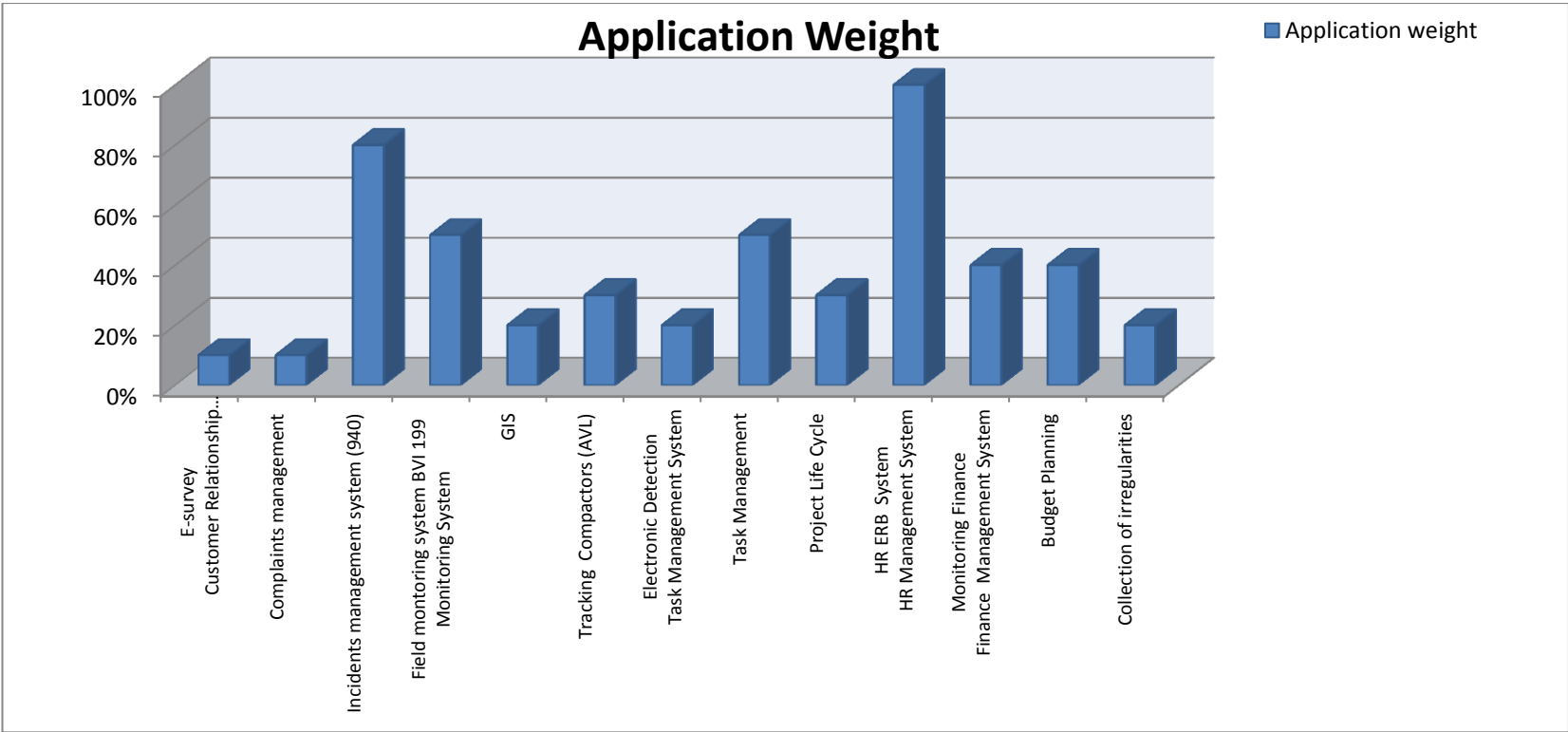


Figure 29: Application Weight

The most important steps are the application's impact on the strategic goals and where the weight of each application can take these strategic weights from the strategic management department.

In this step should apply an equation which is considered one of the most important steps that affects the results of the application's impact on the strategic goals. It could be found that through this equation there are other equations that depend on it. This was used for finding the application impact on the strategy to achieve the strategy by using the matrix and loop (identified in Figure 18, algorithm 1 on page 101 in Chapter 5). This method was not previously used by Kaplan and Norton and is one the researcher's contributions. This will be explained further in the next section which explains equations and implementation.

In table 12 below, this shows the impact of implementing the application on the organisation's strategy, as seen in Figure 8, algorithm 1 on page 101 in Chapter 5.

Job Family Weight	Strategic Job Family	Applications	Application weight	Application impact on Strategy
22%	Customer Relationship Management (CRM) System	E-survey	%10	2%
		Complaints management	%10	2%
		Incidents management system (940)	%80	18%
22%	Monitoring System	Field monitoring system BVI 199	%50	11%
		GIS	%20	5%
		Tracking Compactors (AVL)	%30	7%
26%	Task Management System	Electronic Detection	%20	5%
		Task Management	%50	13%
		Project Life Cycle	30%	8%
10%	HR Management System	HR ERB System	%100	10%
20%	Finance Management System	Monitoring Finance	%40	8%
		Budget Planning	%40	8%
		Collection of irregularities	%20	4%
100%				100%

Table 12: Application impact on strategy

In Figure 30 the chart shows us the percentage of the application impact on strategy which is important to use later in the research, to establish the level of application readiness and the percentage of the application weight and job family weight.

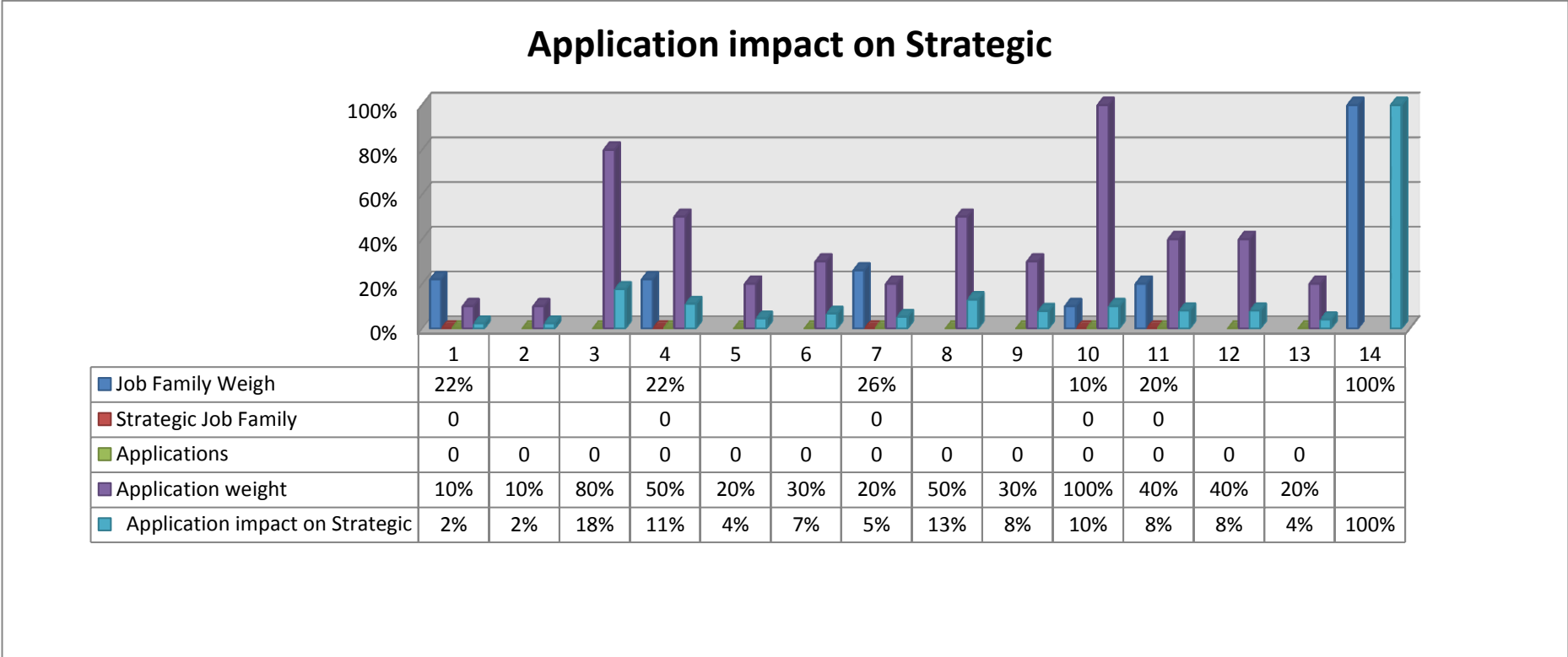


Figure 30 : Application impact on strategy

The organisation has a strategy and either owns or buys a system for the organisation's work, however, they do not have the measurements in place to assess its readiness and preparedness of a new system to take advantage of the organisation's used or required applications. So, in table 13 sort out application impact on strategy by using the algorithm 1 in Figure 18 on Page 101 of Chapter 5, can create a new style to determine the readiness and preparations needed. This also measures the readiness of partner applications to achieve the organisation's strategies; the table below shows the application impact on strategy in descending order of priority.

Table 13 Application impact on strategy in descending order of priority

Applications	Application impact on Strategy
Incidents management system (940)	18%
Task Management	13%
Field monitoring system BVI 199	11%
HR ERB System	10%
Project Life Cycle	8%
Monitoring Finance	8%
Budget Planning	8%
Tracking Compactors (AVL)	7%
Electronic Detection	5%
GIS	5%
Collection of irregularities	4%
E-survey	2%
Complaints management	2%
Total	100%

Table 13: Application impact on strategy in descending order of priority

All the steps have been done before to reach this result of the application impact on strategy and depend on this result. Figure 31 now finds each application's effective percentage on strategy and should be used to find the application readiness and to find the success of hypothesis (H4, H5 and H7). This chart shows us the percentage of each application and the percentage of effectiveness on strategy.

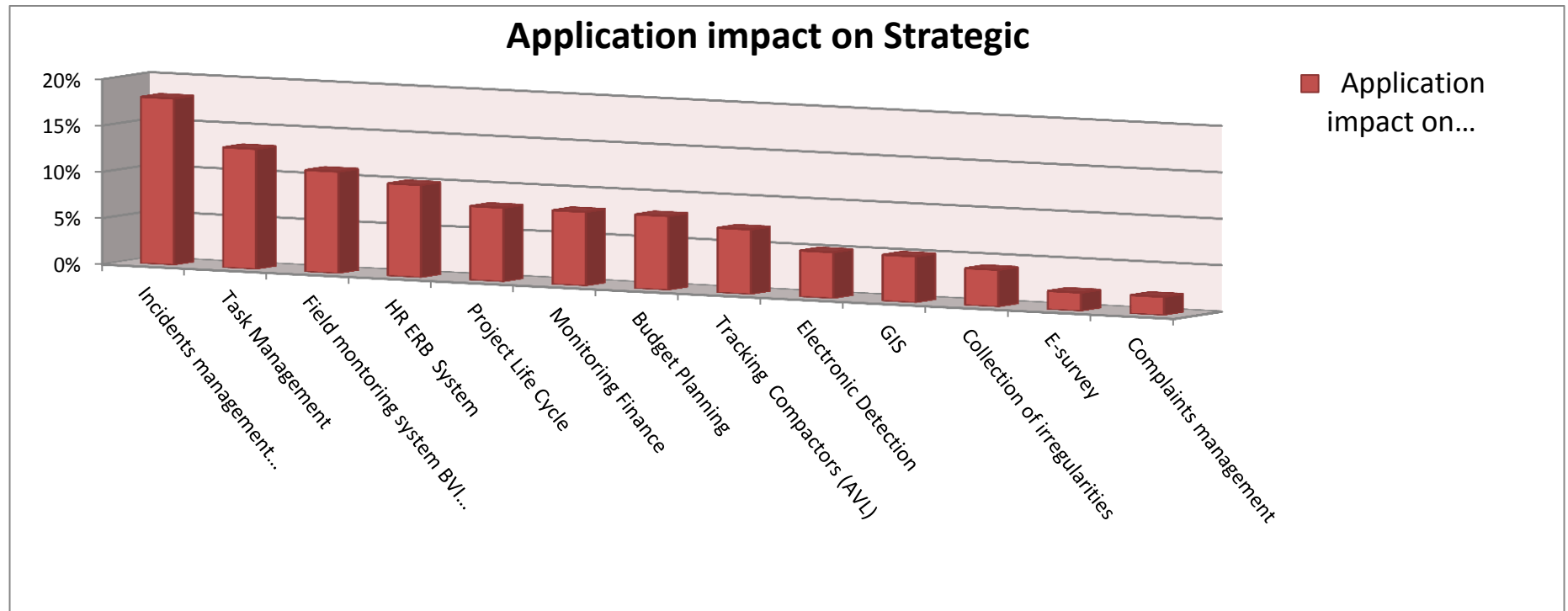


Figure 31: Percentage of application impact on strategy

Kaplan and Norton created an Evolution Index, but they did not specify the importance of applications in the success of implementing the strategy. The researcher used strategic weights to determine the impact of applications on the success of the strategy and additional elements of the new measurement which were not used by Kaplan and Norton (automation, training and usability) were used to create a new created an Evolution Index to contribute to the new measure. This makes it easier managers of information technology to know the degree of the IT application's impact on the success of the strategy. This can be found in the loop and matrix in chapter5 and in the evaluation index. Here we can measure the success of the hypothesis (H, H2, H3, H4, H5 and H6).

Table 14 below shows the three important factors of this research (automation, training and usability) and uses the colours red, yellow and green which were used in strategic maps in Figure 15 on Page 97 of Chapter 5 to determine whether each application works well or not. If the application is in red (0-60), this needs to be repaired or created. Yellow applications (61-80) identify what needs to be changed or requires additional functions to be added and applications in green (81-100) are those which probably work. This analysis helps the IT department to determine weaknesses and flaws in applications where changes are required in order to enable the organisation to achieve its strategic objectives.

Table 14 Evaluation Index:

Evaluation Weight	50%	25%	25%	
Applications	Automation %	Training %	Usability %	Evaluation Index
E-survey	90%	0%	0%	45%
Complaints management	100%	0%	0%	50%
(940) Incident management system	95%	100%	50%	85%
Field monitoring system BVI 199	50%	100%	0%	50%
GIS	60%	0%	0%	30%
Tracking Compactors (AVL)	65%	65%	70%	66%
Electronic Detection	100%	70%	0%	68%
Task Management	0%	0%	0%	0%
Project Life Cycle	45%	75%	65%	58%
HR ERB System	90%	0%	0%	45%
Monitoring Finance	85%	40%	40%	52.5%
Budget Planning	70%	25%	0%	41.3%
Collection of Irregularities	50%	20%	0%	30%
AVERAGE	69%	38%	17%	48%

Table 13: Evaluation Index

The average result of application readiness is 48 % according to the measurement concept in Figure 21 on Pages 104. The average result in the red area is between (0-61) according to Figure 15 on Pages 97 and therefore, the application needs big changes or edits to enable them to be effective. Some of the applications need to be created, as indicated in Table 14 at 0%. The researcher will then recommend a plan to enable the application to achieve the organisation's strategies by adopting the three factors (automation, training and usability).

In Figure 32 the chart provides us with the percentages of the three important factors (automation, training and usability) which will be used to find the application's readiness, determine the application's weaknesses and identify any areas required to be fixed in order for the organisation to effectively achieve its strategic objectives.

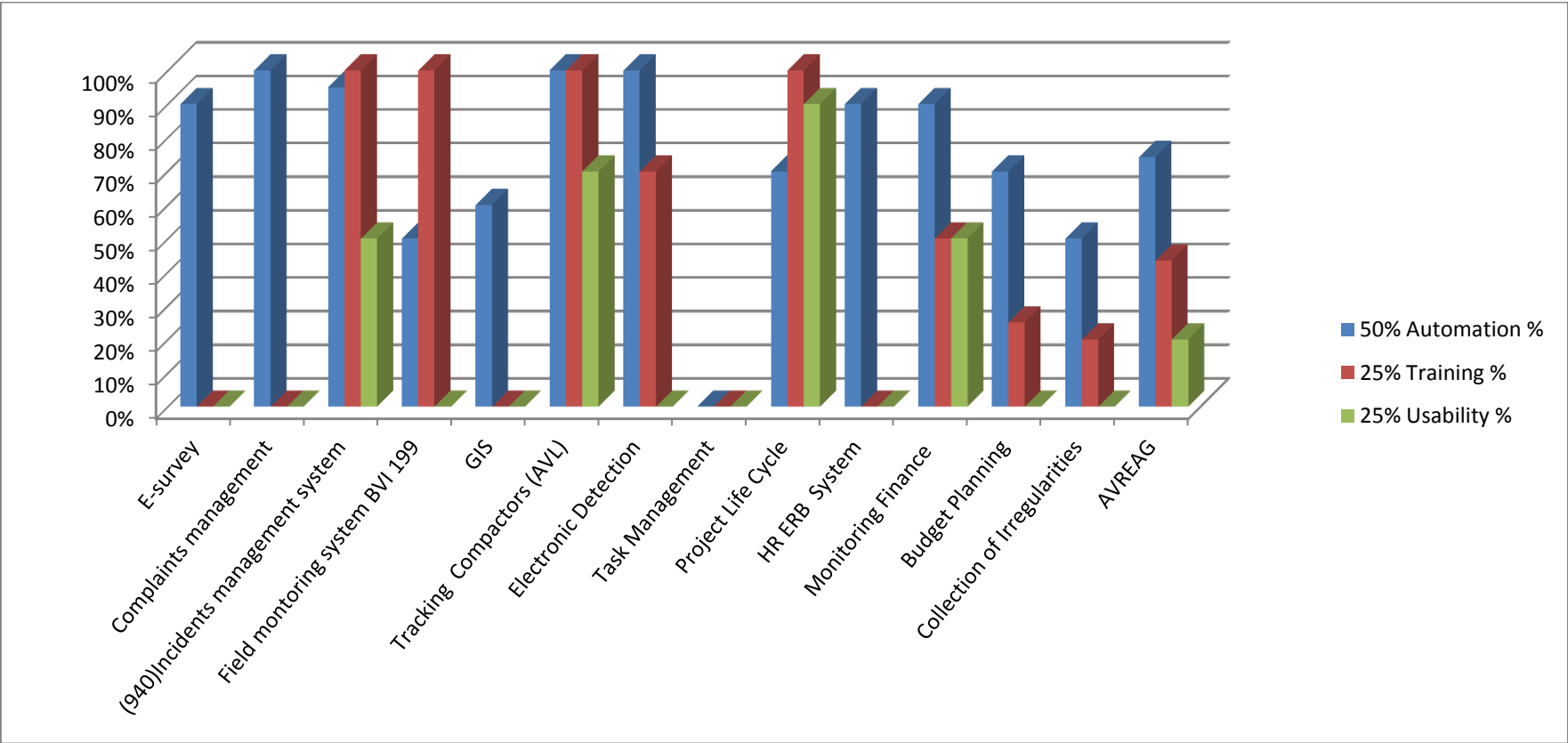


Figure 29: Percentage of the three important factors

Table 15 shows the steps taken to find the application’s readiness, which resulted from the previous Table 14 and the application’s impact on strategy derived from the results obtained from Table 13. This results from the previous steps taken to obtain the measure of an application’s readiness to support the achievement of the strategic goals; here we can find the success of hypothesis (H3, H4 and H5).

Actual Application Readiness

Application Readiness	Application impact on Strategic	Evaluation Index	Application Readiness
E-survey	2%	45%	1.0%
Complaints management	2%	50%	1.1%
Incidents management system (940)	18%	85%	15.3%
Field monitoring system BVI 199	11%	50%	5.6%
GIS	5%	30%	1.4%
Tracking Compactors (AVL)	7%	66%	4.5%
Electronic Detection	5%	68%	3.4%
Task Management	13%	0%	0.0%
Project Life Cycle	8%	58%	4.4%
HR ERB System	10%	45%	4.5%
Monitoring Finance	8%	53%	4.2%
Budget Planning	8%	41%	3.3%
Collection of irregularities	4%	30%	1.2%
Average		48%	50%
Sum	100%		

Table 14: Percentage of Actual Application Readiness

Table 15 shows us the impact some applications have on strategy which has big weight and less evaluation index. From this the researcher can take some suggestion to improve the application's readiness through the three factors (automation, training and usability – as explained in Table17 on Page 141) to positively effect the application to increase its impact on strategy and on the evaluation index to achieve organisation strategies.

The researcher finds some important applications can be edited to create a big impact on the applications and to improve the application's readiness to achieve the organisation's strategies. Here the researcher should look for the causes of the deficit in the tables which are referred to in the coming tables and are trying to modify and change the three variables in Table 14 which are the values of what should be adopted. By measuring this the researcher can give increased staff training, improvement and repair automation software deficiencies or create new ones. the researcher can also improve the usability and functionality. By measuring this again after a period of time the differences in achieving the goals and implementing the strategy can be noted.

In Figure 33 the chart provides the identification of the percentages and the results of the previous table, but here are the best results that can determine the values and categories. The chart provides us with clear percentages of the Application's Actual Readiness to enable it to achieve the organisation's strategic objectives. By establishing this readiness the researcher was able to calculate the percentage contribution to the strategic objectives.

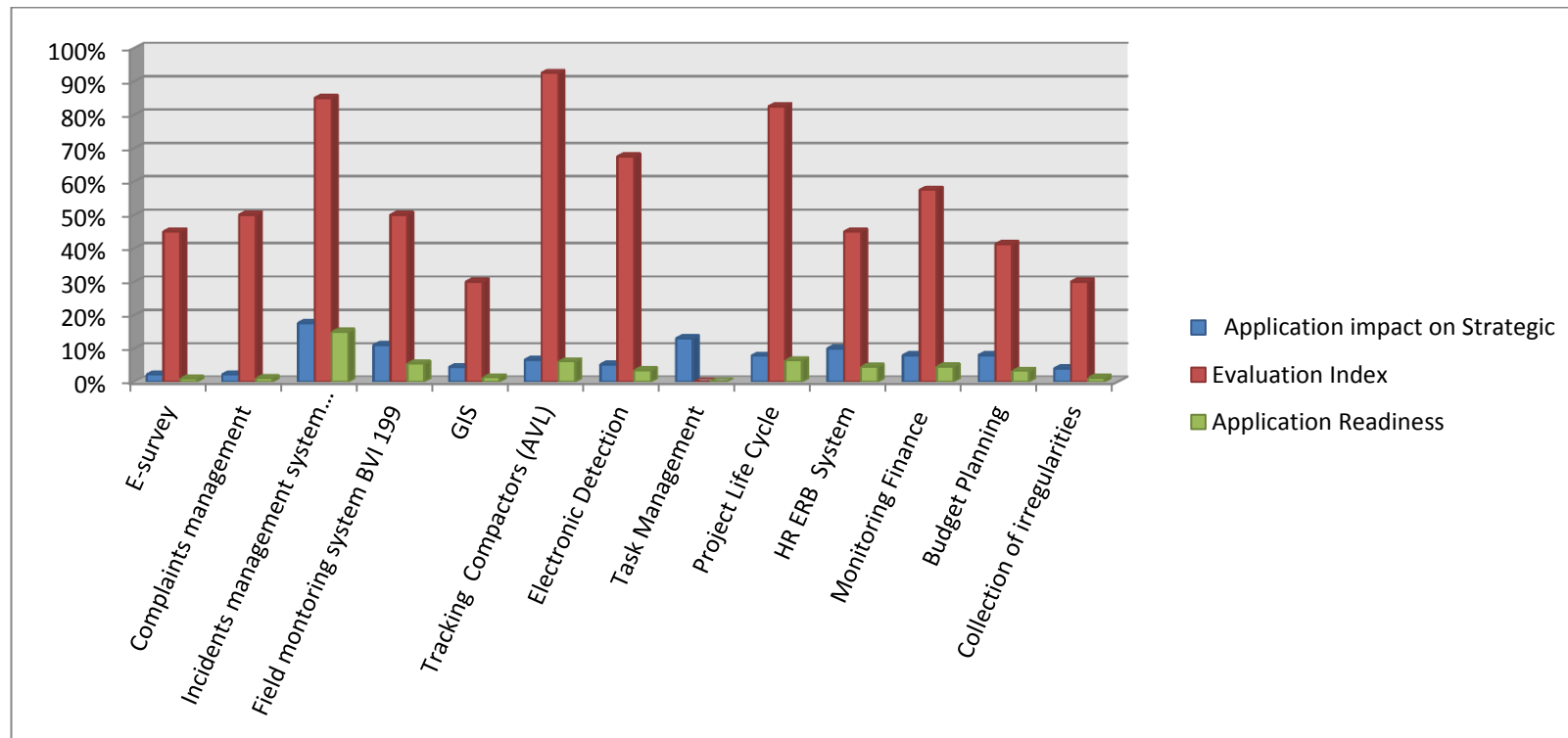


Figure 30: Actual Application Readiness

In Table 16 the researcher has sorted the application impact on strategy in descending order of importance and prioritises the application's required to fix it.

Application impact on Strategic Sorted:

Applications	Application impact on Strategic
Incidents management system (940)	18%
Task Management	13%
Field monitoring system BVI 199	11%
HR ERB System	10%
Project Life Cycle	8%
Monitoring Finance	8%
Budget Planning	8%
Tracking Compactors (AVL)	7%
Electronic Detection	5%
GIS	5%
Collection of irregularities	4%
E-survey	2%
Complaints management	2%

Table 15: Impact on strategy in order of priority

All changes adopting the three factors (automation, training and usability) concentrate on any factor less than 50% improve it to reach 50% or more if assuming any factor under 50% improved to 50% the first stage the evaluation index will 64% that means will the average will be in beginning of yellow area in Table 17 and the result effect on the table 19 to increase application readiness percentage.

Evaluation Weight	50%	25%	25%	
Applications	Automation %	Training %	Usability %	Evaluation Index
E-survey	90%	50%	50%	70%
Complaints management	100%	50%	50%	75%
(940)Incidents management system	95%	100%	50%	85%
Field monitoring system BVI 199	50%	100%	50%	63%
GIS	60%	50%	50%	55%
Tracking Compactors (AVL)	65%	65%	70%	66%
Electronic Detection	100%	70%	50%	80%
Task Management	50%	50%	50%	50%
Project Life Cycle	45%	75%	65%	58%
HR ERB System	90%	50%	50%	70%
Monitoring Finance	85%	50%	50%	55.0%
Budget Planning	70%	50%	50%	60.0%
Collection of Irregularities	50%	50%	50%	50.0%
AVERAGE	73%	62%	53%	64%

Table 16: Suggestion change in three factors

In Table 18, this shows us three colours and put three stages first. The orange color is used where a there was a big impact from the application and the evaluation index is less than 61 so this can be increased in the red to a good area. Unless it is too near to yellow or more than 62, the effect will be changed. The second stage blue colour shows the application has less effect but should also be changed to have an effect on the strategy. The third colour of purple indicates where the application is working fine and having a good effect on the strategy. If all editing has been completed, this represents a good change and the effectiveness level will reach 100%.

Suggestion table :

Application Readiness	Application impact on Strategic	Evaluation Index	Application Readiness
E-survey	2%	45%	1.0%
Complaints management	2%	50%	1.1%
Incidents management system (940)	18%	85%	15.3%
Field monitoring system BVI 199	11%	50%	5.6%
GIS	5%	30%	1.4%
Tracking Compactors (AVL)	7%	66%	4.5%
Electronic Detection	5%	68%	3.4%
Task Management	13%	0%	0.0%
Project Life Cycle	8%	58%	4.4%
HR ERB System	10%	45%	4.5%
Monitoring Finance	8%	53%	4.2%
Budget Planning	8%	41%	3.3%
Collection of irregularities	4%	30%	1.2%
Average		48%	50%
Sum	100%		

Table 17: Suggestion to improve application readiness

In the following Table 18 this shows us if there are any changes applied to the Evaluation Index after can determined the three factors and tied to solve the problems which would affect the application impact on strategy and the Evaluation Index.

The result will have a high effect on the application readiness which means the application will be highly used by employees, thus it is necessary to support them to achieve the strategic goals. Hence, by this result will achieve our research objectives and answer all research questions and approve the researcher's contribution.

The next step is the recommendation after the evaluation of the table and determination of which application needed to be fixed or created to achieve the strategic objectives.

Table 18 shows us the applications using the researcher's suggestions the result that change achieves to strategic objective with best way, by changing some factors in Table 17, this has an effect on Table 19 the average result for application readiness changed to reach 65%.

Table 19 Target

Applications	Application impact on Strategic	Evaluation Index	Application Readiness
E-survey	2%	70%	1.6%
Complaints management	2%	75%	1.7%
Incidents management system (940)	18%	85%	15.3%
Field monitoring system BVI 199	11%	63%	7.0%
GIS	5%	55%	2.5%
Tracking Compactors (AVL)	7%	66%	4.5%
Electronic Detection	5%	80%	4.0%
Task Management	13%	50%	6.3%
Project Life Cycle	8%	58%	4.3%
HR ERB System	10%	70%	7.0%
Monitoring Finance	8%	55%	4.4%
Budget Planning	8%	60%	4.8%
Collection of irregularities	4%	50%	2.0%
Average		64%	65%
Sum	100%		

Table 18: Suggestion Target

6.5 Discussion

The objective of this research study was to develop a strategy map framework and develop a suitable application capable of integrating strategic level business plans with the IT functions of an organisation. The application also needed to have the ability of effectively measuring how successfully the strategic plans had been implemented. Before the application could be implemented, a thorough assessment of the organisations IT readiness to incorporate the new application also had to be undertaken.

The study started with an extensive review of literature in order to fully understand the requirements of the study. Various alignment models and frameworks of business and IT were reviewed. The reviewed literature helped the researcher to understand the different levels of business management and the IT function of an organisation. A number of strategic models were also reviewed in order to gain background knowledge and information pertaining to the Balanced Scorecard framework as this is a commonly used tool with many examples of its successful implementation with good results.

In order for the researcher to effectively carry out this study, an understanding of the definition of a strategic model was required, as well as an understanding of the behaviour of IT systems, their components and the necessary requirements to enable a new IT application to integrate smoothly between all the departments of an organisation . The readiness approach, whereby an organisation is assessed on how equipped it is to adopt the new applications, is an effective way of determining its effectiveness. In the research a case study approach has also been used that supports an empirical investigation to be conducted for observing a real life phenomenon using several sources of information.

The study focussed on the Balanced Scorecard methodology which has the necessary functionality to assess the readiness of the different entities of an organisation which, in this case, was the business strategies, the existing IT systems and the new IT applications.

As a result of extensive literature review and in-depth study of the Balanced Scorecard theory a strategy maps framework was developed. The developed framework proposed enables an organisation to integrate its business strategies with its IT systems and their respective components with best result by using very impressive factors (such as weight of strategies, application readiness and priority). One benefit of the framework is that it is able to measure an organisation's IT application's readiness to incorporate new IT applications. As a result the IT systems of the organisation will be more efficient and effective and thus enable its employees to more effectively fulfil their requirements in terms of working towards the vision and mission of the organisation and implementing its business strategies. This in turn will ensure that revenue is generated and enable the organisation to achieve its strategic objectives.

The framework was evaluated and validated in a public sector organisation and the Balanced Scorecard effectively implemented in respect of the organisation's business strategies and IT functions. The analysis confirmed the IT application's readiness in all departments of the organisation and the data obtained from different measurements exhibited a good validation of the framework.

6.6 Summary

This chapter presents the organisation used as a case study in this research, which is the Jeddah Municipality in Saudi Arabia; this includes a brief history about it, the main reason for choosing it and their experience of using the Balanced Scorecard. Introducing the implementation of the methodology used in this research by using the three factors that researchers adopt to change the application's readiness (automation, training and usability) and implement the equations and algorithm which were used in this case study has been presented with describe for Figures and tables to be understand for the reader. The evaluation plan has been followed in this research with the implementation of the researcher's suggested methods in order to achieve the research objectives and answer all the research questions.

CHAPTER 7

Conclusion and Future Work

- **Summary of Work**
- **Thesis Contributions**
- **Limitations of Study**
- **Future Work**

Overview

This chapter presents the conclusions of the contribution to the research and some recommendations. Section 7.0 discusses the objectives of the research study and the researcher's findings. Section 7.1 summarizes the thesis chapter by chapter; section 7.2 shows the thesis contributions. Section 7.3 discusses the limitations of study and finally, Section, 7.4 concludes with ideas for future work.

7.1 Summary of Work

The researcher presents evidence to demonstrate that it is possible to measure an organisation's IT readiness by calculating the priority of each IT application through the weights assigned to it and other criteria as shown in Chapter 5. The application with higher priority has more effectiveness in achieving the organizations strategic goals.

The researcher begins by introducing the broad area and main focus of this research, the Balanced Scorecard. The thesis starts by presenting the background to the term Balanced Scorecard, its principles, historical information and some other definitions related to it. After this the three generations of the Balanced Scorecard are explored in detail with a breakdown of the changes to the system with each new version. A detailed explanation of Clarify and Translate Vision follows and then the limitations of the Balanced Scorecard are discussed.

The methodology followed during the study provides the research design and research methodology concepts and explains the differences between them. The choice of qualitative methodology gives some information about why this methodology was chosen and also provides an explanation of quantitative and qualitative methodologies and the differences between them. This section also discusses the information

technology readiness approach, the case study approach and finally ends with the hypothesis research.

The thesis continues with an analysis of the proposed strategies which had been designed by the organisation's strategy managers along with an analysis of the strategic planning approach, including the process of measuring strategic performance which, shows the necessary concepts taken into consideration.

Then the implementation process for the Balanced Scorecard system for integrating the organisation's IT functions with its business strategies follows with a discussion of how to communicate the necessity for the Balanced Scorecard to the employees of the organisation. It is necessary for employees to understand how this links with the strategic objectives of an organisation with the aim of delivering the organisation's plans, delivering its targets and aligning its strategic initiatives. Next the researcher looks at how to enhance strategic feedback and finally, outlines the cause and effect relationship with respect to time.

The researcher presents the information capital readiness concept followed by an explanation of the strategy map and its intangible assets. A brief discussion about alignment follows which explains about understanding the alignment between an organisation's IT processes and business strategies. In this section the researcher explains the necessary requirements to measure the IT readiness of the organisation, how to find the applications needed and how to calculate the priority of each IT application by using some algorithms and equations, as well as performing an evaluation of how to define the actual application's readiness by matrix. The procedure includes the calculation of Organisation Weight to Strategy (OWTS), defining the job family weights, the IT application impact, the evaluation index and the actual readiness; finally suggestions are given to enhance the goals and achievements based on the application's importance and the current readiness.

The researcher begins by looking at the most important parts of the process of the Balanced Scorecard, a description of its four elements and a discussion of the learning and growth perspective. A brief outline of the data collection technique follows which discusses the best mode of gathering information, either by using interview techniques

and/or questionnaires. One of the most important research contributions is a case study based on a sample population of one of the government ministries of Saudi Arabia, the Jeddah Municipality. The case study provides some history about the organisation and highlights the main reasons why the researcher chose this organisation. The case study outlines their experiences in using the Balanced Scorecard, follows the implementation of the readiness method and finally conducts a case study analysis with results that proved the success research contribution.

7.2 Thesis Contributions

In directive to focus the main contribution of this thesis, will review the research questions and how solved this questions by given better result by giving the analysis of dilemma presented in the beginning in chapter 1 research questions on this thesis:

Is there a scientific or systematic theory for IT readiness that can be used in discovering an efficient/novel technique of reducing the gap between information technology and business?

This question has been answered in two part of this research first part gives us the information about cause and effect relationship with our Hypothesis Research (H1, H3) to reduce the gap between information technology and strategic management to success achieves the mission and vision this part found in this research chapter 4 section 4.1.

The other part of answer of this question has been answered how will reduce the gap between information technology and business by concept of reduce the gap between information technology and business that is reduce number of the problem and increase the efficient to get better result by alignment between IT and Business Strategies in the research used some theoretical to help us in this such as functional integration to success achieves the mission and vision this part found in this research chapter 5 section 5.4.

From the main question the research question was based on three sub-questions the first sub- question described as:

Is there a relationship between strategic management objectives and IT readiness?

it is important for an organisation to successful in business should following strategic management objectives all organisations today using computerise system to do the work and it should be ready for this work, from this phases that sure there is big relationship between strategic management objectives and IT readiness that means IT operationally and strategically must work in the same direction if any one of them change direction maybe they fail, so for both of them in order it's very important to be positive impact on the strategic together, in this research mentions of the answer in chapter 4 section 4.1 and chapter 5 section 5.1.

The second sub question:

Is balanced scorecard a strategic system?

The answer to this question is not easy but it is not hard to find mention of balanced scorecard 1992 by Robert Kaplan and David Norton , in Chapter 2, Section 2.2 as a tool that can be used in a modern way to measure the performance of companies that give a comprehensive view of the business through time and scale use broad to cover more and more companies and organisation with the improvement to the back through the generations spaced intervals to show improvement on performance measurement and the evolution of the Balanced Scorecard , this led to the development of hypotheses and theories of the balanced Scorecard considered through three generations of the best produced by 20th century laws measurement strategies that have transformed this from tool to measure the performance of a strategic planning system to measure performance and follow-up periods on strategic short and long, in chapter 4 section 4.6 will find the answer as well as in the case study implementation of the relation.

The third sub question:

Is the linkage between information technology and business effective?

Dealing builds relationships that must have mutual benefits from the presence of influence that connects these relationships, so the use of business information technology makes a very strong presence of the two makes the impact of each one on the other.

The alignment between business and IT is very important and effective on the linkage between business and IT; most businesses fail the reason for lack of alignment business and information technology in the right way in this research found the answer to Implementing the Balanced Scorecard (BSC) System, chapter 4 section 4.7.

The novelty of this research is the procedure to solve many problems facing the user using IT applications:

Critically analyse the application of BSC to find an IT application's readiness to achieve strategic objectives.

One of very important things in application strategy that objective weighs, that using strategic weighs on each application to determined application readiness, the senior manager together with the head of department are responsible for defining the basic strategic perspectives after do critical analysis of the application and calculate objectives weigh to strategy the research should be success in this analysis that lead to success as well in first point research objectives with implementation of the algorithm in Figure 16, Chapter 5.

Identify the factors that lead to the success or failure of the implementation of the strategy (strategic impact).

This stage can't get strategic impact until distribute the objectives to IT job family and find the weighs for each job family after that using IT job family in this research can get IT job family and calculate job family weights in chapter 5 Figure 17 after that using IT job family to get strategic impact that no one used strategic impact before to evaluate application readiness to find application priorities this lead to success as well in second point research objectives with implement algorithm chapter 5 Figure 18.

Determine strategic weights Influence the success of strategic plans of BSC factors.

In this point should be find strategic weights and used to determine the a new factors that used in this research this factors no one used it before to measurement intangible assets (Automation, Training, Usability) adopting Kaplan and Norton maps method in this assets using the using the colour red, yellow and green that used in strategic maps in chapter 5 Figure 15 to determined which application is work good, which application needs to repair or simple additions and which application needs to repair or big (hard) additions to achieves the strategic objectives, this step to determined application readiness and priorities application that lead to success as well in third point research objectives with implement algorithm chapter 5 Figure 16, 17 and Figure19.

By these novelties this research success to answer for research questions and achieves research contribution and research objectives.

Exposure of information relating different approaches from diverse areas is must be doing. This research could be the first to empirically investigate compatibility in Saudi public organisations.

It is assumed that the proposed model will convey an inclusive approach to the thriving Balanced Scorecard project. The model will be very important to many organisations since it gives an opportunity for Balanced Scorecard implementation plans. It is also assumed that by analysing and prioritizing IT readiness to achieving the strategic goals, the research has been in the forefront of effectively achieving this aim.

This research success to measure not easy can measure (intangible) it with find new measurement application readiness to achieves strategic objectives and gives the organisations recommendations to reach to mission and vision.

7.3 Limitations of Study

This study can make a positive contribution to the development of strategic management systems in KSA; as in any research, this study is also subject to certain limitation that must be recognized and that could also suggest areas of further research. However, every care was taken in structuring this research so that these limitations would not significantly affect contributions.

First, the time frame was one of the main constraints. Given the limited time frame, a complete investigation of the phenomena under consideration, especially with case studies, could not be undertaken. Though all possible efforts were made to interview as many people as possible in the organisation the lack of time was seen as the main inhibitor to this. With more time given for the investigation, a greater amount of richer data could have been obtained.

7.4 Future Work

There are many ways to further refine and extend the work presented in this thesis. This thesis presents a framework to measure an organisation's IT applications' readiness to implement new systems designed to reduce the gap between its strategies and IT in an integrated fashion. In order for an IT application to be deemed as 'ready', it is necessary that the following three factors, namely: automation, training and usability) with their respective components to be in place. The framework has been evaluated in one department and as such it can be generalized that it could also be successfully implemented in other departments and it will still give the desired result of measurements with the three factors which were used in the measures of this study. In the future the framework can be validated in a large body of an organisation and in other different types of organisation. Since the use of IT and IT application is a continuous and evolving process in any organisation which uses IT to help to achieve its strategic

objectives, the level of the organisation's readiness between both the entities is different. Researchers agree that the gap cannot be removed completely since both the entities evolve at different rates.

In the future a theoretical framework could be designed to assess and determine the level of an organisation IT application's readiness for each separate entity to enable the organisation alignment between its strategies and IT functions to be assessed and controlled much more efficiently and effectively.

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Appendix: A

I am a PhD research student at De Montfort University, School of Technology, Department of Software Technology Research Laboratory (STRL). My research has tried to find a new measure to assess the role of Information Technology applications within an organisation and also to answer the question 'Is Information Technology a partner to achieve strategic goals?'

My research needs to get more information. Your participation is voluntary and no personal information about will be given to anyone and will only be used for the purposes of this research. I guarantee this information will be discarded after the search results have been obtained. I have some questions here, but rely on interviews to obtain more in-depth more explanations with a clear view.

The interview will only take 10-15 minutes of your time, thank you for your participation.

Manger and Head of Department Questions:

N	Questions	Yes	No
1	Does the department have a strategic plan?		
2	Do you develop the strategic plan for the department?		
3	Is the strategic plan 100% effective?		
4	Do you need always technical support?		
5	Do you need more employees to achieve the strategic goals?		
6	Do you share strategic goals with other departments?		
7	Are there problems in the applications which mean you can't achieve strategic goals?		
8	Do you put weights on IT applications?		
9	Can you now give me a specific number ratio of technical support department to you?		
10	Do you use computer applications in 100% of your work?		

Employee questions:

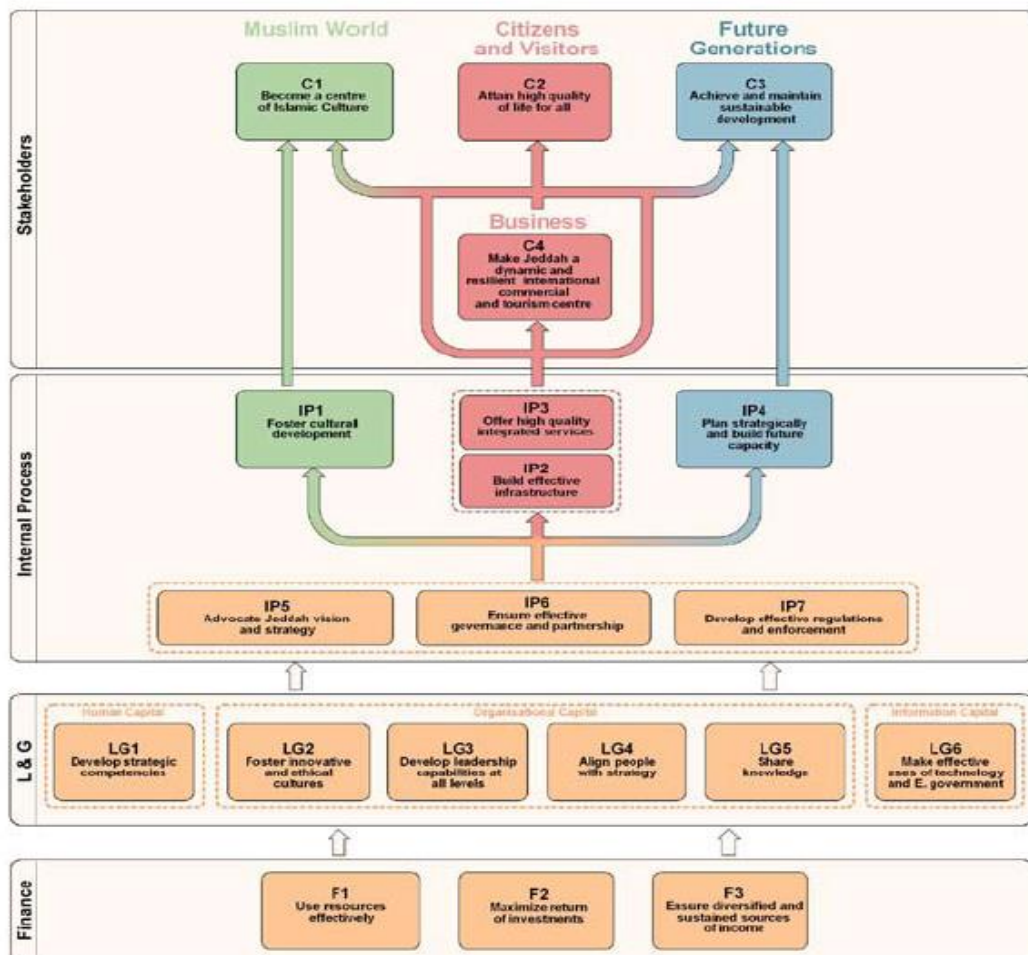
N	Questions	Yes	No
1	Do you have plans strategies?		
2	Do you have a short period of strategic plans?		
3	Do you have plans for strategic, long period?		
4	Do you have an annual rate required for the implementation of strategic plans?		
5	Number of Employees enough to take actions strategy?		
6	What is the degree of achievement of the strategy? Can you give me a specific number?		
7	Do employees have the strategies to achieve?		
8	Do you assess the employees' rate of verifying the strategy?		
9	Can you execute strategies and goals without access to computer applications?		
10	Is the computer system you have integrated?		
11	Do you have problems with the Department of Information Technology?		
12	Do you need to train staff on an ongoing basis to accommodate the system and does this work efficiently to achieve the strategic goals?		
13	What do you think is the reason for the lack of success of the strategy element – is this your applications?		
14	Is there a common application with other sections which is incomplete?		
15	Is the IT department required to contribute to achieving the strategy?		

Appendix: B

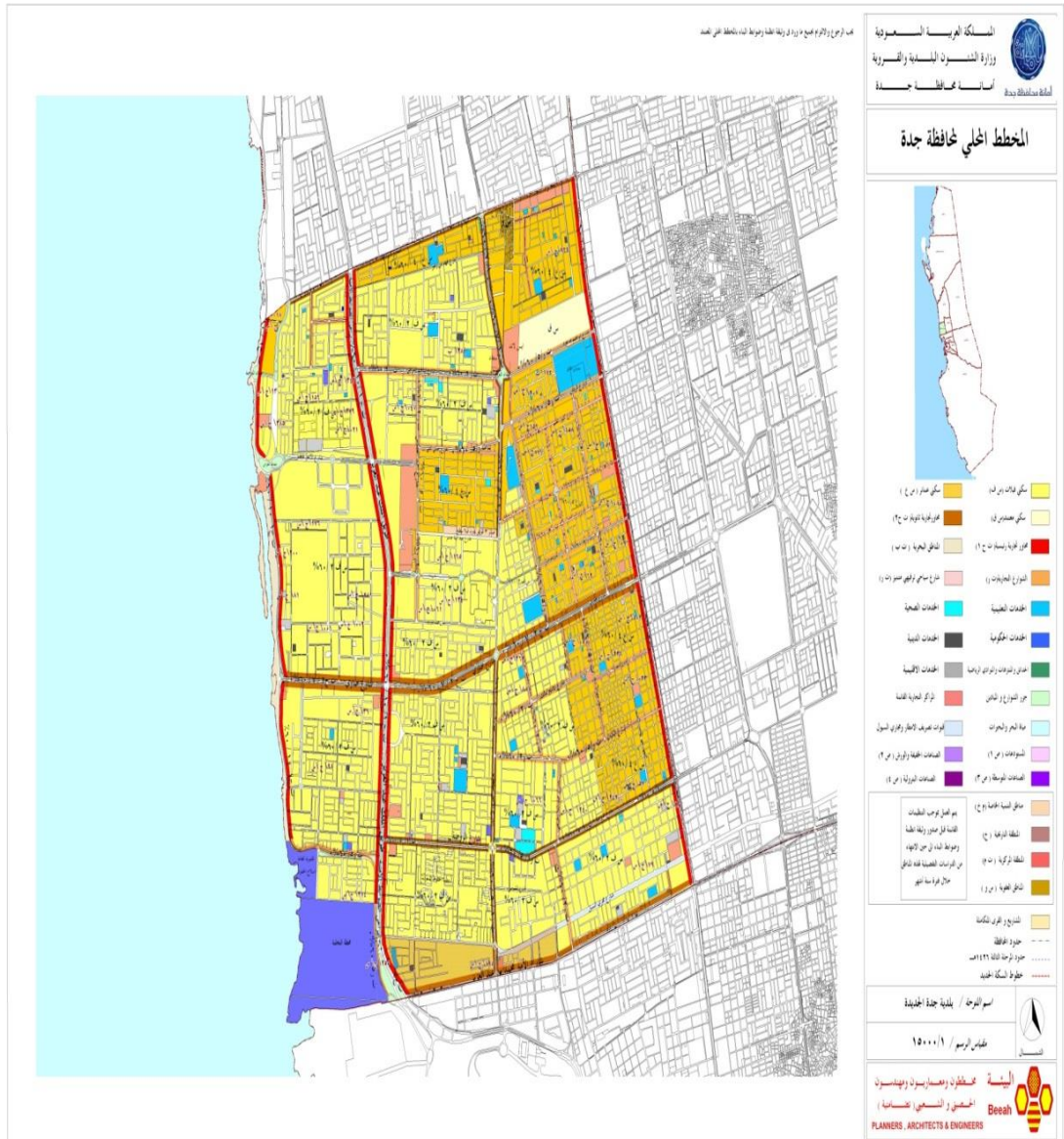
This is Jeddah strategy map for long tram expected 2028 A.D

For Saudi Arabia using Islamic calendar expected 1450 A.H

Jeddah 1450 Strategy Map



This is the Jeddah map for cleaning areas which is divided into many parts so as to easily measure the percentage of clean areas.



Screen shot 1

Measurement screen used for cleaning parts of Jeddah city by employees in order to help them to finish the job.

الإسم	الوزن	القيمة الحالية	إنتذار	مستهدف	بطاقة أداء
كثافة البعوض البالغ الناقل لمرض حمى الضنك		106	90	0	بطاقة أداء مكافحة مرض حمى الضنك
بلدية ذهران - كثافة البعوض البالغ الناقل لمرض حمى الضنك	%100	9	90	0	
بلدية أبحو - كثافة البعوض البالغ الناقل لمرض حمى الضنك	%100	14	90	0	
بلدية المطار - كثافة البعوض البالغ الناقل لمرض حمى الضنك	%100	3	90	0	
بلدية نول - كثافة البعوض البالغ الناقل لمرض حمى الضنك	%100	0	90	0	
بلدية خزام - كثافة البعوض البالغ الناقل لمرض حمى الضنك	%100	7	90	0	
بلدية أم السلم - كثافة البعوض البالغ الناقل لمرض حمى الضنك	%100	2	90	0	
بلدية البلد - كثافة البعوض البالغ الناقل لمرض حمى الضنك	%100	30	90	0	
بلدية عسفان - كثافة البعوض البالغ الناقل لمرض حمى الضنك	%100	0	90	0	
بلدية الجامعة - كثافة البعوض البالغ الناقل لمرض حمى الضنك	%100	3	90	0	
بلدية الجنوب - كثافة البعوض البالغ الناقل لمرض حمى الضنك	%100	5	90	0	
بلدية الشرفية - كثافة البعوض البالغ الناقل لمرض حمى الضنك	%100	17	90	0	
بلدية العزيزية - كثافة البعوض البالغ الناقل لمرض حمى الضنك	%100	2	90	0	
بلدية تریمان - كثافة البعوض البالغ الناقل لمرض حمى الضنك	%100	23	90	0	
بلدية جدة الجديدة - كثافة البعوض البالغ الناقل لمرض حمى الضنك	%100	1	90	0	

Screen shot 2

Appendix: C

Dashboard for some measures to be easily identified against each measure of the strategy level.



Screen shot 3

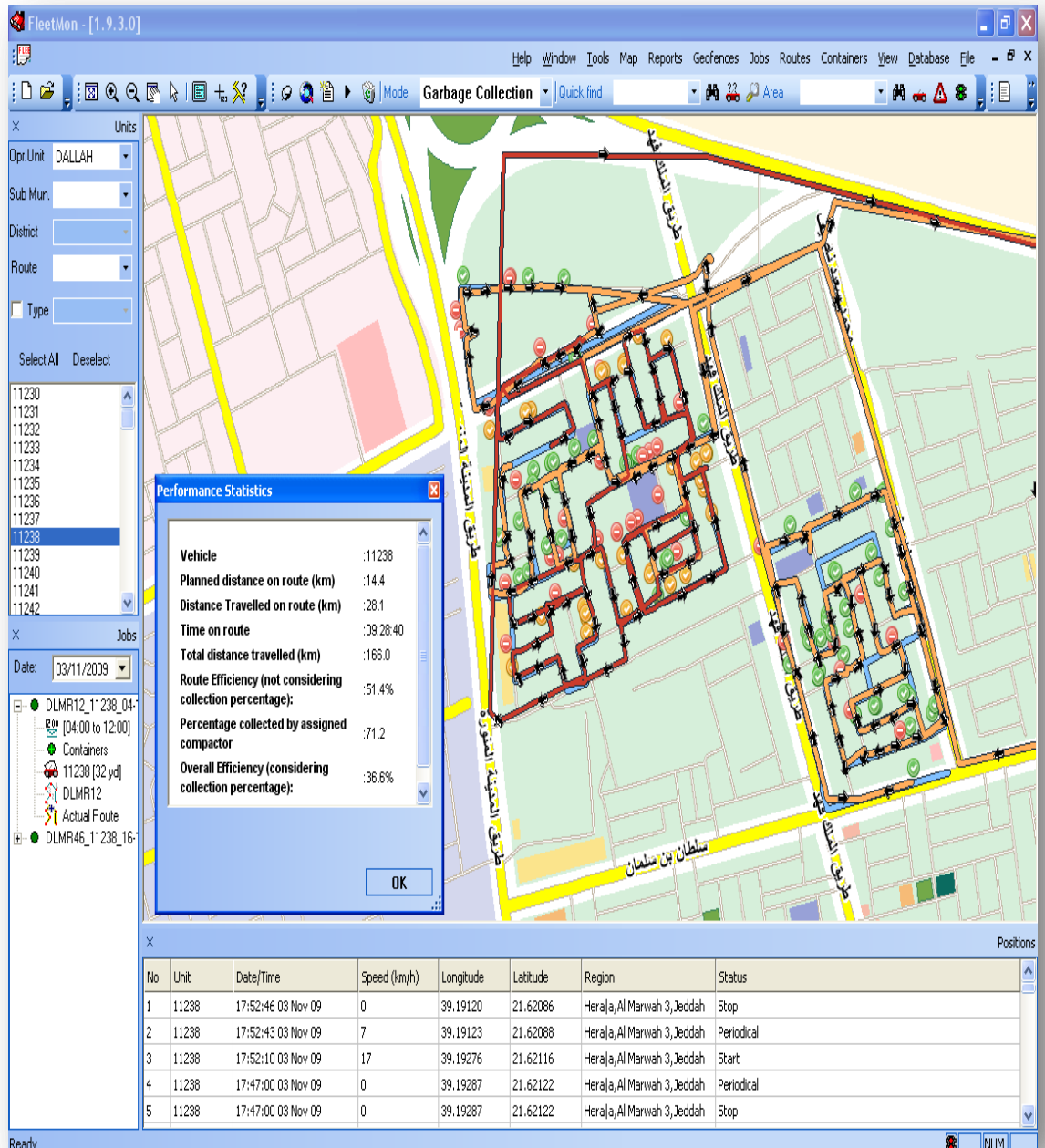
Tracking system (AVL) to follow the cleaning car to monitor and asses that the job is being carried out correctly.

The screenshot displays the FleetMon software interface. The main window shows a map with a yellow highlighted area representing a sweeping route. The interface includes a menu bar (File, Database, View, Containers, Routes, Jobs, Geofences, Reports, Map, Tools, Window, Help), a toolbar with various icons, and a sidebar with filters for Units, Jobs, and Positions. The Units sidebar shows filters for Dpr. Unit (DALLAH), Sub Mun., District, Route, and Type (Sweeper). The Jobs sidebar shows a date filter for 15/10/2009 and a job entry for DLMR01 [15/10/2009] with a time range of 03:00 - 06:30 and unit 22240. The Positions table at the bottom provides real-time data for the unit.

No	Unit	Date/Time	Speed (km/h)	Longitude	Latitude	Region	Status
1	22240	11:09:24 04 Nov 09	54	39.26141	21.60841	Al Ajwad 2, Jeddah	Periodical

Screen shot 4

Tracking system (AVL) tracking many car in one time to make more control and job time.



Screen shot 5

This application is the tracking system to determine any missing or problem events for ant clean car and monitoring.

Reports

أمانة محافظة جدة

تقرير تفصيل المحطات الانتقالية

تاريخ و وقت إصدار التقرير : ١٤٠٢ ٢٠٠٩/١/٠٤

مدى الوقت/التاريخ : ٢٣:٥٩ ٢٠٠٩/١/٠٤ - ٠٤:٠٠ ٢٠٠٩/١/٠٤

الرقم	رقم المركبة	دخول	خروج	المدّة
الصناعية				
1	11239	11/4/2009 10:29:53 AM	11/4/2009 10:47:39 AM	00:17:46
2	11426	11/4/2009 9:56:12 AM	11/4/2009 10:19:32 AM	00:23:20
3	11430	11/4/2009 8:17:09 AM	11/4/2009 8:37:43 AM	00:20:34
4	11431	11/4/2009 9:08:35 AM	-	-
5	11437	11/4/2009 7:23:19 AM	11/4/2009 7:46:53 AM	00:23:34
6	11442	11/4/2009 8:03:36 AM	11/4/2009 8:29:01 AM	00:25:25
7	11446	11/4/2009 7:52:27 AM	11/4/2009 8:18:05 AM	00:25:38
8	11448	11/4/2009 8:25:06 AM	11/4/2009 8:47:09 AM	00:22:03
9	11449	11/4/2009 8:05:39 AM	-	-
10	11449	11/4/2009 8:05:39 AM	11/4/2009 8:26:24 AM	00:20:45
11	11452	11/4/2009 8:24:26 AM	11/4/2009 8:44:38 AM	00:20:12
12	11466	11/4/2009 8:21:23 AM	11/4/2009 8:41:34 AM	00:20:11
13	11469	11/4/2009 8:42:52 AM	11/4/2009 9:01:31 AM	00:18:39
14	11579	11/4/2009 8:46:27 AM	11/4/2009 9:08:25 AM	00:21:58
15	11580	11/4/2009 7:57:01 AM	11/4/2009 8:25:29 AM	00:28:28
16	11582	11/4/2009 7:56:43 AM	11/4/2009 8:17:46 AM	00:21:03
17	11583	11/4/2009 8:28:44 AM	11/4/2009 8:38:35 AM	00:09:51
المرورية				
1	11426	11/4/2009 9:49:47 AM	11/4/2009 9:55:20 AM	00:05:33
2	11429	11/4/2009 8:27:52 AM	11/4/2009 8:33:18 AM	00:05:26
3	11429	11/4/2009 11:47:22 AM	11/4/2009 11:54:14 AM	00:06:52
4	11430	11/4/2009 8:08:29 AM	11/4/2009 8:16:15 AM	00:07:46
5	11430	11/4/2009 11:58:14 AM	-	-
6	11431	11/4/2009 9:01:56 AM	11/4/2009 9:07:35 AM	00:05:39
7	11432	11/4/2009 9:21:20 AM	11/4/2009 9:26:59 AM	00:05:39
8	11437	11/4/2009 7:16:27 AM	11/4/2009 7:22:14 AM	00:05:47
9	11437	11/4/2009 11:21:15 AM	11/4/2009 11:26:16 AM	00:05:01

تقارير

الفئة: تقارير أداء المركبات

نوع التقرير: 10- تفصيل المحطات

ويب

جداول ممتدة

وحدة الصليبات: دله

البلدية الفرعية: [البلدية الفرعية]

مركز من قبل وحدة: ضوابط

المركبات

رقم المركبة

11230 ✓

11231 ✓

11232 ✓

11233 ✓

11234 ✓

11235 ✓

11236 ✓

يومها: Wednesday - 04

تاريخ البدء: ٢٠٠٩/١/٠٤

بداية الزمن: ٠٤:٠٠

نهاية التاريخ: ٢٠٠٩/١/٠٤

نهاية الزمن: ١٣:٠١


تكوين

طباعة

Screen shot 6

Report for each clean car and how many times the bin was left.

Reports



 أمانة محافظة عمّان

مكتبها كنس الدروب

تاريخ و وقت إصدار التقرير : ١١:٢٤ ٢٠٠٩/١١/٠٤

مدى الوقت/التاريخ : ٢٣:٥٩ ٢٠٠٩/١١/٠٤ - ٠٠:٠٠ ٢٠٠٩/١١/٠٤

الرقم	البلدية الفرعية	تصاح الطريق	وقت التنفيذ	رقم المركبة
1	العزيزية	DLAZ0004	04/11/2009 03:00-06:30	22242
2	العزيزية	DLAZ0009	04/11/2009 03:00-06:30	22243
3	العزيزية	DLAZ0010	04/11/2009 03:00-06:30	22243
4	العزيزية	DLAZ0020	04/11/2009 03:00-06:30	22250
5	بريمان	DLBR0005	04/11/2009 03:00-06:30	22241
6	بريمان	DLBR0008	04/11/2009 03:00-06:30	22246
7	بريمان	DLBR0009	04/11/2009 03:00-06:30	22246
8	بريمان	DLBR0017	04/11/2009 03:00-06:30	22310
9	بريمان	DLBR0022	04/11/2009 03:00-06:30	22311
10	المطار	DLMR0003	04/11/2009 03:00-06:30	22240
11	المطار	DLMR0009	04/11/2009 03:00-06:30	22244
12	المطار	DLMR0010	04/11/2009 03:00-06:30	22245
13	المطار	DLMR0012	04/11/2009 03:00-06:30	22248
14	المطار	DLMR0016	04/11/2009 03:00-06:30	22249
15	المطار	DLMR0017	04/11/2009 03:00-06:30	22251
16	المطار	DLMR0022	04/11/2009 03:00-06:30	22314
17	المطار	DLMR0023	04/11/2009 03:00-06:30	22314
18	المطار	DLMR0028	04/11/2009 03:00-06:30	22315
19	المطار	DLMR0029	04/11/2009 03:00-06:30	22315

تقارير أداء المركبات
 نوع التقرير: B- المسارات التي لم يتم
 ويب
 جداول ممتدة
 وحدة الصيانة: دلّه
 البلدية الفرعية: [البلدية الفرعية]
 مكائن آلة
 مرشح من قبل وحدة: [المرشح من قبل وحدة]
 المركبات: [رقم المركبة]

Wednesday - 04
 تاريخ البدء: ٢٠٠٩/١١/٠٤
 بداية الزمن: ٠٤:٠٠
 نهاية التاريخ: ٢٠٠٩/١١/٠٤
 نهاية الزمن: ١١:٢٣

تكوين
 طباعة

Screen shot 7