UNIVERSITY OF BAHRAIN

College of Engineering



Department of Mechanical Engineering

Improving Operations Management Performance of Bahraini Service Industrial Organizations Using Balanced Scorecards (Public Sector)

A Thesis Submitted in Partial Fulfillment of the Requirements for the Master Degree in Engineering Management

Submitted by

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Kingdom of Bahrain

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Thesis Discussion Committee Decision

Student Name: Mohamed Jasim Mohamed	Student ID: 20024160
Department: Mechanical Engineering	College: Engineering
Program: Master in Engineering Management	
Thesis Title: Improving operations management performance of Bahraini Service industrial organizations using Balanced Scorecards (Public sector)	
Supervisor Name: Prof. Saad Sulaiman and Dr. Bader Al-Mannai	Student GPA: 3.6

The Discussion Committee met on ___ (day and date) Monday 1/6/2015 in Hall no. M-162 (hall/room no.) ____. Upon discussing the student whose details are stated above in public, the discussion committee recommends the following:

The student awarded grade A- In the thesis subject Engineering Management

☐ Without making any changes to the thesis

☐ After making the modifications attached with this decision

Discussion Committee Members Approval:

Name	Signature
1. Prof - Saad Sulaiman (Advisor)	
2. Dr. Bader Al-Mannai Prof. Mohd Farid El Sabri (Internal Examiner)	
3. Dr Umar Al-Turki (External Examiner)	

DEPT OF MECHANICAL ENGINEERING

ABSTRACT

The kingdom of Bahrain is one of the GCC countries that insists on its ministries and different public services agencies to implement a type of performance management systems. In order to satisfy this need, the Ministry of Works (MOW) and the Electricity and Water Authority (EWA) have already gone through implementing the balanced scorecards (BSCs) performance management system.

Because of the recent concern about the BSCs in the Kingdom of Bahrain; it became interesting to study the experience of service industrial organizations of Bahraini public sector that have implemented the BSCs. The aim is to study different implementation processes of the BSCs system, to study how BSCs could improve the operations management in the service industrial organizations of the Bahraini public sector and to review the process of selecting the key performance indicators (KPIs) that are used in operations management.

The researcher used a qualitative research by applying the case study methodology at MOW and EWA in Bahrain in order to achieve research objectives. Based on the collected data and information, the researcher has examined to which level Bahraini service industrial organizations used the BSCs in operations management, determined the effects of BSCs implementation on operations management, developed a detailed roadmap for implementing the BSCs in operations departments and discussed the characteristics and needed guidelines while selecting the KPIs.

The results of this study were consistent with the previous findings from the literature that the BSCs successful implementation has many positive impacts of the operations management department of the organization and consequently in improving the overall performance.

The researcher aims that in future the study could be applied on more governmental organizations in Bahrain, which considering the BSCs to be their performance management system.

DEDICATION

I dedicate my dissertation work to my loving parents, for instilling the importance of hard work and higher education, my wife and my wonderful son for their support and patience. I also dedicate this dissertation to my instructors who never hesitate in sharing their knowledge and experience throughout the research period. I dedicate this work and give special thanks to my best Mohamed Allam for his help and encouragement.

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LIST OF ABBREVIATION

BSC	Balanced Scorecard
BSCs	Balanced Scorecards
EWA	Electricity and Water Authority
MOW	Ministry of Works
KPI	Key performance Indicator
KPIs	Key performance Indicators
OSM	Office of Strategy Management
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
ESBI	Eectricity Supply Board International
PMI	Project Management Institute
GCC	Gulf Cooperation Council
SWOT Analysis	Strength Weaknesses Opportunities Threats Analysis
PESTEL Analysis	Political Economic Sociological Technological Legal Environmental Analysis
DCC	Distribution Control Center
EDD	Electricity Distribution Directorate
PPP	Public Private Partnership
KPP	Key Planning Player
LPO	Leading Professional Organization
SQS	Sustainable Quality Services
SAM	Strategy Aligned Management

CHAPTER ONE: INTRODUCTION

1.1 Background

1.2 Purpose of the Study

1.3 Thesis Outline

CHAPTER ONE
INTRODUCTION

1.1. Background

Public sector and governmental organizations are not far from the reality that to continue in today's environment, they should be flexible, service oriented, and cost effective. Many counties have encouraged their governments to adopt performance management systems and put more focus and concentration on the quality of the provided services for citizens (Chemengich, 2013).

At the same time, several types and approaches of such systems have been developed and discussed by private and public firms. The balanced scorecard (BSC) approach is one of the most famous approaches in the field of performance management and operations improvement as reported by many management academics and organizations (Martinez, Kennerley and Neely, 2004).

The BSC approach is considered as a successful and systematic approach to enhance organizational performance and assist the top management in executing strategies by translating them into operational actions which could be measured by a set of developed key performance indicators (KPIs) (Kaplan and Norton, 1992).

As a result, the BSC approach assists organizations to manage the strategy, mission and vision over the long term strategic planning process, and enable the operational improvement through translation

of the strategic content into measurable actions in the operations department (Cobbold and Lawrie, 2002).

The Kingdom of Bahrain is one of the GCC countries that concerns about applying the BSCs in order to improve organizations performance and manage strategies. The Ministry of Works and the Electricity and Water Authority in Bahrain, have already begun the process of implementing BSCs system at each of the two organizations. Their successful implementation was recognized and rewarded by Palladium Group in 2009.

Accordingly, because of the recent concern about the balanced scorecards in the Kingdom of Bahrain; it became interesting to study the experience of Bahraini service industrial organizations that have implemented the approach.

The objective of this research is to study the implementation process of the BSCs system and how it improved the operations management in service industrial organizations in the Bahraini public sector. Moreover, the research examines to which extent the organizations have succeeded in improving their operations management by implementing BSCs. In addition to that; the study will review the process of selecting the key performance indicators that are used in operations management along with their performance targets in these organizations.

1.2. Problem Statement

The recent concerns of Bahraini public sector organizations in implementing the BSC, necessitates developing suitable procedure

and guidelines for BSC successful implementation which will help in improving operations management performance.

1.3. Purpose of the Research

To study the implementation of the BSC at service industrial organizations at Bahraini public sector and to investigate how the operations management of these organizations was improved by the BSC implementation.

1.4. Research objectives

1. Develop a BSC implementation roadmap for operations department in a service industrial organization in the Kingdom of Bahrain.
2. Determine the effect of BSC implementation on the operations management performance of the service industrial organizations of the Bahraini public sector.
3. Examine and identify the level to which Bahraini service industrial organizations use the BSC in operations management.

1.5. Research Significance

1. Provision of information about the successful implementation experience of Bahraini public sector organizations in adopting the BSC.
2. The development of the BSC implementation roadmap for the operations department in a service industrial organization of the Bahraini public sector.

1.6. Thesis Outline

This research is divided into eight chapters, which are further subdivided into several sections.

The first chapter introduces the research objectives, the significance of this research and briefly, gives a background regarding the research and the BSC approach.

The second chapter presents the relevant literature to examine the impact of the BSCs on organizational performance. In addition to that, revision is provided for the BSCs and strategic management theories that are related to operations management in service industrial organizations.

The third chapter describes the methodology which was implemented in this study along with the data gathering techniques. Specifically, this chapter explains the research methodology and the study design, data collection methods, and finally the data analysis methods used in this study.

The fourth chapter describes the first case study of this research which is Electricity and Water Authority (EWA). EWA is a governmental organization responsible for providing the electricity and water services to Bahrain citizens. EWA has successfully implemented the BSCs as a performance management system at 2007 and was awarded by the Palladium Hall of Fame due to EWA clear vision and strategy, well-articulated implementation process, successful alignment of business units, and motivated employees.

The fifth chapter describes the second case study which is the Ministry of Works (MOW). MOW is a governmental organization responsible for Bahrain infrastructures, public construction projects sanitary and drainage systems. MOW has successfully implemented the BSCs as a performance management system in 2008 and was awarded by the Palladium Hall of Fame along with EWA for its innovated approach of BSCs implementation process, initiatives prioritization matrix, project management and risk management integration with BSCs.

The sixth chapter describes the BSC implementation road map which is suggested by the researcher based on the data, information and findings from the two case studies. A detailed procedure was illustrated according to the findings and the literature reviews best practices.

The seventh chapter presents the validations techniques that were applied by the researcher for the case studies data and findings. These techniques actually based on the qualitative researches validation methods. Moreover, the researcher, in order to improve validity and generalization, has applied a suggested roadmap for developing a BSC for an existing business unit at EWA and compare the results of the BSC with the existing BSC. In addition to that, the BSC is being cascaded to a new level using the developed roadmap.

The eighth chapter summarizes the objectives and method of the research, to present the final conclusion based on the research findings and discussion, evaluate the limitations of this study, give

recommendations for practice and mention the possible ideas for future research.

1.7. Research Plan

The following chart, Figure (1) summaries the research approach which was applied by the researcher in order to achieve the thesis objectives and developing a roadmap to help operations department in implementing the BSCs and improving their operations management practices.

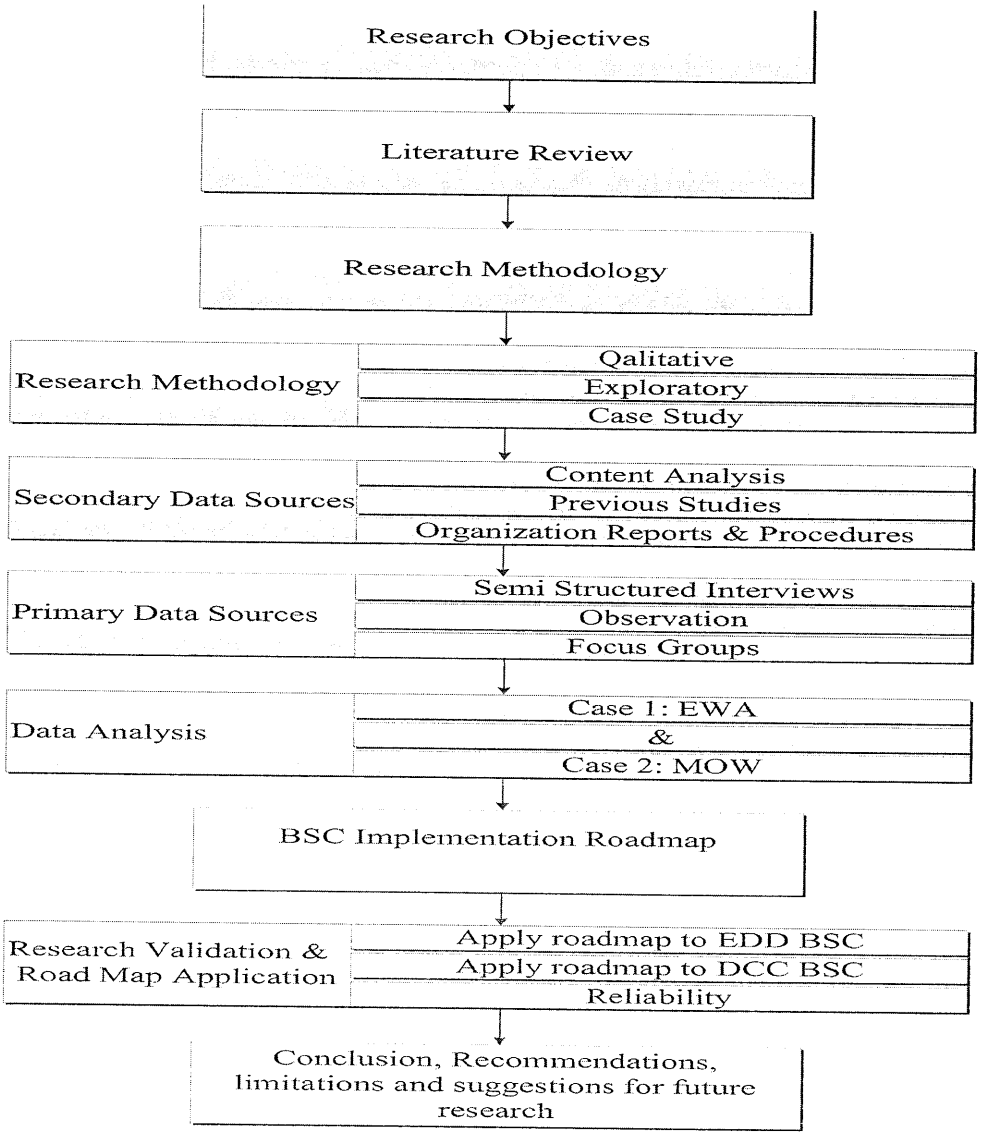


Figure (1)
The research plan

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

2.2 History of the BSC Approach

2.3 The BSCs Framework

2.4 Office of Strategy Management

2.5 Developing and Implementing BSC

2.6 Public Sector BSCs

2.7 The BSC and its Relationship with Operations Management

2.8 BSCs Implementation in Bahrain

2.9 Challenges and Barriers to BSC Adoption

2.10 BSCs Criticism

CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

In this chapter, the researcher has reviewed the past studies, researches and articles about the BSCs, its development, the BSCs implementation in the public sector and how it could improve operations management. The balanced scorecard is a performance measurement system (the first generation) which was established by Harvard Business School Professor Robert Kaplan and the management consultant David Norton in 1992. Their research directed them to realize that traditional financial measures are unable to deliver a truthful overview of the organization performance. In addition, Kaplan and Norton described how operational measures of customer satisfaction, internal processes, the organization's innovation and improvement activities complements the financial measures (Kaplan and Norton, 1992).

Moreover, they come up with the standard BSC which includes the four perspectives: financial, customer, internal processes and learning and growth. The BSC requires that the organization managers should develop a set of performance measures which are a mix of the traditional financial measures and the non-financial measures (Kaplan and Norton, 1992).

As well, the standard BSC translates vision, mission and strategy of the organization into measurable operational performance measures to assess its overall performance and operations improvement (Beasley et al., 2006).

2.2. History of the BSC Approach

In 1990, a study was conducted by Robert Kaplan and David Norton involving 12 big companies. They evaluated how these companies applied performance measurements to monitor and control the performance and behavior of their companies and workforce. Findings of this study were used in order to develop a performance measurement system that has a balanced view of financial and non-financial measures (Kaplan and Norton, 1992).

Accordingly, the BSCs approach had become one the most significant and effective management system of the past 25 years (Javadian Kootanaee et al., 2013). In 1996, the BSCs founders Kaplan and Norton extended their BSCs concepts to include strategic value (Kaplan and Norton, 1996).

Hence, the BSC is not only a performance measurement system, but also a strategy management system that could be used by organizations to set their strategies, align different operations, and get their performance improved (Manandhar and Tang, 2002).

Furthermore, the BSCs framework could be used in many industries to assess and improve performance such as information technology industries (Kim and Davidson, 2004).

2.2.1 The first generation of the BSCs

As mentioned earlier, the first generation of the BSCs includes the four standard perspectives (Kaplan & Norton, 1992):

1. **Financial perspective:** Includes a few critical traditional measures that could answer the question of how do we look to our shareholders?

Financial perspective is related to the organization strategy contribution to the financial results improvement.

2. **Customer perspective**: Include customer related measures aims to answer the question of how do customers see us? The organization should translate its main customers' needs into specific key performance indicators. The common key performance indicators for customer perspective are related to customer satisfaction, attraction, acquisition, retention, market share and profitability.
3. **Internal processes perspective**: operational measures aims to answer the question of what processes must we excel at? Internal processes perspective focuses on the most critical processes within the organization in order to achieve customers and shareholders requirements and goals that are defined in the two pervious perspectives. Usual key performance indicators within this perspective concentrate on operations, innovation, and after sale services.
4. **Learning and growth perspective**: usually involves intangible measures that should answer the question of how can we continue to improve, create value and innovate? This perspective concentrates on driving learning within the organization. The qualification of any organization developed through investments in research and development, systems and procedures, new equipment, and in human resources. Normally, learning and growth perspective has the following key performance indicators: employees' competences and skills, employees' empowerment, employees' motivation and information systems.

These perspectives should be used by organizations management to develop a set of measures that provide information about the organization performance. These standard perspectives are not fixed according to the different organizations requirements as discussed through many articles and researches focusing on the identification of alternative perspectives (Butler, et.al., 1997; Ahn, 2001; Elefalke, 2001; Irwin,2002).

2.2.2 The second generation of the BSC

The first generation of the BSCs suffered from some weaknesses in the design which has been resolved through including the strategic objectives and cause and effect relationships in the BSC which form the second generation of the BSCs (Cobbold and Lawrie, 2002).

Furthermore, the second generation BSCs performance measures were linked to the corresponding strategic objectives. In addition to that, the strategic objectives were suggested to be between 20 to 25 (Rangarajan and Mishra, 2014). Through the new improvement to the BSC by adding the cause and effects relationships, a visual illustration of the strategic objectives with their related causal linkages at all the four perspectives established the strategy map (Armitage and Scholey, 2006).

2.2.3 The third generation of BSC

One problem which emerged with the second generation of the BSC was that ambiguity regarding how to choose and create strategic objectives and who is responsible for that. Moreover, the causal relationships among the strategic objectives were still unclear. Furthermore, the need to evaluate the effect of strategic objectives necessitated the development of a new design tool which is the destination statement (or the organization vision).

The destination statement was a statement of what the strategic success should look like and what the organization was trying to achieve in a specified time frame. It should be also created at the beginning of the design process, to make the selection process of strategic objectives easier in order to select measures and targets to track the performance improvement of these objectives (Cobbold and Lawrie, 2004).

In addition to that, the third BSCs generation refined the second one by giving more significance and functionality to strategic objectives selection, casual linkage of objectives and performance measures and adding the improvement programs or initiatives (Armitage and Scholey, 2006).

2.2.4. Types of BSCs

Based on the development of the BSCs over the years, different types of implementation approaches were found and it could be classified as the following (Speckbacher, Bischof and Pfeiffer, 2003):

- Type one: a specific multidimensional framework for strategic performance measurement that combines financial and non-financial strategic measures.
- Type two: a type one BSC that additionally describes strategy by using cause and effect relationships.
- Type three: a type two balanced scorecard that implements strategy by defining objectives, action plans, results and connecting incentives with balanced scorecard.

2.2.5. Total performance scorecard

The idea of the balanced scorecards has been further extended to the total performance scorecard. The new idea included the personal integrity and organizational performance (Rampersad, 2005, 2008). Rampersad has recommended developing personal balanced scorecards for the workforce based on a personal vision, mission, and strategy.

Performance measures, targets and actions plans should be developed to complete the personal scorecard and further has integrated with organizational balanced scorecards. This new approach of aligning the personal scorecard with organization balanced scorecards leads to better alignment of the workforce and improved learning process which enabled achieving higher performance levels (Narasimhan, 2004).

2.2.6. The motivation for adopting the BSC

The BSCs system guides the entire organization to work according to a common vision, mission and strategy through providing its systematic supervision and regular performance reviews (Kaplan and Norton, 2001). The BSCs could be applied and used for many reasons and to acquire many benefits (Wiersma, 2009; Dreveton, 2013). The most important reasons that could inspire organizations to implement the BSCs are reported by Hoque and James (Hoque and James, 2000).

2.3 The BSCs Framework

The BSCs approach provides a balanced view of the long term and short term objectives. Moreover, it balances the organizational outcomes and

the performance drivers (Brown, 2002). In addition to that, its cause and effect relationships between measures in each of these perspectives are described as if a change occurred in the leading measure will result in a change in the lagging measure (Kaplan and Norton, 2001).

2.3.1 Basic components and characteristics of BSC

These are the main components which should be included in any BSCs system. The main components are strategic themes, perspectives, strategic objectives, performance measures, performance targets, and strategic initiatives (Balancedscorecard.org, 2013).

a) Strategic themes

Themes are vital to the organization strategy and provide a clear picture about how organizations would achieve its mission and execute strategies. Usually organizations choose about three to four strategic themes comprising of strategic objectives through perspectives (Balancedscorecard.org, 2013).

Furthermore, for most of the organizations, the strategic theme will revolve around stakeholder groups; such as customers, shareholders or about operations excellence. A strategic theme is an area in which the organization must excel in order to achieve its vision. One can look at the proposed set of strategic themes and ask this question: "If we excel in these three or four areas, will we achieve our vision?" (Asefeso, 2013)

b) Strategic perspectives

There are four standard perspectives suggested by BSCs founders Kaplan and Norton as the following:

- Financial perspective: return on investment, shareholder value, cost reduction, increase revenue.
- Customer perspective: customer satisfaction and relationships.
- Internal process perspective: what are the processes that we should excel on to succeed?
- Learning and growth perspective: how will we go on from lessons learned and sustain our ability to change and improve?

However, organizations have the opportunity to choose their perspectives according to their needs of satisfactorily measuring performance (Kaplan and Norton, 1996). The foundation of BSCs is that these perspectives are interconnected by its objectives and any possible changes in one of them will have consequences in the other objectives. This is known as the causal relationships of the BSCs (Kaplan and Norton, 2004). The perspectives are used to help the process of objectives setting and choosing suitable key performance indicators to measure the objectives performance and the strategy success can be determined (Kaplan and Norton, 1996).

c) Strategic objectives

The critical success factors of the organization that need to be achieved in order to execute strategy and realize the organization mission (Kaplan and Norton, 1996). Additionally, the strategic objectives should focus on the main customers and stakeholders requirements which actually shape what the organization is going to do and will be the foundation for defining the performance improvement. Failure in meeting these requirements means that serious performance problems are going to occur (Mathys and Thompson, 2006).

Furthermore, the BSCs implementation team should attempt to have around 20 key performance indicators (2gc, 2013). The goal is to be focused on the key and critical performance goals; too many measures lead people to focus on their preferred goals and not the key ones (Kaplan and Norton, 2005).

d) Strategy Map

The strategy map is an illustrative picture of all strategic objectives across the BSC perspectives that are linked through the cause and effect relationships. It provides a powerful communication through the organization by sharing its strategy and objectives. Usually the strategy map contains the objectives owners names attached to the relative objectives and measures (Kaplan and Norton, 2004).

e) Performance measures

The key performance indicators could be classified as leading and lagging indicators based on the measured data. Leading indicators are the drivers of future performance and the enablers of the positive progress while lagging indicators are the effects or results which are related to the past performance (Kaplan and Norton,2007). Moreover, wrong selection of key performance indicators may seriously disturb the performance of the organization, department or the business unit (Eckerson, 2006).

In addition to that, some key performance indicators are commonly used through organizations while others are unique to each organization as they reflect their strategy and specific conditions of operating. Each organization should select the key performance indicators based on their

relevance and not on their popularity (Harvey, 2005). Furthermore, it is incorrect to specify how many key performance indicators the organization should have as a specific number, the idea is to focus on the critical areas and at the same time keeping their number reasonable (Cronin, 2007).

Likewise, the following characteristics should be considered while choosing measures and key performance indicators: linked (related to the operations strategy and its objective); repeatable (continuous over time to allow comparisons); leading (lead to future performance); accountable (reliable, verifiable and accurate); available (can be derived when needed) (Smartkpis.com, 2013).

f) Performance targets

Measurement only is not enough. As soon as a set of appropriate key performances indicators has been defined for the organization or department, the desired level of performance should be specified (Griffin, 2004). One of different approaches that are used to define the needed improvement through setting the performance targets is the SMART criteria. This approach requires that any performance indicator or target should satisfy the following five criteria: specific, measurable, achievable, relevant and time bound. SMART is an acceptable technique to develop performance targets and making decisions about its selection (Hursman, 2010).

2.3.2 Importance weights of BSC

Some of key performance indicators (KPIs) are more important to the organization than others. However, it is unadvisable to neglect the less important KPIs. Therefore, weights for indicators and perspectives in the BSCs can solve this issue. The applied weights to a key performance indicator or perspective in the BSCs represent its importance (Ittner, et.al., 2003). Similarly, these importance weights are used to better evaluate performance. Kaplan and Norton suggest a balanced weighting structure with the nonfinancial measures having similar importance or more than the traditional financial measures (Kaplan & Norton, 2001).

2.3.3 Strategic initiatives

Initiatives role is to close the performance gap between the current organization performance and the defined targets based on the BSCs key performance indicators (Niven, 2005). Initiatives are projects with a finite start and end date which are used in order to put the operations strategy into action (Niven, 2002).

In addition, Initiatives require budget to make things happen which necessitate that budgeting process is to be linked to the balanced scorecards (Niven, 2002). Usually, organizations have a lot of initiatives or projects running and others are waiting to be implemented. However, not all of them are aligned to strategy (Kaplan and Norton, 2007).

Additionally, the BSCs approach provides an organized framework in which initiatives can be evaluated according to its strategic significance (Niven, 2002).

a) Strategic Initiatives Prioritization

The collection of initiatives or projects should be focused on achieving organization objectives and ultimately its strategy. Using initiatives effectively will help in closing existing performance gaps between current and desired level of performance, which in turn will support in achieving the objectives (Cobbold and Lawrie, 2002).

According to that, strategic initiatives should be prioritized based on their strategic impact on the strategy. A workshop could be used to prioritize the key strategic initiatives by considering how the initiative supports the expected outcome, initiative requirements and expenses (Niven, 2002).

b) Link initiatives to budgeting process

A major problem that often occurs while developing the BSCs is that the budgeting process is not properly linked to it in order to allocate the needed resources. It is an essential step for governmental organizations, where the budget usually received through the government over certain procedures and processes which may affect the performance of the organization if the needed resources are not received within a certain time (Kaplan and Norton, 2001; Niven, 2003).

2.3.4 Alignment by cascading BSC

The deployment will involve reviewing and aligning the first BSC level with other parts of organization such as divisions, operating units or branches in order to integrate the corporate BSC into the lower levels (Kaplan and Norton, 2006). However, most organizations choose to implement the first BSC at the strategic business unit level due to the reason

that organizations want to build a BSC that covers the entire value adding process (Kaplan and Norton, 1993).

Generally the cascading process of the BSCs starts from the corporate BSC to the organizational businesses and support units ending with the individuals' BSCs as the best type of cascading (Kaplan and Norton, 2006).

2.4 Office of Strategy Management (OSM)

The office of strategy management team is responsible for helping the organization to have a common view of its strategy. It is also in charge of identifying and realizing corporate synergies. Furthermore, the OSM team generally reports to the organization leader such as the chief executive and works as a facilitator through the processes of strategy development and BSCs cascading to the different business units. The office also works for the cooperation between the different business units and make sure of the alignment to the corporate strategy (Kaplan and Norton, 2006; Kaplan and Norton, 2005).

2.5 Developing and Implementing BSC

The BSCs approach translates the organization strategy into strategic themes, objectives and measures. The choice and controlling of measures and targets is an essential process of BSCs implementation. The following steps summarize the most important activities and processes during the balanced scorecards implementation.

2.5.1 Process and duration

The BSCs implementation process can have different implementation time frames depending on the size of the organization, project scope and project complexity. The implementation process varies from four weeks up to a year or even in two years in complex organizations (Kaplan and Norton, 1996; Rohm, 2005).

2.5.2 BSCs team establishment

The BSCs team should contain people from the organizations different managerial level to have better alignment while implementation (Niven, 2003). Moreover, support from consultants or experienced people are generally required before implementing the BSC to make sure of the corporate vision and strategies or set up them if not exist (Kaufmann and Becker, 2006).

2.5.3 The strategy focused organization

Kaplan and Norton demonstrate how to transform the BSCs from a performance measurement tool to a performance management system that helps different organizations in creating a strategy driven performance organization. They suggest five principles of the strategy focused organization (Kaplan and Norton, 2001):

1. Translate the strategy into operational terms.
2. Align the organization to the strategy.
3. Make strategy everyone's everyday job.
4. Make strategy a continual process.
5. Mobilize change through executive leadership.

2.5.4 Execution premium process (XPP)

The Execution Premium Process is a comprehensive management model designed to address one of management's greatest challenges: linking strategy formulation and planning with operational execution. It consists of six major stages (Kaplan and Norton, 2008): develop the strategy; translate the strategy; align the organization; plan operations; monitor and learn; and test and adapt.

2.5.5 Automation of scorecards

Automation is important to have a successful implementation of the BSCs as it provides visibility to the process allowing for broader participation of the workforce and facilitates a quick change of the organization culture (Assiri, Zairi and Eid, 2006). Furthermore, the BSCs automation can provide different types of data and information regarding the BSCs components such as the BSCs measures, strategic objectives, performance target, performance alarms, graphs, presentations, and reports (Palazzolo, 2004).

Likewise, the BSCs software can be designed to analyze historical data and automatically provide the right data and information to the right working people at the right time through e-mails and internet or intranet integration (Kamhawi, 2011).

2.5.6 BSC evaluation

BSCs implementation regularly requires endless evaluation and modification to make sure that it is still valid. Similarly, the BSCs are like hypothesis that has never been applied and tested before (Kaplan, 2010). A usual practice of many organizations is to postpone the cascading of BSCs to

other departments and business units for some time until the first BSC is well established (Murby and Gould, 2005).

2.6 Public Sector BSCs

The BSCs originated as a performance measurement system, but quickly evolved into a widely accepted performance management and strategy implementation tool. The originators of the concept developed it with the private sector in mind. Accordingly, achievements of the financial objectives were the main goal of BSCs (Northcott and Taulapapa, 2012). The balanced scorecards framework emphasizes that the financial objectives can be achieved by focusing on the drivers of performance in the other three perspectives. It also places value on the perspectives of customers and other stakeholders. Thus, it looks at performance from different perspectives and across different objectives and stakeholders (Marr and Creelman, 2011).

These features of BSCs have caught the interest of the governmental and public sector organizations which have to adopt performance management systems (Aidemark, 2001; Modell, 2004). Public sector and non for profit organizations can adapt the BSCs approach but the attention will be on customer perspective rather than financial objective (Niven,2002). A comparison of Balanced Scorecards in private and public sectors is shown in Table (1) (Mathys and Thompson, 2006).

Table (1)
Comparison of BSCs in the Private and Public Sectors, Source: (Mathys and Thompson, 2006)

Features	**Privates Sector**	**Public Sector**
Focus	Shareholders Value	Mission effectiveness
Financial goals	Profit; market share growth, innovation, creativity	Cost reduction, efficiency, accountability to the public
Efficiency concerns of clients	No	Yes
Desired outcomes	Customer Satisfaction	Stakeholder satisfaction
Stakeholders	Stockholders, bondholders	Taxpayers, legislators, inspectors
Who defines budgets priorities	Customer Demand	Leadership, legislators funding agencies,
Key success factors	Uniqueness; advanced technology	Sameness, economies of scale, standardized technology

Furthermore, Kaplan and Norton recommend the BSCs to be adapted by public sector organizations through basically reorganizing the perspectives and taking the customers to the highest level of the hierarchy (Kaplan and Norton, 2001). Several academics who examined the usefulness of the BSCs in public sector have also agreed to the view of Kaplan and Norton (Aidemark, 2001; Bilkhu-Thompson; 2003, Niven, 2005).

On the other hand, few academics disagree with the usefulness of the balanced scorecards in the public sector (Northcott and Taulapapa, 2012). Similarly, Griffiths mentioned that it is difficult to identify the cause and effect relationships in the public sector and the reorganizing of perspectives is not a direct process (Griffiths, 2003).

2.7 The BSC and its Relationship with Operations Management

Operations play an important role in the creation and execution of the organization's strategy. Business environment situations have changed from mass production which emphasis on high volume, low cost production to an environment demanding performance on measures such as quality and speed of delivery as well as cost, (Brennan 2011).

2.7.1 Operations department

All organizations aim to improve its operational performance through the employment of various types of performance measures which assess the efficiency and effectiveness of their processes and different activities in addition to their strategic objectives. Furthermore, the operations department is responsible for managing organization resources which are needed to the transformation processes that convert inputs of materials and resources into outputs of products and services. Performance measurement tools can help in evaluating resource allocation processes in order to determine how resources can be better managed and distributed (Davis, Aquilano and Chase, 2003).

As well, operations department is one of the most important departments at any organization where its performance directly affects the overall performance of the entire organization. The question that always has been asked by any organization mangers is "are we doing well?" or "How well is operations performance?" This question could be answered using the BSCs which provide the operations department managers and the organization management with a better picture of their operations performance (Brennan 2011).

Likewise, organizations and operations departments applied different performance approaches in order to provide products and services within their financial and quality limits and at the right time. One of the most successful approaches that have been used for more than 20 years is the BSCs (Marr and Creelman, 2011).

2.7.2 BSC and operations management

The alignment between operations strategy and the corporate strategy in addition to the other main and support departments are a major factor that directly affects the organizations success (Voss, 1992). Similarly, conflicts between operations strategy and the corporate strategy will badly affects the organization performance and the achievement of the strategic objectives (Ward, 1996).

The BSCs method is very helpful for managing the operations strategy and the operations department different activities by translating strategic objectives into operational action and through many perspectives other than the financial perspective in balanced view of different performance areas (Kaplan and Norton, 2004).

Furthermore, there are many benefits reported from the organizations that have successfully implemented the BSCs approach (Madsen and Stenheim, 2014). Some of the main benefits are helping the operations departments' managers in identifying and focusing on the strategic objectives and the essential operations and processes with the intention of improving operations performance. The BSCs through the strategy maps has better communicated the strategic objectives to organization workforce and aligned them to be focused on the same targets (Marr and Creelman, 2011).

2.8 BSCs Implementation in Bahrain

Many companies and organizations in the Kingdom of Bahrain have adopted the BSCs approach as a performance management system. A survey of 120 large and medium firms was conducted to evaluate the usage and usefulness of the BSCs among Bahraini organizations. The results show that all respondents consider the BSCs system very useful to Bahraini companies. Moreover, the most important issues that encourage the organizations in Bahrain to adopt the BSCs system are the following (Juhmani, 2007):

- BSCs system supports organizations to assess the application of vision and strategy.
- BSCs system enables the organizations management cascading strategies to business units then being translates into operational measures.
- BSCs system provides the high management with a comprehensive framework that helps in translating the organization strategic objectives into a coherent set of performance measures.

Another research investigated the BSCs adoption by manufacturing firms in Bahrain supported the growing use of BSCs among these firms. Furthermore, the study findings show that organizations which have adopted the BSCs were successful in selecting, implementing and integrating of suitable performance measures. These organizations have recognized that the chosen performance measures affected the performance of their workforce in addition to the organizational performance (Mahmoud, 2014).

One more research discussed the successful implementation of the BSCs approach at EWA and how it helped in improving the overall performance at all levels of the authority. Reasons helped the authority in their implementation are (Al Ansari, 2006):

- The workforce awareness programs that were conducted by office of strategy management team.
- The authority top management commitment where the chief executive was a strategic objective owner of the BSCs and champions the implementations process.
- The implementation process was based on the best practices that were recommended by the authority consultants.
- The automation process of the BSCs assists and facilitates in handling many tasks related to the BSCs measurements.

A further article was published about MOW described how it has created and implemented a world-class BSCs system in order to assist the ministry in defining and executing their strategy. The successful implementation of the BSCs was recognized by Palladium Hall of Fame in 2009. The article summarized how the ministry corporate strategy map and BSC have been cascaded into the organizational different levels after it has been totally aligned with the 2030 vision of Bahrain, in addition of how the BSCs implementation has improved the operations management at the ministry (Marr and Creelman, 2010).

2.9 Challenges and Barriers to BSC Adoption

Constructing a BSCs performance management system for an organization is considered as complicated efforts. The most common BSCs

implementation Challenging problems and barriers are (Prieto and Carvalho, 2009; Kaufmann and Becker, 2006; Sharma and Gadenne, 2011):

- Appropriate collection of the performance data.
- Defining the required performance measures.
- Describing the cause and effect relationships among objectives of the different perspectives.
- Failure to translate strategy in to strategic objectives.
- Ineffective communication and communication barriers with BSCs implementation team.
- Lack of organization executives' interest on the BSCs implementation.

2.10 BSCs Criticism

The BSCs have been criticized by several researchers who disagree with the empirical nature of the framework. BSCs criticism focuses on the technical design of the original approach proposed by Kaplan and Norton. Researchers have basically concentrated on the absence of reference where Kaplan and Norton failed to take account of any citation of earlier articles in their initial papers (Nørreklit, 2003).

Furthermore, the cause and effect relationships among the BSCs perspectives and strategic objectives have been faced by some academics criticism (Norreklit, 2000). The causal relationships across all perspectives are difficult to be verified (Sharma and Gadenne, 2011).

Likewise, the BSCs approach is a performance management system that does not provide any consideration about the competition or technical changes and risk of uncertainties (Norreklit, 2000).

Furthermore, organization employees are unable to recognize how to contribute in order to improve overall performance through their daily work activities, the BSCs through linking it to compensation and rewards does not create positive motivation. In addition to that, the BSCs require improvement of stakeholders' knowledge regarding the performance contribution and compensation system (Decoene and Bruggeman, 2006).

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

3.2 Research Methodology

3.3 Case Study

3.4 Data Gathering

3.5 Information and Data

3.6 Research Plan

CHAPTER THREE: RESEARCH METHODOLOGY

3.1. Introduction

The goal of this study is to explore how operations management performance is improved using BSCs in Bahraini public sector, and suggest a roadmap for implementing the BSCs approach in operations department. Two organizations were studied in this study by the researcher. This chapter provides an overview of the used research methodology and data gathering in this study.

3.2. Research Design

3.2.1. Exploratory and descriptive research

There are many classifications of research methods in the literature. Researches could be classified based on their objectives into three types; exploratory, descriptive or explanatory. Exploratory researches are broad in focus and rarely provide definite answers to specific research issues. The objective of exploratory research is to identify key issues and main variables. It includes literature searches and focus group interviews. Explanatory Researches explain the nature of certain relationships.

The researcher based on the thesis objectives choose to apply first an exploratory research in order to investigate the effects of the BSC implementation on operations management at service industrial organizations of Bahraini public sector and then a descriptive research to describe the BSC planning, implementation and evaluation processes at

these organizations.

3.2.2. Quantitative and qualitative research

Moreover, research methods are classified generally into quantitative research and qualitative research. A useful way to distinguish between the two methods is to think of qualitative methods as providing data in the form of words (or maybe visually), and quantitative methods as generating numerical data. Quantitative methods include surveys, laboratory experiments, formal methods like econometrics, and numerical methods like mathematical modeling. Qualitative research methods were first developed in the subjects of social sciences to help the researchers to study the social and cultural phenomena. These include action research, case study method, ethnography, grounded theory, and phenomenology.

The qualitative research focuses on opinions and interpretations. This implies observations and discussions with participants at different environments (Kirk and Miller, 1986). The qualitative research gives the researcher an opportunity to discover and reveal shades on things that could otherwise be difficult to disclose through quantitative research (Eisenhardt, 1989).

The case study research method is one type of the qualitative research methods that was chosen to be applied in this thesis. A case study is a detailed intensive study of a unit, such as a corporation or a corporate division that stresses factors contributing to its success or failure. Case studies involve analysis of real world problems of which one has experience or is able to observe. Moreover, case study research is the most common qualitative method. There are a numerous definitions available for case study

research methodology. A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (Yin, 2003).

In addition, case studies could be used to study the whole organization or to focus on a specific topic, subject or problem by analysis and deep investigation of a single individual, group, or event to (Yin, 2003). Case studies enable researchers to gain a full view of a certain phenomenon and allow generalization based on the results and conclusions (Noor, 2008)

The researcher choose the case study approach to get a better understanding and a broader experience about implementation of BSCs in the operations management of Bahraini public sector.

The main focus of the research is on examining the BSCs implementation best practices in the MOW and EWA, key performance indicators selection and how to improve operations management. This information will be used in developing a detailed BSCs implementation roadmap.

3.3. Case Study Selection and Sampling

The study targets the service industrial organizations in the Bahraini public sector that have implemented the BSCs. After a preliminary investigation which was done by the researcher, it is found that only two organizations could be involved in the research, namely: MOW and EWA.

The researcher got the information from the Ministry of Commerce, Civil Service Bureau and the Bahrain Center of Excellence regarding which

organizations had announced that they were implementing the BSCs. In order to contact the chosen organizations, a brief introduction about the research was given by the telephone to take their permission for participation in the study followed by a formal letter from University of Bahrain. The two organizations agreed to participate in the research through their Office of Strategy Management (OSM) Section.

The researcher, based on the aim of the research, has used purposive sampling selection where the researcher has made the decisions about the individuals to be involved in the sample based on their specialist knowledge about the BSCs, operations management, managerial position and the organization most important activities in addition to their willingness to participate in the research. The researcher is going to discuss each selection criteria of participants in the relative data gathering method section. The selected organizations were considered based on the following reasons:

- Service industrial organization from the Bahraini public sector.
- Leaders in innovative performance management practice.
- Have experienced employees who really understood and played a role in BSCs implementation and at the same time were ready to cooperate and contribute in the research by providing evidence, opinions and suggestions.
- Provide management approval for direct observation and access for available secondary data sources such as managerial reports, procedures, historical archives and related documents.

3.4. Data Gathering

The gathered information and data could be classified according to their sources into primary and secondary data sources. Primary sources provides the information and data which was gathered by the researcher himself for this research purposes, while secondary sources provides data and information which was gathered by others and reported in their own publications. Secondary data is helpful in providing the researcher with an initial picture about the research subject.

3.4.1. Secondary data sources

The content analysis data gathering technique was used in this research as a secondary data source. The researcher has read and analyzed different reports, archives, documents and records of targeted organizations in the case studies. The secondary data was used by the researcher to develop the questions for the first phase of the semi structured interviews.

3.4.1.1. Content analysis:

All the related existing documents and reports at the EWA and the MOW were reviewed and analyzed by the researcher. The gathered data where classified into different categories according to its relevance as following:

a) Pre-implementation of the BSC:

- Vision, mission, values and strategies.
- Motivations for BSCs implementation.
- Requirements before implementation.

b) Implementation of the BSC:

- BSC design: strategic themes; strategic objectives; BSCs perspectives; KPIs,
- BSCs usage; strategic initiatives; performance reporting; updating of objectives and KPIs

c) Post-Implementation

- BSCs cascading process
- Individual BSCs
- Performance evaluation

The content analysis was applied at both case studies according to the three categories mentioned above.

❖ **Electricity and Water Authority (EWA):** The researcher has reviewed the following documents and reports at EWA:

- The BSC implementation reports, plans and documents.
- Statistical data in order to calculate the related measures and KPIs.
- Performance graphs and charts of measures before and after BSC implementation.
- BSC strategy maps (2007 - 2012).
- Different KPIs reports (2002-2013).
- Different KPIs definitions (2007-2012).
- BSC newsletters (2007-2013).
- BSC brochures (2007-2013).

❖ **Ministry of Works (MOW):** The researcher has reviewed the following documents and reports at MOW:

- The BSC implementation reports, plans and documents.
- Annual reports for the last 5 years.

- Performance graphs and charts of measures before and after BSC implementation (2000-2013).
- BSC strategy maps (2008-2014).
- Different KPIs reports (2000-2014).
- Different KPIs definitions (2000-2014).
- Related case studies and books about the MOW (2007-2013).
- Executive Strategy Manager ESM reports (2010-2013).

3.4.2. Primary data sources

The researcher decided to use the semi structured interviews, focus groups and direct observation methods as the primary information and data sources in order to achieve the research objectives.

Furthermore, the researcher aimed that through these several data gathering tools, to achieve triangulation of data in order to build stronger validity and reliability of findings (Yin, 2003).

3.4.2.1. Observation

Observation is an essential data collection tool that can provide important and rich information. Observation data collection method was applied especially at EWA where the researcher is working, which gives him the opportunity to be close to the process. The researcher applied a direct observation where he has attended many activities related to the BSCs in order to observe what is happening. This allowed him to get awareness and comprehensive understanding about the atmosphere and how these activities are performed in the daily work. Moreover, the researcher has attended many BSCs meetings and workshops where he sat on one side observing, taking notes and asking questions when needed to clarify certain issues.

Furthermore, the direct observations have complimented the other data gathering sources which were helpful in data cross checking with what was obtained through the semi structured interviews (Eriksson and Kovalainen, 2008).

a) Electricity and Water Authority

The researcher used to take notes about the daily observation in the period of the 7th of December 2012 till the 05 of June 2013. The gathered data and information were analyzed, edited and discussed with the office of strategy management team and the concerned staff from the different directorates to insure the validity of data. The researcher has classified the gathered data during the direct observation at EWA into the following:

- The revision of the performance measures values through monthly, quarterly and yearly reviews.
- The data administration process.
- Preparing performance reports and comparing it with the generated graphs and charts from ESM.
- Updating the performance measures data.
- Cascading the BSCs to other directorates.
- Awareness sessions of the BSCs.
- Training programs for the concerned staff.
- The governing process using BSCs.
- Evaluating the performance of different KPIs and applying the needed changes.
- The integration of BSCs measures and Bahrain Center of Excellence measures.

- The improvement at the operational departments after implementing the BSCs.
- The establishment of new operational KPIs.
- The establishment of new standard KPIs.
- The feasibility of BSCs automation software.
- The movement toward the personnel BSCs.

b) Ministry of Works

The observation data gathering technique was applied at the MOW by regular visits for the different activities to cover:

- Data administration process of BSCs.
- Strategic and operational review meetings.
- BSCs awareness sessions and training programs.
- Initiatives prioritization meetings.
- KPIs evaluation and analysis for usefulness.
- The integration of BSCs and project management.
- Measuring the performance of certain operations impacts.
- Cascading BSCs to different organizational levels.
- The impacts of BSCs measures and Bahrain Center of Excellence measures when used together.
- The use of BSCs software.
- The application of operations measures by the operations managers.

It was useful through the observation period at MOW to use their knowledge management data base of documents and reports to cross check the collected data. All the gathered data were validated by the office of strategy managements at the MOW. The observation period for the MOW was from June 2013 till December 2013.

3.4.2.2. The Semi-Structured Interviews

Data can be collected by using unstructured and semi-structured interviews or by using structured interviews. The researcher chose to use the semi-structured interviews for many reasons. Initially, when using semi-structured interviews, the researcher encourages an informal conversation covering certain themes and questions. These questions may vary from one interview to the next, and the order in which questions are asked may vary also.

Additionally, the semi-structured interviews are used in this exploratory research to provide the researcher with a deep understanding and knowledge through the two cases in order to achieve the research goals.

The semi-structured interviews were conducted at the operations department, management and office of strategy management at EWA and MOW. The interviews usually conducted at the interviewee office at the working hours and lasted for about two hour.

Thirty six people from the EWA and the MOW have been selected to be interviewed who were recommended by the office of strategy management of these two organizations. Furthermore, all the semi-structured interviews were being conducted as one to one interviews. A schedule of different meetings was arranged to have: daily meetings for one week; weekly meetings for one month; and two meetings per month for three months. The interviews were started at the second week of February 2013.

In addition, the contact with each interviewee was made by a phone call to the nominated person through the office of strategy management to make an appointment regarding the semi-structured interviews and explain the purpose, significance, scope of the study, the interview estimated time, the researcher name, the researcher phone number and a reference name

from the office of strategy management. The nominated people were chosen based on their relevance to each organization BSCs and their managerial level.

The researcher had scheduled the semi-structured interviews starting with the EWA. Each interview lasted for two hours. The purpose and structure of the interview was explained to the interviewee at the beginning of the meeting. The interviewees were open and have explained comprehensively their experience and knowledge regarding the BSCs.

a) Interview questions

The researcher has created an interview guide (Appendix A) in order to ensure the consistency during the interviews and that the questions are answered systematically in addition to have the interviews on track. In fact, the use of an interview guide through all interviews has improved the data accuracy and comparability for analysis and between the two cases.

In addition, all the semi-structured interviews questions were prepared before the meetings. The researcher has chosen to write and take notes of the interviewees' answers because participants do not like to record their answers by a tape recorder. The answers after analysis and editing were reviewed with the interviewees to insure the validity of data.

Furthermore, the semi-structured interviews were focused on gathering data and information that is difficult to be collected from other sources. The interviews covered BSC pre-implementation; implementation; post implantation stage and operations management improvement through the BSCs.

The last interview was conducted on the 19th of November 2013. A

total of 34 responses out of 36 were achieved (response rate 94 %). Two responders one from EWA and one form MOW were scheduled but could not be interviewed due to unavailability in Bahrain.

b) Selection criteria of participants

After the case study selection, it is important to ensure the participants will meet the selection criteria where they need to:

- Be involved in the BSCs implementation process.
- Have experiences about the organization performance before and after the implementation of the BSCs.
- Be willing to share knowledge and experience and to contribute in the research.

3.4.2.3. Focus groups

The researcher has invited twelve people through written invitation to participate in the focus group sessions in order to get the anticipated group size. Nine out of twelve agreed to participate (response rate 75 %). The invitation contains information about the research objectives, focus groups purpose, location, date, time and the length of the focus group sessions. The researcher follow-up the invitees through phone calls to confirm their attendance.

Six focus group sessions were conducted for Electricity Distribution Directorate (EDD) and Distribution Control Center (DCC) BSCs development through the validation and application of the BSCs roadmap (Appendix B). Each focus group session has lasted for two hours where the researcher worked as a moderator to keep the group focused and on track to achieve the maximum members' participation and responses.

Moreover, the researcher has started the focus group session with an introduction about the purpose of the session, its length, how the data will be used and explained the planned progress in addition to some related data presentations and handouts which were used to improve the members' contribution. At the end of the session, the researcher compiled the written information from the session including notes about the overall performance of the session.

When all focus group sessions are completed, the researcher has analyzed the written focus group reports and notes using qualitative data analysis methods. The researcher started to analyze each focus group session step by step as the BSCs suggested roadmap.

3.5. Data analysis Overview

The research data analysis started with the two case studies profiles which presents an introduction about these organizations BSCs. Next, the researcher has discussed the BSCs implementation process based on the gathered data.

In order to organize the gathered information and data, the researcher has arranged them according to predetermined subjects related to the BSCs implementation stages. The classification of findings was established based on the conducted interviews' questions, observations' notes and content analysis' conclusions in order to enhance validity through cross checking the information and data.

In order to fulfill the research requirement, the code phrases and words were used based on the common terminologies of the BSCs as suggested by Kaplan and Norton in addition to the best practices in the literature review

(Kaplan and Norton, 2008). The collected data from data gathering methods has been analyzed and clustered into the following groups:

- Strategic content: vision, mission, values, strategic pillars and strategies.
- Available performance management system.
- Motivations for BSCs implementation.
- Preparations for BSCs implementation: analysis, training, consultancies and allocation of resources.
- BSCs design: themes, perspectives, objectives, KPIs and strategy map.
- BSCs usage: performance targets, BSCs automation tools and programs, initiatives, improvement programs.
- Performance analysis: periodic reviews, correction plans for poor performance and feedback to related processes.
- Performance evaluation: checklists of performance evaluation, schedules of evaluation, higher management involvement in evaluation process.
- BSCs cascading: BSCs deployment and alignment.
- Individual BSCs: linkage to rewards and compensation systems, linkage to performance appraisals and linkage to other related departments and units.
- BSCs implementation pitfalls: failures causes, difficulties and shortcomings.
- BSCs advantages and benefits: strategic and operational benefits, performance measurements and strategy management benefits.

CHAPTER FOUR: ELECTRICITY AND WATER AUTHORITY (EWA)

4.1 Introductions

4.2 Case Site Selection

4.3. Selection Criteria of Participants

4.4 Data Analysis Overview

4.5. Overview of the Organization

4.6. Reporting the Findings

4.7. EWA Operational Business Unit Example

4.8. Operations Performance Improvement Examples

CHAPTER FOUR: ELECTRICITY AND WATER AUTHORITY (EWA)

4.1. Introduction

In the previous chapter, the research methodology was defined and the most suitable research instruments were chosen in order to achieve the research objectives. The purpose of this chapter is to present the gathered data, information and the key findings through the different techniques from EWA. In addition, it provides a short background about EWA and its BSCs implementation process where further detailed explanation of the design, implementation and use of the BSC at EWA is provided in the following sections.

4.2. Overview of the Organization

EWA is a service industrial organization from the Bahraini public sector. Its workforce is around 3500 employees with different professions and managerial positions working at EWA 17 directorates. EWA has the following managerial levels (it will represent the BSCs levels later on):

- Top management level (executives).
- Middle management level (Directors).
- Operational level (chiefs and heads).

The Kingdom of Bahrain is a small island which is located in the Arabian Gulf. EWA is the authorized service provider for electricity and

water in the Kingdom of Bahrain for the domestic, commercial and industrial sectors. There are currently three electricity and water generation stations and two electricity only generation stations in the Kingdom of Bahrain with a total capacity of approximately 4 gigawatt of power.

4.2.1.Electricity sector

As a result of the economic and population growth, electricity consumption has increased over the past years from an annual peak load of 1,216 MW in 1999 to 3400 MW in 2013. The kingdom of Bahrain electrical grid that includes the transmission and distribution networks is owned and operated by the Electricity and Water Authority.

Electricity and water prices are subsidized by the government of Bahrain and kept at low levels compared to other neighboring countries. The low prices of providing electricity and the increasing population growth in additional to the economic growth has resulted in a high increased consumption of electricity. EWA estimated that electricity demand is growing by an average of 7 percent annually. Bahrain has one of the highest per capita energy consumption rates in the world although that electrical power is produced using gas and steam turbines which are very costly to operate.

Many steps were taken by the Kingdom of Bahrain in order to assist EWA in meeting the growth in power and water demands. Bahrain encouraged independent power producers' developments and has laid the governing framework for the privatization. The Government of Bahrain in 2003 moved in the direction of liberalizing power generation. In 2007 EWA finished its first private power project, Al Ezzel independent power

producer. Al Ezzel is a gas operated power station where the commercial operation was started in April 2006 with a capacity of 470 MW and reached its whole capacity of 950 MW in April 2007.

EWA sold Al-Hidd Electricity and water generation station in 2007 which was the largest power plant in the kingdom of Bahrain to an international company for USD 738 million. In February 2012, Al-Ddur power and water station started operations with a production capacity of 1234 MW and desalination capacity of more than 48 million gallons per day.

Moreover, Bahrain network is now linked to the Gulf Cooperation Council interconnection grid (GCC). The electricity demand in GCC countries has increased at a rate of three times compared to the global average over the past few years. In 2004, The Gulf Cooperation Council (GCC) planned for a combined power grid where the first phase of it was accomplished in the first quarter of 2009 by connecting the networks of Bahrain, Kuwait, Qatar and the Kingdom of Saudi Arabia. The remaining GCC members, United Arab Emirates and Oman were connected into the grid by the end of 2011.

The project goal is to secure the power supply of the members' countries especially in emergency cases and to help in reducing the costs of the generation in GCC countries. With the current GCC interconnected grid, Bahrain can import 600 MW from other members of the regional grid.

4.2.2. Water sector

According EWA, Bahrain current water usage is more than 114 million gallons per day and it is expected to reach an estimated 140 million gallons per day by 2018. Similar to the electricity process, the water prices are also subsidized by 60 percent of the actual costs to the consumers by the Kingdom of Bahrain government. The water resources are generally from nonrenewable groundwater extraction. 67 percent of water in Bahrain is supplied through desalinization plant and the remaining from the underground water.

The Kingdom of Bahrain uses cogeneration method for desalination of water which is a costly process that involves consumption of huge amounts of fuel to generate the needed heat to extract pure water from sea water. In order to improve productivity, minimize costs and reduce the usage of nonrenewable resources of fossil fuel, The Electricity & Water Authority is looking for new successful technologies that were implemented in the area such as implementing reverse osmosis method.

4.2.3. Renewable energy sector

It has been declared that the Kingdom of Bahrain aims to start implementing renewable energy projects. Bahrain 2030 Vision includes a goal regarding the generation of 5 to 7% of the Kingdom of Bahrain needed energy through renewable sources. In 2014 a renewable energy projects of 5 MW, containing a solar energy panels was installed by an American company which is Petra Solar and start operating in two locations in the Sukhair area. One of these locations is near to Bahrain Petroleum Company offices in Awali and the other location is at the University of Bahrain.

4.2.4. BSCs at EWA

Electricity consumption in Bahrain has doubled compared to the past 10 years. Taking this into consideration, in addition to the continued development, has necessitated that EWA should review its vision, mission and how to successfully execute its strategy. As said by the EWA top management that BSCs approach is a very useful instrument which assists EWA in establishing its master plan and aligning it to the Bahrain 2030 Vision.

EWA is a service industrial governmental organization which provides very important services to customers. Many of its operations are critical through the different types of processes: generation; transmission; and distribution. EWA aims through implementing the BSCs that it could improve its operations management to the desired performance level and to be aligned with its 17 directorates, Bahrain economic strategy and the 2030 vision.

4.3. Reporting the findings

The findings are divided into three main parts based on the gathering data used instruments. As mentioned earlier, the researcher data gathering techniques are semi-structured interviews, observations, focus groups and content analysis.

4.3.1. Content analysis

The content analysis was one of the secondary data sources of this research through the revision of the available documents, performance

reports, procedures and historical data archives. The researcher divided the content analysis work based on the available sources as the following:

- Historical data archives.
- BSCs implementation documents and procedures.
- Performance reports.

The content analysis was used firstly to gather basic data and information about EWA which was very helpful for the researcher while preparing the semi-structured interviews questions. Furthermore, content analysis data was supportive for cross checking with the semi-structured interviews data and observations notes.

4.3.1.1. Historical data archives

The researcher has reviewed EWA available annual reports for the years 2003 to 2007. These reports were prepared manually and published by EWA before implementing the BSCs through its different directorates. In addition to that, the researcher has reviewed the directorate performance annual reports for the years 2010 to 2013.

For the aim of evolution EWA overall operations performance before and after the implementation of the BSCs and whether its performance of operations management has been really improved due the implementation, the researcher has investigated the different used performance measures at EWA over 10 years period as shown in the following sections.

The performance data was also extracted from the BSCs software application, distribution network follow up application, distribution control application and the fault reports center.

4.3.1.2. BSCs implementation documents and procedures

These are the training material of the BSCs team and the office of strategy management such as the Palladium Kaplan and Norton BSCs certification boot camp which is a specialized course conducted by BSCs founders. In addition to that, the researcher has reviewed the workshops and meetings reports and documents for the EWA BSCs implementation process. Actually this data was beneficial for the researcher later on while developing the BSCs implementation roadmap. Moreover, it has guided the researcher to some of the obstacles for the implementation process and how EWA were able to overcome them. Furthermore, the researcher was able to study EWA key performance indicators manuals in order to know their definitions and the calculation methods which actually embedded in the BSCs application software.

4.3.1.3. Performance reports

There are many different types of performance reports at EWA which differ from one directorate to another according to its type of work and expertise. Many of the common performance reports through the operational directorates are the following:

- Daily reports, weekly reports, quarter reports, semiannual reports and annual reports.
- Operations reports, maintenance reports and commissioning reports
- Abnormality reports
- Construction reports and reinforcement reports.

Furthermore, the distribution improvement report by EWA consultant (Electricity Supply Board International (ESBI)) and summer performance plans (by EWA) have provided the researcher with the recent network performance data.

The analysis of these documentations and performance archival records was necessary to serve as introductory research which has provided the researcher with insightful information and data before the semi-structured interviews started. The most important documentations were regarding EWA BSCs have been used by the researcher in preparing the semi-structured interviews questions.

After that the researcher complemented the documents reviews with the interviewees' answers in order to come up with comprehensive analysis.

4.3.2. Semi-structured interviews

The researcher through cooperation with the office of strategy management at EWA has designed the interviewing period into three parts. A schedule of different meeting was arranged as shown in Appendix (A). The semi-structured interviews arrangement is to have daily meetings for one week, weekly meeting for one month and then two meetings per month for three months. The interviews were started at the second week of February 2013.

The first week meetings were spent with EWA strategic planning unit and the office of strategy management team in order to gather the required data and information of BSCs.

4.3.2.1. The first cycle interviews

The first cycle of the semi-structured interviews focused on the pre-implementation stage of the BSCs through questions that covers the following areas:

- Current situation of performance management at the organization.
- Motivation to implement a performance management system.
- The reasons for choosing the BSCs approach.
- The preparations for BSCs implementation.

The participants in the first cycle of interviews were mainly from the office of strategy management and the BSCs coordinators from the different directorates at EWA. The semi-structured interviews were conducted at the office of strategy management at EWA headquarter. The interviews with the BSCs team were conducted at each employee office in the different directorates. In total, nine out of eleven targeted people were interviewed with a response rate of 82% at EWA.

4.3.2.2. The second cycle interviews

The purpose of the second cycle semi-structured interviews was to find out further details regarding the BSCs implementation stage in addition to the participant's points of views and opinions about the encountered problems. The second cycle interviews questions covers the different BSCs implementation stages including: planning; design; usage; cascading and alignment; performance reporting; and automation.

The semi structured interviews were conducted at each employee office in the different directorates. Most of the participants were BSCs coordinators and from the BSCs measurement team with a response rate of 84%.

4.3.2.3. The third cycle interviews

This cycle semi-structured interviews focused on validating and cross checking the gathered data and information from the previous interviews. In addition to that, the third cycle interviews question covers the following areas:

- Performance revision through the BSCs.
- Performance evaluation.
- Strategy and strategic objectives updating process.
- Key performance indicators updating process.

The semi-structured interviews were conducted with the BSCs core team and EWA middle management with a response rate of 77%.

4.3.3. Interviews data analysis

As mentioned previously in the research methodology, the researcher has chosen to write the participants answers during the interviews. After finishing the interviews, the researcher has typed all the semi-structured interviews questions along with their answers which have been confirmed with the interviewees in order to increase the validity and reliability of data.

4.3.3.1. First cycle semi structured interviews

a) Strategic content

According to the first semi-structured interview with the office of strategy management chief, EWA strategic content could be summarized through its vision, mission and values.

EWA Mission: Provide electricity and water services to all sectors in the kingdom of Bahrain with the highest reliability and quality and with the optimum utilization of the available resources.

EWA Vision: we will proactively support the kingdom of Bahrain's economic development through:

- Smart investment in key infrastructure.
- Improved customer experience.
- Efficient, dynamic process.
- Skilled people working together for you in a safe environment.

b) The need for the BSC

The participants answer the researcher question about why the BSCs system has been introduced at EWA, as well as the motivations behind the introduction by the following:

- The government orientation for its ministries and authorities for applying performance management systems.
- Drive accountability for a smooth transition from a Ministry entity to an authority.

- Develop and embed a performance oriented culture for tangible results.
- Increase focus on improving customer experience.
- Align investments and initiatives to strategic objectives.
- Drive team work across directorates; to solve issues across the critical processes.

c) The beginning of BSC at EWA

In 2006, EWA top management has conducted several workshops in order to decide which approach they are going to apply to manage their organization performance and to align EWA strategy with Bahrain 2030 Vision. These workshops have resulted in choosing the BSCs as EWA strategy and performance management system. In addition to that, an experienced consultant was chosen in order to assist EWA in the BSCs implementation steps. An initial working committee was established to take care of the BSCs implementation projects includes EWA leaders from the chief executive, vice chief executives and directors.

EWA committee started its work by reviewing the existing vision, mission, strategy and values. In addition to that, SWOT analysis was used to assess the needed changes especially to support the alignment with Bahrain 2030 Vision and the economic board strategy. As a result, the existing vision, mission and strategies were established aiming to better represents the authority. Furthermore, this committee was more refined to become EWA BSCs team. "It was an innovative idea to have a specialized team leading the adoption of the

balanced scorecards at EWA" as stated by Yasser Al-Hamad, EWA public relation chief. In addition to that, EWA tries to benefit from the best practices for BSCs implementation as suggested by its consultants, which was clear from their implementation steps in the following sections.

d) EWA BSCs team

EWA after reviewing others organizations implementation stories with consultant, followed certain steps in order to overcome their failures. One of these steps was to establish the BSCs team that consists of three groups:

- **Leadership group**: It consists of EWA top management, chief executive, vice chief executives and directors. The leadership group champions the process and is responsible for taking the strategic decisions and fully participates and leads BSCs management workshops and performance reviews. Moreover, the leadership group provides the needed resources and oversight support for the core team and the measurement team.

- **Core group**: It consists of specialists in the BSCs from EWA and consultants and responsible for the development of the implementation plan and to lead the execution process by working as a facilitator while creating the BSCs components and the strategy map. In addition, the core group is the kernel that will become later the office of strategy management.

- **Measurement group:** It consists of employees from different directories (chiefs and heads) who are experts in the key processes data measurements and responsible for measures and updating of data. Measurement group is responsible for developing comprehensive definitions of measures, key performance indicators and their targets in addition to identifying the data sources for them. Usually the measurement team involves of professionals who are exposed to the daily activities and operations.

e) BSC core group training

In order to insure that EWA core team has the needed knowledge, skills and competencies, EWA management has sent core team members for BSCs training (Boot Camp) which was done by Kaplan and Norton themselves. Moreover EWA core team consists of employees with different experiences and professions such as information technology professionals, performance management experts and strategy analysts.

f) Employees BSC awareness

EWA initiated an awareness campaign which was targeting its employees in order to educate them regarding the BSCs and performance management. EWA distributed a lot of banners and booklets through its directorates and conducted a program of seminars at its training center for all of its employees.

4.3.3.2. Second cycle semi structured interviews

The questions of the second cycle were focused on EWA BSCs implementation procedure. In addition to that, the researcher through certain questions was seeking to discover the obstacles that EWA found through BSCs implementation and how they were being overcome.

a) The strategy focused organization

EWA has followed the strategy focused organization best practice approach in developing its balanced scorecards. The strategy focused organization steps for implementing the BSCs was suggested by Kaplan and Norton as exhibited in Figure (2) (Kaplan and Norton, 2001).

EWA has translated the above mentioned steps of the strategy focused organization as the following:

- EWA leaders are committed and continue to actively drive change from the front as explained at Appendix (C).
- EWA translated its strategy into operational terms through its strategic themes, strategic objectives and key performance indicators combining all of them through cause and effects relationships in the strategy map.
- EWA directorates are aligned and increasingly working together as one team across boundaries to resolve issues. BSCs are cascaded down and aligned from customer to operations and then to enablers. EWA started at July 2007 with 28 people and



Figure (2)
The strategy focused organization steps to implement BSC, (Kaplan and Norton, 2001)

at October 2014 there were 400 people working together for the BSCs.

- EWA is motivating for strategy through active awareness program, and My HR initiatives will help align personal objectives and incentives to drive desired behaviors in addition to the plasma screens, posters, newsletters, awareness sessions and rewarding performance.
- EWA Governance process: EWA based on its monthly theme review and quarterly strategy review meetings where monthly theme meetings are dealing with hot issues. EWA makes the strategy execution a continuous process.

Basically, EWA develops its strategic objectives based on four strategic themes and four BSCs perspectives linked through cause and effect relationships in the strategy map. EWA realizes the cause and effect relationships in its strategy map as: **If our employees are enabled and have the required skills, they will be able to implement and accelerate the process in a dynamic and efficient manner. This will lead to customer satisfaction as their needs are met resulting in on-time payment leading to the financial growth of EWA.**

b) Strategic themes

EWA BSCs teams started a series of workshops in order to breakdown EWA strategy into 24 main strategic objectives. Moreover, the team focuses its effort to come up with four strategic themes that works as the basic foundation of its BSCs performance management

system. Strategic themes workshops that involves the chief executive, vice chief executive, and directors were arranged according to the BSCs implementation calendar (was prepared by EWA BSCs team, EWA consultants and approved by EWA chief executive). The method of breaking down EWA strategic content (vision, mission, strategy and values) into main strategic objectives was done through workshops involved brainstorming, open discussion and focus groups. EWA consultant worked as a facilitator through these different activities.

Big white board was used by EWA facilitator in order to arrange the agreed results through these activities. The starting point was writing up EWA goals around its strategy through brainstorming session. After that, these goals are summarized and clustered into categories according to the similarities among them. These categories were discussed through focus groups which were directed by the vice chief executives. Finally, EWA came up with four strategic themes and 24 strategic objectives.

In addition to that, EWA BSCs team according to EWA top management has setup EWA strategy cycle to be for five years where the first version started at 2007 and ends at 2012. EWA second version of its BSCs has started a new cycle in 2013 with an updated strategy which will last till 2017. In 2007, the corporate level BSC of the EWA was ready. Based on the strategy focused organization methodology for BSCs implementation, which was applied over 12 workshops for the BSCs team and 8 top management meetings, EWA BSCs system was designed for the corporate level.

EWA has defined its four themes as the following.

- **Deliver operational excellence**: Streamlined, efficient and optimal processes that enable faster and integrated response and management with the most effective quality control.
- **Serve customer needs**: Working efficiently to deliver reliable, responsive, timely and consistently high quality products and service to all customers.
- **Grow with Bahrain**: Building the end to end capacity to meet demand and support the growth of Bahrain through effective decision making and transparent allocation of resources to key priorities.
- **Foster a caring and enabling environment:** A professional organization, with motivated, skilled, and accountable individuals working together across directorates as one team.

Due to the reason that EWA is a service public sector organization, all its themes are focused toward improving operations management and better serving citizens with high quality services and customer satisfaction. This approach is complied with what was suggested by Kaplan and Norton.

EWA chief executive has mentioned that team work was one of the empowering advantages among EWA workshops. Furthermore, EWA office of strategy management chief has recommended that the BSCs team should include managers from all directorates who work for EWA more than ten years and in different locations in order to ensure that they have enough knowledge and experience. In addition to that, offices of

strategy management members were chosen by EWA chief executive which shows the importance of the BSCs for EWA top management and their endless support.

c) EWA BSCs perspectives

After the final agreement on the strategic themes, EWA BSCs team through the continued workshops and meetings with EWA consultant has developed the strategic objectives. In the first version of the corporate BSC, EWA chose to apply the standard form of the BSCs.

- **Financial Perspective**: which is reflected through four strategic objectives as the following
  - Achieve a sustainable EWA with an appropriate ROI (3 measures).
  - Optimize cost to serve (8 measures).
  - Maximize revenue through segmentation (1 measure).
  - Achieve net revenue growth in line with economic growth (1 measure).
- **Customer Perspective**: which is reflected through three strategic objectives as the following:
  - Provide me with a high quality and reliable product (1 measure).
  - Meet my needs through quick, responsive service (3 measures).
  - Have the capacity to meet demand (6 measures).
- **Internal Processes and Systems Perspective**: one of the most important perspectives at Electricity and Water Authority which is obvious through its following twelve strategic objectives:
  - Excel in core process (9 measures).

- Establish and implement quality assurance and standards (1 measure).
- Manage EWA resources effectively (5 measures).
- Excel in customer relationship management (6 measures).
- Drive conservation (3 measures).
- Build customer awareness (3 measures).
- Excel in planning and risk management (4 measures).
- Optimize electricity and water sourcing (3 measures).
- Achieve efficiency through proactive partnering and alignment (1 measure).
- Drive sufficient investment in water and electricity infrastructure (5 measures).
- Minimize non-revenue consumption economically (2 measures).
- Excel in customer delivery process (5 measures).

▪ **Leaning and Growth of Employees of EWA Perspective**: which is reflected through five strategic objectives as the following:

- Be a caring organization (1 measure).
- Foster effective leadership, skills and competencies (4 measures).
- Improve communication through enhanced knowledge management and decision making systems (2 measures).
- Foster a culture of empowerment and strategic accountability (2 measures).
- Work as a team across EWA (2 measures).

All EWA BSCs perspectives have the same importance score. As mentioned by the chief executive, EWA is a non for profit organization but the financial perspective strategic objectives focused on better

utilizing of budget and assets and in the same time reducing operating costs.

d) EWA performance measures

EWA BSCs team in cooperation with consultant has prepared simple criteria for selecting performance measures and key performance indicators. Measures and key performance indicators role is to evaluate the validity of the strategy, evaluate the organization performance and test the progress in achieving strategic objectives.

EWA believed that measures should not be used as a tool to identify culprits, to award or punish people. Measures should be used to establish discussions about the bad performance and problems and how to find solutions and corrective actions. Aiming to build a systemic approach for selecting and creating the performance measures and the key performance indicators for all directorates, businesses units and processes at EWA, the following criteria was established by the BSCs team, office of strategy management and EWA consultant.

- **EWA Criteria for measures selection**

  - **Strategic communication**

    The selected measures should suitably link and focuses on the organization strategy and should not disperse attention, distorts performance or underestimate behavior. It should be evaluated through top management by comparing each measure against strategic objectives.

- **Repeatable and reliable**

  Are the measures quantifiable, reliable and repeatable?

- **Frequency of update**

  Updating frequency is important and should be meaningful on a monthly or quarterly basis cycles. Annual cycles should be considered.

- **Usefulness for target setting**

  Meaningful targets for improvement could be established and practical for establishing accountability for measures

- **Useful to establish responsibilities**

  Teams could define responsibilities for each measure by drilling down for more details.

The BSCs team used the above mention criteria as wide guidelines for developing and selecting the performance measures and KPIs through a serious of meetings and workshops which were directed by vice chief executives.

Performance measures workshops were divided into three parts. First part was concentrated in reviewing the main processes and business units at EWA which directly affects its overall performance. It has been agreed about these processes to be generation, transmission, distribution and customer services. The second part of the workshops was allocated for reviewing the strategic objectives through the supporting business units. In addition to that, the existing measures and KPIs were evaluated for its usefulness and whether it is enough for each strategic objective to use what available or develop new measures and KPIs. The third part of the workshops was the most important part where the BSCs team

members and the EWA sections' chiefs in addition to the business units' heads were in the final stage of defining the performance measure.

Initially, they decided to check the approved existing measures from the previous workshops. Then, any missing measure that is related to certain objectives especially these objectives which did not have any measure were reviewed with consultant. Suggestions in this regard were evaluated between the gathered groups. Finally a preliminary set of measures and KPIs were approved and it has been decided that each concerned section should assess its relevant measures and the feedback is going to be discussed in the strategic performance reviews. Moreover, EWA has employed a specialized company to study its set of KPIs in certain areas such as human resources and customer relationship.

e) BSC components owners

EWA top management believed that in order to get things done, certain responsibility and accountability should be there. Due to that EWA BSCs team has defined four levels of BSCs ownerships. EWA applied a hierarchy of management through the BSCs ownership in attempt to reflect the managerial positions through the BSCs system. Appendix (D) is showing EWA organization chart. The different ownerships of the BSCs components at EWA are as the following.

- **Theme leaders:** responsible for the overall performance of EWA strategic themes and strategic objectives within each theme by coordinating with relevant objective owner. Usually vice chief executive are the theme leaders.

- **Objective owners:** EWA defines two types of objective owners as the following:
  - **Objective management owner**
    - Strategic Governance Responsibility.
    - Work with respective theme leader to review objective performance, reaching conclusion on the key issues affecting the objective.
    - Act as initiative leader coordinating across directorates and sections to ensure initiatives are delivered, and constantly checking relevance to closing the performance gap.
    - Responsible for working with own theme leader to reach conclusion on the theme performance, highlight key issues and areas requiring decisions and actions.
    - Usually EWA directors
  - **Objective delivery Owner**
    - Functional Responsibility.
    - Accountable for delivering the objective, and working with objective management owner and theme leader to identify issues and propose solutions.
    - Supports initiatives through ownership, resourcing and sponsorship; highlighting potential pitfalls in closing performance gap.
    - Usually EWA sections chiefs.
  - **Measure owner**
    - Functional Responsibility
    - Responsible for gathering relevant information and tracking the measure, to help objective and theme leaders understand

the performance and highlight key issues for discussion and resolution.

- Usually EWA business units heads

f) EWA Strategy Map

EWA strategy map for 2007-2012 contains 24 strategic objectives. Four strategic objectives are relative to the financial perspective. Dr. Abdulmajeed Ali Alawadhi the Chief Executive is the owner of "Achieve a sustainable EWA" strategic objective.

Under the customer perspective there are three strategic objectives while under the internal processes, EWA has twelve strategic objectives which emphasize on the importance of the operations management through this perspective and through the operations excellence strategic theme.

The learning and growth perspective has five strategic objectives. EWA strategic themes are clearly shown in the strategy map with a unique color for each theme. Three themes are intersecting vertically though the perspectives while foster caring organization theme is placed horizontally and aligned to the learning and growth perspective to work as enabler to the other themes.

The cause and effects relationships are clear in EWA strategy map which show how achieving certain objectives will positively affect other strategic objectives. In addition to that, EWA strategy map clearly shows the alignment to the Bahrain 2030 Vision and how achieving EWA strategic objectives will assist in achieving Bahrain 2030 Vision

objectives. Figure (3) represents EWA corporate strategy map 2007-2012.

After getting the corporate strategy map ready, EWA has started again another BSCs awareness campaign for its employees and strategic partners such as GCC electrical link control and EWA contractors through printed newsletters and training seminars.

g) Performance targets

The participants responded to the researcher questions regarding EWA performance targets that it should be more systematic than the actual situation. EWA defines targets based on the performance measures types. The outcome measures and performance drivers' targets are different in nature. Moreover, financial measures and non-financial measures are also different.

EWA has used its historical information data about performance in order to develop its performance measures targets for certain measures while it has used international figures for other KPIs. Furthermore, for certain measures, EWA used its experts' opinion to setup performance targets.

In addition, EWA has employed a specialized company to conduct performance survey through EWA customers in order to setup reliable targets which actually improve EWA operation management and performance.

In conclusion, EWA used three main techniques in defining performance measures and KPIs targets based on its types. EWA could use the historical data, surveys, international figures and experts' opinion.

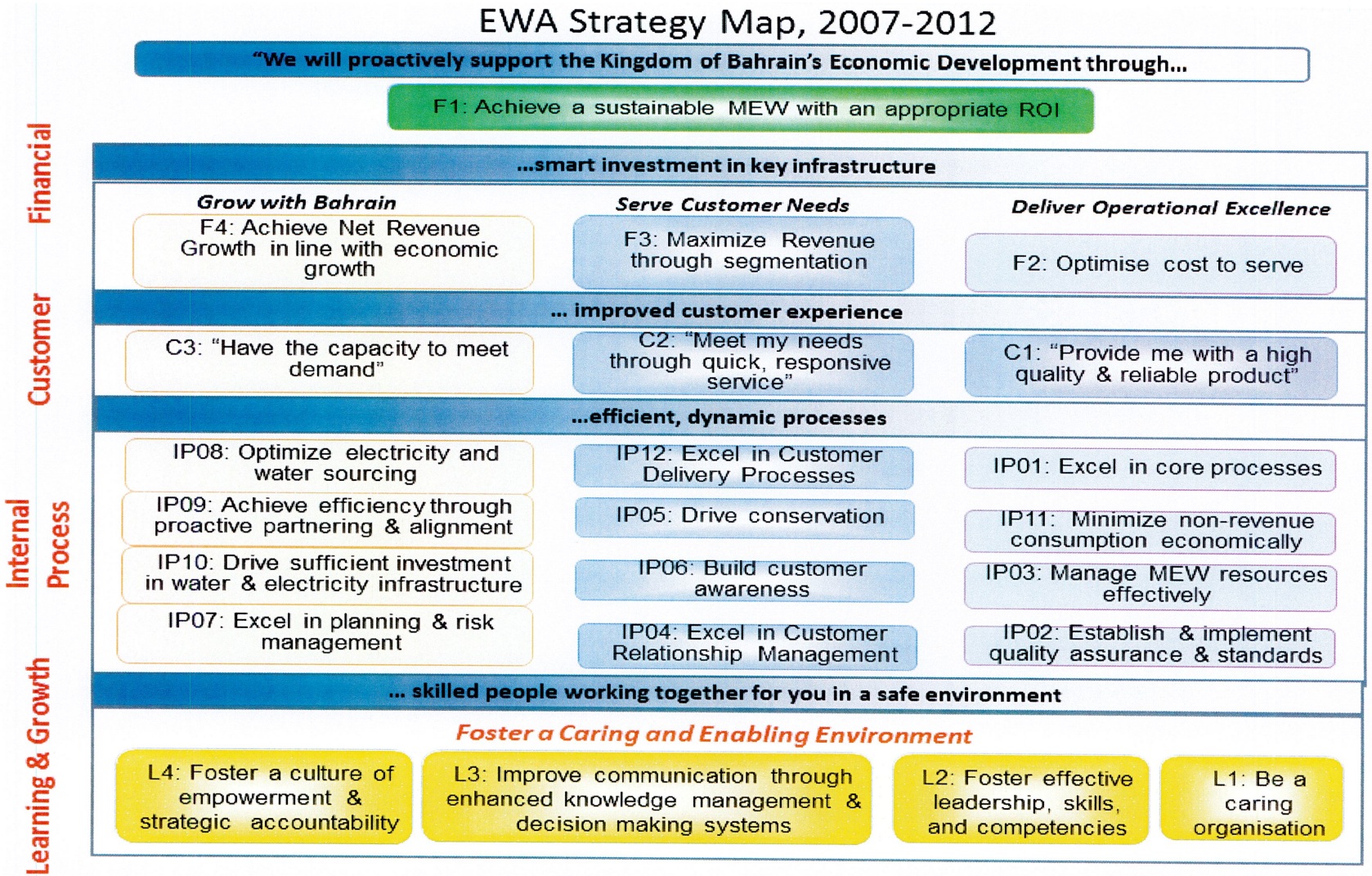


Figure (3)
EWA strategy map 2007-2012, (EWA OSM, 2007)

EWA management usually changes its performance targets after the annual strategic and operational performance reviews.

After the performance targets are decided, measures' owners will update its performance values based on its frequency. Objectives owners will keep eyes on the performance of certain objectives that actually are behind targets. Discussions through operational reviews will come up with certain initiatives or programs in order to close the gap between actual performance and targets.

h) Initiatives and programs

Semi-structured interviews participants were asked about EWA initiatives and programs applications. The researcher could define three types of initiatives at EWA.

- **Strategic initiatives**: it has an overall effect on the organization through all main and support directorates such as changing the working hours at EWA, and the working environment in certain directorates.
- **Operational initiatives**: it has direct effects on certain directorate such as using modern vehicles for EDD for isolating and locating faults. Another example is the establishment of maintenance depots for Muharraq, Riffa, Budaya and Manama which have dramatically improved operations and maintenance performance.
- **Improvement programs**: are systematic yearly improvement programs of EWA network and equipment such as high voltage reinforcement schemes.

Furthermore, EWA established its own system of governing BSCs initiatives and programs by establishing specialized committees for each initiative or group of initiatives such as reinforcement committee, renewable energy committee, and system upgrade committee.

In addition, these committees usually are directed by a person from the higher management such as vice chief executives or the chief executive himself. In order to effectively manage these initiatives, EWA has established a system of regular performance reviews and reporting which is linked to the BSCs software.

In summary, when the objective owner found it is needed to apply certain initiative in order to match the actual performance with EWA targets, he will discuss this issue in the performance review. EWA management will agree about the needed solution as an improvement initiatives and whether it should be governed by a committee or the objective owner himself.

Furthermore, this process of managing initiatives usually has certain constrains which are mainly budget, time, human resources and equipment. Usually for the strategic initiatives at EWA, its requirements will be decided and approved through the annual performance review meetings. These initiatives are usually implemented on the long term and with huge resources and requirements such as constructing primary substations or installing earth fault indicators in all secondary substations.

For prioritizing performance initiatives, EWA established a system of weekly operational meetings for the cross functional team members with the top management in order to discuss the pending operational

issues between different EWA directorates and agree about the required initiatives based on the needed resource and the strategic importance of each initiative.

i) Performance reporting

Due to the different nature of EWA directorates, it was so important for them to have a performance reporting system that could be suitable for all of these directorates and in the same time capable of interpreting the needed data. EWA has applied three types of performance data reporting as the following:

- **Performance measures situation**: using the traffic light colors to indicate the situation of that measure and the corresponding strategic objective. EWA defines three statuses:
  - Green: Good performance.
  - Yellow: lower than targeted.
  - Red: Poor Performance.

- **Measures data value**: depends on the type of measure and the requirement of the department to have the data in numerical form, charts or graphs.
- **Initiative reporting:** each initiative has an owner who is kept accountable of progress that is shown using the same traffic light colors but in special forms to clearly distinguish between the performance of objectives and initiatives.

Furthermore, the complication of EWA organizational structure where it has around 3500 employees in 17 different directorates, necessitated that EWA should use a suitable software application to handle the huge amount of performance data.

j) BSCs automation

EWA after having all the BSCs components ready and in use, they have evaluated the situation and the number of measures and KPIs data. The results were discussed in the strategic performance review meeting and with EWA consultant. The decision was to evaluate the available BSCs software application based on the following issues:

- **Usefulness:** the application could be flexible and has the capacity to handle huge amount of data and in different formats (numerical, graphs or charts).
- **Capability of integration with existing applications:** many applications are used within EWA and with other public sector utilities where the BSCs application should have and interface with these applications.
- **Evaluation and analysis:** The application should have evaluation and analysis tools for measures performance data.
- **Flexibility for customization:** The application should be easy to customize certain features as the needs of EWA.
- **Levels of authorization** the application should provide different levels of authority according to the user role.

4.3.3.3. The third cycle semi-structured interviews

The last cycle of the semi-structured interviews was used as mentioned earlier to cross check the participants' answers in order to increase validity and reliability of data. Furthermore, these interviews focus on the performance evaluation and analysis stage at EWA in addition to the strategy, strategic objectives and measures updating process.

a) Performance reviews

Mainly there are two types of performance reviews at EWA, the strategic performance reviews and the operational performance reviews. Strategic performance reviews are usually for the corporate BSCs level and involved EWA chief executive, vice chief executives and directors. The frequency of strategic performance reviews is quarterly, semiannually and annually. For quarter strategic performance reviews, the situation of certain KPIs will be discussed along with the progress of the related initiatives. In the semiannual strategic performance reviews, the situation of the strategic objectives along with their measures and initiatives will be discussed. Accordingly, correction actions will be taken and implemented through cross functional team to minimize any delay. The annual strategic reviews will focus on EWA strategies and validity of the strategic objectives which could be modified or changed accordingly. These reviews work as a feedback for EWA strategy which could be updated based on the results.

The establishment of the cross functional team at EWA was an innovative idea where it includes key employees from all directorates at EWA. Regular meetings arranged between the cross functional team to

solve any pending issues that affect EWA operations and performance. Recently EWA has enlarged its team to include its partners form other utilities or main customers.

b) BSCs cascading and business units alignment

EWA BSCs implementation process as suggested by Kapan and Norton through the strategy focused organization approach has started by the corporate level (Kaplan and Norton, 2001). After making sure of the successful implementation of the corporate BSCs, EWA BSCs team has decided to cascade down the BSCs to the directorate level.

EWA decided to use the same four strategic themes and the four BSCs perspectives in order to have better alignment between business units and corporate level. In addition to that, EWA has seen the strategic themes as general wide objectives that evolve form the strategy. EWA considered the BSCs perspectives as the best view angles that they should see their objectives through and due to that it should be fixed for all managerial levels as mentioned by the strategic planning unit chief.

The office of strategy management members and the BSCs team members when asked about cascading the BSCs to below the directorate level, their answers were as the following:

- Still EWA needs more time to develop its workforce at the frontline capabilities and knowledge about performance management and BSCs.
- It will need investment and resources which unavailable now.

- There are certain constrains of regulation and procedure which needed to be updated before going forward in cascading the BSCs to lower levels especially for the support directorates.
- It needs arrangement with Bahrain center of excellence and the civil service bureau.

4.3.4. Observations findings

The researcher used to take notes about the daily observations in the period of the 7th of December 2012 till the 5th of June 2013. The gathered data and information where analyzed, edited and discussed with the office of strategy management team and the concerned staff from the different directorates to insure the validity of data. The researcher has classified the gathered data during the direct observations at EWA into the following:

- The revision of the performance measures values through monthly, quarterly and yearly reviews.
- The data administration process.
- Preparing performance reports and comparing it with the generated graphs and charts from ESM.
- Updating the performance measures data.
- Cascading the BSCs to other directorates.
- Awareness sessions of the BSCs.
- Training programs for the concerned staff.
- The governing process using BSCs.
- Evaluating the performance of different KPIs and applying the needed changes.

- The integration of BSCs measures and Bahrain Center of Excellence measures.
- The improvement at the operational departments after implementing the BSCs.
- The establishment of new operational KPIs.
- The establishment of new standard KPIs.
- The feasibility of BSC automation software.
- The movement toward the personnel BSCs.

Observations data gathering method has allowed the researcher to understand and get awareness about EWA working environment and how the daily activities and operations are performed. Furthermore, observations method has complimented the semi-structured interviews through comparing of what has been said by interviewees and what is actually happen. The researcher has made direct observations through many BSCs activities performance meetings. The findings from the observations data gathering technique are described through the following sections.

a) BSC awareness and alignment

EWA is a big organization which has a workforce of 3500 employees and due to the huge organization structure; these employees are diverse in their education levels. Due to this reason, EWA has spent of resources for the BSCs awareness and training programs although still EWA has the problem of lack of enough knowledge regarding the BSCs especially among the front line level of employees.

Furthermore, this lack of knowledge affects EWA operations performance where the operational level employees do not know how their work is contributing to EWA overall performance. For example, when EWA implemented an advanced technology to decrease the response time in answering complaints call but the frontline workers ignore these calls due to overload of work.

In addition to that, EWA partners such as measured term contractors are an important element that directly affects the operations performance where all the repairing work and maintenance work are done through them. The problem is that, contractors' performance is ignored in the performance measures and KPIs.

Similarly, the different public sector utilities are also ignored by the EWA BSCs while their performance directly affects EWA operations and overall performance. For example, if EWA target in clearing new supply connection request is one week and the wayleave from other utilities will take one month. EWA will never achieve this target.

b) Measures and KPIs

Due to the lack of awareness about the BSCs and how to deal with data and information related to the KPIs at the workers level, the BSCs team and the office of strategy management have depended on the BSCs coordinators for the measures data updating. As a result, many measures updating process will be delayed or not done in a proper way.

Furthermore, the lack of employees' experience who are updating KPIs causes errors and mistakes which finally need huge effort in tracking its sources and doing the needed corrections. What is more, some of these errors are difficult to be figured out, which finally will impact the whole performance assessment process.

One of the good points about the BSCs automation software is saving employees' time by entering the different performance data and BSCs information only one time and the different applications should extract it by an interface between them. At EWA, the interface between the applications needs more efforts to be applicable for all existing applications. Employees usually will get bored by entering the same data in many applications.

The KPIs feedback is very important for the related sections to have the final performance assessments especially if these KPIs depend on many measures for several departments. In the observed departments, these data were gathered and sent to management but no feedback is returned back to the concerned department.

c) Office of strategy management

This unit is responsible for the BSCs implementation, measures updating, performance reviews arrangements, initiatives progress monitoring and many other responsibilities through coordinating with the BSCs team and EWA directorates' coordinators.

According to the researcher observations, the eight people who were working in this unit, two of them were responsible for the executive strategy manager software support and three people were strategy analysts in

addition to three other people worked as BSCs facilitators. It was noticed that office of strategy management are very loaded by many tasks which may affect the quality of output.

d) Operations management and BSCs

It is clear from EWA BSCs and its strategy map, the focus is on the operations management through the following BSCs components:

- **Operations excellence strategic theme:** EWA reflects the importance of excelling in its main operations in order to improve the overall organization performance. The operations excellence theme clusters EWA main operations strategic objectives aiming to improve the operations management of these operations by integrating it with the BSCs.
- **Internal processes perspective**: which has the most number of strategic objectives, measures and KPIs due to that EWA is an industrial service organization and most of its objectives are within the internal processes which according to Kaplan and Norton involve the operations management activities (Kaplan and Norton, 2004).
- **Learning & growth perspective:** Empowering the workforce through hiring well qualified employees, seek assistance from worldwide experts, providing the specialized training programs for the core processes' employees and employing the most advanced information systems and equipment. For example:

- EWA employment candidates should have GPA above 3.0.
- EWA has signed a contract with KEEMA (which a professional company for electrical systems) and has employed ESBI as EWA consultant.
- Recently EWA has implemented advanced systems for managing its operations, financial affairs and customer relationship management.

▪ **Individual level BSCs:** An innovative initiative to cascade the BSCs to the individual levels was established by EWA which is called (MY HR). After setting up the BSCs system and insuring that the corporate level is finished and working in addition to the directorate BSCs level, EWA has moved to the individual level BSCs. The researcher through his interviews and observations found that it was better to cascade the BSCs to more managerial levels such as department level and business unit level then to the individual level.

e) Initiatives and programs

The BSCs have improved EWA operations management practice in many ways as described in the coming sections. Several important areas were ignored before due to the absence of relevant objectives or performance measures. For example, before the implementation of the BSCs, the faults in the distribution network were followed through the control system engineers and operations crew who will be send to the affected area. After isolating the faulty part, the job transferred form operation department to maintenance department who is responsible for repairing and then restoring back the affected area to main system. All

these activities were occurring without systematic performance measurement.

After the BSCs implementation, many measures were identified in order to track performance, and performance targets were defined aiming to improve operations management to the desired level to achieve EWA objectives and strategies. An example of the developed measures:

- Number of faults for each type: Transformer, cable, fuse, overhead line, low voltage board, circuit breaker, electrical busbar.
- Restoration time.
- Repairing time.
- Time form fault till restoration.
- Length of the cable x number of faults.
- Loading of transfer number of faults.

Using the above mentioned measures has opened new insights for improvements for EWA operations management. EWA now through the performance review meetings evaluates its measures and KPIs for its validity and usefulness and at the same time compares it to other utilities from the same sector such as Dubai Electricity and Water Authority (DEWA).

Accordingly, EWA keeps improving the performance through changing the measures' targets in addition to the recent usage of the international performance measures. Furthermore, the evaluation of the weaknesses in the current performance has guide EWA to improve its operations by solving and correcting the problems that have caused these weaknesses. For example, the delay in restoration time was found to be

most of the time due to the traffic in the roads, so EWA started an initiative of having different maintenance crews in the different areas all over Bahrain. Furthermore, the assessment of the repairing activities has guided EWA to that repeated failures are due to certain used materials in one case and wrong practices by contractors in another one.

f) Performance evaluation and analysis

EWA has used many resources and applications in order to analyze its performance data in the best way that could enable EWA managers of making the best decisions for managing its operations. The Executive strategy manager from Palladium which is the BSCs software application for EWA has many analysis tools for the performance measures and KPIs. Moreover, BSCs team is able to track and drill down for any performance historical information.

Furthermore, themes performance is also calculated and discussed through the strategic performance reviews. These meetings involved all EWA executives, directors, BSCs team members and office of strategy management members. In these meetings, usually strategic objectives performance data are discussed with the concerned owners and any needed actions will be taken and documented through the BSCs application.

g) Obstacles for BSCs usefulness at EWA

- **Shortage of resources**

One of the main obstacles for implementing the BSCs effectively is the absence or shortage of resources essentially at the planning and

designing stage as confirmed by the operations excellence theme owner at EWA.

Based on the researcher observations, doing the same thing more than one time while data entering for BSCs measures made people thinking that it's a useless process and they just want to finish it without any care of the quality and accuracy of their work. Furthermore, conflicting work priorities will lead to a situation that people will do the easiest tasks for them without focusing on the strategic important issues.

- **EWA organizational culture**

  According to the researcher observations, EWA current organizational culture is supporting the BSCs implementation process. The problem came from people who were not aware about the BSCs role at EWA and they consider it just another new management idea which will be changed soon by another one. These people negatively affect the performance management due to their resistance in performing the related BSCs tasks.

- **Communicating EWA strategy and linking it to operations**

  Not all of EWA employees are fully aware about its strategy or how to focus on the most important tasks and how to perform these tasks in such a way that could improve the overall performance. Furthermore, the disconnection between the main operations and EWA strategy in addition to the lack of knowledge about the importance of the BSCs has led to have employees without any

willingness to improve their performance and always assume it is satisfactory.

4.4. EWA Operational Business Unit Example

According to the research objectives about improving operations management performance of service industrial organizations of Bahraini public sector using BSCs, an example of an operational directorate is illustrated to show how the BSCs adoption improve the operations performance which consequently improve the organization overall performance.

4.4.1. The Electricity Distribution Directorate (EDD) profile

EWA cascaded down the BSCs through all its 17 directorates. To show how EWA succeeded in that, EDD was chosen as an example because it is one of the main directorates at the authority.

The Electricity Distribution Directorate (EDD) is in charge of the electricity distribution network in the Kingdom of Bahrain. Electricity Distribution Directorate mission is **to provide the electricity energy of the best possible quality to the customers and ensure to install a robust infrastructure capable of meeting the increasing short term and long term demands of power in a safe and sustainable way conforming to the highest international standards.**

EDD comprises of four main sections which are:

- Planning and Materials Section.
- Constructions Section.
- Maintenance and Operations Section.

- Street Lighting Section.

Moreover, EDD encompasses three main support units which are:

- Technical Services Support Unit,
- Geographical Information System (GIS) Unit
- Administration Services Support Unit.

These sections and units collaborate to manage the distribution network efficiently aiming to provide a reliable and secured supply to the customers and maintained through prudent planning based on sound engineering processes. The key responsibilities of EDD are:

- Planning and implementing of distribution network plans and projects to deliver new supply connection services and to reinforce the existing network.
- Planning and implementing of planned and corrective maintenance of the distribution network and substations.
- Operations and monitoring of the distribution system for optimum network open point arrangements and load transfers as well as daily scheduling and operational planning for electricity shutdowns.
- Planning and implementing of new street light plans and projects, planned maintenance and replacement of the old street lights columns.
- Managing emergency faults and power failures as well as street light failures in coordination with other Emergency Depots, and ensure safe and continuous supply to the customers with minimal disruptions.
- Preparing technical descriptions and specifications that are aligned with relevant international standards for electricity distributions equipment and materials.

- Preparing procurement documents for materials, evaluation of tenders and inspection of procured materials.
- Managing of materials stock control and monitoring of availability of critical items.

4.4.2. The process of cascading BSCs

The cascading process will produce departments and may be branches BSCs that are linked and aligned to the corporate BSCs but in the same time reflect customer requirements, work processes and stakeholders needs of its defined department. Over the BSCs cascading process, the organization needs to specify and discuss the cause and effect relationships that exist among outcomes performance drivers, lagging and leading measures. Moreover, eventually the organization should link departments' goals and performance to the organization strategy.

4.4.3. EDD strategy map

EDD strategy map contains 24 strategic objectives, four perspectives and four strategic themes. The strategic themes are: grow with Bahrain; serve customer needs; deliver operational excellence; and foster a caring and enabling environment. While the strategic perspectives are: financial perspective; Customer perspective; internal processes; and learning and growth perspective.

Furthermore, the strategic themes and the BSCs perspectives for EDD are similar to the corporate BSCs in order to have better alignment. The strategic objectives of the financial, Customer and learning and growth perspectives are almost the same compared with the corporate BSCs.

On the other hand, the strategic objectives of the internal processes perspective which are 12 objectives are different when compared with same perspective at the corporate BSCs. EDD director justified the similarities between EDD and corporate BSCs objectives by the importance of uniformity and consistency throughout the organization. Furthermore, strategic objectives translated into different meanings according to the corporate strategy or the operations strategy. At the same time the office of strategy management found that a possible disadvantage of this approach is limiting the creativity of business units' staff where it is recommended having them determine how they could best improve operations performance and finally achieve related objectives.

4.5. Operations Performance Improvement Examples

Many advantages and benefits were gained through the successful implementation of the BSCs. The operations management performance is one of the things which have improved due to the adoption of the BSCs at EWA.

The following are some examples of KPIs which have been studied over a long period of time to evaluate the performance improvements before, while and after implementing the BSCs at EWA. Performance data and information was obtained through the content analysis of EWA historical data archives and performance reports as mentioned earlier in the content analysis section.

4.5.1. The reinforcement KPI

This indicator serves many objectives and has a lot of meanings. By comparing the requested circuit for urgent reinforcement and the performance of this indicator, management could have a clear evaluation of the operational situation regarding the cable loading policy. Moreover, the number of summer and winter reinforcement jobs reflects the improvement regarding the planning of the work schedule and the improvement in the planned preventative maintenance programs which should occur in winter and only the emergency reinforcement take place in summer. The indicator performance improvement is shown in Figure (4).

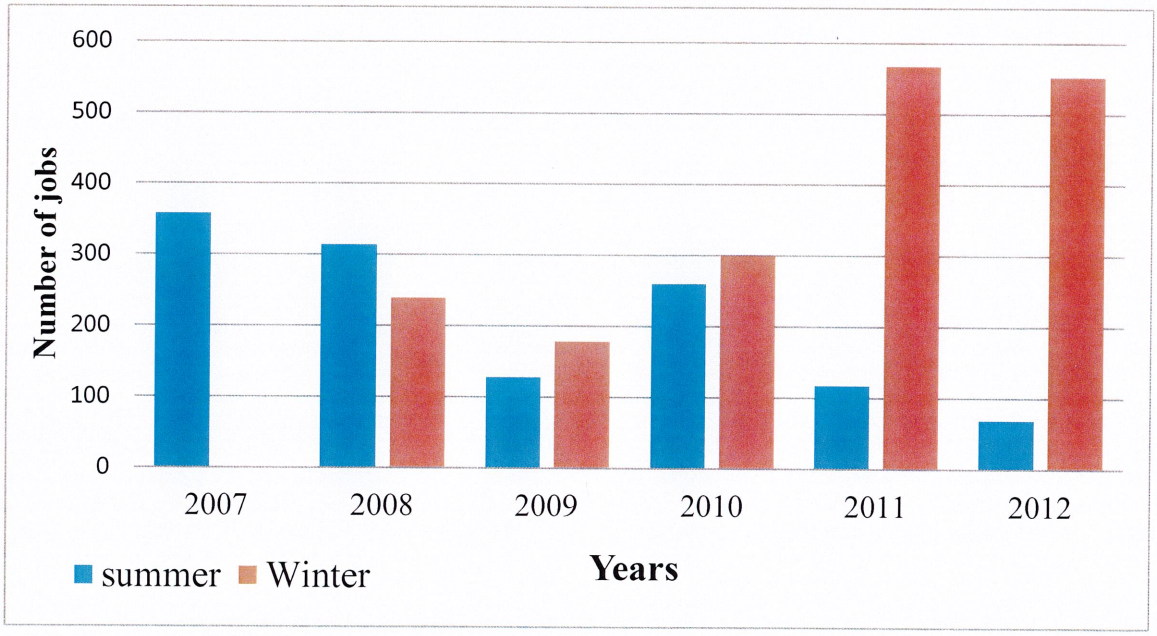


Figure (4)
The reinforcement jobs KPI

This KPI is showing that there are many improvements regarding EWA plants, systems and network since they apply the BSCs approach in 2007.

The weather at the kingdom of Bahrain is very hot in summer where temperature is above 40°. The peak consumption in summer causes many faults due to overloading of distribution cables. The above chart shows the reinforcement jobs that are done in order to inforce the weak points in the network which led to improvement over a period of time (2007-2012).

It is obvious that the reinforcement jobs were gradually transferred from summer to winter which represents a big improvement in managing and planning authority works. Before, the reinforcement jobs were occur after cables failures in summer as emergency reinforcement jobs but now the reinforcement jobs are planned as preventive maintenance work.

4.5.2. Spare power capacity KPI

Another important KPI is the spare power capacity which describes many aspects related to the power demand, power generation and power availability. According to this KPI many other activities take place such as taking the peak data for the substations, planning next year network expansion, preparing the reinforcement schemes and review the generation capacity. The indicator performance improvement is shown in Figure (5).

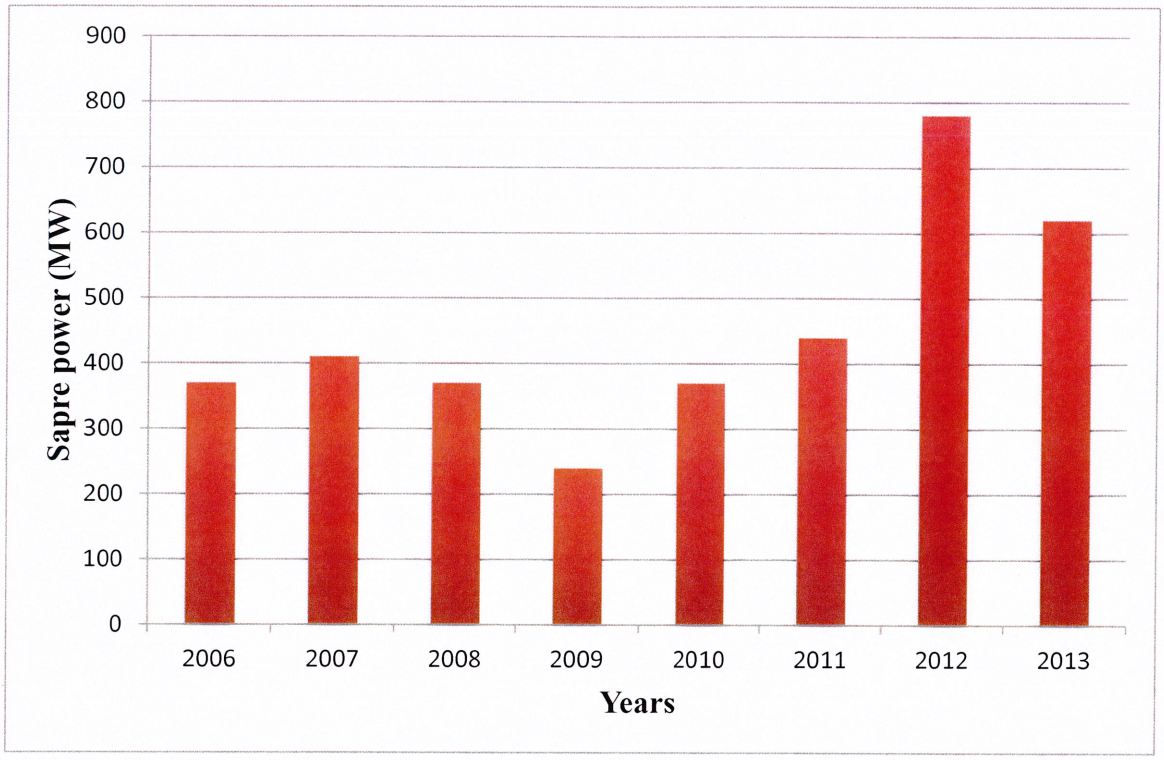


Figure (5)
Spare power capacity KPI

4.5.3. Growth in EWA network KPI

Another improvement of implementing the BSCs as a management system at EWA, is working as a team along all different departments in the authority. BSCs software provides a lot of reports and analysis of performance data which enables the authority for better planning and design of the network. A direct advantage of this improvement is stopping load shedding that was happening before due to shortage in generation.

Figure (6) below shows that the growth in the network has increased since the BSCs was implemented. This is due to the changes of looking into

the different operational aspects. By getting better information and data through KPIs; EWA managers improve their operations management and became more focused on the main responsibilities and activities in addition to the critical processes. The increase of the network growth currently is based on the economic, population and industrial growth as shown in Figure (6).

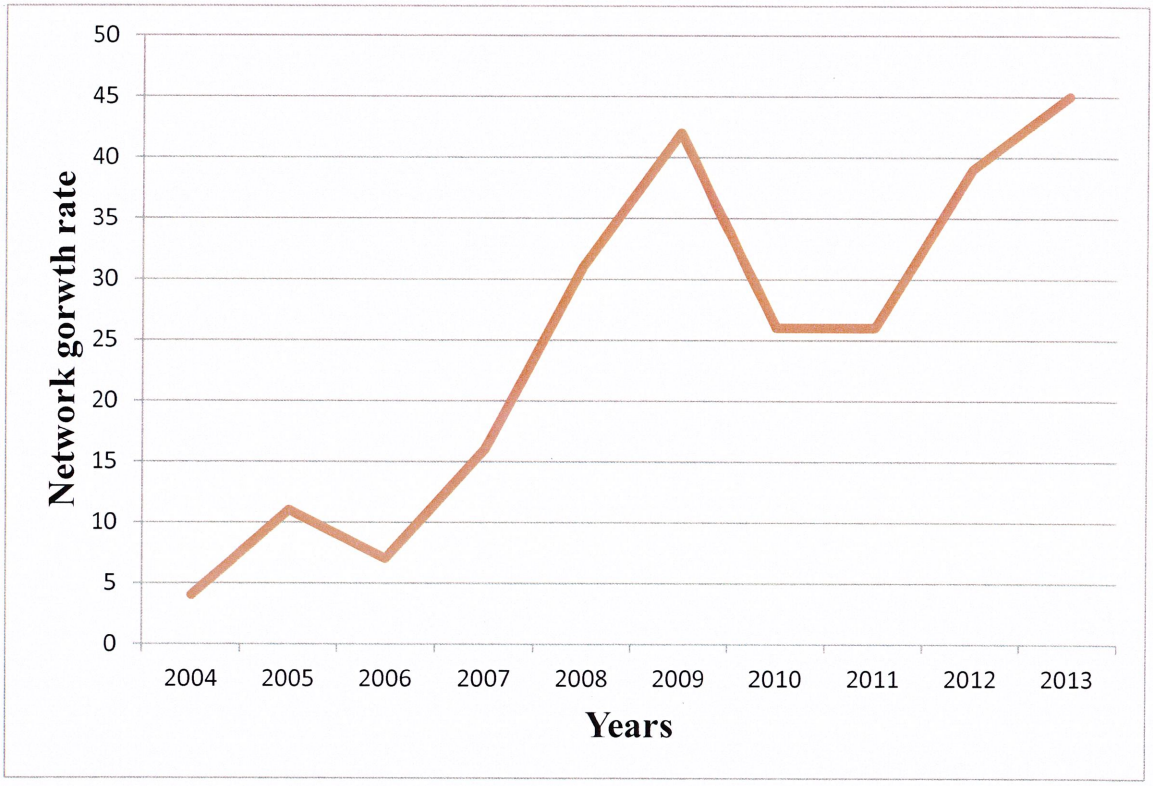


Figure (6)
EWA network growth rate KPI

4.5.4. Failures restoration time KPI

The failures restoration time KPI is one of the new KPIs which were established after implementing the BSCs. In addition, many performance targets have been set based on scientific decisions which lead to an obvious

improvement results. For example, any high voltage cable fault should be restored within two hours (EWA high voltage target) as a maximum time. The authority consequently employs many initiatives to achieve this target. The results are shown in Figure (7).

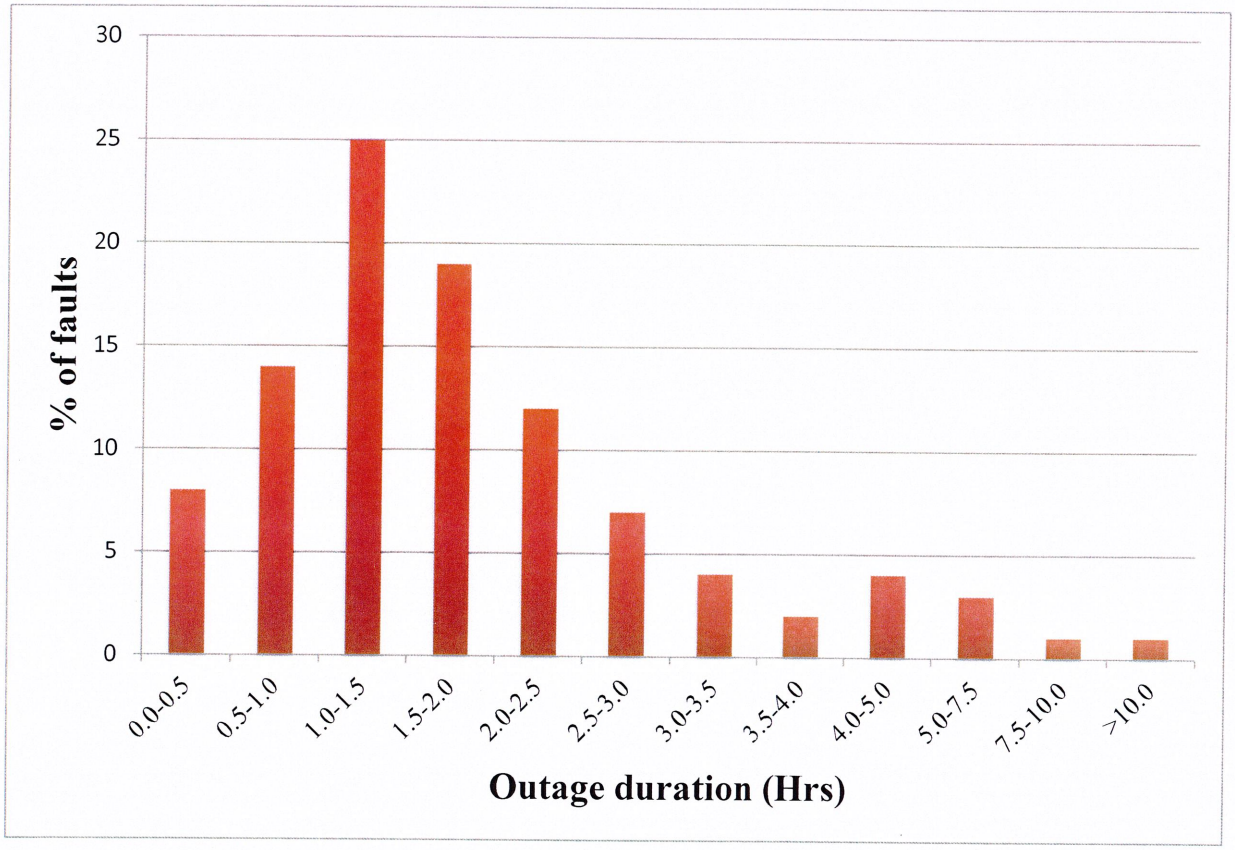


Figure (7)
Failures restoration time KPI

4.5.5. SAIDI and SAIFI KPIs

Additionally, another improvement to the operations management which was added by the BSCs is using international indices for network performance as KPIs and at the same time to work as benchmarks for EWA.

It has been recommended by the OSM and the authority technical consultant that implementing the BSCs enable the authority of using international and standard KPIs such as the indices SAIDI and SAIFI in order to measure its network performance where:

- SAIDI: System Average Interruption Duration Index (Minute/customer/year) which is shown in Figure (8)

- SAIFI: System Average Interruption Frequency Index (Interruption / Customer) which is shown in Figure (9)

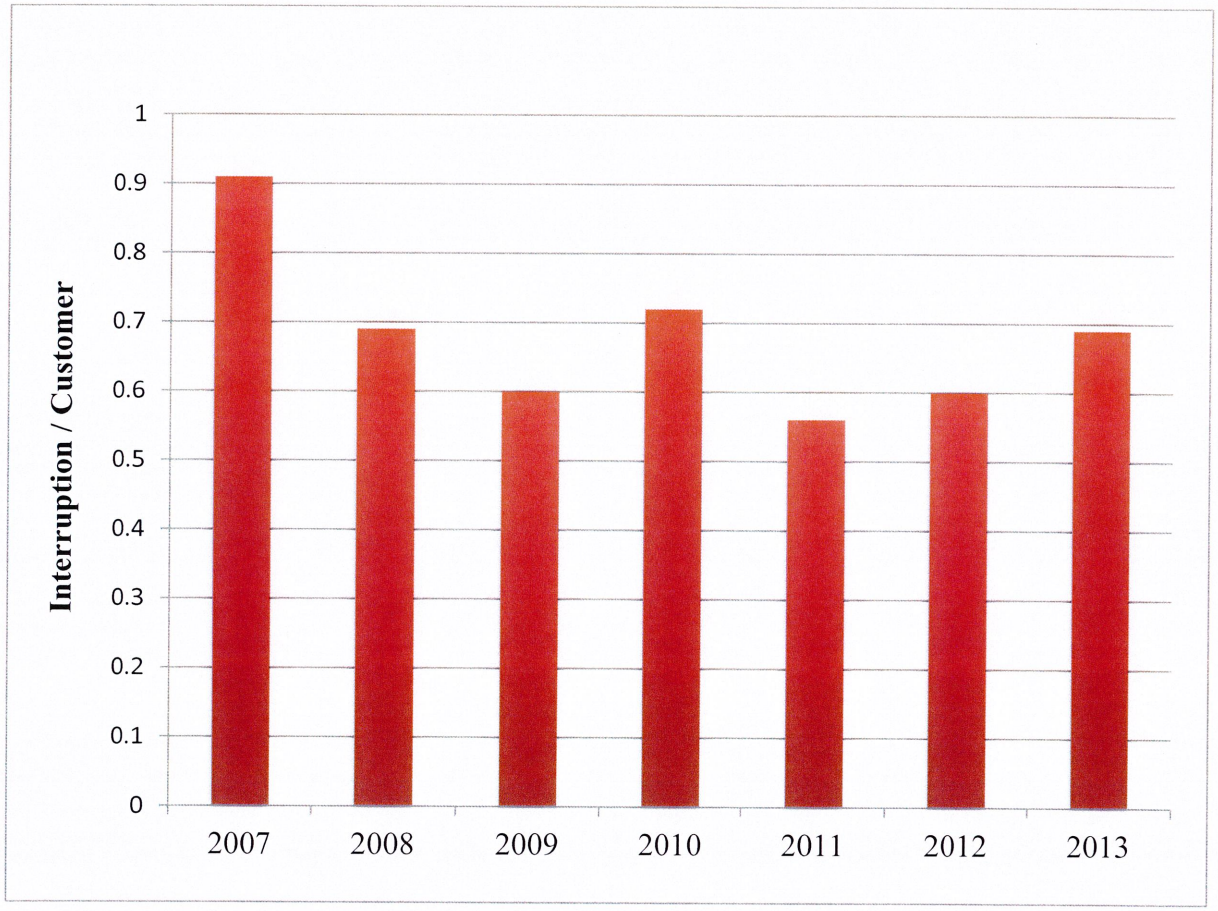


Figure (8)
System Average Interruption Frequency Index (SAIFI) KPI

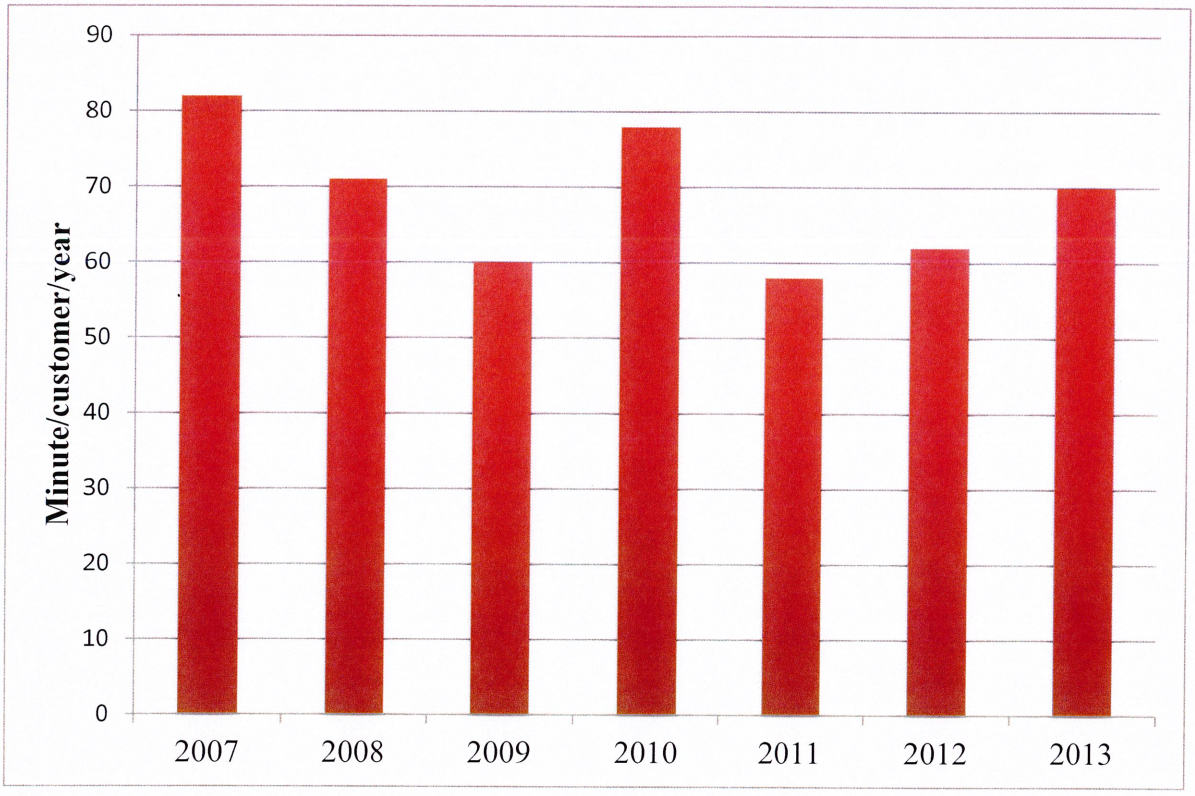


Figure (9)
System Average Interruption Duration Index (SAIDI) KPI

The improvement is a continuous process especially for BSCs and KPIs. The idea is not to show the performance figures in nice formats or graphs but to do the needed investigations and analysis of these figures and performance data in order to improve it to the desired level.

EWA believes that the learning process through its BSCs is a continuous process where they keep in adding, modifying and replacing KPIs as needed through the outputs of the different performance reviews. Examples of the added KPIs are the average restoration time and the average repairing period. The average restoration time is the time which is taken by the operations staff to restore the power supply to consumers after failure

while the average repairing period is defined as the period of time that is taken by the maintenance people to repair a fault. Moreover, through using these two indicators, the authority has improved its operations performance year by year due to that the balanced scorecards team are monitoring and controlling the performance and updating the performance targets which became achievable by employing different types of initiatives.

Finally, the researcher has mentioned some chosen KPIs in purpose of showing how the operations management has improved after implementing the BSCs which accordingly improved the total performance of EWA.

4.5.6. Installed street lighting services KPI

EWA is responsible for the street lighting services all over Bahrain. As a part of EWA initiatives to improve the quality of living in Bahrain through the alignment between EWA BSCs and Bahrain 2030 Vision, EWA team focused on all provided services. The installed street lighting services has improved through many programs as shown in Figure (10).

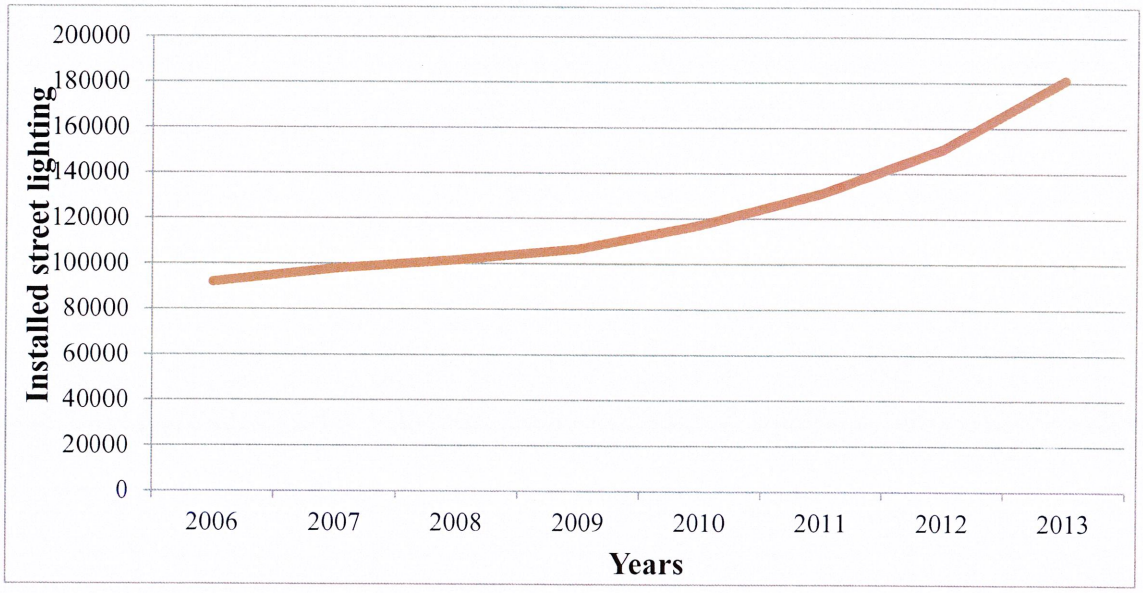


Figure (10)
Installed street lighting services KPI

4.5.7. Asset utilization percentage KPI

EWA managed its resources in an effective way through faster decision making and more integrated approach to overall budgeting through its BSCs. EWA asset utilization KPI serves many strategic objectives through all BSC perspectives. The improvement over the years is clear as shown in Figure (11).

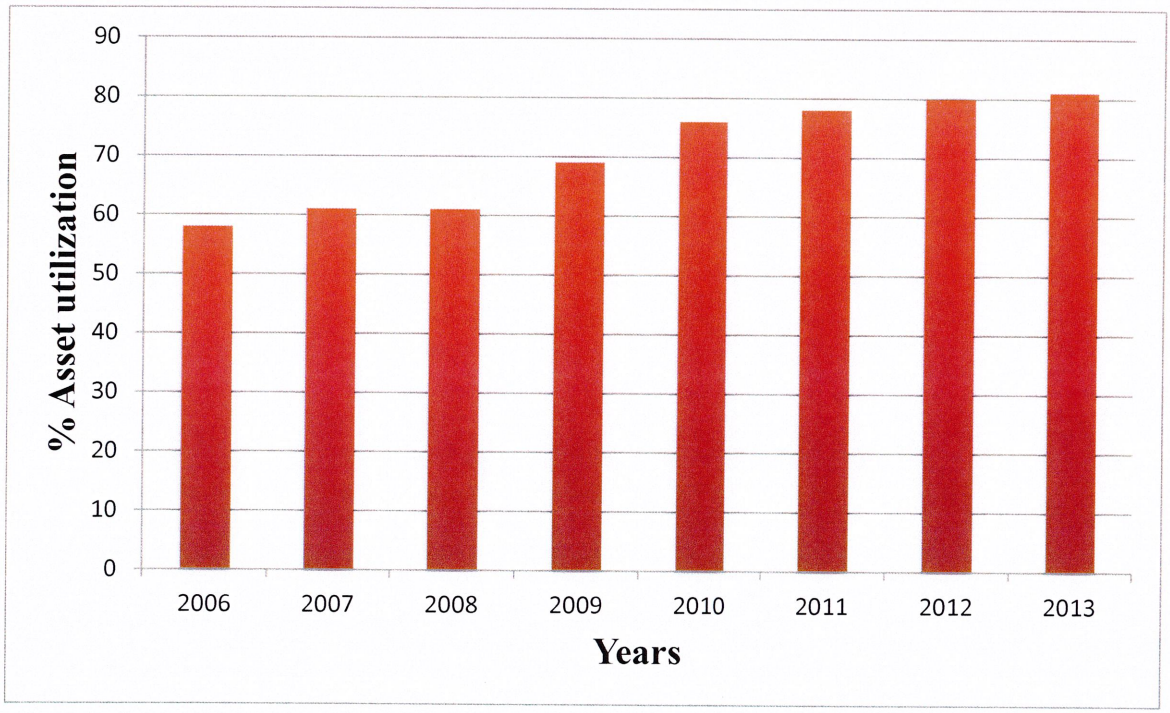


Figure (11)
Asset utilization percentage KPI

4.5.8. Customer service delivery index KPI

EWA has identified its main customers and core value delivery processes. Accordingly, EWA invested the needed resources to assure the

delivery of its services in a manner that is responsive to customer needs. The improvement is clearly shown in Figure (12).

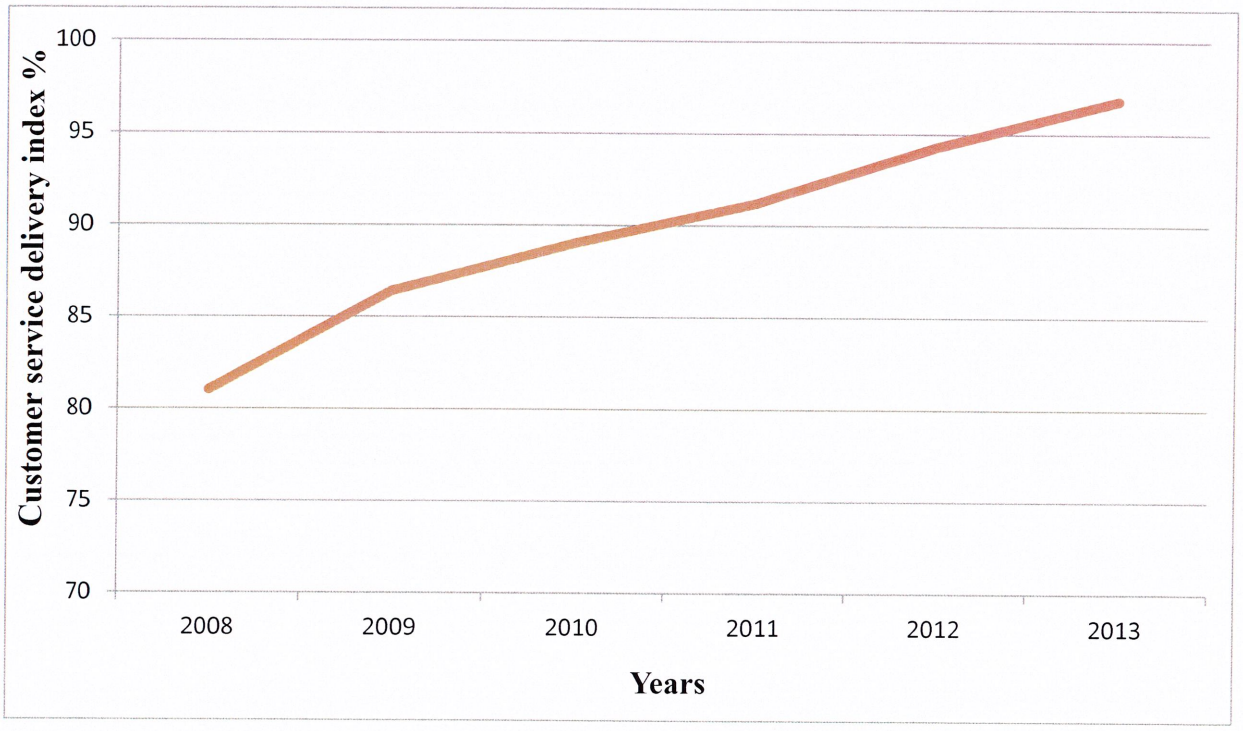


Figure (12)
Customer service delivery index KPI

4.6. Conclusion

EWA has successfully implemented the BSCs in the corporate level and the directorates' level. The BSC implementation was led by EWA chief executive and the established BSCs team. In addition, the BSCs

implementation at EWA helped in improving its operations performance as mentioned earlier through the examples of EWA KPIs.

EWA has invested in the BSC implementation in order to construct a robust performance management system that can be always improved and updated based on the different types of changes. As a result, EWA overall performance is continuously improving as EWA workforce learn from current performance experience.

CHAPTER FIVE: MINISTRY OF WORKS (MOW)

5.1 Findings Overview

5.2 Ministry of Works Profile

5.3 Starting of BSCs at the MOW

5.4 The Professional Implementation (2007 BSC)

5.5 Strategic Initiatives

5.6 Cascading the BSCs

5.7 Office of Strategy Management

5.8 BSCs Ownership

5.9 Action Plans and Performance Reviews

5.10 Strategy Quality

5.11 Objectives and Initiatives Reporting

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5.14 BSC Automation

5.15 MOW Benefits from the BSCs

5.16 Operations Improvements through BSC

5.17 Conclusion

CHAPTER FIVE: MINISTRY OF WORKS (MOW)

5.1. Findings Overview

The same data gathering techniques and procedure were used at the MOW. The researcher started the data gathering stage of the research by content analysis through collecting and reviewing any available materials. The reviewed materials were:

- MOW annual reports for 2008, 2010 and 2011
- BSCs software performance reports.
- BSCs implementation workshops and meetings reports.

Moreover, the semi-structured interviews were conducted through three cycles as described in the previous chapter for EWA. The researcher also has applied the direct observation through arrangement with the strategic planning section at MOW.

The following sections summarize the gathered data through the three different data gathering methods where the researcher has followed the same sequence as with EWA.

5.2. Ministry of Works Profile

The MOW is in charge of all public infrastructures in the Kingdom of Bahrain which includes road networks, drainage structures, and governmental structures. The Ministry of Works is responsible for several sectors of the public works in Bahrain. The main sectors are:

- Construction Sector: planning, design, construction and maintenance of public infrastructure.
- Roads Sector: engendering, planning, design, construction and maintenance of roads, bridges, and traffic facilities.
- Sanitary Engineering: engendering, planning, design, construction, operations and maintenance of sanitary facilities.

Additionally, the Central Planning Organization (CPO) is an important part of the Ministry of Works where its role is to synchronize and harmonize the planning and implementation of all the public infrastructure schemes and projects between the public sector organizations.

Many types of projects come under the responsibility of the MOW from small project such as schools, access roads and sanitary house connections to the medium-sized and large complex projects which are strategic to the country such as bridges, hospitals, ports and sports facilities that generally require huge resource and take long time to be completed.

The ministry different works are done according to the Bahrain Economic Vision 2030 and the National Development Strategies. The Ministry of Works vision **is to be a leading professional organization providing quality services to the people of Bahrain that is based on two deliverables: increasing the quality of life for all who live in Bahrain and supporting national development goals for economic progress.**

5.3. Starting of BSCs at the MOW

Implementing the BSCs has been helpful in driving extraordinary and measurable improvements in the ministry performance. Especially by

employing its management commitment and employees awareness in translating the strategy into operational terms and actions were exemplary.

5.3.1. The need for the BSC

Many analysis and workshops were carried out by the MOW (including SWOT analysis) in order to evaluate the current situation of the ministry and to come up with a demonstrative vision, mission and values. The main results are:

- Inflation and faster economic growth.
- Growing costs of doing business: construction, operations, maintenance and the difficulty in attracting and retain high quality staff resulting in scarcity of resources.
- The greater demands on public infrastructure due to the growth in population.
- Governmental and public stress to provide high quality services (Bahrain Vision 2030 and aspirations).
- Delayed decision making in government due to bureaucracy.
- Rapid technological changes.

The discussion also includes the idea of adoption of the BSCs where they define several objectives of using it as a management system at the MOW. The objectives are

- Achieve the desired results and accomplishments in the ministry mission and strategic objectives.

- Acquire an appreciated position within the public sector as a leader in providing public works services and earn recognition for excellence in strategy management implementation and execution.
- To embody the principles of the strategy focused organization and share this experiences.

5.3.2. The First BSC at MOW

The foundation of the MOW BSCs and strategy management started at 2002 and corresponding to the government commitment of instructing its ministries and authorities to implement organizational structures and strategy management system. The MOW launched a management development plan at 2004 which involves a large number of initiatives to advance service delivery and improvement of performance excellence. In the same year, the MOW has conducted a diagnostic study using PESTEL technique which involved an analysis of the political, economic, social and technological factors in the external environment of an organization that can affect its activities and performance. These forces can identify both opportunities and threats for an organization.

A process of meetings include all the managerial levels of the ministry were arranged at a hotel in an innovative way to study, discuss and take the needed decisions about vision, mission and core values. The most important success achieved was the establishment of the BSCs including a strategy map of objectives, measures, targets and initiatives. It was the first version of the ministry BSCs and strategy map.

While the MOW performance has significant improvements because of

implementing the BSCs from 2004 till the mid of 2006, it experimented some difficulties due to that the office of strategy management (OSM) was not established yet. Also, the consultant who had assisted the initial implementation did not interpret the BSCs as a strategy management system as described by Kaplan and Norton and in the literature for the best practices.

The main problem was that the first strategy map includes objectives that are actually initiatives. Consequently, the performance measurement process was for initiative rather than strategic objectives and that led to some opposition to the adoption of the BSCs approach by the workforce in the initial stages.

5.4. The Professional Implementation (2007 BSC)

The BSCs efforts were carried out by a well-defined project to reestablish the MOW BSCs, KPIs and strategy maps. The project comprised a synthesis of the standard BSCs based on the strategy focused organization procedure which was described by Kaplan and Norton in their 2nd book and the strategy aligned management (SAM) approach (basically a modified form of the BSCs design and implementation defined by Bill Barberg) (Kaplan and Norton, 2001; Marr and Creelman, 2011)

5.4.1.The strategy focused organization

The MOW translates the five steps as the following:

a. **Mobilization:** mobilize change through executive leadership and higher management, driven by the need for change, supports the effort to create the new approach of managing based on a performance

oriented culture. The single most important condition for the BSCs success is the ownership and active involvement of the executives' team. An effective BSCs adoption originates through the recognition that it is not a measurement project; it is a process of change which will lead to successful execution of the ministry strategy. The office of strategy management was established reporting directly to the minister and plays a full and intimate role across the organization.

The MOW Minister, who is the highest authority at the ministry and the first owner of the BSCs, always insists on the ministry managers and staff to concentrate on strategy and not only the day to day operations. He constantly repeats on the managers that they should spend at least 15 percent of their time on the strategy and the BSCs. The MOW top management commitment that has streamed down over all the ministry levels led to a high degree of involvement in constructing, managing and maintaining the BSCs from executives till operational staff. MOW organization chart is shown in Appendix (E).

b. **Translate the strategy into operational terms:** The BSCs approach is used to translate the strategy into a language that everyone understands. It is a framework to describe and communicate strategy in a consistent and insightful way. A strategy map is the most powerful way of communicating the cause and effect relationships that show how intangible assets are transformed into tangible. The scorecard's use of quantitative lead and lag measures allows value creating processes to be described, measured and eventually managed.

c. **Align the organization around its strategy:** The BSCs approach is used to cascade the strategy to all parts of the organization and align resources needed to accomplish the strategy. Business units and shared service units become linked to the strategy through the common themes and objectives that permeate their scorecards. Successful organizations use their BSCs in a coordinated manner to ensure the whole exceeds the sum of the parts. The MOW has effectively cascaded down the national strategies from the Bahrain 2030 Vision to the ministry corporate level and then cascaded the ministry itself strategy to all its sectors and different directorates.

d. **Motivate to make strategy everyone's job**: The reward and recognition system is used to align individuals to the performance objectives. Strategy focused organizations require that all employees understand the strategy and conduct their daily operations in a way that contributes to the success of the strategy. Executives use the BSCs to communicate and educate the organization about the new strategy. Where possible, successful organizations link incentive compensation to the BSCs.

e. **Govern to make strategy a continual process:** Strategy execution is linked to the budget, and a reporting system based on the BSCs KPIs is used to provide feedback on overall performance.

As the organization begins to use the BSCs for management reporting, it also uses it to test its assumptions of strategy. When needed, amendments should be made in order to improve performance and operations management. The performance and the quality of the strategy are reviewed during quarterly reviews. Six quarterly reviews for the

cascaded units are arranged each quarter by the office of strategy management at the MOW. These reviews serve as an introduction to the ministry corporate BSCs review.

The performance reviews includes all sectors and directorates. Each review is a combined operations and strategy review. MOW regularly analyzes the linkage between strategic KPIs and operational measures in the quarterly reviews. The MOW is concentrated on improving strategy management by learning from the different quarterly, biannually and annually reviews.

5.4.2. MOW strategic content

The process of reestablishing the MOW BSCs started with awareness workshops and training sessions. One of the most important things is that from the initial implementation stages of the BSCs for managing and executing the MOW strategy, it had the acceptance and the commitment of the highest levels of the ministry management. The following step in implementing the BSCs was attracting professional staff support which was done by their wide participation in this process.

The strategy was reexamined coming up with a revised mission, vision and values which is **provide public works services to enhance the quality of life**, vision to be **a leading organization providing quality services**, and values: **ethics and integrity, excellence, professionalism, team spirit and effective communication.**

After that, four cross functional teams were established from the MOW executives to create the strategy map based on the defined strategic themes.

Each of them were assigned with a specific team named as the theme team as mentioned by the SAM methodology.

In 2007, the themes and perspectives were integrated together to form the MOW strategy map in a workshop which included 200 senior managers and professional staff members from the 1600 ministry employees. In that workshop, existing strategies and objectives were discussed in order to make sure of their alignment to the Bahrain National Vision.

The BSCs of the MOW is constructed based on four strategic themes which are already aligned with the Bahrain 2030 Vision and relocate the MOW to be a leading professional organization implementing the values of fairness, competitiveness and sustainability. The MOW to be a key planning player in order to deliver a high quality services by the partnership with the private sector (public-private partnership). This allows for larger investment to the Kingdom of Bahrain which will improve the quality of life for all citizens.

5.4.3. MOW strategic themes

MOW describes its strategies through the following four themes which are shown in Figure (13):

- **Public-private partnership:** Delivering MOW mission through the best combination of public private sector competencies and the partnership to expand the private sector investments in public developments and services (shown by a blue line).
- **A key planning player:** Ensuring effective cooperation and coordination between all governmental bodies in order to fully

contribute towards effective Bahrain vison and strategic goals. This includes ensuring effective policy planning/making and regulatory enforcement (shown by a green line).

- **Sustainable quality services**: Managing projects and services in better way in order to deliver high quality services (shown by a purple line).
- **A leading professional organization**: By retaining and attracting professionals and experts with high quality skill and competencies to have high performance workforce and organization (shown by a red line).

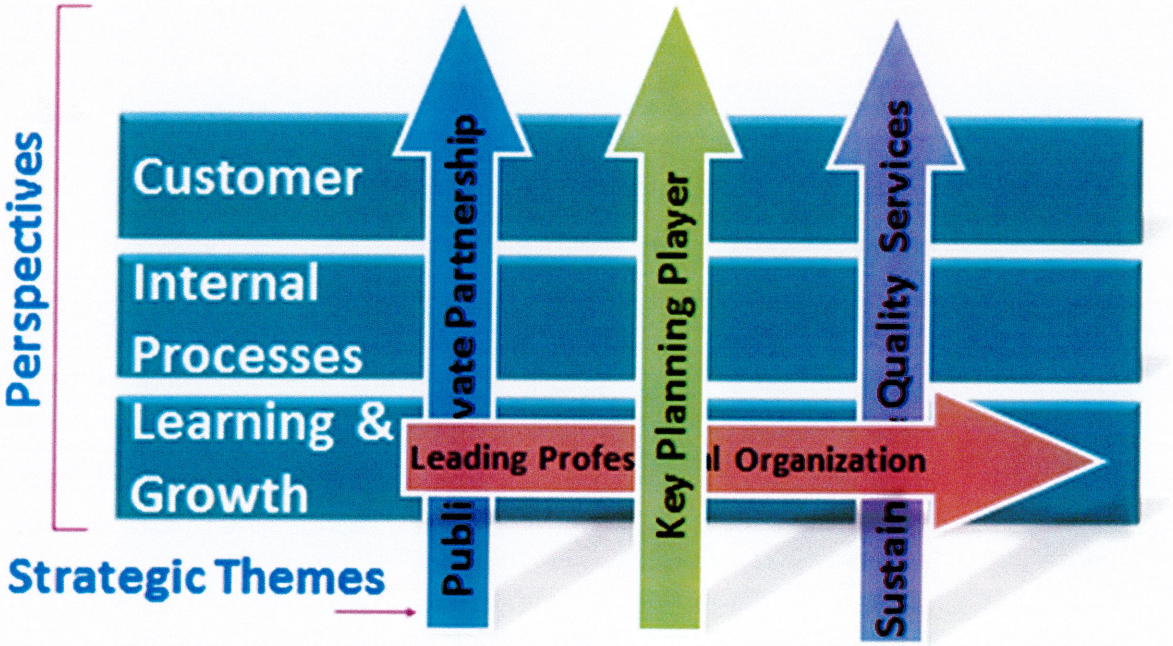


Figure (13)

MOW strategic themes, (Works.gov.bh, 2013)

5.4.4. MOW corporate strategy map

The MOW corporate strategy map (shown in Figure 14) contains 19 strategic objectives connected using the cause and effect relationships and four perspectives: Stakeholders; Customer; Internal Processes; and Learning and Growth perspective. The MOW substituted the financial perspective of the standard BSCs by the stakeholder perspective since that the MOW is a governmental nonprofit organization.

In the strategy map, the objectives cause and effect relationships are visually represented using arrows which illustrates that the performance on one of them will influence the other objective or objectives performance. The MOW described its four themes, four perspectives and objectives by horizontal and vertical dimensions. The learning and growth perspective is shown as the horizontal theme which is leading professional organization theme. The three other themes public-private partnership theme, key planning player theme and the quality of service theme are shown vertically. MOW sees the horizontal theme as it powers the delivery of the vertical themes by employees' dynamic involvement and contribution. In order to make sure that purpose of the strategic themes realized, the MOW allocates themes owners who are responsible for all the objectives and initiatives under this theme.

In addition to that, the ministry strategy map contains the pictures of each objective owner in order to enhance accountability by make it easier for employees to find who they must contact if needed. This was an innovative idea that has been recognized by the BSCs creators.

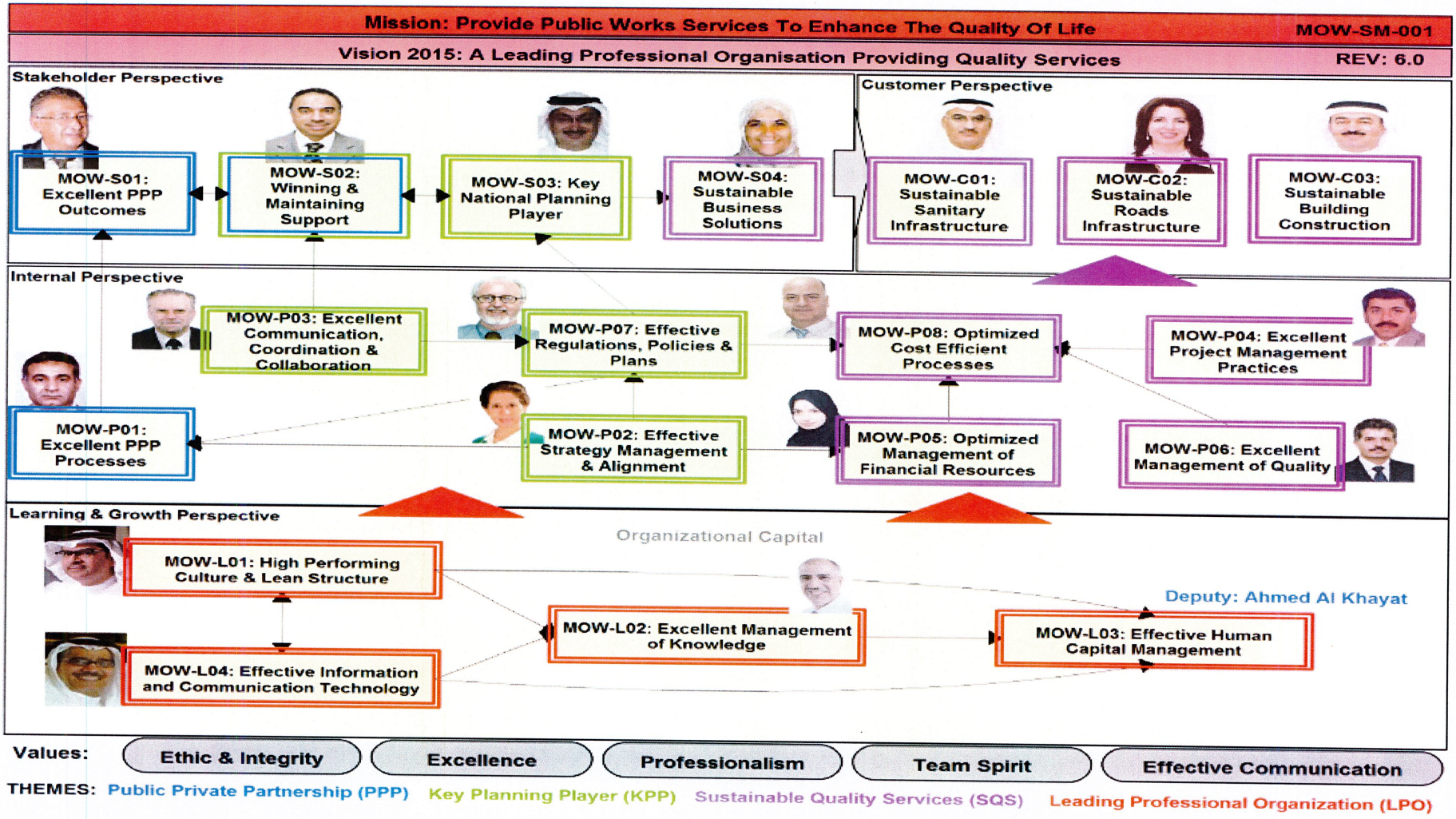


Figure (14)

MOW corporate strategy map, (Works.gov.bh, 2013)

5.4.5. MOW measures and targets

a) Measure selection criteria

After defining the strategic themes, perspectives and strategy map, the BSCs team start choosing and creating the required measures and targets. Performance targets have been chosen for each objective. Some of them are short term targets for one year while others are long term targets for more than four years based on the strategy cycle which is aligned with the Bahrain 2030 Vision.

MOW has developed its own innovational process where they linked measures quality assessment to a precise process by defining the standard measures, performance indicators, key performance indicators as the following:

- **Performance measures**: any discussed measure by which performance can be assessed.
- **Performance indicator:** the subset of measures that have been assessed as of sufficient quality in terms of a defined set of quality criteria (requires an internal benchmark to be put in place).
- **Key performance indicator**: the subset of performance indicators that have been selected as the most important of all the performance measures (requires an external or historical benchmark to be put in place).

MOW modified the SMART Criteria to define its measure where they use A for Ambitious rather than Attainable. The ministry version of the SMART acronym is:

- **Specific**: Well defined in specificity, scope and detail.
- **Measurable**: Practicality; quality data can viably be collected at least quarterly.
- **Ambitious**: Targets are challenging.
- **Relevant**: Closely indicate performance of objective, high conceptual quality.
- **Time-bound**: Targets set over a vision time horizon.

b) Measure selection process

Defining and selecting performance measures and KPIs for nonprofit organizations is a difficult process as mentioned by strategic planning section chief. The MOW strategic objectives are focused on its stakeholders' and customers' needs and requirements. The stakeholders are mainly Bahrain government and the customers are mainly Bahrain citizens and other public sector utilities. The most common difficulties are related to breaking down strategic objectives and its linkage with day to day operational measures.

In addition, dealing with nonfinancial performance measures as described by the BSCs through the causal relationships among objectives and its relevant measures, was a good guide for the MOW during the process of defining its measures and KPIs. Furthermore, MOW started the process of defining its performance measures through identifying the main objectives that they are aiming to monitor and control through the BSCs implementation. These objectives considered by the MOW as the key success factors which are going to define the desired outcomes from preforming the operations and activities.

The MOW strived to keep the key success factors number as a maximum of ten factors that covers all BSCs perspectives.

The BSCs team, the strategic planning section and the ministry consultants were a group that started a series of workshops in order to translate the key success factors into performance measure for each BSCS perspective. After that, the team started identifying the core processes, operations and activities that will affect the capability of the ministry in achieving the key success factors. For each key success factor, a measure or a set of measures has been selected among the already available measures, or suggested by the consultant and discussed with the team for their agreement about it. The suggested measures are based on the experience of the consultant and the BSCs team with other similar organizations.

MOW has conducted a research regarding the chosen performance measures through the old historical data to test its usefulness if compared to available performance results and conclusions. Accordingly, the MOW management has assigned an objective owner to each key success factor in the BSCs. The objectives owners were chosen according to their work experience that should be related to the objectives area. Similarly, each performance measure was assigned with a specific employee to be the measure owner. MOW BSCs team and its consultants kept the measures owners responsible for determining the performance targets. In addition to that, certain measures performance targets were chosen from the best practices standards.

A final evaluation was performed by the MOW for the cause and effects relationships and how the performance of an objective could affects others considering performance targets. The preliminary results of the cause and effect linkages have shown that some of the objectives were not properly linked to the other objectives. After the needed corrections were performed, a closed loop of performance was established by moving backwards from the achieved targeted performance to the organizational strategy.

5.5. Strategic Initiatives

The MOW leaders realized that most of their work and operations are of projects type which needs special focus and attention. One of the innovative actions that were taken by the ministry was the establishment of the initiatives prioritizing criteria and matrix.

5.5.1. Initiatives prioritizing

MOW started prioritizing its initiatives by creating a list containing all of the existing and the new initiatives. Subsequently, these initiatives are evaluated for their alignment compared to the strategic objectives. Then, these initiatives are given scores based on their importance and their difficulty of implementation. The MOW has established helpful criteria for prioritizing their strategic initiatives based on three main subjects:

a) **Strategic alignment (importance)**: includes
   - Objective alignment which is the level of alignment of the initiative to the ministry corporate or strategic business units' objectives.

- The percentage impact on the strategic objective itself.

b) **Value (benefit)**: includes
   - The financial value (such as generate income/savings or enhance the financial growth of the Ministry).
   - Sustainability (economic, environmental, social and cultural).

c) **Ease of implementation against difficulties**: includes
   - Duration: the needed time to implement the initiative.
   - Cost.
   - Organization difficulty: stakeholder involvement/breadth and depth of change.
   - Technical difficulty: scarcity of resources.

For each element, a specific weighting will be assigned to generate a final score which will be entered into a prioritization matrix. The prioritization matrix is a 5 x 3 table involves a scale of importance as very low, low, medium, high and very high in the horizontal axis. The vertical axis involves a scale of difficulty as low, medium and high. The ministry teams will process this matrix to prioritize initiatives and link them to the required resources.

5.5.2. Aligning initiatives with budget

MOW submits the required budget to the Ministry of Finance based on the prioritized strategic initiatives specifying their strategic alignment with Bahrain National 2030 Vision and aspirations. The MOW provides the needed budget requirements to the Ministry of Finance with the strategic initiatives via the Cabinet Economic Sub-committee. Timing of this process

is critical due to that it followed the annual corporate review in order to combine financial data to make sure that it is linked to strategic objectives.

5.6. Cascading the BSCs

In this stage, the MOW has finished their corporate strategy map. Referring back to the strategy focused organization process for implementing the BSCs, the ministry should cascade the BSCs down to the different sectors and then to the different directorates. In addition, any cascaded BSCs should be aligned to the MOW vision, mission and the corporate strategy.

5.7. Office of Strategy Management (OSM)

The MOW established their office of strategy management (OSM) in 2006 under the name of strategic planning and quality management section (SPQM). Currently, it is named as the strategic planning section and in charge of overseeing the BSCs implementation program and driving the ministry strategy through all its main work processes. The OSM involves eight people in addition to the external consultants who are helping in certain issues. As a facilitator, the OSM supports strategy analysis, formulation, planning, execution, monitoring, and validation. The office is also responsible for the executive strategy manager software which manages all the BSCs data.

One of the innovative steps at the MOW is that the OSM reports directly to His Excellency the Minister of Works which demonstrates the

importance that the organization places on it and gave the OSM the needed power to introduce the desired change and management.

5.8. BSCs Ownership

The effort to have a wide sort of participation and to have the staff assisting in implementing and maintaining the BSCs is one of the factors that empower the success of the whole process. This builds up a sense of shared ownership of the strategy and the BSCs which is vital strength to help executing it.

MOW four themes are under the responsibility of the theme team owners who are the Ministry of Works undersecretary and the three assistant undersecretaries. They are fully accountable for the objectives and strategic initiatives of their themes. These teams cross the business unit and support units in order to extend the ownership and to get things done. Each theme team consists of a group of employees who are chosen from various business units and support units.

Furthermore, for each of MOW objectives, there are owners responsible for objectives performance along with their team in the sector or the directorate level. The members of these teams are assigned ownership of the measures and the initiatives. Hence, there are specific owners for every theme, objective, measure and initiative in the MOW BSCs.

5.9. Action Plans and Performance Reviews

The OSM conducts a sequence of performance reviews. The different teams of MOW strategic themes action plans are reviewed and updated

annually to be linked to the annual strategy review and finally cascaded to the concerned business units. The strategy map and BSCs are reviewed, analyzed quarterly for improvement of performance progress and the effectiveness of implementation of the strategy to any necessary remedial action is taken when needed as soon as possible.

Every objective owner prepares a performance report to be presented to his Excellency the minister in the quarterly review cycles in order to improve the personal accountability and commitment. Reviewing process starts with the internal sector business reviews (ISBRs) which are directed by an assistant undersecretary while the sector business reviews (SBRs) and corporate reviews are directed by His Excellency the Minister of Works. The sector business reviews started with the roads, sanitary and construction sectors and then continued for the corporate support, human resources, information technology and finance units. In order to raise the significance of all objectives and enhances personal obligation and responsibility, all the objective owners should report in front of His Excellency the Minister during the sector business reviews and the corporate reviews.

5.10. Strategy Quality

Strategy review is more than just successes or failures in strategy implementation. The OSM assesses the quality of every sector and directorate BSCs and provides a score for it. The quality of the strategy should be reviewed while evaluating any BSCs in terms of its objectives, measures, targets, initiatives, and timeliness of reporting. At the end, based on these marks, the OSM held a discussion in order to provide assistances and improve the current BSCs.

5.11. Objectives and Initiatives Reporting

MOW has learned from its previous experience and clearly differentiates between reporting of objectives and initiatives of its BSCs. MOW, at early BSC implementation stages, has phased the problem of reporting the performance of initiatives rather than the strategic objectives which seriously affect the overall performance.

5.11.1. Color coded performance interpretation

The MOW followed SAM approach for reporting their strategic objectives performance. They used four color codes opposite to the conventional three color codes (traffic lights). The overall performance statuses of the objectives are represented by color codes based on the current year targets where each objective is represented by one or more measures. The color codes make it easier and faster in evaluating performance of each objective by just a look. The MOW uses the following codes for objectives performance interpretation:

- Red representing poor performance.
- Yellow representing lower than targeted performance.
- Green representing good or targeted performance.
- Blue representing breakthrough performance (added by MOW).

While for reporting of the initiatives, the ministry uses three color codes (the traffic light) as the following:

- Red represents initiative in trouble.
- Amber represents initiative has some issues but manageable.
- Green represents initiative great, ahead.

5.12. Project Management Office

The project management office is staffed by project experts in managing projects using world class project management methodologies in order to make sure that the MOW initiatives are strategically aligned. The project management office defines and maintains standards for project management and it is the source of documentation, guidance on the practice of project management, training and execution according to the worldwide recognized Project Management Institute (PMI). The MOW supports its projects management office and practice through several initiatives such as:

- **Intranet**: is used to store all the projects templates make them available to all staff.
- **Electronic Document Management System (EDMS)**: A new system serves as a store of the projects documents to be accessed by the project team members and stakeholders.
- **Project Management Information System (PMIS)**: a system to automate the project management and help in controlling, reporting of the projects progress and measuring performance in order to assist in completing on time, within budget and with a high quality.

Moreover, the ministry is working to accomplish certification from the project management institute for its staff in order to confirm that the ministry staff has the essential level of skill and competencies of project management methodologies related to governmental projects.

5.13. Risk Management

The MOW has sought after a comprehensive BSCs system by involving a risk management framework in order to properly control possible risks. At 2009, the ministry has linked the risk management with its strategy management by linking their BSCs with the risk standard ISO 31,000: 20009. Consequently, MOW clearly specifies risks which may disturb the execution of their strategy and strategic objectives. The risk management standards integration with the BSCs cascaded to all levels at the ministry.

The MOW has developed a map with the possibility of risk if happened. In the developed risk map, the vertical axis is scaled from very low to very high and the undesirable consequences on a horizontal axis from very low to very high. The potential risks maps were titled with the risk type, its description and the proposed initiatives to minimize it. These maps were applied for each objective. Currently, each objective is measured for both its performance and its risk where the objective owner is held responsible for both of them.

5.14. BSC Automation

The BSCs automation is an important part in improving performance, operations management and strategy management. The MOW used to manage its BSCs by the SharePoint application and its associated tools. The increasing requirements and amount of the handled performance information made it inadequate and hard to deal with. The BSCs application, the Executive Strategy Manager (ESM) from Palladium was chosen by the MOW in 2008 to replace the SharePoint. This decision was taken after

waiting for more than a year before purchasing a software application for the reason that the ministry want to make sure about the software specification, tasks and how to get the best utilization of it.

The new application has reduced the load of the paper work and manual data entering processes by many times. It has also enhanced the performance evaluation based on better and easier updating of measures and targets in addition to the ability to track the progress of the different initiatives and projects.

5.15. MOW Benefits from the BSCs

The implementation of the MOW approach by the Ministry of Works has led to remarkable achievements and improved performance results such as the considerable increases in delivery of projects that worth around 660 million U.S. dollars in 2007 compared to just 92.5 million U.S. dollars in 2002 with only a little change in the ministry workforce which represents a major increase in capacity and productivity of the ministry workforce.

Moreover, implementing the latest generation of BSCs approach has qualified the MOW to become a key planning player in all national strategies and a leader in public-private partnership and project management practices. It has positioned the ministry between the best known professional organizations in Bahrain and the Gulf area.

What is more, the MOW nowadays has a vision; mission and strategy which are explained through four strategic themes and 19 strategic objectives with a fully documented performance measurement system based on the participative work of all employees including the senior staff who are

responsible for themes, objectives, measures initiatives and performance reporting. Furthermore, the ministry workforce has better understanding of the strategy, objectives, operations management and how to link them to the daily operational activities.

a) Summary of key results

- **The public-private partnership theme:**
  - Great growth in the investment from the private sector and in outsourcing services in order to improve the infrastructure expansion which was zero in 2002.
  - The BSCs enabled the MOW to handle more projects than any time before, where 50% of government tenders and expenditure of government's project budget is spent by MOW.
- **Under the quality services theme:**
  - Robust alignment with stakeholder interests and customer requirements.
  - Hundred percent of initiatives and projects with their costs are associated to the ministry strategy and strategic objectives.
  - Superior budget utilization as a result of using the BSCs (a major issue in previous years) that is mainly significant for parliamentary stakeholders.
  - Customers, stakeholders, and media satisfaction for performance and achievements; from among the lowest public relation ranked governmental entities to one of the top three (from less than 30% in positive public perception to a rising

70%).

- Strategy management has widen up the horizons to new frontiers that were never expected before such as cost recover schemes, revenue generation schemes and sustainable complete business plans for various entities across the ministry.
- The ministry nowadays has an up and running strategy management system managed and facilitated by the office of strategy management in addition to a project management methodology and system managed and facilitated by the project management office.

- **Under the key planning player theme:**
  - Management systems implemented: strategy management system (BSCs application), project management system based on project management institute best practices.
  - All sectors strategies developed, integrated and aligned to the MOW and Bahrain national and economic strategies:
    - Roads master plan
    - Highways master plan,
    - Intelligent traffic systems strategy,
    - Integrated transport strategy,
    - National roads safety strategy;
    - Sanitary master plans,
    - Storm water drainage master plan

- Great enhancement in the national coordination between key ministries, authorities and any stakeholders involved in the infrastructure development.

- **Under the leading professional organization theme:**
  - Ten times the increase in the training budget.
  - Reduced staff turnover rates.
  - Incentives and reward systems are linked to performance management system (BSCs).
  - The ministry project management certified people have increased from only 2 during 2004 to 53 in 2011.
  - An organization that is strategy focused based on the adoption of the BSCs would not be fragmented having no more negative competitiveness among departments, but rather collaboration towards a common goal.

5.16. Operations Improvements through BSC

Finally, the MOW is a winner of the international hall of fame award from palladium for the excellence in strategy management and execution, improvement in operations management and as well as others regional awards. Furthermore, the ministry is ranked as one of the 12 top percent in the world for executing strategy and linking it to operations, as per the Palladium Survey for 2008. Some of MOW KPIs will be shown below in order to describe the operational improvement at the ministry after implementing the BSCs.

5.16.1. MOW efficiency KPI

Most of the work that is handled by the ministry is of the projects type. The ministry supervised various types of projects for construction of public buildings, roads, highways, bridges, harbors, airports and sanitary systems. The work efficiency KPI has shown dramatic improvement for the MOW after implementing the BSCs as shown in Figure (15). The investments in its workforce, technological systems, project management systems and the implementation of the BSCs helped the ministry in achieving its goals efficiently. The efficiency KPI is one of the most important indicators at the ministry which is discussed and evaluated annually.

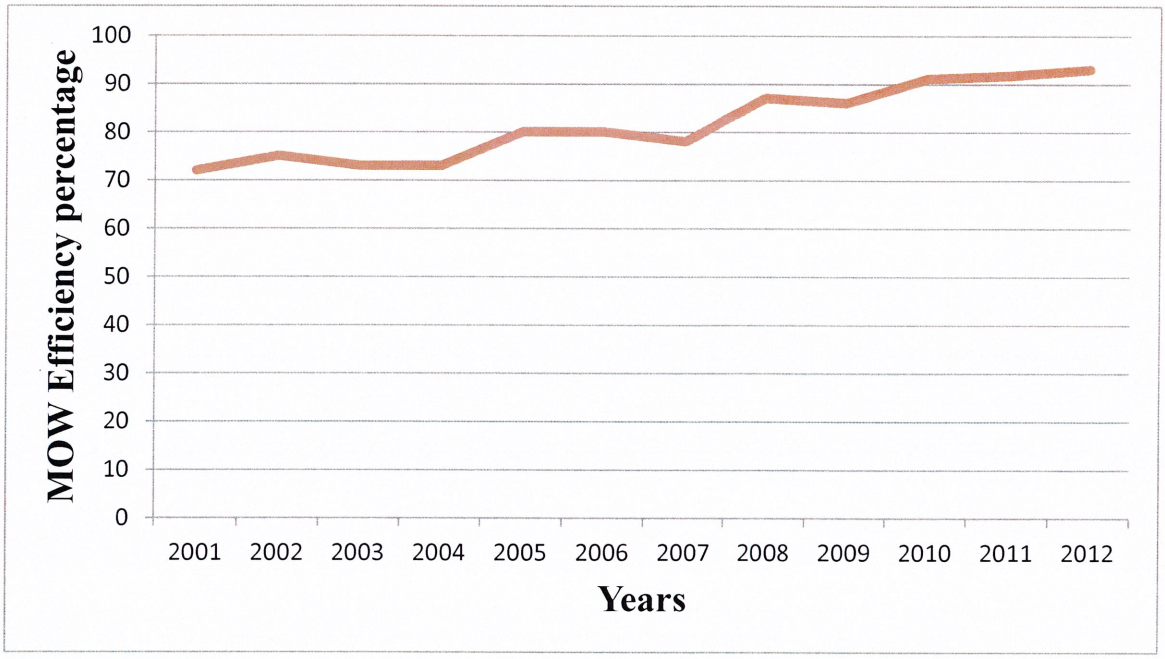


Figure (15)
MOW efficiency KPI

5.16.2. Sanitary percentage of population served KPI

As mentioned earlier in the previous case study, the BSCs approach provides systematic roles for defining indicators and setting up performance targets for them in order to get the operations performance improved through applying the required initiatives. The following KPI has improved after implementing the BSCs due to that, it has been better measured according to predefined performance targets.

The operations improvement is clear according to Figure (16) since the BSCs approach was implemented. Redefining and updating targets after performance reviews will maintain the level of the continuous achievements of operations management improvements.

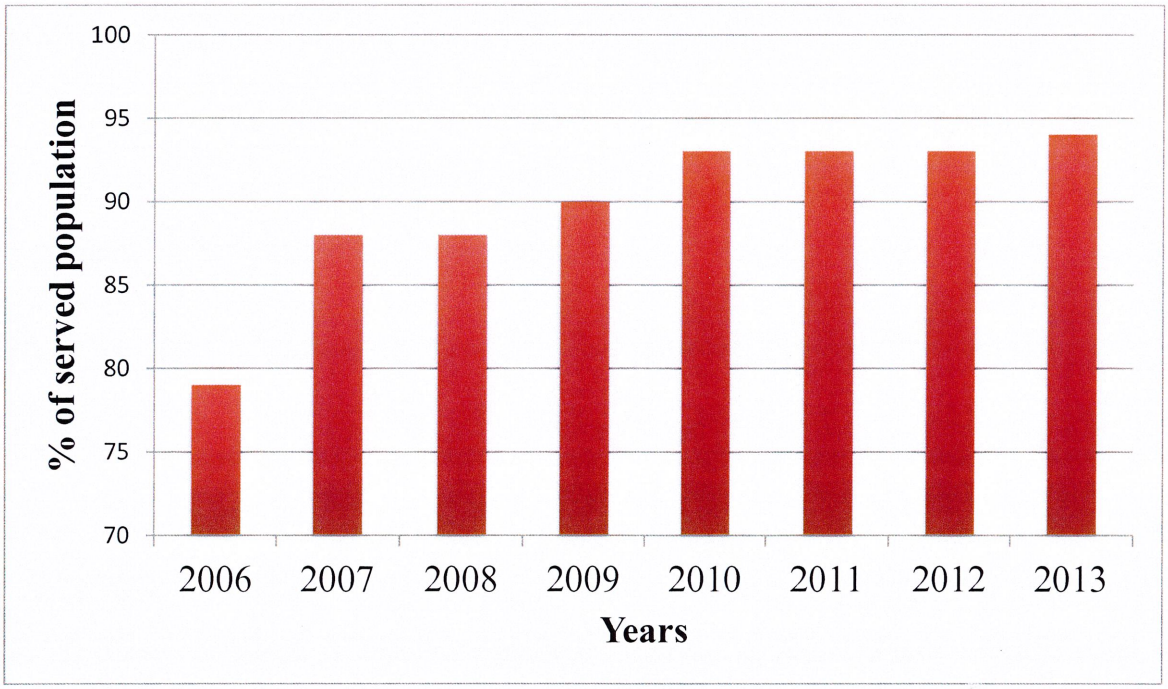


Figure (16)
Sanitary percentage of population served KPI

5.16.3. Response time to emergencies KPI

Response time to emergencies is one of the main KPIs at the MOW. It has got a serious attention from the top management. It experience dramatic improvements after the BSCs approach has been applied which was reflected on the performance as shown in Figure (17).

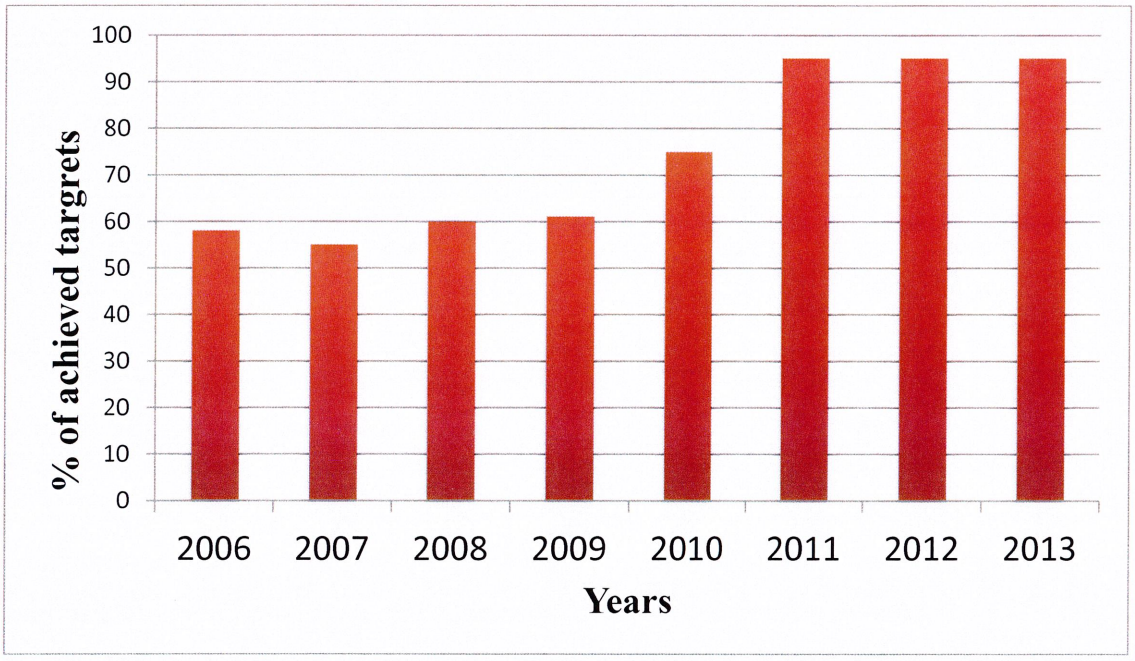


Figure (17)
Response time to emergency KPI

5.16.4. Workforce improvement KPI

The BSCs creators believe that the employees are very important for the organization success and performance improvement. This is recognizable from the identification of the learning and growth as one of the standard BSCs perspectives. Accordingly, the MOW adopts the same idea which was clear in its perspectives and themes. The following indicator provides the

ministry with required data regarding their workforce capabilities of handling its tasks and projects. Similar to the previous indicators, the BSCs helped in improving this indicator after it has been applied as shown from Figure (18).

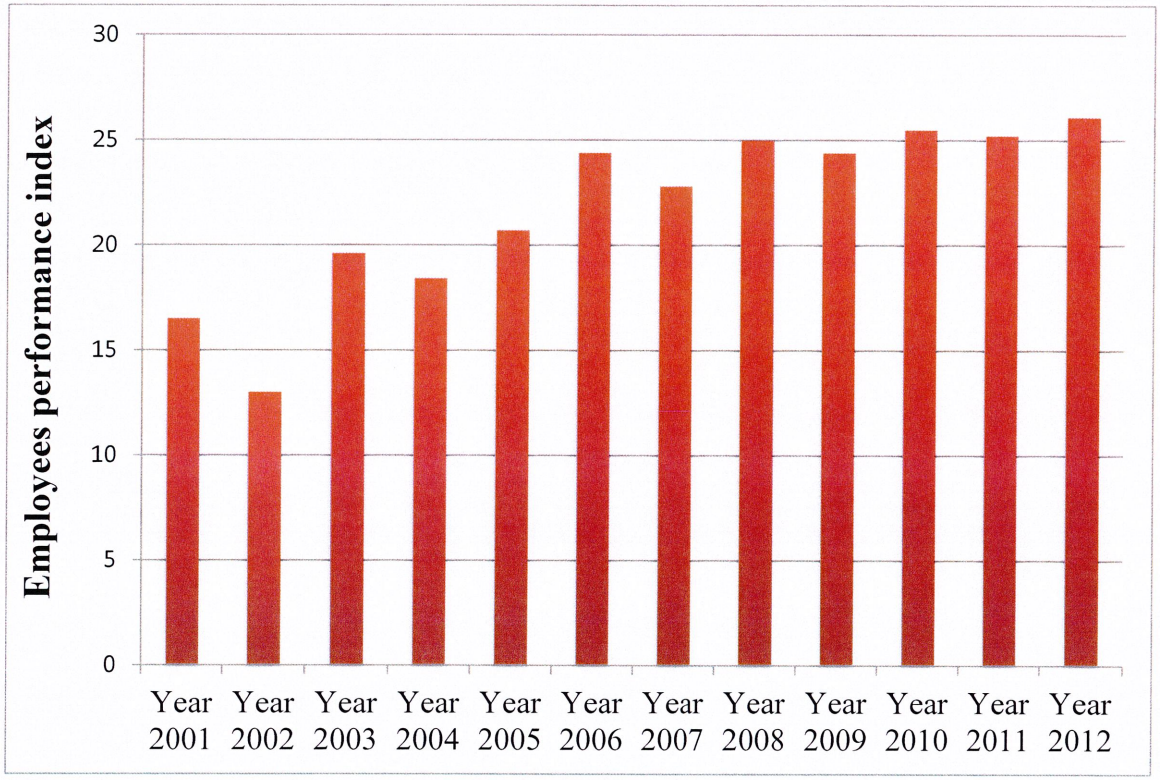


Figure (18)
Workforce improvement KPI

5.16.5. Percentage of roads improvement KPI

The roads sector is one of the main sectors at MOW and in the same time important to other public utilities. The MOW measures its performance through many KPIs related to the road sector. The percentage of roads

improvement KPI summarizes MOW initiatives in this regard where its historical performance data is shown in Figure (19).

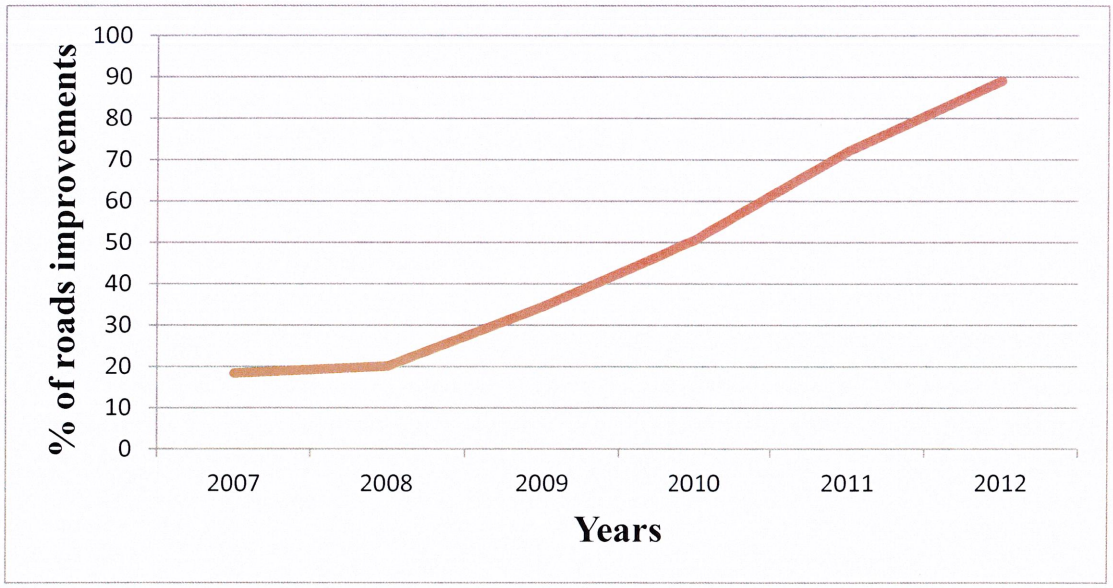


Figure (19)
Percentage of roads improvement KPI

5.16.6. New opened roads KPI

Furthermore, the new opened roads KPI measures MOW performance in managing Bahrain roads network through the different performance measures such as journey time, average speed and new add kilometers measure. The historical performance data of this KPI is shown in Figure (20) which reflects the positive results of MOW in managing its operations of roads sector.

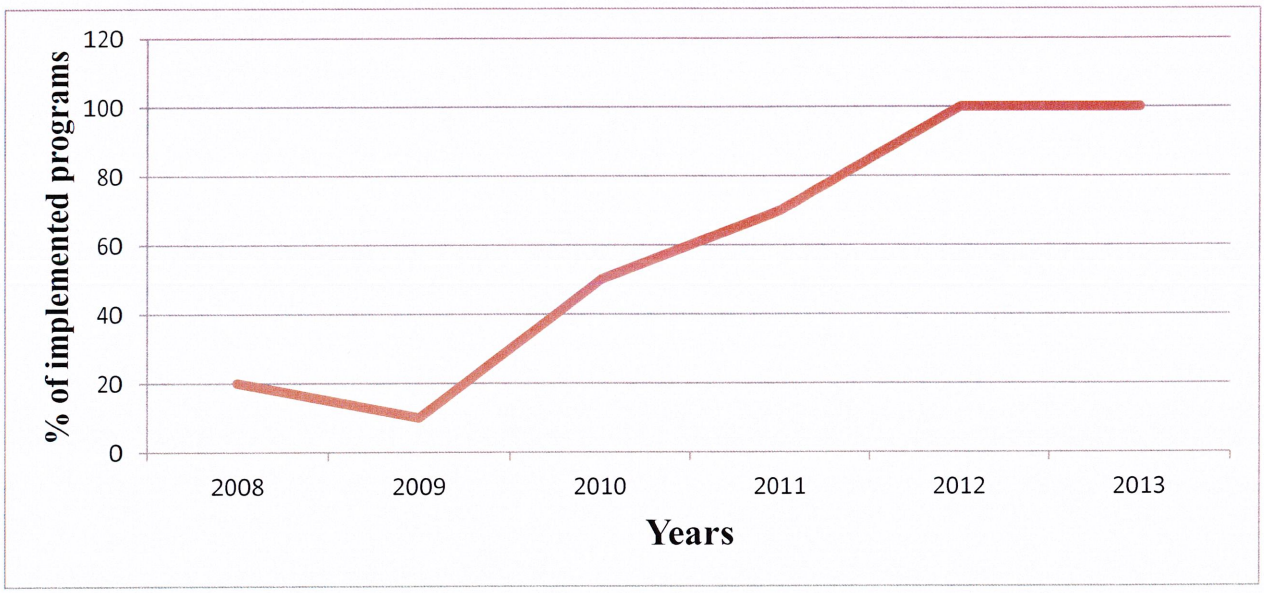


Figure (20)
New opened roads KPI

5.16.5. Themes performance

The visualization of the BSCs and KPIs varies from one organization to another. Some of them want to see the performance situation of each objective by its indicators. Others want to see the performance of the themes as a group of consistent objectives. Figure (21) is showing the performance improvement at the different BSCs themes where:

1. PPP: Public Private Partnership.
2. LPO: Leading Professional Organization.
3. KPP: Key Planning Player.
4. SQS: Sustainable Quality Services.

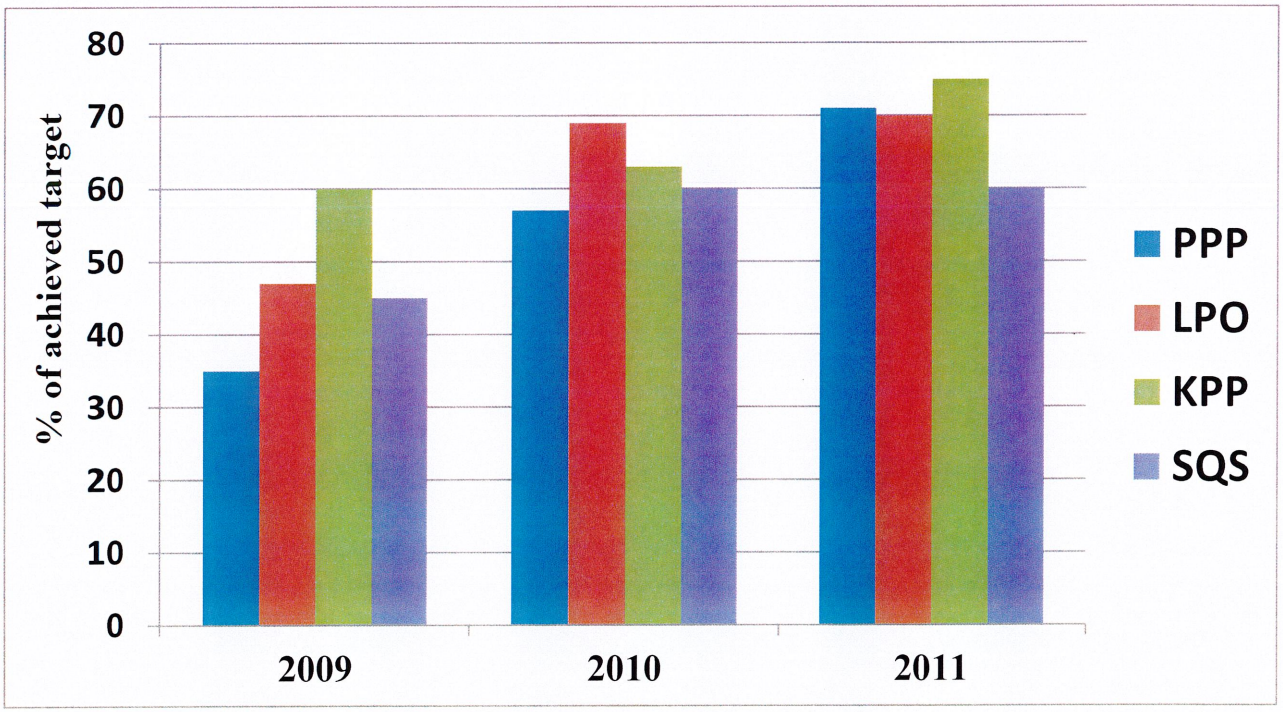


Figure (21)
The performance improvement of MOW themes

From the above figure, it is visible that all the themes are improving. One of the reasons for this improvement is that the Ministry of Works staff became more professional when dealing with performance aspects regarding the BSCs and the KPIs. Moreover, the operations of the ministry have been improved since it has now a systematic management and decision making process. The performance targets for the different operations, activities and projects are always updated to maintain the improvement as a continuous process.

Table (2) is showing certain KPIs of the MOW, its actual performance values at 2012 and the performance targets for the year 2015. The MOW has set its own criteria for the selection of measure and targets which was a

modified version of the SMART criteria. They chose to have their targets to be ambitious rather than attainable in order to improve their productivity and work efficiency and in the same time reach the maximum possible improvement.

Table (2)
Different types of KPIs of MOW

No	KPI	2012 (Actual)	2015 (Target)
Roads Sector KPIs			
1	Average Journey Speed (Km/h)	**42**	**66**
2	% of Lane km Constructed Compared with Required	**97%**	**100%**
3	Reach of Service, # of Lots Served	**4000**	**4000**
4	% Reduction in Roads Fatalities	**85%**	**67%**
Sanitary Sector KPIs			
5	% of Population Served	**93%**	**95%**
6	Infiltration Rate	**50%**	**35%**
7	Connections Completed on Time	**85%**	**100%**
Construction Sector KPIs			
8	% of Compliance with Green Building Criteria	**40%**	**100%**

5.17. Conclusion

The MOW is one of the best examples of the organizations which implement the BSCs according to the Kaplan and Norton approach (the strategy focused organization). The ministry which manages road projects, construction developments, and sanitary systems for the Kingdom of Bahrain has 17 cascaded strategy maps consist of 200 objectives, 500 measures, and 300 initiatives.

The corporate level strategy map contains about 20 objectives linked via causal relationships through the four strategic themes. Owners were assigned for all themes and objectives. Additionally, the ministry has established the OSM in order to support sectors, directorates and sections in implementing their strategy and in maintaining and updating their BSCs.

CHAPTER SIX: THE BSCs IMPLEMENTATION ROADMAP

6.1 Introduction

6.2 The Need and Motivations for BSCs

6.3 BSCs Implementation Mechanisms

6.4 The BSCs Implementation Roadmap for Operations Department

6.5 Conclusion

CHAPTER SIX: THE BSCs IMPLEMENTATION ROADMAP

6.1. Introduction

This section of the study outlines a detailed procedure for implementing the BSCs approach for operations department in service industrial organization of the Bahraini public sector. A good BSC expresses operations strategy through strategic objectives and measures which should be linked together by cause and effect relationships from the drivers of performance in the learning and growth perspective to the customer and stakeholders as outcomes perspectives.

Different ways are considered to present the findings from this study from the MOW and EWA. The researcher decided to link what was learned and found to a roadmap which can be used and followed step by step to develop BSCs at operations departments of a public sector organization in order to improve their operations management practice and department performance.

The researcher aimed to assist operations department managers in implementing BSCs and achieving performance improvement by presenting how others have approached BSCs development and by explaining the needed progressive steps.

6.2. The Need and Motivations for BSCs

As mentioned earlier through the previous chapters, the BSCs performance management system has several benefits and advantages if successfully implemented in public or private sector organizations. Before reaching a decision about implementing the BSCs or any other performance management system, the organization top management should have real needs to do so. These needs should be the motivational forces that initiate the decision regarding the BSCs implementation. This is because the BSCs implementation process needs budget to be allocated, administrative, human and technological resources to be assigned and leadership commitment in order to establish a successful BSCs performance management system.

6.3. BSCs Implementation Mechanisms

The BSCs implementation process can have different implementation time frames depending on the size of the organization, project scope and project complexity. The implementation process varies from four weeks up to a year or even in some cases two years (Kaplan and Norton, 1996).

Furthermore, several mechanisms could be used by the operations department managers in order to develop the BSCs system. The main idea is to follow a systematic procedure, such as the suggested roadmap, while collecting the required data to establish the BSCs different components. These mechanisms could be meetings, focus groups, interviews, Delphi method, surveys or workshops that combine different mechanisms. The suggested roadmap mechanisms and duration is as per Table (3).

Table (3)
Summary of BSC implementation process in operations department

Phase	Implementation Step	Mechanism	Needed Time
Planning	The need for BSC, Team establishment	Management Meeting	Up to three weeks
	Strategic content Analysis- customers & stakeholders requirements	Workshop 1	
	Operations strategy	Workshop 2	
	Strategic themes – BSC perspectives	Workshop 3	
	Strategic objectives	Workshop 4	Up to four weeks
	Performance measures	Workshop 5	Up to four weeks
	Strategy Map	BSC team Meeting	Up to one week
Implementation	Automation	BSC team Meeting	Up to four weeks
	Performance targets	Steering Committee Meeting	Up to four weeks
	Performance analysis	Steering Committee Meeting	Based on the department action plans
	Strategic Initiatives	Steering Committee Meeting	
Evaluation	BSC Evaluation	Steering Committee Meeting	
	BSC Cascading	Steering Committee Meeting	

6.4. The BSCs Implementation Roadmap for Operations Department

The BSCs implementation roadmap could slightly vary between the operations department in an organization that already has implemented it or not. In the organization that already has implemented the BSCs in the corporate level or in another department, the operations department managers should evaluate the situation for the following:

- The area of BSCs implementation (corporate level, departmental or business unit level).
- The existence of BSCs team.
- The existence of BSCs software application.

The existence of the BSCs in the corporate level will make it easier for the operations managers to develop the operations department BSCs by following the roadmap steps and coordinating with the existing BSCs team. Furthermore, the availability of the BSCs software application will speed up the implementation and usage of the scorecards. In addition to that, the available BSCs team could provide assistance through cascading and developing the operations department BSCs. Similarly, the availability of the BSCs in other department or business unit could help the operations department manager through their experience with the implementation process.

The detailed roadmap for BSCs implementation, as shown in Figure (22), involves 3 stages:

- BSC planning stage.
- BSC implementation stage.
- BSC evaluation Stage.

Each of these stages will be discussed in details in the following section.

6.4.1. BSCs team establishment

Both EWA and MOW involved a group of people from the top management and professional staff in the BSCs team. This practice has resulted in further ideas development and greater acceptance of the BSCs among the two organizations workforce.

BSCs team enhances the process of adopting the BSCs more quickly by encouraging the acceptance of its idea and concepts through the operations department employees.

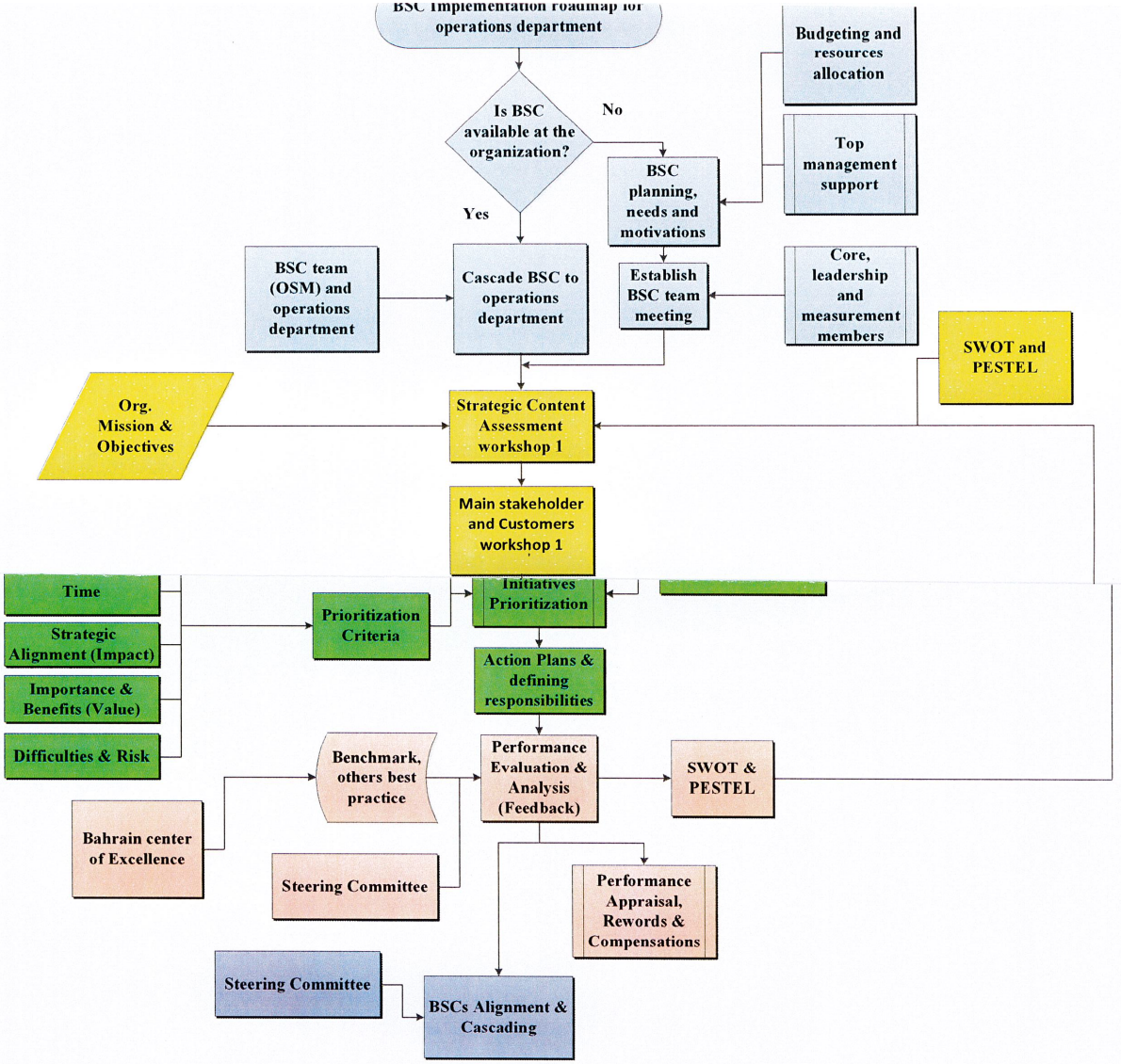


Figure (22)
Implementation and evaluation stages steps

In addition, the BSCs team should contain people from all operations department managerial levels to ensure alignment during implementation and to prevent the development of objectives that in contrast of corporate, other departments or other business units' objectives.

- The BSCs team based on the research scope should be formalized as the following:
- **Operations department level (managers):** To champion the BSCs and provide the approval of the final proposals by coordinating with the corporate management.
- **Business unit Level (section heads):** To manage the overall BSCs implementation and maintaining processes.
- **Operational Level (operational groups' seniors):** To provide measurement data for the BSCs and update different KPIs and measures.
- **The BSCs consultants**: who could be from external expertise company or internal BSCs experienced employee.

The BSCs team in addition to the above mentioned members should be supported by administrative assistance, information technology assistance and a working location equipped with the needed tools.

It is recommended that the established team, reports directly to the operations department executive in order to facilitate the implementation process by providing support and solve any occurred difficulties or problems.

6.4.2. Stage one: BSC planning

The planning stage involves activities and tasks related to the development of the BSCs model itself. The planning stage begins with understanding the main stakeholders' requirements and main customers' needs which actually shape the operations department vision and strategies. After that, all BSCs components will be developed through the cooperation of all managerial and operational staff of the department. The planning stage implementation steps are shown in Figure (23).

a) Step one: assessment and analysis

The BSCs implementation process starts with an assessment and analysis of the organization's existing strategic content: mission, vision, and values. The mission statement should be discussed with the internal and the external stakeholders of the department. The BSCs team in order to fulfill this requirement; should apply SWOT analysis or PESTEL analysis along with interviewing the operations department managers and business units heads.

Assessing the operations department internal strengths and weaknesses, as well as the opportunities and threats in the external environment should be discussed with organization corporate management along with the main customers and stakeholders.

As a result, a final set of vison, mission and values will be established by the BSCs team. The BSCs team should ensure alignment of the vision, mission and strategy statements with the organization corporate level.

(1) BSC Planning Stage

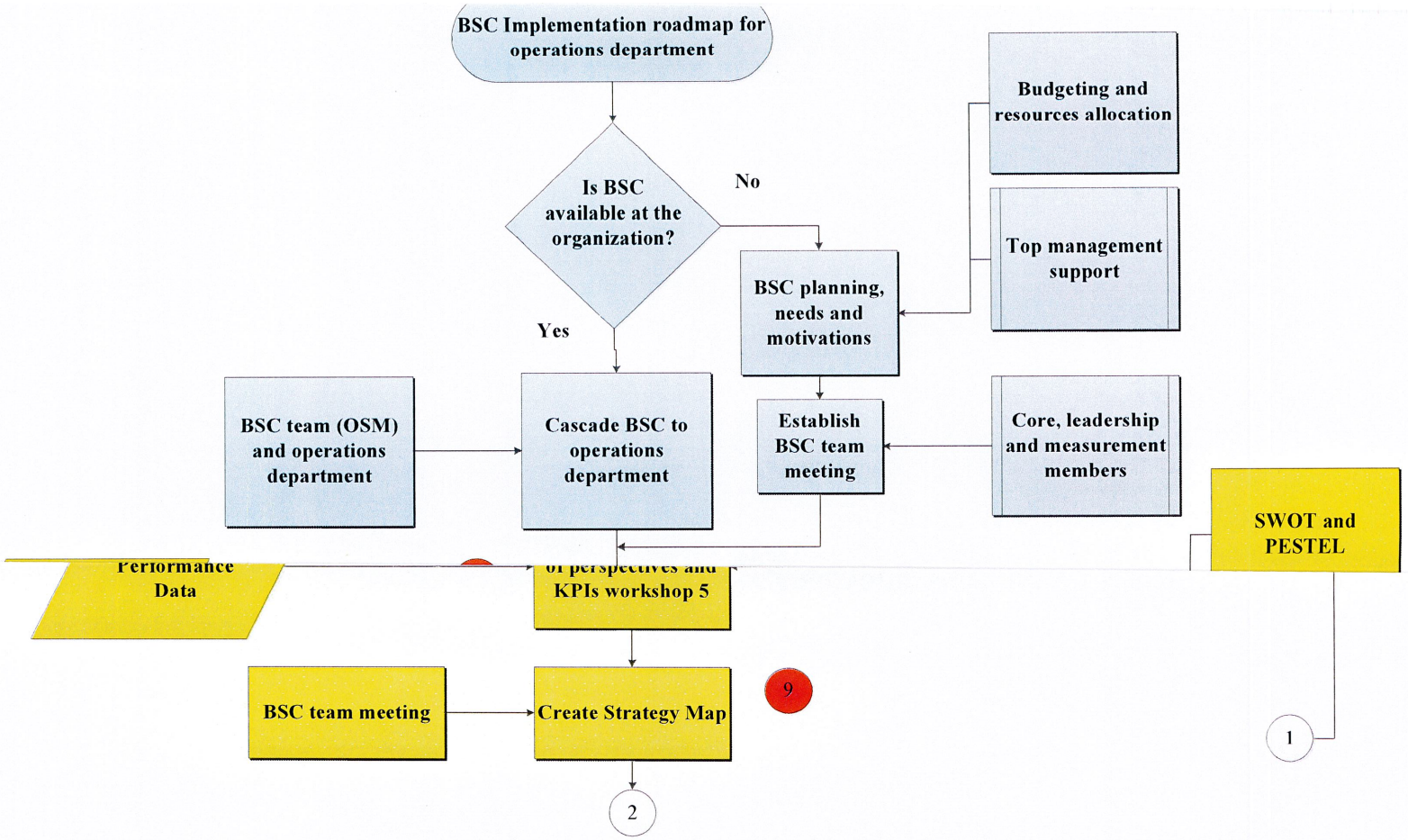


Figure (23)
Planning stage steps

b) Step two: defining the main customers and stakeholders requirements

If the main stakeholders and customers' requirements are not properly understood by the BSCs team, it will be difficult, if not impossible, to develop strategies that are responsive to customers and to stakeholders needs. Initially, the BSCs team will arrange the first workshop that includes the team members, operations department manager, business units heads and the top management representative in order to define the operations department main stakeholders and customers. The workshop will start with a brainstorming session in order to collect preliminary data regarding the department main stakeholders and customers' needs and requirements based on the department vision. Then, the results of the brainstorming session will be further discussed through focus groups, or used to prepare questions for surveys in order to correctly define the needs and requirement. It is recommended to have a specialized organization conducting these surveys where any error in collecting data is going to affect the whole process. EWA has employed a company to collect these data while MOW has conducted a series of focus groups to come up with its stakeholders and customers' needs and requirements.

According to the research scope, the operations department stakeholders are mainly, Bahrain Government, Bahrain Parliament, Ministry of Finance, Civil Service Bureau, other departments within the organization and some other public sector utilities. In addition, the operations department main customers are Bahrain citizens, other public utilities or departments within the organization. These stakeholders are

going to shape what the operations department has to do and will define the needed performance improvement through the operations department strategies.

c) Step Three: defining operations strategy

According to the operations department vision, main stakeholders and customers' needs and requirements, the BSCs team members along with the operations department management are going to formulate the operations strategy. In the case of non for profit organizations which work for public sector, there are common components in their strategies such as serving citizens in a better way with higher products and services, better utilization of budget and reducing operating costs. Furthermore, the operations strategy should be aligned with organization corporate strategy. This could be ensured by involving the organization strategy analyst or the strategic planning unit in the formulation of the operations department strategy.

Accordingly, a second workshop containing the BSCs team members, operations department manager, business units heads, a representative from the top management and the organization strategy analyst is conducted for developing the operations strategy. The operations strategy should be approved by the organizations chief executive.

d) Step four: BSCs strategic themes setting

Once the BSCs team members have agreed upon the operations department strategic content (vision, mission, values and strategy), then it should be reflected into three to four strategic themes. For most of the

organizations, the strategic themes will revolve around main stakeholders, customers and operations.

A third workshop is usually arranged to develop the strategic themes. This workshop should include the BSCs team members, the operations department manager and the business units heads. The workshop will start with a brainstorming session. Then the resulted preliminary proposed themes will be discussed through focus groups in order to minimize the number of themes to around three to four themes which actually represent the department vision and strategy.

In case that the organization already has implemented the BSCs at the corporate level, then it is the BSCs team and the operations department manager decision to use the same strategic themes as at the corporate level or to create new themes. EWA and MOW have used the same strategic themes for all BSCs levels. Most industrial organizations and governmental organizations have the operational excellence as a main strategic theme. Additionally, each strategic theme will pass vertically through all BSCs perspectives. The MOW decided to have one of the strategic themes passing horizontally through learning and growth perspective. This approach targeted to have a theme that works as a foundation or enabler for the other themes.

e) Step five: BSCs perspectives setting

The BSCs allow operations department managers to look though different perspectives which better translate the department vision and strategy into strategic objectives. The logical philosophy of the BSCs is that the improvement at the learning and growth will be reflected as

improvement in performance through the internal processes which will accordingly improve the customer experience and satisfaction in addition to the financial results.

Furthermore, for public sector organizations, which do not focus on profit as a main objective, the customer satisfaction and fulfillment of stakeholders' requirement are the dominant factors in their BSCs perspectives. In addition, the traditional BSCs perspectives could be used but the financial perspective focus will be on better utilization of budget, cost reduction and in rare cases increasing revenue. A better illustration of public sector BSCs is through the modified arrangements of the BSCs perspectives as shown in Table (4).

The first arrangement was used by EWA as shown in Figure (3) in Chapter 4 while the third arrangement was used by MOW as shown in Figure (14) in Chapter 5.

It is recommended to define the BSCs perspectives in the third workshop with the strategic themes because the same groups of people are needed throughout the workshop activities. In addition to that, defining BSCs perspectives and strategic themes during the same workshop will save time and resources of BSCs team and operations department.

f) Step six: Strategic objectives differentiation and development

The developed operations strategy will be translated into appropriate strategic objectives which are going to identify what the department has to do in order to execute the operations strategy and achieve better operations management and improvement. These

objectives will be categorized according to the strategic themes and BSCs perspectives.

Table (4)
Four suggested arrangements of BSC perspectives

	BSC perspective	Example from Bahrain
1	Financial perspective	EWA
	Customer Perspective	
	Internal processes perspective	
	Learning and Growth perspective	
2	Customer Perspective	New version of BSC for EDD, DCC BSC
	Financial perspective	
	Internal processes perspective	
	Learning and Growth perspective	
3	Stakeholders Perspective	MOW
	Customer Perspective	
	Internal processes perspective	
	Learning and Growth perspective	
4	Customer perspective	From literature
	Internal processes perspective	
	Learning and Growth perspective	
	Financial perspective	

- **The Customer Perspective**

In order to develop objectives for the customer perspective, the operations department should understand what adds values to customers. Organizations that emphasize operational efficiency

usually provide certain values, such as competitive pricing, on-time delivery, or excellent quality. Other organizations may add values for customers through their great relationship with them or by stressing pioneering and exceptional products or services. In addition, it is very important to define customers and the values that will be provided to them, otherwise, the department may face the threat of developing BSCs that are not suitable with the competences of the organization. The operations department may select from three strategies:

- **Operational efficiency**: to add value for customers by providing competitive pricing, superior quality, on-time delivery or diverse product lines.
- **Customer relationships**: to add value for customers through personalized services and customized solutions, trust and brand loyalty, and other one to one relationships.
- **Innovative products and services**: to add value through inventing creative products and features, excellent delivery of products and services, and other product leadership initiatives.

Furthermore, for operations department in a governmental organization, the customer perspective may include strategic objectives related to the department dealer, agents or distributor.

- **The internal processes perspective**

Internal processes perspective focuses on the critical operations and activities that provide the highest impact on performance. These processes should be managed effectively and improved in order to achieve stakeholders and financial objectives. Due to that, the internal

processes objectives should be defined after the customer perspective objectives.

In addition, the internal processes perspective focuses on both short-term and long-term processes the operations department must excel in, to achieve the customers and stakeholders or financial objectives. For the operations department, internal processes are the most important perspective in order to ensure the stability of operational activities and business. Also, the internal processes show how the department is going to satisfy customers' needs and fulfill stakeholders' requirements by the existing processes or new ones that should be established.

The three main areas that the strategic objectives of the internal processes focus on, are:

- Product leadership: innovative new products; continuous improvement of existing products.
- Customer relationship: customer support service; customer contact.
- Operational excellence: reduce operating costs; improve quality; improve delivery time; improve supplier relationship.

- **Learning and growth perspective**

Learning and growth is the fourth BSCs perspective which works as the foundation that allows the operations department to achieve its objectives and execute the operations strategy through translating the required process skills and competencies into learning and growth plans. The role of learning and growth perspective is to support the

present and future improvement of knowledge, skills and competencies which are needed to perform and accomplish the main processes and operations activities properly. Without providing workforce with the required skills and competencies; the other perspectives of the BSCs cannot be fully realized.

Learning and growth perspective covers many aspects which may differ among different industries or organizations but usually it will cover the following categories:

- **Information technology systems:** such as applications and systems for execution of internal processes activities and operations.
- **Organization culture:** such as motivation, alignment, communication, and other qualities of empowering the organization.
- **Workforce capabilities:** technical skills; leadership skills; communication skills.

▪ **Financial perspective**

Financial objectives define the expected financial performance according to the organization strategy. Financial objectives are ultimate targets of private sector organizations and performance driver or enabler for the public sector organizations. Cost reduction, productivity and asset utilization are the major focus of public sector organizations.

- **Development of strategic objectives**

A fourth workshop will be conducted in order to define the strategic objectives for each of the BSCs perspectives. The operations department manager, business units' heads, BSCs team members and the top management representatives will be divided into four groups (the number of BSCs perspectives). The operations department manager, top management representative and the consultant will work as a facilitating and leading group during the strategic objectives development process. Each group will be responsible for one BSCs perspective where it is preferable to have people categorized on the groups according to their experience.

At the end, all the developed objectives will be discussed between all groups taking into consideration the following points:

- Objectives should be clear and specific without adding too much information in the objective statement.
- Objectives always should be related to the vision and strategy achievement.
- Differentiation between objectives and initiatives or targets.
- The causal relationships between objectives through strategic themes and perspectives.

The facilitating and leading group should always work together with all groups in order to keep the number of objective to the minimum critical objectives that could be considered as the critical success factors. EWA and MOW have a maximum of 24 objectives in BSCs where it is recommended to keep the number between 20 and

25 objectives. The final set of the strategic objectives will be approved by top management in order to proceed with the next implementation steps.

- **Strategic objectives owners**

For each strategic objective, an owner should be responsible for this objective. The objective owner is responsible for the objective performance, measures, initiatives, performance improvement programs, reporting and presenting of objective through the operational and strategic reviews. According to the managerial levels at service industrial operations department in the Bahraini public sector organizations, the objective owners will be the business units heads. A recommended practice is to have the operations department manager as an objective owner on the top level of the BSCs.

g) Step Seven: performance measures development

In the process of developing performance measures and KPIs, it is important to ensure their strategic linkage to the operations department strategy and vision in addition to achieving the strategic objectives. Each of these objectives should be measured through one or more performance measures.

- **Performance measures selection**

In order to select and create the suitable set of performance measures and KPIs, a fifth workshop is needed with the same structure that was used in the process of defining perspectives (fourth workshop) will be used again here. The same four groups are

responsible for developing performance measures for the relative BSCs perspective taking into consideration the following points:

- The measure type: leading measure (performance driver) especially in internal processes and learning and growth perspectives or lagging measures (outcomes) especially in financial and customers perspectives.
- Keep the measures number controllable (critical few measures).
- The measure should be linked to its relative strategic objective and representative of the objective performance.
- The measure could be used for improving performance by defining targets to it.
- There are available performance data sources for the measure.
- The performance measure usefulness should justify the cost of collecting its data.
- The performance measure should be comparable between other departments, business units or organizations and over time.

Practically, a lot of the performance measures could be extracted from the present performance systems and processes in the operations department. The developed set of measures from this workshop will be considered as preliminary set of performance measures. Furthermore, in the fifth workshop the following tasks will be performed:

- Identifying the data source for each of the selected measures.
- Providing permissions for the measures owners to receive the needed data within a specified time period.

- Identifying how each of these measures is going to impact the others through the cause and effect relationships.
- Defining the performance functions and equations for any needed calculations to find each measure performance value.
- Deciding the best data interpretation way to be used for each performance measure.

The set of measures should be reviewed with the concerned employees as per their experience with this measure. The evaluation involves the linkage to the relative strategic objective, available performance data source and the frequency of measurements. As a result, the revision and evaluation comments will be analyzed by the BSCs team along with the operations department management and consequently any needed modification will be done.

- **Performance measures evaluation**

The next step is to use the available performance data in order to evaluate the usefulness of the defined performance measures. The evaluation process involves the previous mentioned points in developing measures in addition to consistency of measures with each other through providing logical results.

It is recommended to compare the preliminary set of measures with those of other similar departments within the same organization if the BSCs are already implemented or of different organizations. In addition to that, the KPIs libraries are useful for this purpose.

- **Performance measures owners**

The final step in defining the performance measures is to assign measure owner to each performance measure who will be kept accountable and responsible for measure data updating and performance. Measure owners should be trained by the BSCs team or a training agency where the training should cover the measures details, the method of gathering data and updating it, the interpretation method, measure performance review and fundamentals of performance analysis. In addition to that, the measures owners will be trained about the whole BSCs performance management system.

h) Step eight: defining importance weights of BSC

Usually some of KPIs or performance measures are more important to the operations department than others. However, it is unadvisable to neglect the less important key performance indicators. Therefore, importance weights for indicators and perspectives in the BSCs can solve this issue. The applied weights to a KPI or perspective in the BSCs represent its importance to the operations department and its impacts on the performance. Importance weights should be assigned by the BSCs team or a cross functional performance improvement focus group. Mission, strategy and objectives could be used as references in assigning importance weights. There should be an alignment between the strategic objectives importance and the assigned weights.

The importance weights are used to better evaluate performance. Kaplan and Norton suggest a balanced weighting structure and show that nonfinancial measures are at least as important, if not more important,

than financial measures. The facilitating and leading group at the fifth workshop is going to discuss all performance measures, and BSCs perspectives according to strategic objectives importance of each of them. Accordingly, an importance weight will be assigned to each performance measure and BSCs perspective. The suggested BSCs perspectives importance weights by Kaplan and Norton were as shown in Table (5) (Kaplan & Norton, 2001).

Table (5)
Suggested weights for each BSC perspective

Perspectives	Weights
Financial	22 %
Customer	22 %
Internal Processes	34 %
Leaning & Growth	22 %

i) Step nine: strategy map formation

The strategy map is a visual presentation that contains the operations strategy and the operations department defined strategic themes in addition to strategic objectives that are linked through the cause and effect relationships through the four BSCs perspectives. An innovative approach that is used by the MOW is to add the objectives owners' names and their pictures on the BSCs strategy map aiming to increase the responsibility towards the BSCs successful implementation and objectives achievement. The BSCs team is going to develop the strategy map of the operations department according to the developed strategic themes, perspectives, strategic objectives and performance measures. Figure (24) is showing a suggested arrangement by Kaplan and Norton of the BSCs components through the strategy map of a for

profit organization. The BSCs team could use it as a reference along with the chosen arrangement of the BSCs perspectives mentioned earlier.

In addition, the cause and effect relationships between objectives through the perspectives should be reviewed by the concerned persons in the operations department (usually will be the objectives owners and performance measures owners).

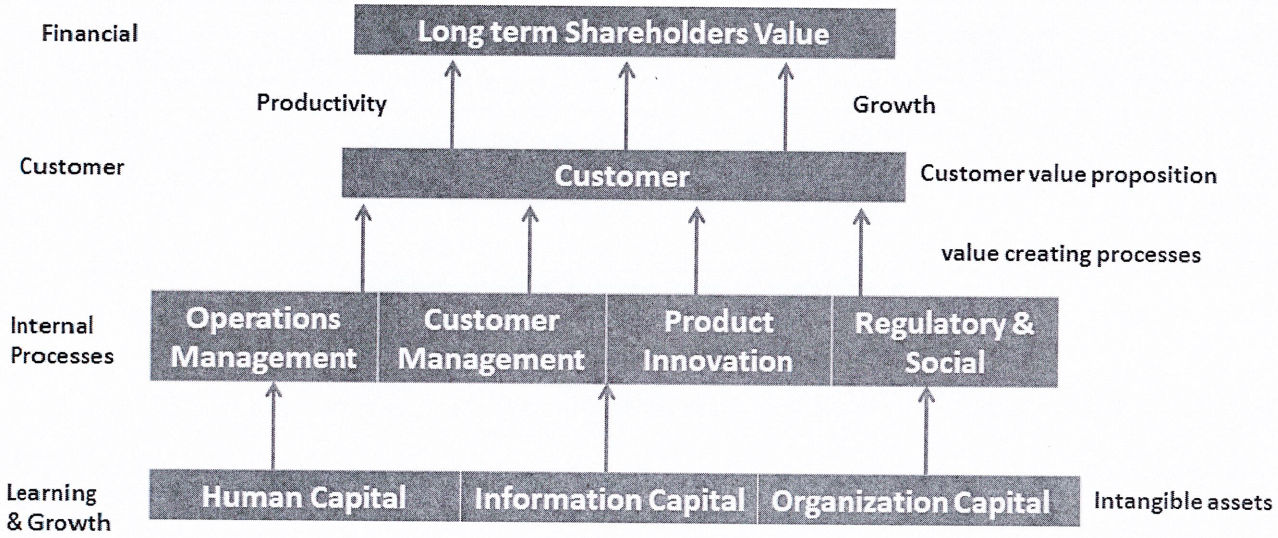


Figure (24)
A simplified strategy map, (Kaplan and Norton, 2001)

6.4.3. Stage two: BSC implementation

For the operations department at a service industrial organization of the Bahraini public sector, it is recommended to have a steering committee within the department, which includes the department manager, business units heads (objectives owners) in addition to the BSCs team members. This committee is responsible for the strategic performance of the organization,

which includes the decisions regarding performance targets approval and improvements, the strategic initiatives, cascading of BSCs to lower business units, BSCs periodic reviews and evaluation. The steps of the implementation stage are shown in Figure (25).

a) Step ten: automation

Automation enhances the implementation, reporting and maintaining the BSCs. It helps in handling different operations management and communicating performance information to get the accurate performance figures to the right people at the correct time. In other words, automation supports people in making enhanced judgments and improved decisions because it offers quick access to actual performance data.

The BSCs team, according to the operations department needs and requirements, department managerial levels, related business units, workforce size, performance appraisal, rewards and compensation systems, will define the BSCs software specifications. After that, the available software applications in market will be evaluated against these specifications. As a result, the BSCs team will choose the most suitable application to be approved by the steering committee and to assign the required budget and resources. Subsequently, the BSCs team along with department information technology support department coordinate with the software provider for customization of the operations department BSCs components, installation, training and software support.

(2) BSC Implementation Stage

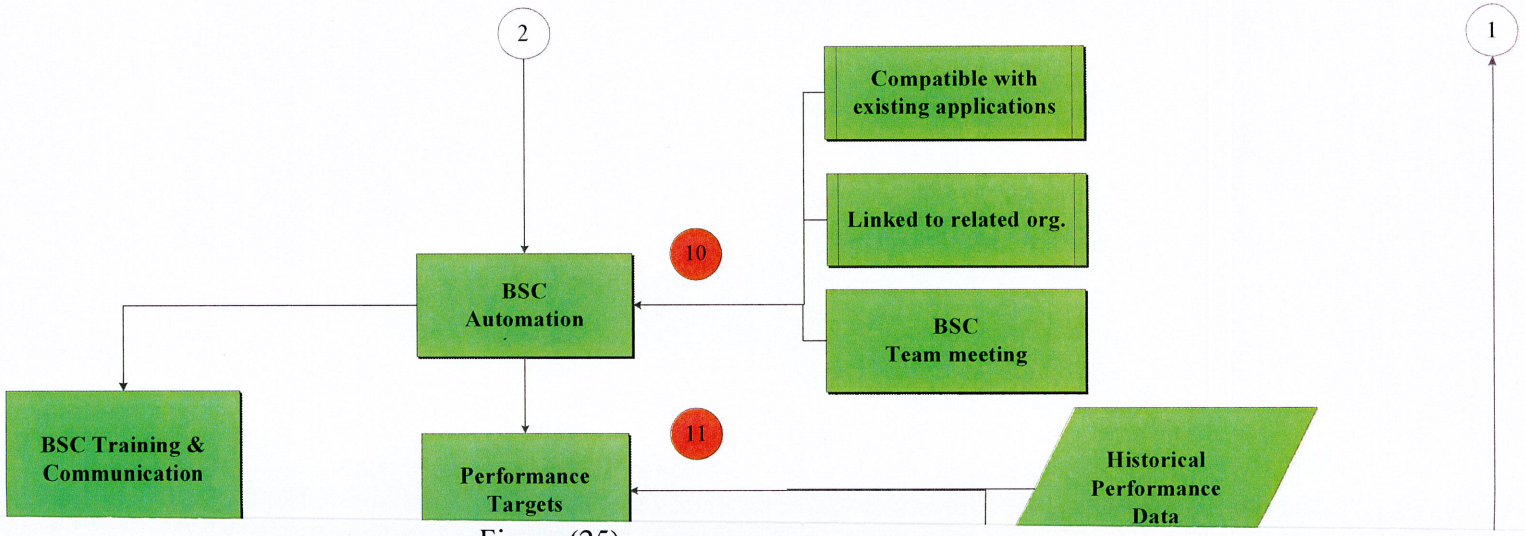


Figure (25)
BSC implementation, evaluation and cascading stages steps

Before using the BSCs software application, the BSCs team, themes owners, objectives owners, measures owners and operations department managers should be trained on using this application. In addition to that, levels of authority should be defined between these people, to have each individual dealing only with his part of the BSCs without affecting others parts or exposed to unneeded information.

b) Step eleven: performance targets

Measurement only is not enough. As soon as a set of appropriate KPIs have been defined for the operations department, the desired level of performance should be specified. Moreover, the workforce should be motivated in order to strive in achieving these defined targets. Consequently, targets should be mutually agreed between operations department management and the measures owners who are responsible for the progress in achieving these targets.

The steering committee will assign each measure owner responsible for studying and analyzing the available performance data of his measure in order to come up with a proposed performance target. The measures owners while developing the performance targets should keep in mind the following points:

- **Achievable:** the performance targets should be realistic based on the current performance data. If it is set too high (such as a too ambitious target), not only will it be irrelevant but it will ensure failure.

- **Relevant:** the desired level of performance should be linked and related to the achievement of the operations department objectives and operations strategy.
- **Time related**: the appropriate time interval and deadline is identified. It should be possible to collect the relevant information either as it happens or within a short time period, if not it will lose its significance.

Furthermore, operations manager should give special attention to the performance drivers (leading measures) as powerful tools to drive department toward performance improvement. The outcomes (lagging measures) could be shown as long term achievements.

The proposed set of performance targets will be used after approval from the steering committee of the operations department. The BSCs team should start monitoring the progress of performance towards achieving the approved targets and the updating process through the BSCs software application. As a result, through the performance analysis and performance evaluation at the operational and strategic performance reviews, the steering committee is continually changing these targets according to the current performance and the desired one.

c) Step twelve: performance analysis

Performance analysis is an essential part of BSCs implementation in order to improve performance and operations management. The steering committee is responsible for performance analysis that should be done on regular basis as decided by the committee but it should not be more than three months long. The main issues that should be discussed are:

- Follow up the strategic themes performance.
- Strategic objectives performance reports revision.
- KPIs analysis for bad performance results.
- KPIs and performance measures validity.
- The progress of the strategic initiatives.
- Issuing of performance data and reports to other departments.

Furthermore, the BSCs software application is considered as a very useful instrument that provides many analyzing tools where the user can drill down to investigate the root causes and data of certain measure performance. In addition, the software application could be configured to provide certain reports that automatically send to predefined individuals to take necessary actions in the right time.

d) Step thirteen: strategic initiatives and improvement programs

As mentioned earlier, the steering committee is responsible for decisions regarding the strategic initiatives and improvement programs. The committee will coordinate with the organization top management during the budget allocation period (every two years in Bahrain) to have the required resources and budget in order to achieve the strategic objectives and to execute operations strategy.

Usually the different departments in the organization are competing for budget and resources. The operations department steering committee should ask for the needed budget and resources based on the BSCs results. Furthermore, the received budget and resources often are less than the requested by the departments. A recommended practice is to establish initiatives prioritization criteria.

- **Strategic initiatives prioritization**

The BSCs team should consider the following questions while thinking about the prioritization criteria for the initiatives:

- How the initiatives could support the expected outcomes (BSCs strategic objectives and operations strategy)?
- What are the initiative requirements?
- What are the initiative expenses?

The MOW in Bahrain has developed an innovative procedure for prioritizing initiatives where the procedure includes the following points:

- Strategic importance to the objectives achievement.
- Needed resources.
- Easiness of implementation.
- Related risks.

The steering committee could use the focus groups and the experts' opinions as an initial proposal to introduce scores for each above mentioned points which will be used later to get the initiatives prioritized based on their total score and the committee decision. The committee will receive the prioritization criteria to be reviewed and approved. As a result, these criteria will be applied for any coming initiatives or improvement programs for final decision and allocation of budget and resources.

6.4.4. Stage three: BSC evaluation

The BSCs in order to be valid for measuring and managing the operations department performance, it should be periodically evaluated according to a predefined process.

a) Step fourteen: BSC evaluation

The operations department steering committee is responsible for arranging a sequence of regular meetings of two types:

- **Operational performance review meeting**: Usually on monthly basis, and it includes the operations department business units heads, measures owners and a representative of the BSCs team.
- **Strategic performance review meeting**: Usually on quarterly basis, and it includes the operations department themes owners, objectives owners, measures owners, and the BSCs team members.

The feedback of the operational performance reviews is discussed in the strategic performance reviews as needed in certain cases such as:

- Bad performance of certain objectives that needs immediate actions.
- Unsatisfactory progress of strategic initiative which will affect the achievement of targets.
- Any needs regarding KPIs modification, changing or removing.

Furthermore, the BSCs team is responsible for evaluating the overall BSCs implementation and usage through the operations department business units. During the evaluation process, the operations department BSCs team should focus on the following:

- The progress in achieving the operations strategy; through the analysis of the performance of each strategic theme.
- Defining the weak points and obstacles at business units according to each strategic objective performance and desired achievement.
- Assessment of KPIs validity and usefulness and the possibility of updating them.
- The changes in the business or operating environment.
- The workability and effectiveness of the automation software application.
- The need for cascading or modifying the cascading and alignment levels of the BSCs.

In addition to the above points, the BSCs team could use the SWOT analysis again and update the BSCs components accordingly. The results of the evaluation and analysis will be discussed in the operations department steering committee. Usually the discussion revolves around:

- Performance achievements.
- Any pending problems regarding operations management.
- Financial results and budget reports.
- Future improvement plans.
- Operations strategy update.

A recommended way for increasing responsibility of workforce and effectiveness of operations management improvement through the BSCs implementation is by including the organization top management in the

evaluation process. As a result, the steering committee of the operations department has to present the evaluation results to the top management of the organization on regular basis through presentation in front of the chief executives. The direct communication through power point presentation is better than sending written reports.

6.4.5. Stage four: BSCs cascading

Cascading the operations department BSC to its lower level business units and working groups is important where they cannot use this BSC directly. Cascading a BSC is to translate the first level BSC down to the next managerial levels (from corporate to directorate or department to business unit). The final level for cascading is after reaching the individuals level BSC.

Furthermore, the cascading process depends on the feedback from the operations department BSC performance analysis, BSC evaluation and the steering committee decision.

a) Step fifteen: alignment by cascading BSC

According to the results of the strategic reviews, the steering committee along with the BSCs team decide the suitable time for cascading the BSCs to the operations department' business units. Usually the cascading process will pass through the same steps mentioned earlier while developing the BSCs. The same groups will be engaged in addition to any needed business units staff of senior engineers and engineers (scope of the research service industrial organizations) since it is the next lower level after the operations department.

After making sure that the three levels of the service are correctly cascaded and aligned to the corporate vision and strategies, it is recommended that BSCs team start developing the individual BSCs with the operations department. The individual balanced scorecards will link the employees' performance annual appraisal, compensation and rewards systems to the operations management performance through the performance achievement and improvement according to the BSCs.

For the public sector operation departments in Bahrain, the BSCs software should be compatible with the Civil Service Bureau human resources software in order to link the performance appraisal, compensation and rewards systems to the BSCs application. As a result, during the evaluation of the BSCs software application, this feature should be checked.

Accordingly, the operations department finally should have the following BSCs levels as shown in Figure (26):

- Departmental level.
- Businesses units' level.
- Operational groups' level.
- Individual level.

As cascading the BSCs down, the number of scorecards will increase accordingly. The BSCs team and operations department managers should always ensure the alignment between all these BSCs through the operational and strategic performance reviews. In addition to that, the BSCs software application should be updated accordingly.

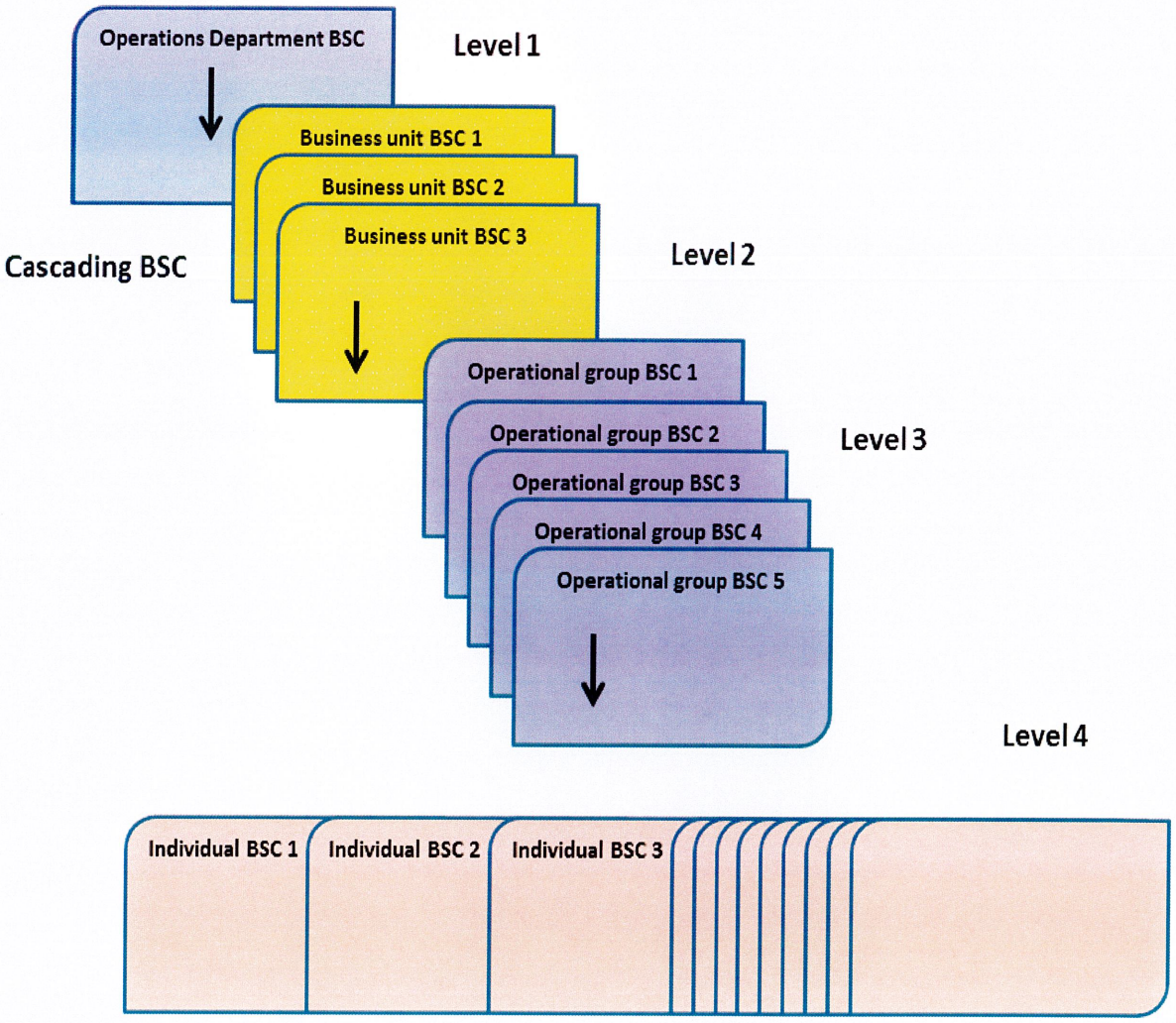


Figure (26)
Cascading BSC to all operations department levels

6.5. Conclusion

Towards the end, the BSCs approach is a management tool which supports the operations department managers in implementing the operations strategy and in translating it into operational actions. In the two studied cases that have been reviewed in this report, MOW and EWA, there were dramatic improvements in their operations performance over the years resulting from the successful implementation of the BSCs.

The researcher based on the data analysis and findings has developed a detailed roadmap for BSCs implementation at the operations department of a service industrial organization from Bahraini public sector. The roadmap includes recommendations and suggestions as per the best practice for the BSCs literature and innovation ideas form the two cases studied.

CHAPTER SEVEN
RESEARCH VALIDATION AND ROADMAP APPLICATION

7.1 Introduction

7.2 Validation Techniques

7.3 Validation through Implementation

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CHAPTER SEVEN
RESEARCH VALIDATION AND ROADMAP APPLICATION

7.1. Introduction

Qualitative researches validation has two characteristics. The first is to perform the research in a professional and systematic manner and to reduce the gap between reality and representation. The second thing is to present clearly how the research was performed. Qualitative researches achieve higher validity because its data are close to the research field than in quantitative researches Moreover, in qualitative researches, the opinions and interpretations of the research are considered in a way which makes data closer to reality. Furthermore, qualitative researches are stronger than quantitative researches in terms of validity due to the consideration of the view and the opinion of the interviewee or the participant on a subject matter in a research project (Bryman, 2008).

7.2. Validation Techniques

The qualitative research validation could be done using the suggested eight strategies for validity by Cresswell, 2007. No study needs to include all of them, but it is recommended to apply at least two validation techniques. The researcher has chosen to apply the following:

1. **Adequacy of data**: The researcher has successfully achieved the data adequacy through applying several data gathering methods (semi-structured interviews, observation and content analysis) during enough research time period.

2. **Appropriateness of data**: the two cases (EWA and MOW) have been purposively chosen with determination according to the research type and objectives rather than randomly.
3. **Participants Check**: the researcher has returned to the participants in the interviews while data gathering process and data analysis stage in order to confirm the entire written data along with the interpretations of findings for its accuracy and trustworthiness.
4. **Triangulation**: the researcher has imported data and information from different sources through data gathering methods in purpose of cross checking and corroborating evidence. The first data gathered from the content analysis were used as introductory information for question preparation of the semi-structured interviews.

   Furthermore, the interviews questions data were compared with the observation findings and researcher notes. Finally, all data and findings were analyzed in order to come up with the suggested road map and researcher recommendations.
5. **Peer review or debriefing**: This research was supervised via two supervisors who checked and discussed the research findings and results with the researcher in regular meetings.

Moreover, Bahraini BSCs experts' points of view regarding findings, interpretations and the BSCs implementation roadmap were taken into consideration by the researcher. The experts were chosen based on their experience in developing and implementing the BSCs at the Bahraini public sector. The experts are:

1. Abdulhussain Monfaridi; CEO Consultant, National Oil and Gas Authority.

2. Hala idrees; Chief; the Office of Strategy Management (OSM), EWA.
3. Yasser Al Hamad; Chief; Public and international relations. (was Strategy Specialist), EWA.
4. Saleh Al-Ansari; Strategy Specialist, EWA.
5. Patrick C.A.; Strategy Specialist, EWA.
6. Yasser Al Rumaithi, BSC Software Specialist, EWA.
7. Samaa Alrays; Chief of Quality Assurance Section, Ministry of Health.
8. Rajaa Alzyani; Chief of office of strategy management, MOW.
9. Fatima Rajab,Strategy Manager, BAPCO,

7.3. Validation through Implementation

The validation of the developed BSC implementation roadmap was achieved through applying the roadmap at business unit which already has a BSC. After that, the developed BSC was compared to the existing BSC to check the similarities and differences.

7.3.1. Electricity Distribution Directorate (EDD)

In order to validate the developed roadmap for the BSCs implementation at the operations department in service industrial organizations, it was applied at EDD which is an operational business unit at EWA. EDD was chosen due to the following reasons:

1. The distribution of electricity is the final process of EWA operations.
2. EDD considered as the link between the EWA and its different customers, contractors and part of the stakeholders.

3. Most of EWA services are provided through EDD.
4. Failure in execution of the EDD operations strategy will seriously affect EWA overall performance.
5. EDD network and substations are the biggest part of EWA assets and in same time the network is distributed all over Bahrain.

7.3.2. Team establishment

EWA already has implemented the BSCs as a performance management system through the corporate and directorate's level. Referring to the researcher suggested roadmap, EDD should establish a BSC team where they could ask the help of the existing office of strategy management and strategic planning unit during the BSCs cascading process.

The established BSC team for EDD BSCs involved twelve people as following in Table (6):

Table (6)
EDD BSC team members

	Members	Section
1	Office of strategy management	BSC expert
2	Strategic planning unit	Strategy analyst
3	Distribution operations	Senior staff
4	Distribution maintenance	Senior staff
5	Distribution control	Operational staff
6	Distribution construction	Senior staff
7	Distribution planning	Senior staff
8	Distribution material	Senior staff
9	Distribution special projects	Operational staff
10	Distribution IT support	It engineer
11	Distribution administration	Administration specialist
12	Distribution Directorate	Senior staff

The BSC team members were chosen by the researcher and the recommendation of the OSM and EDD director. The main factors for selecting the above mentioned members in Table (6) are:

- Work experience in EDD (more than 5 years).
- Participation in BSC implementation.
- Enough knowledge about EDD operations.
- Willingness for research contribution.
- Availability during the research period.

Around 67 % of the team members were senior and strategy related staff while 33 % of them form the supporting units or operational professionals. The researcher worked as a facilitator through the BSCs development process where this job is usually done by a BSCs consultant.

7.3.3. BSCs planning stage

7.3.3.1. Assessment and analysis workshop (workshop 1)

The facilitator (in this case the researcher himself) arranges for a series of focus group meetings among the BSC team members and EDD managers in order to start the assessment and analysis of EDD strategic content.

Accordingly, BSC team has reviewed EDD strategic content which involves the EDD mission, operations strategy, values and EWA corporate BSCs. In addition to that, a SWOT analysis has been conducted by the BSC team. As a result, the following updated vision, mission, strategic pillars were established:

a) **EDD SWOT analysis**

SWOT analysis is a tool for auditing an organization and its environment. SWOT results in brief are:

- **Strength:**
  - Clearly defined job descriptions, work responsibilities and having experienced professional staff.
  - Out sourcing part of EDD work.
  - Working in computerized environment.
  - Pre-allocation of budget.
- **Weakness:**
  - Noncommittal attention by EDD contractors to their defined job responsibilities.
  - Over loading of contractors especially during summer.
  - Insufficient budget allocation.
  - Improper/incomplete code of practice.
  - Improper work environment and offices for certain operational units.
- **Opportunities:**
  - Offering consultation to other companies.
  - Development of staff by giving exposure to modern engineering systems.
  - Upgrading distribution network and control system
  - Strategic partnership with other GCC electricity and water providers.
- **Threats:**

- Inability to supply /sustain power to all consumers, especially in summer time.
- Privatization of EDD
- Damages caused to our network by third party.
- Tampering of energy meter records/registers by consumers.
- Unauthorized modification for the electrical connections.

b) **Vision**: By 2017 EDD is a Model of Excellence in the provision of electricity services with minimum interruptions and timely revenue collection.

c) **Mission**: Is to distribute power required by developers and public, in a safe and sustained way, conforming to the highest international standards.

d) **EDD strategic pillars**:

- Delivering a responsive and consistent service to customers.
- Providing sufficient and sustainable power capacity supporting the Kingdom of Bahrain economic development.
- Ensuring effective financial management of EWA affairs.
- Maintaining a talented, high performing workforce to deliver EWA objectives.

7.3.3.2. Main stakeholders and customers

The BSC team along with EDD management through a focus group meeting (in workshop 1) has defined the main stakeholders to be:

- EWA top management.
- Funding Agencies.
- Bahrain government.

- EWA partners.

In addition, the main customers have been defined to be:

- Bahrain citizens.
- High voltage customers.
- Investors.

Furthermore, the main stakeholders' requirements and the main customers' needs are defined to be:

- Provision of excellent, reliable, cost effective and quality supply of electricity to different sectors of consumers.
- Develop strategic and operational plans for improvement of provided services to consumers.
- Ensure the best levels of operational efficiency and minimum energy loss through maintaining, developing and improving the distribution network.
- Professionally respond to Bahrain increasing demands for electricity services.
- Utilize modern and advanced information technology systems such as Geographical Information System (GIS), Customer Services System (CSS) and Resource Planning System (RPC) to provide excellent customer services.
- Develop workforce competences and skills through a system of ongoing training programs.

7.3.3.3. Operations Strategy workshop (workshop 2)

As a result, of the analysis of the strategic content and the findings of the SWOT analysis, the BSC team has conducted brainstorming session and focus group meeting (in workshop 2) to define EDD operations strategy. Accordingly, **EDD operations strategy** to be **"provide electricity of the best possible quality to the customers and to install a robust infrastructure capable of meeting the increasing short and long term demands of power in a safe and sustainable way conforming to the highest international standards".**

7.3.3.3. EDD strategic themes workshop (workshop 2)

Next, a second workshop, which included focus group meetings, was arranged in order to define EDD strategic themes. The BSC team has to decide whether to use the same corporate level themes or to develop new themes. The decision was to apply the same corporate level themes due to the following reasons:

- The corporate level strategic themes still applicable for the EDD BSC according to the operations strategy.
- To ensure alignment with the corporate BSC and the Bahrain 2030 Vision.
- To facilitate the linking process of objectives and measures between corporate BSC and EDD BSC.
- To facilitate the usage of the same BSC software application.

As a result, the following strategic themes have been used in EDD BSC:

- Grow with Bahrain
- Deliver operational excellence
- Serve customer needs

- Foster a Caring and Enabling Environment

7.3.3.4. EDD BSC perspectives (workshop 2)

BSC perspectives focus group meetings were arranged through workshop 2 in order to develop EDD BSC perspectives. The BSC team believed that EDD is a governmental service business unit that should focus on its customers more than on financial issues. Accordingly, BSC team has decided to use the same BSC perspectives as the corporate level but to change the order of the financial and customer perspectives (arrangement 2) as shown in Table (4) in Chapter 6.

Furthermore, the BSC team has decided to apply the importance weights to BSC perspectives aiming to emphasize on the importance of the internal processes perspectives for EDD. As a result, the internal processes perspectives importance weight is 40 % and all the other perspectives are 20 % as shown in Table (7).

Table (7)
EDD BSC perspectives and importance weights

	Perspective	Importance Weight (%)
1	Customer	20
2	Financial	20
3	Internal Processes	40
4	Learning and Growth	20

7.3.3.5. EDD strategic objectives workshop (workshop 3)

In order to define EDD strategic objectives, the researcher has reviewed EDD performance reports and annual reports for the last five years.

Furthermore, the researcher has conducted a meeting with EDD directors regarding the main objectives of EWA and EDD. The findings were discussed with BSC team through EDD objectives workshop that started with a brainstorming session and ended up with focus group meeting for each BSC perspective.

a) The main strategic areas that have been discussed:

- Achieve the best budget and assets utilization.
- Improvements of services and value delivered to customers.
- Improvement of supply reliability with minimum supply failures and outage durations.
- Using standards and international values as benchmark targets for certain KPIs such as:
  - SAIDI, SAIFI and CAIDI.
  - Reduction of interruptions.
  - Application process time.
  - Optimize plant utilization.
  - Improvements of productivity through recruitment, training, technology and process improvement.

- **Final strategic objectives**
  - **Customer perspective**
    - Maintain enough capacity to meet growing demand.
    - Meet distribution customers' needs and requirements through better services.
    - Provide high class of services.
  - **Financial perspective**
    - Achieve better budget utilization.

- Optimize cost reduction.
- Maximize revenue through high voltage investments.

- **Internal processes perspective**
  - Improvement of the EDD systems security.
  - Better cooperation between generation, transmission and distribution in different operations.
  - Encourage private sector contribution in EDD system improvement.
  - Excel in customer requests fulfillment.
  - Reduce customers' wrong connection and installation through awareness programs.
  - Maintain distribution network reliability.
  - Excel in EDD main activities through all sections (operations and control, planning and material, construction and contracts).
  - Establish better procedures for materials management and assets utilization.
- **Learning and growth perspective**
  - Improve workforce electrical skills and competencies.
  - Invest in modern information technology infrastructure.
  - Enhance the team working culture through EDD different sections.
  - Workforce is recognized and rewarded.

Each strategic objective was assigned with an objective owner to be responsible for performance, data updating and relevant initiatives. The

objectives owners according to EDD managerial hierarchy will be department chiefs and sections heads.

7.3.3.6. Key Performance Indicators (KPIs) workshop (workshop 4)

The same focus groups arrangement which was used for defining the strategic objectives was used again in order to select the KPIs for EDD. The BSC team has conducted a brainstorming session to review the existing KPIs and its relevant performance historical data. Furthermore, the BSC team has reviewed a set of measures that were suggested by Bahrain Center of Excellence in addition to the already used KPIs by other electricity provider through EWA consultant (ESBI).

Furthermore, performance data source and frequency of updating were identified for all KPIs. A measure owner was assigned to each of these KPIs as per EDD managerial hierarchy. Table (8) provides an overview of EDD discussed KPIs.

Table (8)
EDD discussed KPIs

EDD KPI	Frequency	Data Source
Peak power	Daily	System control
Peak demand shortage	Daily	Load dispatch control
Average time to supply (form existing substation)	Monthly	Planning
Average time to supply (form new substation)	Monthly	Planning
Average time to connect after payment	Monthly	Low /high voltage operations
Notification of supply interruption	Monthly	Distribution control
Frequency of complaints	Monthly	Fault report center
Average time to resolve complaints	Monthly	Fault report center
Average waiting time on call center	Monthly	Call center
Maintenance outages	Monthly	Maintenance
Number of transformer failures	Monthly	Maintenance
Average supply restoration time	Monthly	Low /high voltage operations
Number of high voltage customers	Monthly	High voltage

		operations
Number of low voltage customers	Monthly	Low voltage operations
Forced outages duration	Monthly	Maintenance
Forced outages number	Monthly	Maintenance
Overhead line failure rate	Monthly	Maintenance
Billing meter failure rate	Monthly	Metering
Emergency response	Monthly	Fault reports center
Scheduled appointments missed with customers	Monthly	Fault reports center
First call restorations rate	Monthly	Call center
Employee unavailability	Monthly	Administration
Help desk response time	Monthly	Technical supports/ call center
Meter reading accuracy	Monthly	Metering
Meter reading accuracy	Monthly	Metering
Meter reading accuracy	Monthly	Metering
Help desk response time	Monthly	Technical supports/ call center
Meter reading accuracy	Monthly	Metering
Network losses	Yearly	Planning
SAIDI	Yearly	Operations
SAIFI	Yearly	Operations
CAIDI	Yearly	Operations
Length of network	Yearly	Distribution control
Number of bulk supply points	Yearly	System control
Illegal connection rate	Yearly	Low /high voltage operations
Training & workforce development programs	Yearly	Administration
Employee training index	Yearly	Administration
Fuel cost of mobile generators	Yearly	Maintenance
Staff cost index	Yearly	Administration
Fault clearance index	Yearly	Maintenance
Lost time work incidents	Yearly	Risk control
Customer awareness	Yearly	Technical supports
Lubricating oil consumption	Yearly	Maintenance
Productivity	Yearly	Distribution control
Transformer utilization ratio	Yearly	Maintenance/ planning

There are additional performance measures which contribute to the above mentioned KPIs with data regarding the planned, unplanned and forced outages.

a) Performance data sources

Measures owners are responsible for performance measures and KPIs updating according to the performance data. EDD performance data could be collected and imported through many sources. Modern computerized systems at EDD enabled measures owners of getting the right information and the right time. The following are some examples of performance data sources at EDD.

- Advanced power meters (smart meters).
- Proactive relays.
- Control systems.
- Maintenance records.
- Call center.
- Fault report center.
- Low voltage and high voltage operations records.
- Distribution control center.
- Load dispatch center.

b) Importance weights

There are many approaches to apply the importance weights to the KPIs. The BSC team decided to keep all the KPIs at this stage at the same importance level due to the following reasons:

- KPIs should be in use for certain time period until the measures owners become assured about performance and measures importance.
- BSC team believed that it is better to keep the EDD BSC as simple as possible to be understood by workforce.
- In order to minimize the complication of mathematical representation, which may mislead the managers while taking the necessary decisions.

c) Strategy Map

In this stage, the BSCs team is ready to develop EDD strategy map based on the strategic objectives, strategic themes and BSC perspectives. The strategy map contains the strategic objectives arranged through the strategic themes and the BSC perspectives. The new version of EDD strategy map is shown in Figure (27).

7.3.4. Implementation stage

In fact, the implementation stage of the BSC should start after finishing the planning and design of the BSC components. According to the validation purpose of the roadmap implementation in this chapter, the researcher is going to present the planned implementation process and the needed tools for successful implementation. At the end, a comparison will be conducted in order to check the differences between the existing EDD BSC and the new version developed by the suggested roadmap.

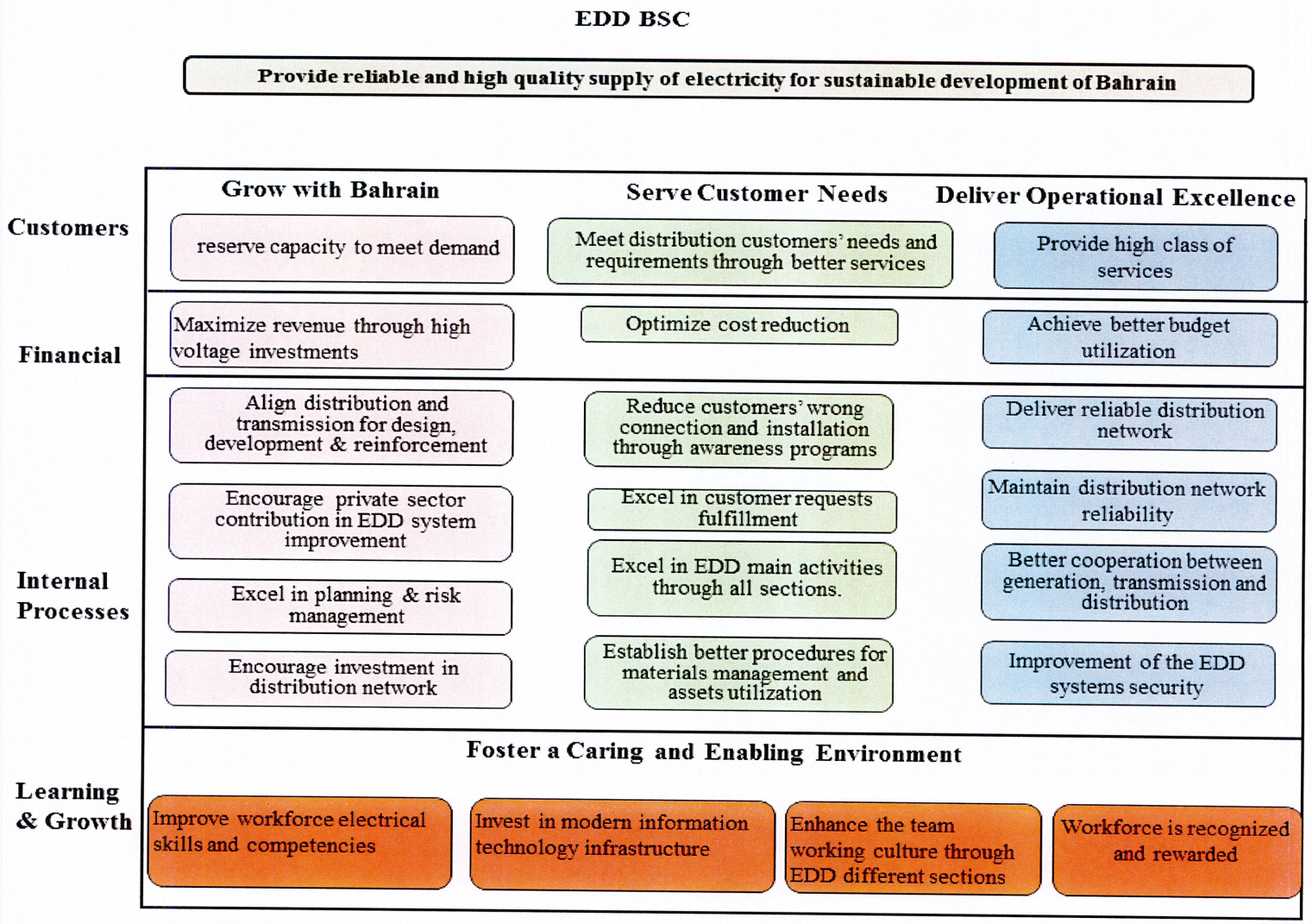


Figure (27)
EDD new BSC strategy map

7.3.4.1. Automation

In order to decide which BSCs software application to use, the BSC team arranged a meeting between the team members to discuss this issue. Through the meeting, many available software applications were discussed including the Executive Strategy Manger that has been used be EWA. The BSC team decided to use the same application due to the reason that it fulfilled all team requirements.

As a result, the BSC team has to contact EWA office of strategy management, strategic planning unit and information technology unit in order to use the same software application for EDD and to do the needed customization of BSC. The traffic light colors where applied to represents the actual performance of strategic objectives and strategic themes as per Table (9).

code	color
Poor performance	
Less than target performance	
Good/ targeted performance	

Table (9)
Traffic light color and performance code

7.3.4.2. Performance targets

The BSC team asked each measure owner to study the historical performance data (if available) to be discussed later with objectives owners in order to define the targets for each measure.

According to the historical performance study and the desired level of performance defined by the BSC team and objectives owners, the targets will be identified for each KPI and measure.

7.3.4.3. Performance gap and initiatives

In order to get EDD performance improved, EDD management should employ the needed improvement programs or initiatives to achieve the targeted performance by defining the performance gaps between the actual performance and the desired targeted performance. Initiatives are considered as the action plans or projects which are taken by the EDD in order to fill the performance gap.

The roadmap suggested that BSC team should establish prioritization criteria for initiatives where the final initiatives should be discussed with EDD top management or steering committee after filling the form shown in Table (10).

Table (10)
Initiative prioritization form

No.	Initiatives	Initiative Owner	Initiative Objective	Initiative Measure	Initiative Theme	Initiative Total Score
1						
2						
3						
4						

7.3.4.4. Performance reviews

The BSC team, strategy management office, strategic planning office have set a schedule of performance reviews at different times as shown in Table (11). In addition, each of these reviews has its own performance reports that should be analyzed and discussed. The feedback from monthly, quarterly and semiannually reviews will be discussed in the annual reviews (especially for BSC evaluation) where its results will be used to change the strategic content as needed. At the same time, the performance achievements will be used as benchmarks through the annual reviews compared with other business units.

Table (11)
EDD Performance review schedule for one year

	Performance review type	**Frequency**	**Attendance**
Meeting 01	Operational review	Month 1	Measures owners/BSC team
Meeting 02	Operational review	Month 2	Measures owners/BSC team
Meeting 03	Part 1-Operational review	Month3	Measures owners/BSC team
	Part2-Strategic review	Quarter 1	Objectives owners/EDD director/ Top management representative
Meeting 04	Operational review	Month 4	Measures owners/BSC team
Meeting 05	Operational review	Month 5	Measures owners/BSC team
Meeting 06	Part 1-Operational review	Month 6	Measures owners/BSC team
	Part 2-Strategic review	Quarter 2	Objectives owners/EDD director/ Top management representative
Meeting 07	Operational review	Month 7	Measures owners/BSC team
Meeting 08	Operational review	Month 8	Measures owners/BSC team
Meeting 09	Part 1-Operational review	Month 9	Measures owners/BSC team
	Part 2-Strategic review	Quarter 3	Objectives owners/EDD director/ Top management representative
Meeting 10	Operational review	Month 10	Measures owners/BSC team
Meeting 11	Operational review	Month 11	Measures owners/BSC team
Meeting 12	Part 1-Operational review	Month 12	Measures owners/BSC team
	Part 2-Strategic review	Quarter 4	Objectives owners/EDD director/ Top management representative

7.3.5. Evaluation Stage

After putting EDD BSC in use for certain time period (not less than one year), the BSC team based on the performance results and the findings through the performance reviews evaluates EDD BSC. Furthermore, the evaluation process will involve all available BSCs and includes the following activities:

- BSC components validity and usefulness: could be changed if there are changes in the working environment such as privatization of generation.
- Strategic objectives: certain objectives were aleady achieved and new ones should be developed.
- Strategy update: it should be always aligned with corporate level BSC and strategy.

Table (12) is showing the process of yearly workshops for BSC evalutaion which ends up every five years with a new strategy and updated BSCs in order to maintain the alignement with the strategic BSC.

Table (12)
BSC evaluation process cycle

	Performance review type	**Frequency**	**Attendance**
Workshop 01	BSC evaluation	Yearly	Measures owners/BSC team Objectives owners/EDD director/ executives/ strategy management office/ strategic planning unit
Workshop 02	BSC evaluation	Yearly	
Workshop 03	BSC evaluation	Yearly	
Workshop 04	BSC evaluation	Yearly	
Workshop 05	BSC evaluation	Yearly	
Strategy and BSC major updates			

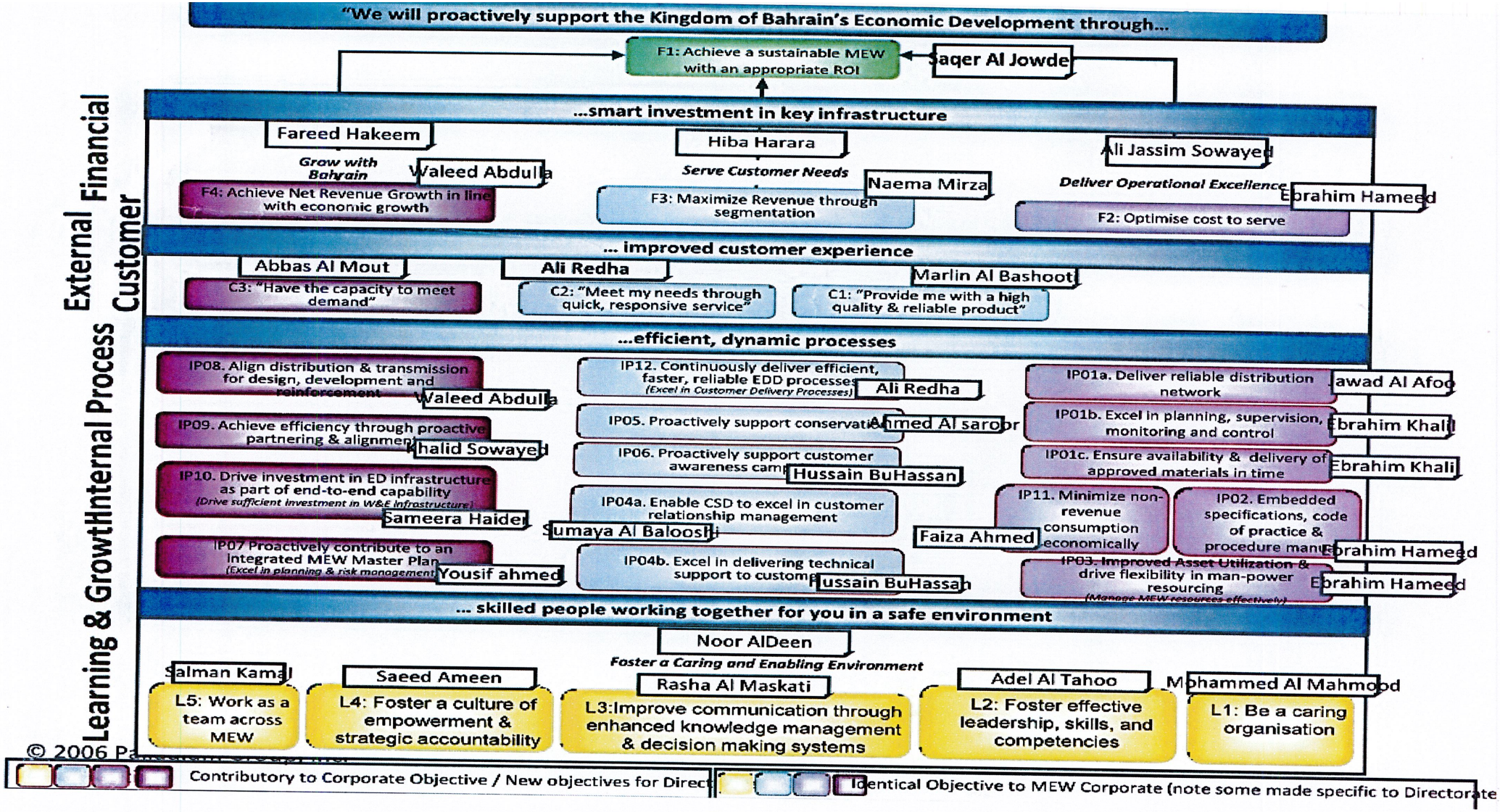
7.3.6. The improvements through new EDD BSC

The comparison between the two BSCs, the developed one using the roadmap shown in Figure (27) and the EDD existing BSC for the strategic cycle 2007-2012 shown in Figure (28), shows the following results:

- The new arrangement of the BSC perspectives is a better representation of a public sector organization business unit.
- The application of the BSC perspective importance weights helped the EDD management to better focus on operations management through reliable performance values which represent the actual situation.
- Unnecessary objectives were eliminated especially if they serve the same need or requirement.
- All strategic objectives were assigned with KPIs while some objectives in the old BSC kept without any performance measure.
- In the old BSC the initiatives prioritization was done by objectives owners themselves, however in the new EDD BSC it should be done through prioritization criteria and the approval of the EDD steering committee.

7.4. BSC Implementation Roadmap Application

After developing new EDD BSC using the suggested roadmap, the researcher has used the roadmap to develop a BSC for the Distribution Control Center. The steps of developing the BSC are shown in the following sections.



Figure(28)

EDD existing BSC strategy map, (EWA OSM, 2007)

7.4.1. Distribution Control Center (DCC)

The DCC is an operational unit that works under the management of EDD. The researcher will use the BSC implementation roadmap to develop DCC BSC. The researcher has coordinated with the OSM team at EWA and DCC management to establish the BSC team as per Table (13).

Table (13)
DCC BSC team members

	Members	Section
1	Office of strategy management	BSC expert
2	Strategic planning unit	Strategy analyst
3	Distribution operations	Senior staff
4	Distribution control	Operational staff
5	System control	Senior staff
6	Distribution planning	Senior staff
07	Distribution IT support	It engineer
08	Distribution administration	Administration specialist
09	Distribution Directorate	Senior staff

7.4.2. BSC planning stage

The BSC roadmap was again applied to develop DCC BSC which did not exist before. In order to improve alignment between EDD BSC and DCC BSC, the researcher along with the BSC team decided to apply the same strategic themes and BSC perspectives structure of EDD.

7.4.2.1. Assessment and analysis

The BSC team members have conducted a strategic content assessment and analysis workshop (workshop1). The workshop started with a brainstorming session to discuss DCC vision, mission and strategy. After that a focus group meeting was conducted in order to apply SWOT analysis.

a) **SWOT analysis of DCC**

- **Strengths**
  - Committed, flexible, quality manpower
  - Regular analysis of failures.
  - Focus on restoration of power supply by any available means
  - Efficient monitoring and follow up.
  - Strict compliance to the new policy for 11kV network.
- **Weaknesses**
  - The outages extremely increased during the summer months. The shortfall of human resources during this period affects the performance adversely.
  - Shortage of authorized manpower for operating 11kV network has caused delays in fulfilling all the demands of the network.
  - Nearly 40% of all LV outages are service cut-out fuse blown. Unless a suitable policy is formed to control these outages, the consumer suffers and EWA resources get wasted.
  - Absence of a comprehensive and integral outage management system which is linked to all aspects of maintenance activities.
  - The average age of the LV field crew is around 47 years that negatively affected the response time.
  - LV and HV fault location unit is under equipped, under staffed and overloaded with jobs especially during summer.
  - The complete supervision for the repair activities is not achieved due to the shortage of staff.
- **Opportunities**
  - Usage of advanced technology for better management of works.

- Merging fault location, repairs and commissioning for 11kV fault repair on 24 hour basis.
- Automation of distribution substations.
- Dividing the distribution network over four working teams.

- **Threats**
  - Privatization of EDD.
  - Damages caused to our network by third party.
  - Increasing costs of managing operations and getting qualified staff.
  - The constraints of budget allocation and material shortage

As a result of the brainstorming and the first focus group meeting, the BSC team has arranged for a second focus group meeting, to define DCC operations strategy and come up with the finalized mission and vision statements. The following is the outcome:

b) **Mission:** Provide reliable and high quality supply of electricity for sustainable development of Bahrain.

c) **Vision:** By 2017 distribution control is a model of excellence in the provision of electricity services with minimum interruptions.

d) **Main strategic pillars:**
   - Ensure maximum cost efficiency within allocated budget and optimize plant utilization.
   - Improvements of services and value delivered to customers.
   - Improvement of supply reliability with minimum supply failures and outage durations.
   - Work towards reduction of interruptions and application process time.

- Improvements of productivity through recruitment, training, technology and process improvement.

e) **DCC Main stakeholders and customers**: as recommended by the roadmap, the analysis and assessment of strategic content workshop activities involved the process of defining the main customers and stakeholders of DCC where:

- **DCC stakeholders:**
  - EWA corporate management.
  - Civil Service Bureau.
  - Funding agencies.
- **DCC Customers:**
  - Bahrain Citizens.
  - Public utilities.
  - High voltage customers.

f) **Operations Strategy**: through employing EWA regulations, DCC will continue operating 11 kV network more effectively, optimizing utilization of distribution assets and resources, enhancing productivity and service level. DCC BSCs along with operations manager defined the operations strategy in the first workshop.

7.4.2.2. DCC strategic themes and BSC perspectives

Strategic themes and BSCs perspectives workshop (workshop 2) ended up with the decision that EDD strategic themes and BSC perspectives (with the same order) which were developed using the suggested roadmap were applied for DCC BSC.

7.4.2.3. Development of strategic objectives:

In order to define DCC strategic objectives, the BSC team members along with DCC management conducted DCC objectives workshop (workshop3). This workshop included four focus groups. Each focus group was responsible for one BSC perspective. The strategic objectives of DCC according to BSC perspectives as the following:

- **Customer Perspective**
  - Satisfied high voltage customers
  - Response to customer needs
  - Provision of stable distribution supply
- **Financial perspective**
  - Optimize cost reduction of distribution operations.
- **Internal processes**
  - Maintain security and reliability of 11 kV network.
  - Maintain high level of cooperation with system control.
  - Integration with call center and fault report center.
  - Provide technical support to all EWA depots.
  - Excel in outage management.
  - Maintain the maximum level of safety at EDD systems
  - Ensure the right practices during emergencies.
  - Ensure the application of EWA load policies and distribution utilization.
- **Learning and Growth perspective**
  - Increase EDD authorized staff
  - Establish smart follow up application
  - Improve staff electrical skill and competencies

7.4.2.4. Performance measures

Performance measures workshop (workshop3), which included four focus groups, was used in order to define the leading and lagging KPIs of DCC. The discussion involved the existing KPIs, the used KPIs by Dubai Electricity and Water Authority and the suggested KPIs by EWA consultant. The final set of KPIs was evaluated for its validity and usefulness using available performance data and BSC software application. After approval from strategy management office and EDD management, the KPIs are ready to be in use, as shown in Table (14).

Table (14)
DCC BSC KPIs

DCC BSC Perspective Measures	frequency	Data source
Customer Perspective Measures		
Availability of distribution assets	Monthly	DCC
Distribution negative effects on consumer	Monthly	DCC/ High voltage unit
Time to connect a high voltage customer	Yearly	High voltage unit
EDD customers satisfaction index	Yearly	EDD
Customer interrupted in a year per total customers	Yearly	Operations/ Maintenance
Total customer interruptions duration per total customers	Yearly	Operations/ Maintenance
Average amount of time electricity available for customers	Yearly	Operations/ Maintenance
Financial Perspective Measures		
Repeated fault cost	Monthly	Operations/ Maintenance
Overtime	Monthly	DCC
Standby	Monthly	DCC
Mobile generators cost	Semiannually	Operations/ Maintenance
Network unnecessary modification cost	Semiannually	DCC/ Planning
Percentage feeders utilization	Yearly	DCC

Percentage transformers utilization	Yearly	Planning
Internal Processes perspective Measures		
Percentage of approved outages	Monthly	DCC
Work load index	Monthly	DCC
Average time to commission after repair	Monthly	Operations/ Maintenance
Average repairing time of faults	Monthly	Operations/ Maintenance
Average restoration time after fault	Monthly	Operations/ Maintenance
Ratio of available generation and requirement	Monthly	Operations/ Maintenance
Percentage of Forced outages	Monthly	Operations/ Maintenance
Percentage of planned outages	Monthly	Operations/ Maintenance
Duration of 11 kV interruptions	Monthly	DCC
Frequency of 11 kV interruptions	Semiannually	DCC
Reserve capacity in distribution network	Yearly	DCC
Percentage of over loaded feeders	Yearly	DCC
system stability performance	Yearly	DCC
losses in distribution networks	Yearly	DCC
Ratio between minimum and maximum demand	Yearly	System control
Time to commission a new distribution equipment	Yearly	DCC
Learning & Growth Perspective Measures		
Workload index	Monthly	DCC
Productivity of control engineer	Monthly	DCC
Employees training index	Yearly	DCC/ human resources
Employee satisfaction index	Yearly	human resources
Employee awareness index	Yearly	human resources

7.4.2.5. DCC Strategy map

DCC developed strategy map is shown in Figure (29). An essential issue that needs to be mentioned about similarity of some objectives over different BSCs levels is that each of these levels has its own translation of these objectives.

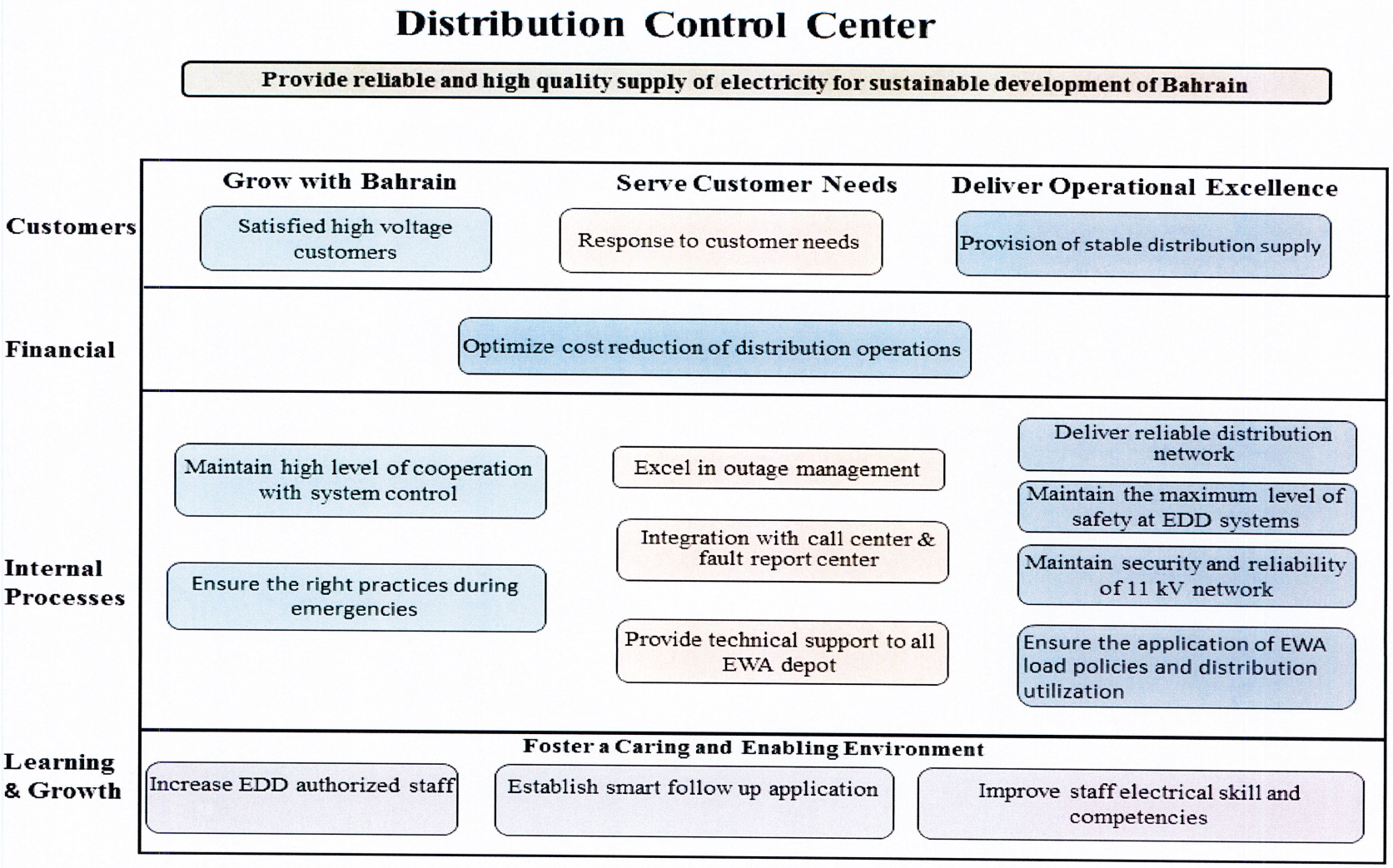


Figure (29)
DCC developed BSC strategy map

As an improvement, the operations data which was used to calculate the KPIs for EDD BSC are now available and can be directly fed to the cascaded BSC software application. Furthermore, during performance reviews, it is easier to analyze certain objective performance through levels of KPIs, rather than applying complicated calculations to achieve the same results.

7.4.3. BSC implementation stage

7.4.3.1. Automation

The BSC team has conducted a meeting with OSM to make the necessary customization for the DCC BSC though the existing BSC software application. Furthermore, the BSC team of DCC, arranged with OSM and EDD BSC coordinator to link the related KPIs together through the software application in order to update the data by one process.

7.4.3.2. Performance targets

Through DCC performance targets workshop (workshop 4), which included four focus group meetings, the DCC BSC team and DCC manager established performance targets for DCC BSC KPIs according to the:

- Historical performance data.
- Distribution network enhancement study.
- Existing performance targets
- Management desired level of performance.

7.4.3.3. Performance analysis

The analysis of DCC performance could be successfully achieved through:

- BSCs software application tools for analysis.
- DCC daily reports: Abnormality reports, Faults reports, SCADA reports and Incidents reports.
- Different groups' reports: Construction, Maintenance, Special Projects, Commissioning and High Voltage consumers' reports.

As a result, a final report will be prepared and sent to the higher management for the decision on performance initiatives and improvement programs.

7.4.3.4. Initiatives and Improvement Programs

The DCC BSC is linked to many other operational units. Because of that, DCC management decided to have a meeting with other units to take the needed decisions regarding the performance initiatives and performance programs. The DCC BSC is usually related to the following initiatives and performance programs:

- Distribution feeders' reinforcement program.
- High voltage consumers' intake substations planned maintenance program.
- Old feeders' replacement.
- Upskilling distribution operators and operations authorized staff.
- Maintaining standard operating procedures
- Developing code of practices

In addition to the above mentioned initiatives and improvement programs, DCC is responsible for any needed initiatives related to the

distribution network or operations and maintenance of low voltage equipment.

7.4.4. Evaluation stage

The BSC team has decided to apply the same evaluation structure of EDD BSC as mentioned in Table (12). Furthermore, the following form was introduced in order to follow up the evaluation process and link the feedback to the upper levels BSCs. The suggested form is shown in Table (15).

Table (15)
BSC evaluation form

BSC Component	Valid	Not valid	Update	comments
Vision				
Mission				
Operations strategy				
Strategic pillars				
BSC themes				
BSC perspectives				
Strategic objectives				
Objectives owners				
Strategy map				
Performance measures				
Measures owners				
Strategic initiatives				
BSC application				
BSC cascading				

7.5. Research Reliability

Quantitative and qualitative research questions and method of data collection are different. The concept of reliability in qualitative researches is related to the thoroughness of the researcher work during collection of data,

data analysis and the detailed description of the applied methods (Davies, 2007). Furthermore, the reliability was achieved according to three aspects:

- Sufficient data: the researcher was able to collect enough data to conduct this study from the two cases over the study period
- Accuracy of data collection: was achieved through employing many data gathering methods, secondary and primary. The results of the semi-structured interviews, observations and content analysis were cross checked with the each other
- Accuracy of data analysis: was achieved through the validation of the roadmap by implementation and comparing with an existing BSC (EDD) and through developing new BSC for DCC.

7.6. Research Generalizability

Generalizability is defined as the level to which the results and conclusions of a qualitative research are applicable to be applied by others (Saunders et. al., 2007).

In this research, the validation of findings and the BSCs implementation roadmap was done though many strategies as suggested in the literature for qualitative researches validation in addition to developing the BSC for the EDD and DCC at EWA. In addition, a comprehensive description of the research was achieved by presenting the research methodology including the different data gathering techniques and data analysis results which could be used by others to develop BSCs within the scope of the research. As a result, the BSCs implementation roadmap could be generalized for service industrial operations departments in the Bahraini public sector.

7.7. Conclusion

The suggested BSCs implementation roadmap was validated through implementation in EDD by developing a new version of EDD BSC. The developed BSC was improved in several issues as mentioned earlier and in the same time more representative of a public sector operational unit.

Furthermore, the roadmap was used to develop DCC BSC which did not exist before. The different implementation steps were performed through coordination with OSM and Strategic Planning Unit at EWA.

CHPATER EIGHT
CONCLUSION AND RECOMMENDATIONS

8.1 Conclusion

8.2 Research Recommendations

8.3 Research Contributions

8.4 Research Limitations

8.5 Suggestions for Future Research

CHPATER EIGHT
CONCLUSION AND RECOMMENDATIONS

This chapter summarizes the conclusion of this research and the main recommendations that were considered important for successful BSCs implementation according to the researcher suggested roadmap and the literature review best practices. Finally, the research contributions, research limitations, and suggestions for future research are included.

8.1. Conclusion

Through the literature review, different approaches discussed the best BSCs implementation practices. Few approaches recommended the implementation to begin from the top management and then cascaded down to other departments. While others recommended beginning the BSC implementation processes at one business unit and after that spreading the implementation at the whole organization.

In this research, the focus was to begin the BSCs implementation process at the operations department as it is considered the main department in many organizations especially at the industrial service organizations of the public sector. Furthermore, the operations department importance is due to the fact that operations performance will directly affect the overall performance of the whole organization. In this thesis the researcher focused on the relationship between BSCs implementation and the performance improvement of the operations management in the public sector through studying two governmental organizations, namely, EWA and MOW. These two case studies enabled the researcher to examine and identify the level to

which Bahraini service industrial organizations have used BSCs to improve operations management performance in the Bahraini public sector.

The researcher has described the experience of EWA and MOW in planning, implementing and maintaining the BSC by following the strategy focused organization principles. Furthermore, the researcher has examined how the BSC could improve the operations management of EWA and MOW different processes and activities.

According to the research findings and the best practices of BSCs implementation in the literature, the researcher has developed a systematic BSCs implementation roadmap for Bahraini public sector operations department at service industrial organizations. Furthermore, the researcher h

8.2. Research Recommendations

It is recommended to use the developed roadmap for successful implementation of the BSCs in operations departments by following the steps and actions embedded in the map.

Furthermore, it is believed that the following points are important for the operations department management in order to avoid others' pitfalls and wrong implementation of BSCs.

- It is recommended that BSC is designed by people who will use it and will be responsible for it. It could not be copied from others as a readymade product. There are many similarities between different BSCs of organizations, although, still each of them has unique components. For example similar BSC perspectives do not mean similar strategic objectives or performance measures.

- The idea of waiting for the correct time in order to implement the BSCs is actually a wrong understanding of it. No need to wait for an ideal situation; start working with BSC as soon as possible and focus on how to learn about improving operations management and the better execution of the operations strategy. The operations management department could start the process of the BSCs implementation which will take around 20 weeks as suggested by the BSCs roadmap. The first version of the BSC after implementation and usage will pass through many evaluation stages during the strategy cycle where it could get updated and modified.
- The BSCs performance management system should translate the operations strategy into operational actions through the strategic objectives and performance measures where, according to the performance targets, the needed initiatives will be implemented in order to improve the operations performance. The wrong translation of the department strategic content into operations strategy will affect the whole BSCs system where it will be constructed based on wrong strategy. As a result, the department management will find that operations are performed but no objectives are accomplished. Many available tools could be used during the strategic content analysis implementation step such as SWOT Analysis or PESTEL Analysis in addition to identifying the main stakeholders' requirements and main customers' needs. As a result, a representative operations strategy could be developed.
- While developing the strategic objectives, key performance indicators and performance targets, the relevant staff who is directly in touch with these BSC components and have experience and knowledge

should be included. The absence of experienced staff will cause these components not to be well defined or could not be defined at all.

- In order to push the BSCs implementation process, strategic objectives and key performance measures should be assigned to decision makers' staff at the department. It is recommended to assign strategic objectives to the first managerial level at operations department and the key performance indicators to the next lower level.
- The budget shortage is one of the main problems in the public sector in Bahrain. The operations department should carefully utilize the allocated budget in order to achieve its strategic objectives. It is recommended that the prioritization criteria of initiatives after being applied for the first time and having initiatives prioritized according to it, next year budget is allocated based on the already prioritized initiatives. In other words, rather than prioritizing initiatives according to the allocated budget, budget should be allocated according to the prioritized initiatives.
- One of the most important steps during BSCs implementation and usage is performance analysis. The goal of implementing the BSCs is not having nice KPIs or charts but measuring the current performance and getting it improved through setting suitable performance targets. Operations department management and BSCs team should analyze the performance continuously through a predetermined schedule and any required actions should be taken accordingly. The analysis of performance should be started with the measures owners, then by the objectives owners and finally through operations management or steering committee.

- The public sector operations departments are usually bigger in size and workforce than private sector. Due to that, awareness programs should be continuously conducted by the BSCs team at all managerial levels. Detailed training programs should be arranged for BSCs related staff such as objectives or measures owners. Unaware staff usually manipulates BSCs measures and performance results as they consider it as a threat or to get better rewards and bonuses.
- The public sector operations departments in Bahrain are usually related to many other departments and public utilities. A recommended practice is to integrate the relationship with these parties through the BSC design and software application especially if they are affecting the department performance.
- Alignment of the BSCs and employee incentive and rewards system is recommended in the BSCs literature. In the case of the governmental organization in Bahrain, this alignment should include all the related agencies like civil service bureau and Ministry of Finance or any other related organization.

8.3. Research Contributions

This research has contributed to the literature through the description of the BSCs implementation in the public sector in Bahrain through EWA and MOW BSCs implementation practices. Furthermore, the research has provided insights about the relationship of operations management improvement and BSCs implementation. In addition to that, the researcher has employed the research findings and the literature review best practices in developing the suggested BSCs implementation roadmap for public

sector operations department at industrial service organization.

8.4. Research Limitations and Difficulties

The conducted research faced the following limitations:

- The implementation of BSCs in Bahrain especially in the public sector is limited which leads to a limited research sample where only two organizations have successfully implemented the BSCs.
- The complicated process of getting performance data and information through public sector organizations in Bahrain where this information considered confidential, has caused that the researcher to spend long time period in taking approvals and permissions to extract the required data.
- The shortage of staff at the strategy management office and strategic planning office of EWA and MOW has caused many difficulties in arranging meetings and interviews with them.

8.5. Suggestions for Future Research

A much broader study involving a larger sample of Bahraini organizations may find out more ways about BSCs development and its role in improving operations management performance. Furthermore, researchers could compare the operations management performance improvement with other organizations in the Gulf Cooperation Council since there is opportunity to share knowledge between these organizations especially during the BSCs related activities.

Moreover, due to the time limitation, the researcher used the suggested BSCs roadmap to develop BSCs for EDD and DCC at EWA.

Other researchers could use the same roadmap for developing BSCs in different organizations and compare their results.

REFERENCES

2gc, (2013). *2GC - Balanced Scorecard and Performance Management Experts*. [online] Available at: http://2gc.eu/ [Accessed 19 Sep. 2013].

Ahn, H. (2001). Applying the Balanced Scorecard Concept: An Experience Report. *Long Range Planning*, 34(4), pp.441-461.

Aidemark, L. (2001). The Meaning of Balanced Scorecards in the Health Care Organisation. *Financial Acc & Man*, 17(1), pp.23-40.

Al Ansari, S. (2006). *Balanced Scorecard at EWA*. Master, Undergraduate. Arab Open University.

Armitage, H. and Scholey, C. (2006). Using Strategy Maps to Drive Performance. *The Society of Management Accountants of Canada, the American Institute of Certified Public Accountants and The Chartered Institute of Management Accountants,*, pp.1-47.

Asefeso, A. (2013). *Balanced scorecard*. [Plaats van uitgave niet vastgesteld]: AA Global Sourcing Ltd.

Assiri, A., Zairi, M. and Eid, R. (2006). How to profit from the balanced scorecard. *Industr Mngmnt & Data Systems*, 106(7), pp.937-952.

Balancedscorecard.org, (2013). *Balanced Scorecard Institute*. [online] Available at: http://balancedscorecard.org [Accessed 13 Mar. 2013].

Beasley, M., Nunez, K. and Wright, L. (2006). Working Hand in Hand: Balanced Scorecards and Enterprise Risk Management. *Strategic Finance*, pp.49-55.

Brennan, L. (2011). *Operations management*. New York: McGraw-Hill.

Brown, M. (2002). Winning Score: How to Design and Implement Organizational Score Cards. *Measuring Business Excellence*, 6(3), pp.50-50.

Bryman, A. (2008). *Social research methods*. Oxford: Oxford University Press.

Butler, A., Letza, S. and Neale, B. (1997). Linking the balanced scorecard to strategy. *Long Range Planning*, 30(2), pp.242-153.

Chemengich, M. (2013). Managing strategic change in public sector. *Standard Research Journal of Business Management*, 1(1), pp.1-40.

Cooper, D. and Ezzamel, M. (2003). A social analysis of the assumptions of the Balanced Scorecard. *Working Paper, University of Alberta and University of Cardiff and University of Cardiff, CF, UK.*

Creswell, J. and Creswell, J. (2007). Qualitative inquiry & research design. Thousand Oaks: Sage Publications.

Cronin, G. (2007). Measuring strategic progress. Choosing and using KPIs. *Accountancy Ireland*, 39(4), pp.30-31.

Davies, M. (2007). *Key Concepts in Social Research Methods*. New York: Palgrave, Macmillan LTD.

Davis, M., Aquilano, N. and Chase, R. (2003). *Fundamentals of operations management*. Boston: McGraw-Hill/Irwin.

Decoene, V. and Bruggeman, W. (2006). Strategic alignment and middle level managers' motivation in a balanced scorecard setting. *Int Jrnl of Op & Prod Mnagemnt*, 26(4), pp.429-448.

Dreveton, B. (2013). The advantages of the balanced scorecard in the public sector: beyond performance measurement. *Public Money & Management*, 33(2), pp.131-136.

Eckerson, W. (2006). *Performance dashboards*. Hoboken, N.J.: John Wiley.

Eisenhardt, K. (1989). Building Theories from Case Study Research. *Academy of Management Review*, 14(4), pp.532-550.

Elefalk, K. (2001). The Balanced Scorecard of the Swedish Police Service: 7000 officers in

total quality management project. *Total Quality Management*, 12(7-8), pp.958-966.

Eriksson, P. and Kovalainen, A. (2008). Qualitative methods in business research. *London, UK: Sage*.

EWA OSM, (2007). *EWA BSC Strategy Map 2007-2012*. Manama: EWA.

Griffin, J. (2004). Developing strategic KPIs for your BPM system. *DM Review*, 14(10), p.70.

Griffiths, J. (2003). Balanced Scorecard Use in New Zealand Government Departments and Crown Entities. *Australian Journal of Public Administration*, 62(4), pp.70-79.

Harvey, J. (2005). KPIs-The Broader strategic context. *Credit Control*, 26(4), pp.65-66.

Hoque, Z. and James, W. (2000). Linking Balanced Scorecard Measures to Size and Market Factors: Impact on Organizational Performance. *Journal of Management Accounting Research*, 12(1), pp.1-17.

Hursman, A. (2010). Measure what matters. *Information management*, 20(4), pp.24-28.

Irwin, D. (2002). Strategy mapping in the public sector. *Long Range Planning*, 35(6), pp.637-647.

Ittner, C., Larcker, D. and Meyer, M. (2003). Subjectivity and the Weighting of Performance Measures: Evidence from a Balanced Scorecard. *The Accounting Review*, 78(3), pp.725-758.

Javadian Kootanaee, A., Kootanaee, H., Hoseinian, H. and Talari, H. (2013). The Balanced Scorecard, Alphabet of the Modern Management: From Concept to Implement. *Advances in Management & Applied Economics*, 3(1), pp.47-60.

Juhmani, O. (2007). Usage, motives and usefulness of the balanced scorecard (BSC): evidence from Bahrain. *International Journal of Business Research*, 7(5), pp.106-117.

Kamhawi, E. (2011). IT and non-IT factors influencing the adoption of BSC systems: a

Delphi study from Bahrain. *Int J Productivity & Perf Mgmt*, 60(5), pp.474-492.

Kaplan, R. (2010). Conceptual Foundations of the Balanced Scorecard. *SSRN Journal*, pp.1-37.

Kaplan, R. and Norton, D. (1992). The Balanced Scorecard- Measurement that Drive Performance. *Harvard Business Review*.

Kaplan, R. and Norton, D. (1993). Putting the Balanced Scorecard to Work. *HBR*. [online] Available at: https://hbr.org/ [Accessed 11 Apr. 2013].

Kaplan, R. and Norton, D. (1996). Linking the Balanced Scorecard to Strategy. *California Management Review*, 39(1), pp.53-79.

Kaplan, R. and Norton, D. (2000). Putting the balanced scorecard to work. *Harvard Business Review*.

Kaplan, R. and Norton, D. (2001). *The strategy-focused organization*. Boston, Mass.: Harvard Business School Press.

Kaplan, R. and Norton, D. (2004). *Strategy maps*. Boston: Harvard Business School Press.

Kaplan, R. and Norton, D. (2005). The Balanced Scorecard: Measures That Drive Performance. *HBR*. [online] Available at: https://hbr.org/ [Accessed 14 Dec. 2013].

Kaplan, R. and Norton, D. (2006). *Alignment*. Barcelona: Gestion 2000.

Kaplan, R. and Norton, D. (2007). *Using the balanced scorecard as a strategic management system*. Boston, MA: Harvard Business School Pub.

Kaplan, R. and Norton, D. (2008). *The execution premium*. Boston, Mass.: Harvard Business Press.

Kaufmann, L. and Becker, A. (2006). Overcoming the Barriers During Implementation and Use of the Balanced Scorecard by Multinational Companies in Brazil. *Latin American Business Review*, 6(3), pp.39-62.

Kim, C. and Davidson, L. (2004). The effects of IT expenditures on banks business

performance: using a balanced scorecard approach. *Managerial Finance*, 30(6), pp.28-45.

Kirk, J. and Miller, M. (1986). Reliability and validity in qualitative research. *Beverly Hills: Sage Publications.*

Lawrie, G. and Cobbold, I. (2004). Third generation balanced scorecard: evolution of an effective strategic control tool. *Int J Productivity & Perf Mgmt*, 53(7), pp.611-623.

Madsen, D. and Stenheim, T. (2014). Perceived benefits of balanced scorecard implementation: some preliminary evidence. *Problems and Perspectives in Management*, 12(3), pp.81-90.

Mahmoud, A. (2014). Adopting of Balanced Scorecard by Manufacturing Firms in Bahrain: An Empirical Study. *Journal of Finance and Accounting*, 2(3), p.53.

Manandhar, R. and Tang, J. (2002). The evaluation of bank branch performance using data envelopment analysis. *The Journal of High Technology Management Research*, 13(1), pp.1-17.

Martinez, V., Kennerley, M. and Neely, A. (2004). Impact of PMS on business performance: a methodological approach. *British Academy of Management Conference Proceedings*, Centre for Business Performance, Cranfield School of Management, Cranfield, pp.1-15.

Marr, B. and Creelman, J. (2010). Creating and Implementing a Balanced Scorecard: The Case of the Ministry of Works - Bahrain. *Management Case Study, The Advanced Performance Institute.*

Marr, B. and Creelman, J. (2011). *More with less.* . New York, NY: Palgrave Macmillan.

Marr, B. and Neely, A. (2003). Automating the balanced scorecard selection criteria to identify appropriate software applications. *Measuring Business Excellence*, 7(3), pp.29-36.

Mathys, N. and Thompson, K. (2006). Using the balanced scorecard at U.S. Postal Service

and Defense Finance and Accounting Service: Lessons learned. Washington D.C , IBM Center for the Business of Government.

Mathys, N. and Thompson, K. (2006). Using the Balanced Scorecard: Lessons Learned from the U.S. Postal Service and the Defence. *Managaging for performamance and results series, IBM Center for the Business of Government.*

Modell, S. (2004). Performance Measurement Myths in the Public Sector: A Research Note. *Financial Acc & Man*, 20(1), pp.39-55.

Murby, L. and Gould, S. (2005). *Effective performance management with the balanced scorecard*. London: CIMA.

Narasimhan, K. (2004). Total Performance Scorecard: Redefining Management to Achieve Performance with Integrity. *The TQM Magazine*, 16(1), pp.67-68.

Niven, P. (2002). *Balanced scorecard step by step*. New York: Wiley.

Niven, P. (2003). *Balanced scorecard step-by-step for government and not-for-profit agencies*. Hoboken, N.J.: Wiley.

Niven, P. (2005). *Balanced scorecard diagnostics*. Hoboken, N.J.: Wiley.

Noor, K. (2008). Case Study: A Strategic Research Methodology. *American Journal of Applied Sciences*, 5(11), pp.1602-1604.

Norreklit, H. (2000). The balance on the balanced scorecard a critical analysis of some of its assumptions. *Management Accounting Research*, 11(1), pp.65-88.

Norreklit, H. (2003). The Balanced Scorecard: what is the score? A rhetorical analysis of the Balanced Scorecard. *Accounting, Organizations and Society*, 28(6), pp.591-619.

Northcott, D. and Taulapapa, T. (2012). Using the balanced scorecard to manage performance in public sector organizations. *International Journal of Public Sector Management*, 25(3), pp.166-191.

Palazzolo, C. (2004). Timing Your BSC Software Implementation. *Balanced Scorecard*

Report, Report, Harvard Business Publishing Newsletters.

Prieto, V. and Carvalho, M. (2009). Literature Review on Balanced Scorecard - Types of Research, Difficulties and Benefits. *20th Annual Conference of the Production and Operations Management Society. Orlando, Florida U.S.A.*, pp.1-21.

Rampersad, H. (2005). Total performance scorecard: the way to personal integrity and organizational effectiveness. *Measuring Business Excellence*, 9(3), pp.21-35.

Rampersad, H. (2008). The way to a high-performance culture with the Total Performance Scorecard. *Strat. Change*, 17(1-2), pp.43-55.

Rangarajan, K. and Mishra, R. (2014). Balanced Scorecard: Evolution from Performance Management Tool to Strategic Management System. *Vidyasagar University Journal of Commerce*, 19, pp.1-20.

Rohm, H. (2005). A balancing act. *Perform Magazine*, 2(2), pp.1-8.

Saunders, M., Lewis, P. and Thornhill, A. (2007). *Research methods for business students*. Harlow, England: Prentice Hall.

Sharma, B. and Gadenne, D. (2011). Balanced Scorecard Implementation in a Local Government Authority: Issues and Challenges. *Australian Journal of Public Administration*, 70(2), pp.167-184.

Smartkpis, (2013). *smart performance resources*. [online] Available at: http://www.smartkpis.com/ [Accessed 19 May 2013].

Speckbacher, G., Bischof, J. and Pfeiffer, T. (2003). A descriptive analysis on the implementation of Balanced Scorecards in German-speaking countries. *Management Accounting Research*, 14(4), pp.361-388.

Voss, C. (1992). *Manufacturing strategy*. London: Chapman & Hall.

Ward, P. (1996). Configurations of manufacturing strategy, business strategy, environment and structure. *Journal of Management*, 22(4), pp.597-626.

Wiersma, E. (2009). For which purposes do managers use Balanced Scorecards?: an empirical study. *Management Accounting Research*, 20(4), pp.239-251.

Works.gov.bh, (2013). *Ministry of Works, Kingdom of Bahrain*. [online] Available at: http://www.works.gov.bh/english/Pages/home2.aspx [Accessed 12 Feb. 2013].

Yin, R. (2003). *Case study research*. Thousand Oaks, Calif.: Sage Publications.

APPENDIX A

Semi structured interviews guidebook

1. The semi-structured interviews covered the following:
   - BSC pre-implementation stage.
   - BSC implementation stage.
   - BSC post implantation stage.
   - Operations management improvement through the BSCs.
2. The semi-structured interviews was arranged over three cycles:
   - **The first cycle covers:**
     - ❖ Current situation of performance management at the organization.
     - ❖ Motivation to implement a performance management system.
     - ❖ The reasons for choosing the BSCs approach.
     - ❖ The preparations for BSCs implementation.

     Participants from:
     - Office of strategy management.
     - BSCs coordinators from the different directorates at EWA.

     Interview location: EWA headquarter/ employee office.
   - **The second cycle covers:**
     - ❖ BSCs implementation stage: planning; design; usage; cascading and alignment; performance reporting; and automation.

❖ The participant's points of views and opinions about the encountered problems.

Participants from:

- BSC team.
- BSCs coordinators from the different directorates at EWA.

Interview location: employee office.

- **Third cycle covers:**

❖ Performance revision through the BSCs.

❖ Performance evaluation.

❖ Strategy and strategic objectives updating process.

❖ Key performance indicators updating process.

Participants from:

- BSC team.
- Objectives owners.
- Measures owners.

Interview location: employee office.

3. Semi-structured interviews schedule:

No	date	Location	time
1	03 February 2013	EWA- Headquarter	08:30
2	04 February 2013	EWA- Headquarter	08:30
3	05 February 2013	EWA- Headquarter	08:30
4	06 February 2013	EWA- Headquarter	08:30
5	07 February 2013	EWA- Headquarter	08:30
6	21 February 2013	EWA- Headquarter	08:30

7	27 February 2013	EWA- Headquarter	08:30
8	06 March 2013	EWA- Headquarter	08:30
9	14 March 2013	EWA- Headquarter	08:30
10	02 April 2013	EWA- Headquarter	08:30
11	18 April 2013	EWA- Headquarter	08:30
12	30 April 2013	EWA- EDD	08:30
13	08 May 2013	EWA- EDD	08:30
14	29 May 2013	EWA- Training Center	08:30
15	05 June 2013	EWA-Training Center	08:30
16	01 July 2013	MOW- OSM	13:30
17	02 July 2013	MOW- OSM	13:30
18	03 July 2013	MOW- OSM	10:30
19	04 July 2013	MOW- OSM	10:30
20	07 July 2013	MOW- OSM	11:00
21	17 July 2013	MOW- OSM	14:30
22	06 August 2013	MOW- OSM	14:30
23	15 August 2013	MOW- OSM	16:00
24	21 August 2013	MOW- OSM	11:00
25	05 September 2013	MOW- OSM	11:00
26	18 September 2013	MOW- OSM	11:00
27	30 September 2013	MOW- OSM	13:30
28	10 October 2013	MOW- OSM	14:00
29	22 October 2013	MOW- OSM	10:30
30	07 November 2013	MOW- OSM	12:00
28	19 November 2013	MOW- OSM	12:00

4. Semi-structured interviews questions.

- **First cycle:**

  - How EWA/MOW started their project with the BSC?

- What was the need for BSC?
- What were the motivations for applying BSC?
- What were the steps taken by EWA/MOW to be able to successfully implement the BSC?
- Was there any team responsible for the process of implementation the BSC? If yes, how people were been selected? And what was the role of each of them?
- Were there any consultants involved?
- Were any trainings programs or workshops provided during this period?
- Why EWA/MOW has chosen BSC not any other performance management system?

- **The second cycle:**
  - What was the chosen approach to implement BSC?
  - Describe the BSC implementation steps one by one in detail?
  - Was there any strategic revision for the EWA/MOW vision, mission and strategies?
  - Why EWA/MOW has chosen to apply the standard BSC perspectives?
  - How the strategic themes were chosen?
  - Describe the performances measures selection process?
  - Does BSC strategy map applied?
  - How to distinguish between KPIs and measures?
  - How targets were been decided?
  - Why EWA/MOW has decided to use BSC software? And why executive strategy manager (ESM) was chosen?

- ❖ Does EWA/MOW integrate its software with other existing applications?
- ❖ Was there any specific budget for the BSC project?
- ❖ Was there any coordination with other governmental entities regarding the BSC implementation?
- ❖ What are the qualities for choosing strategic initiatives?
- ❖ The government budget is decided by ministry of finance for each governmental entity, so how EWA/MOW link their initiatives to budget?
- ❖ How do different KPIs performance values shared with employees?

- **The third cycle:**
  - ❖ What are the performance evaluation criteria at EWA/MOW?
  - ❖ Did EWA/MOW link there BSC to the operational level?
  - ❖ Did EWA/MOW cascade the BSC to operations departments?
  - ❖ How could the operations management benefits from the BSC?
  - ❖ Are there any improvements after implementing the BSC?
  - ❖ Do the frontline employees understand the BSC?
  - ❖ Do the frontline employees understand their role in improving performance and executing strategy?
  - ❖ Could you show any evidence for operations improvements after implementing the BSC?
  - ❖ What were the obstacles for the BSC implantation?

- How does the office of strategy management coordinate with other directorates, sections, departments and units regarding the performance reviews?
- What are the usual consequences for bad performance KPI?
- Does BSC training for BSC implementation team improve the process? If yes, what is recommended regarding the training?
- What are your recommendations for any other utility which want to implement the BSC as a performance management system in order to improve the operations management?

APPENDIX B

Focus group meetings Report

The road map validation based on EDD BSC process was started on Sunday, the 2nd of November 2014.

Time: 13:30 – 15:30.

Location: system control- electricity distribution conference room.

Participants: homogeneous group of nine people.

Participants' selection criteria:

- Was involved in the BSCs implementation process.
- Have experience about the organization performance before and after the implementation of the BSCs.
- Be willing to share knowledge and experience and to contribute in the research.

Objective: to develop electricity distribution directorate BSC through applying the BSC implementation roadmap.

Focus Group introduction and thanks for participating

Focus group meetings applied for:

1. Defining the main customers and stakeholders requirements.
2. BSCs strategic themes setting.
3. BSCs perspectives setting.
4. Development of strategic objectives
5. Performance measures development.
6. BSC implementation and evaluation plan.

Electricity Distribution Directorate (EDD) BSC:

1. Cascading corporate BSC to EDD.
2. The OSM team is available.
3. Strategic content revision (vision, mission and values).
4. SWOT analysis.
5. Main goals and objectives establishment.
6. Brainstorming, strategic themes, the decision is to use the same themes.
7. Define BSC perspectives: the standard BSC is chosen, but relocate the customer perspective to be the first perspective in place of the financial perspective
8. Define the critical success factors (objectives which are related to the critical objectives).
9. Strategy map creation.
10. KPIs selection: revision of the existing KPIs, revision of Dubai Electricity and Water Authority (DEWA) KPIs, experts' opinions.
11. Related professional staff to suggest the performance targets keeping in mind the SMART criteria and focusing of performance drivers
12. Experts' opinions for BSC perspectives and KPIs. (all of them 20 %, except the internal processes 40%).
13. Initiative prioritization, MOW criteria.
14. Performance monitoring & reporting, initiative monitoring & reporting through OSM.

15. Develop a follow up application & integrate with OSM.
16. Performance evaluation, 6 types: daily, weekly, monthly, quarterly, semiannually and annually. Each with different format.
17. The follow up application is the initial stage of the total performance scorecard (individual scorecards), linked to performance appraisal, overtime, compensation and rewards.
18. Integrate BSC KPIs with Bahrain center of excellence measures.

General Discussion:

- Strategic objectives and operations management relationship.
- Think about data and performance measures.
- Focus on cross-functional integration of activities.
- Encourage themes reviews of performance.
- Promote accountability, transparency and team work.
- Agree resolutions to solve and remove the problems/barriers that are affecting our performance.

BSC Themes:

1. **Grow with Bahrain**
   - Achieve Energy Growth in line with economic growth.
   - Have the capacity to meet demand.
   - Optimize electricity & water sourcing.
   - Achieve efficiency through proactive partnering & alignment.

- Drive sufficient investment in water & electricity infrastructure.
- Excel in planning & risk management.

This theme focuses on the macro-economic story and supporting growth in the Kingdom of Bahrain. In this regard it is very closely linked to the National Economic Strategy for infrastructure development and energy needs for the Kingdom of Bahrain through better planning and to have capacity in order to meet demand and minimizing risk especially in the summer months.

The decisions taken for the Grow with Bahrain Theme were:

- The objective (Achieve Energy Growth in line with economic growth) is to be revised.
- The measure is being corrected accordingly.

2. Served customer needs

- Maximize Revenue through segmentation.
- Meet my needs through quick, responsive service.
- Provide me with a high quality & reliable product.
- Excel in Customer Delivery Process.
- Drive Conservation.
- Build Customer Awareness.
- Excel in Customer Relationship Management.

This theme focuses on the quality and reliability of the product that EWA delivers and the responsiveness of EWA to those services required by EWA customers. The major issues for this theme are the duration taken for processing Electricity and Water Supply Applications and for the resolution of our customers' complaints.

Now there is major shift regarding customer relationship and quality of provided services especially after the formulation of Bahrain 2030 Vision.

EWA should make use of the specialized companies' services in conducting surveys to know the opinion of its customers. This means that EWA can claim to be truly a "customer focused" organization by including customer opinion in our strategies for delivering services.

The suggested improvements for the serve customers' needs theme were:

- Develop initiatives with a nominated driver to deal with the unacceptable delays and bridge the gap between current performance and target set for the service.
- The customer satisfaction survey to done yearly.
- A (Build Customer Awareness) program is also to be planned with the goal of EWA having well informed customers.
- A customer awareness document to explain steps to be taken by a customer experiencing an interruption to supply.

- Improved questioning process at the contact center and at the control department to reduce the high number of visits made by EWA staff for issues that are not EWA side of the meter.
- Every unnecessary visit by an EWA crew is a cost that should be eliminated.
- Minor enhancements to customer service system so that the call center staff will have full information on the reason for non-supply when they are taking a complaint.

3. Deliver operational excellence theme

- Optimize Cost to serve.
- Excel in core processes.
- Minimize non-revenue consumption economically.
- Manage EWA resources effectively.
- Establish and implement quality assurance & standards.

The main issues brought to the discussion are summarized as follows:

- The increase in unit cost of electricity and water.
- Operational asset utilization.
- EWA need for following indexes.
    - System average interruption frequency index (SAIFI).
    - System average interruption duration index (SAIDI).
    - Health and safety environment index.
- EWA to improve the efficiency of production, transmission and distribution.

- The reduction of commercial losses and infrastructure rehabilitation programs.
- Develop initiatives with nominated drivers to address the asset utilization at EWA and Electricity losses through (replacing old/faulty meters, HV consumers metering, specifications for procuring transformers with low losses and procedures to improve revenue collection).
- Collect and validate all data for the functionality of all applications relating to the dispatch of power and focusing primarily on the following:
    - The network configuration.
    - N-1 contingency compliance for feeders.
    - Plant's optimization.
    - Solving outstanding issues with independent power producers (IPPs).
    - HV consumers operating at low power factor.
    - Activate the special unit for effective asset utilization and asset management for EWA.

4. Foster for a caring enabling environment theme

- Be a caring organization.
- Foster effective leadership, skills, and competencies.
- Improve communication through enhanced knowledge management & decision making system.
- Foster a culture of empowerment & strategic accountability.
- Work as a team across EWA.

The main issues brought to the discussion are summarized as follows:

- Initiatives to improve performance for all objectives.
  - Be a caring organization
    - Leave buy back.
    - Health club scheme.
    - Health insurance.
    - Scholarship grants for employees children.
  - Foster effective leadership, skills, and competencies
    - Liaise with University of Bahrain, Bahrain Polytechnic and Bahrain Training institute to motivate staff through obtaining an academic accredited certificate.
  - Improve communication through enhanced knowledge management & decision making system
    - Communication Management
    - the Share Point initiative
    - Report progress through the Initiative component in the ESM Application.
  - Work as a team across EWA
    - A new lead measure to monitor the use of ESM for updating progress with Themes, Objectives, Measures & Initiatives at Corporate and Directorate levels.
    - Surveys at EWA by specialists in the field.

Completion of discussion:

- Test the road map through the Strategic Planning unit (EWA office of Strategy Management).
  - applied at Electricity Distribution Directorate
  - Balanced Scorecards Strategy Map of 2007-2012
  - Through focus groups
- Same Mission & strategy:
  - to provide the electricity energy of the best possible quality to the customers and ensure to install a robust infrastructure capable of meeting the increasing short term and long term demands of power in a safe and sustainable way conforming to the highest international standards.
- Use the same corporate 4 themes
  - Grow with Bahrain
  - Deliver operational excellence
  - Serve customer needs
  - Foster a Caring and Enabling Environment

- 4 perspectives: change the order of the financial and customer to be:
  - Customer
  - Financial
  - Internal Processes
  - Learning and Growth
- Addition to the Electricity Distribution Directorate Balanced Scorecards

- Apply weights to the perspectives as the following:
  - **Customer: 20%**
  - **Financial: 20%**
  - **Internal Processes: 40%**
  - **Learning and Growth : 20%**

These weights are assigned based on the experience of office of strategy management and the electricity distribution directorate management

- Measures:

1. **Customer:**

» Provide me with a high quality & reliable product

- Customer feedback satisfaction index

» Meet my needs through quick, responsive service

- % of customer complaints (planned + unplanned outages) unresolved within specified time
- % of customer complaints unsolved within specified time
- Customer feedback satisfaction Index

» Have the capacity to meet demand

- Electricity spare capacity
- % of unserved customers for Electricity & Water

2. **Financial:**

» F1: Achieve a sustainable EWA

- ~~Assets Turnover Ratio~~
- Assets utilization Ratio
- unserved bulk electricity customer

» Optimize cost to serve

- Cost per unit of Electricity Distribution
- Total Cost per unit of Electricity supplied to end customers

» Maximize revenue through_segmentation

- Number of Customer Accounts reclassified from domestic to commercial segment

~~» Achieve Energy Growth in line with economic growth~~

- ~~Energy growth compared to GDP growth~~

3. **Internal Processes:**

» Excel in core processes

- System Average Interruption Frequency Index
- System Reliability Index
- System Average Interruption Duration Index
- Health & Safety Hazard

» Establish & implement quality assurance & standards

- Quality compliance index

» Manage EWA resources effectively

- ~~Electricity dispatched per employee~~
- % Operational assets utilization

» Excel in customer relationship_management

- Customer Process Delivery Index
  - Time from application submission to connection for HV applications
  - Index (Time from application submission to connection for Water applications)
- Main Roads - Street Lighting faults

» Drive conservation

- Monitoring per capita consumption for Electricity
- Number of premises issued or installed with electricity saving devices.

» Build consumer awareness

- ~~% False cases vs Total cases~~
- ~~% physical completion of pilot project for renewable energy production~~
- consumer awareness surveys

» Excel in planning and risk management

- Cost of unplanned projects
- Flexibility in distribution network

4. **Learning and Growth**

» Be a caring organization

- Employee satisfaction index

» Foster effective leadership, skills, and competencies

- % Fulfilment of career development program

~~» Improve communication through enhanced knowledge management & decision making systems~~

- ~~Awareness of EWA strategic priorities~~

- ~~Frequency of use of Knowledge Assets in the knowledge base~~

» ~~Foster a culture of empowerment & strategic accountability~~

» Work as a team across EWA

- Feedback score on team work

Distribution Control Center (DCC) BSC

The road map application meeting was held on Monday, the 15th of December 2014.

- Cascading corporate & EDD BSC to Distribution control department.

  Distribution control department is responsible for the management of 11 kV network under the Electricity distribution Directorate, which generally includes planning of daily outages, making switching programs, giving switching instructions, maintaining log books, issuing safety documents, isolating & restoring 11 kV faults, load shedding/load transfer, system studies, making various reports etc.

  Operations section is responsible for field work, namely, visiting 11 kV substations/intake substations/HV consumers for inspection and carrying out switching operations as part of fault identification, isolation and restoration of faults. The field staff is also required to do manual operations of

switches/CBs in order to transfer load.

The Distribution control department is responsible to monitor the distribution network and take necessary action to operate and maintain it with high- levels of security and reliability to meet the consumer's requirements.

- The OSM team is available.
- Strategic content revision (vision, mission and values).
- SWOT analysis Appendix (16).
- Main goals and objectives establishment: The main goal of the distribution control department is to achieve and maintain the distribution network with high-quality performance through the following strategies:
    - Maintain and adhering to loading policy

      Loading policy is followed by monitoring the feeder loading during the peak time, on daily basis and takes necessary actions such as load transfers through operation staff. In addition to the above, suggesting and requesting reinforcements and rearrangements in the 11 kV network and forward it to Planning department.
    - Achieve high levels of security and stability of the distribution network.

      Through implementing new procedures, following-up the progress of repairing and restoring the faulty circuits and also instantaneous commissioning of the outages.
    - Maintain high standards of reliability of the 11 kV protection system and dependable communication

systems for control and measurements.

- Minimize total number of 11 kV faults.

  11 kV faults are minimized by following depending on the performance of the earth fault devices. This helped in minimizing the stress on distribution network by eliminating stress on 11 kV cables during fault switching on the distribution network which was previously being done.

- Minimize the frequency of occurrence of faults on 11 kV network.

  Through introducing Partial Discharge test which will provide a clear insight in the weak spots of those cables which have developed frequent faults in their previous service period and to repair them before summer starts in order to reduce the number of unwanted outages and to increase the reliability of the network.

- Brainstorming, strategic themes, the decision is to use the same themes.
- Define BSC perspectives: the standard BSC is chosen, but relocate the customer perspective to be the first perspective in place of the financial perspective
- Define the critical success factors (objectives which are related to the critical objectives).
- Strategy map creation.
- KPIs selection: revision of the existing KPIs, experts' opinions

for new KPIs.

- Related engineers to suggest the performance targets keeping in mind the SMART criteria and focusing of performance drivers
- Experts' opinions for BSC perspectives and KPIs. (all of them 20 %, except the internal processes 40%).
- Initiative prioritization, EDD budget linkage, MOW criteria.
- Performance monitoring & reporting, initiative monitoring & reporting through OSM.
- Integration of operation & plants follow up program with EDD application and OSM.
- Performance evaluation and reporting, 6 types: daily, weekly, monthly, quarterly, semiannually and annually. Each with different format.
- The linkage of distribution control to the annual performance appraisal (based on the load of work, achievements of targets).

Initiatives

- Impose the loading policies across all the concerned sections.
- The LV and HV Cable Fault Location unit should be equiped with modern test vehicles.
- Better cooperation from general directorate of traffic when requested.
- Maintain accurate GIS drawings.

- Due to the network expansion, the number of maintenance outages should be increased. Along with the reinforcements and network rationalization jobs in order to minimize the interruptions to the consumers.
- Implement the plans of the partial discharge measurement on 11kv networks so that distribution control can plan outages based on maintenance to avoid interruption to the consumers as well as maintain the reliable network and reduce the number of faults.

Final decisions of discussion

Distribution Control BSC strategy map:

* **Mission:** Provide reliable and high quality supply of electricity for sustainable development of Bahrain.
* **Vision:** By 2017 Distribution Control is a Model of Excellence in the provision of Electricity services with minimum interruptions.

* Customer Perspective:
  - Have Capacity to meet demand.
    - Number of over loaded feeder = number of mobile Generators
  - Meet customer needs through quick, responsive service.
    - Average restoration time after failure= 2 hours.
  - Provide Customer with a high quality and reliable services.
    - Feeders load = 250 amp for Al

- Feeders load = 300amp for Cu

* Financial Perspective:
  - Optimize cost to serve
    - Number of faults restored through generators
    - Number of faults due to wrong operations

* Internal Perspective:
  - Achieve efficiency through proactive partnering and alignment.
    - Number of outage by other depots.
    - Number of faults resorted by other depots
  - Continuously deliver efficient, faster, reliable Distribution Control processes.
    - % of postponed outages
  - Proactively Support conservation.
    - % reduced load by Hv consumer
  - Excel in delivering technical support to customers.
    - % of unsolved problems
  - Deliver reliable distribution network.
    - % of long cables
    - % of delayed PPM programs
    - % of faults resorted through F SW.
    - % of faults restored through EFI
  - Excel in planning, supervision, monitoring and control.
    - % of postponed outages
    - % of overtime spent in outages.

- Minimize non-revenue consumption
    - % of transformers running less than 70%
- Improve asset utilization and drive flexibility in man power resourcing
    - % of authorized operators.
    - % of authorized contractors.
    - % of faults and outages carried by each team

* Learning and Growth
    - Work as a team across EWA.
        - Numbers of faults and outages carried by 2 or more depots.
        - Response time by different depots when needed
    - Improve communication and information technology.
        - % of employees using EWA mobile network.
        - %of tasks that cannot be handled through EWA systems.
    - Effective human capital management.
        - % of vacant positions.
    - Manpower readiness
        - Number of technical training course / employee

APPENDIX C

EWA Executives' Statements Regarding the BSCs

a. Dr. Abdulmajeed Ali Alawadhi Chief Executive: "The Roadmap towards excellence has become a reality now. Thanks to our strategy management tool, the BSCs. With a clear vision, well-articulated implementation program, successful alignment efforts and competent staff involved, will all make the success sustainable and help drive EWA into a brighter future".

b. Sh. Nawaf Bin Ebrahim Al-Khalifa, VCE Administrative & Financial Affairs: "The BSCs represent a new perspective that allows every employee in EWA to clearly see the role he or she plays in providing the service to the people of Bahrain. The idea is for them to be proud of the impact of their work and to encourage them to excel".

c. Adnan Fakhro VCE Distribution and Customer Services: "The BSC is a great communications tool that is teaching managers to think across the organization and not just in functional silos. Moreover it focuses on what gets measured and rewarded gets done"

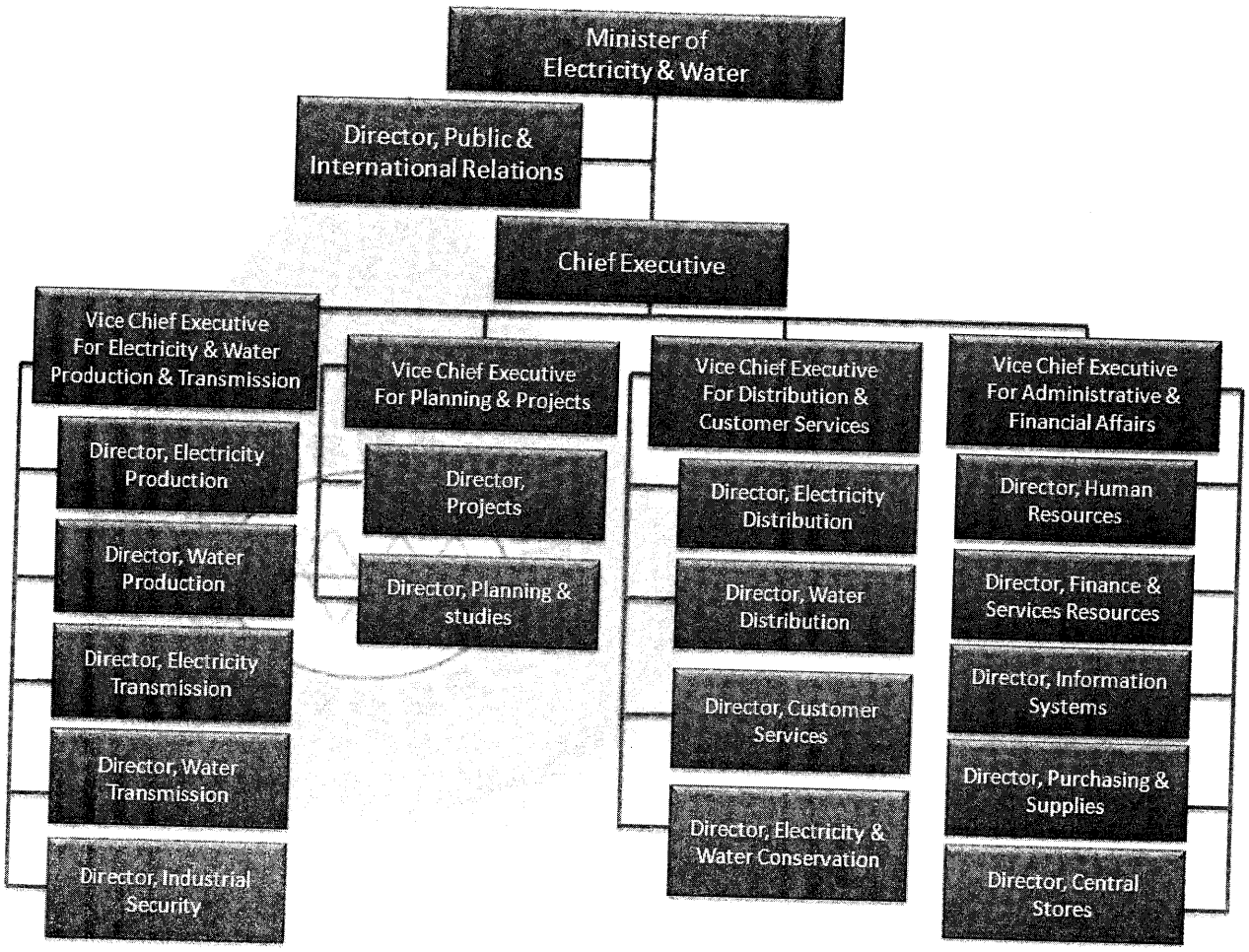
d. Dr. Khalid Ahmed Burashid VCE Planning and Projects: "The BSCs have provided us with a new approach for communicating and managing the business strategic planning and management process. As a tool in the change

process that we are embarked on at EWA, it has become the nerve centre of the enterprise".

e. Batool Abdul A'al VCE Production and Transmission: "Through focusing attention on measures and targets, the BSCs help each individual deliver improved performance in support of EWA's success".

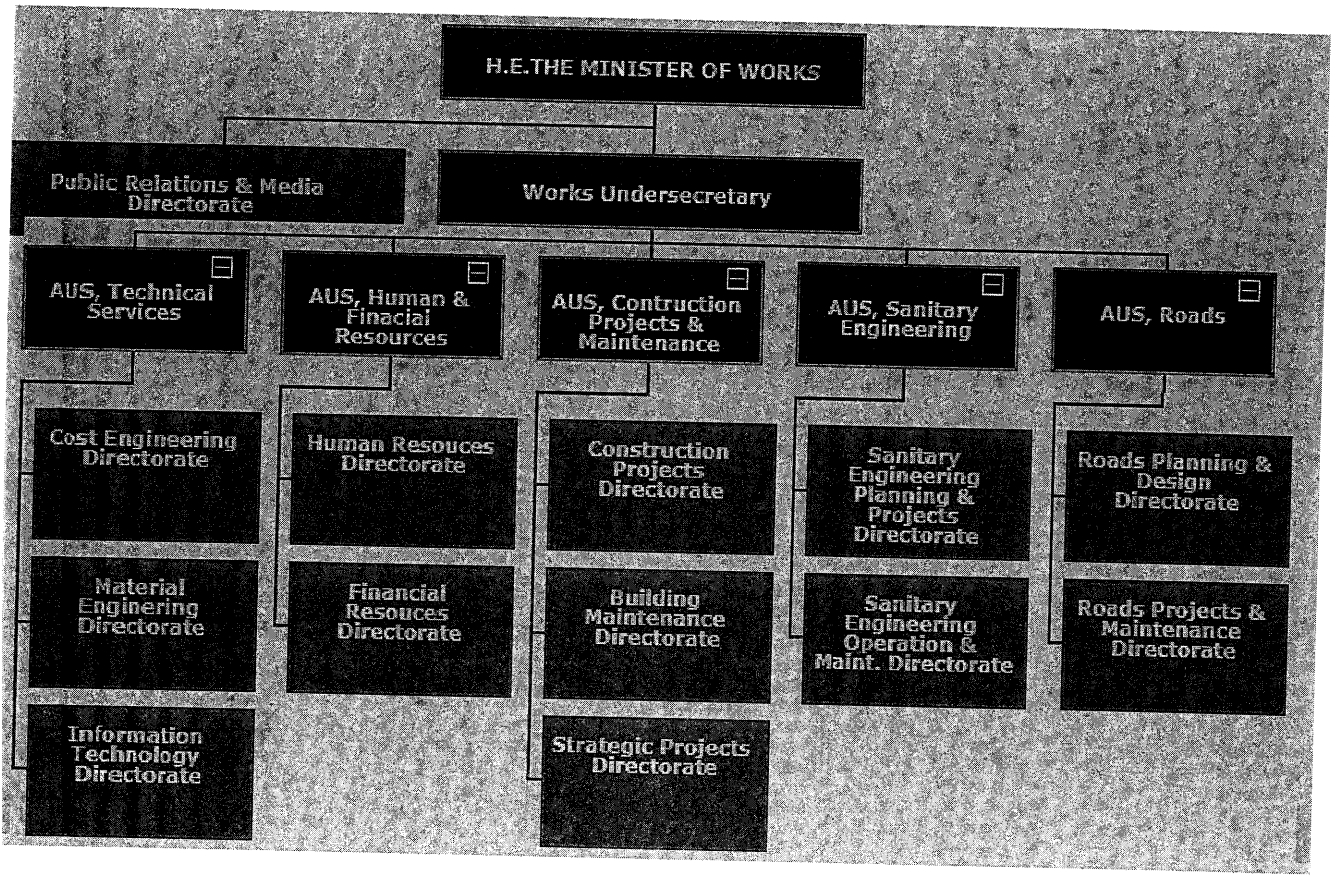
APPENDIX D

EWA Organization Chart



APPENDIX E

MOW Organization Chart



الخلاصة

مملكة البحرين هي إحدى دول مجلس التعاون الخليجي التي تصر على الوزارات وعلى مختلف الوكالات الخدمية العامة تنفيذ نوع من نظم إدارة الأداء. و بهدف تلبية هذه الحاجة، وزارة الأشغال و هيئة الكهرباء والماء قد ذهبت بالفعل الى تنفيذ نظام إدارة الأداء باستخدام نظام بطاقات الأداء المتوازن (BSCs).

و بسبب الاهتمام مؤخرا حول BSCs في مملكة البحرين؛ أصبح جديرا بالاهتمام دراسة تجربة المؤسسات الخدمية الصناعية للقطاع العام البحريني التي نفذت نظام BSCs. الهدف هو دراسة مختلف عمليات تطبيق نظام BSCs، دراسة كيف يمكن لنظام BSCs تحسين إدارة العمليات في المؤسسات الخدمية الصناعية للقطاع العام البحريني واستعراض عملية اختيار مؤشرات الأداء الرئيسية التي يتم استخدامها في إدارة العمليات.

استخدم الباحث بحث نوعي بتطبيق منهجية دراسة الحالة في وزارة الأشغال و هيئة الكهرباء والماء بغية تحقيق أهداف البحث. استنادا إلى البيانات والمعلومات التي تم جمعها، قام الباحث بدراسة مدى استخدام BSCs في المؤسسات الخدمية الصناعية البحرينية في قسم إدارة العمليات، تحديد الآثار المترتبة على ذلك، وضع خارطة طريق مفصلة لتطبيق نظام BSCs في قسم إدارة العمليات ومناقشة الخصائص والتوجيهيات اللازمة أثناء تحديد مؤشرات الأداء الرئيسية.

كانت نتائج هذه الدراسة تتفق مع النتائج السابقة حيث أن التطبيق الناجح لنظام BSCs له العديد من الآثار الإيجابية على قسم إدارة العمليات للمؤسسة، وبالتالي على تحسين الأداء العام. يطمح الباحث أنه في المستقبل يمكن تطبيق الدراسة على المزيد من المؤسسات الحكومية في البحرين تلك التي تأخذ بعين الاعتبار نظام BSCs لكي تتخذه نظام لإدارة الأداء.

جامعة البحرين

قسم الهندسة الميكانيكية



كلية الهندسة

تطوير أداء إدارة العمليات للمؤسسات الخدمية الصناعية البحرينية باستخدام بطاقات الأداء المتوازن (القطاع العام)

أطروحة مقدمة كجزء من متطلبات الحصول على درجة الماجستير
في الإدارة الهندسية

إعداد

محمد جاسم محمد

20024160

إشراف

أستاذ د. سعد سليمان

أستاذ

د. بدر المناعي

أستاذ مساعد

جامعة البحرين

مملكة البحرين

مايو 2015