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PERFORMANCE MEASUREMENT FOR CONSTRUCTION BUSINESSES

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ABSTRACT

Measurement of performance is important to the construction sector as an additional way of improving and sustaining competitiveness in the long-term. Most large construction organisations in the United Kingdom (UK) practise performance measurement because they believe it affects their business positively in the longer-term. Performance measurement is thus, recognised as an important way of keeping an organisation on track in achieving its strategic objectives. However, there are still construction organisations that believe performance ‘measurement’ does not aid in creating and developing appropriate strategies for their organisations, but helps organisations in identifying areas where they did or did not perform well. The improvements in performance thus, can only be brought about through step-by-step strategic guidance to organisations to achieve their performance targets. The first step towards achieving these targets comprises the following: understand the performance measurement process of organisations, and identify the appropriate criteria that need to be measured to improve business; identify strengths and opportunities, which in turn can create a way to maximise profits for an organisation. Such an approach would help organisations target relevant performance measurements and embed them in their organisational strategy in a structured step-by-step manner. Premised on the foregoing, this research project aims to investigate potential tools for improving performance measurement practices in the construction industry. In addition, this research aims to assist organisations in implementing performance measurement in a proper manner and to help them understand the performance measurement process.

The first step (objective 1) of this research is to review the generic body of literature in performance measurement to understand key concepts, definitions and existing practices and identify commonly used performance measurement tools. It is noted that there are several definitions of performance measurement. However, at its basic level, performance measurement is a process of determining how successful organisations or individuals have been in attaining their objectives and strategies. To achieve this, the outputs of an organisation's strategic and operational processes are measured in a quantifiable form; the

results are used to monitor closely the performance of the organisation, internally and externally. Findings of the review (and later those of objectives 2 and 3) reveal that the Balanced Scorecard (BSC) and the European Foundation for Quality Management (EFQM) Excellence Model are the two most widely known and used tools, in all sectors including construction, to measure an organisation's performance. Semi-structured interviews (objectives 2 and 3) were conducted with performance measurement directors and managers in large UK construction companies. The interviews revealed that performance measurement is being practised in organisations directly or indirectly to help improve businesses and profits. The purpose of interviews was to seek the organisations' views on how they approach and conduct performance measurement and derive benefits from it. All organisations agreed that the financial aspects such as profit margins and growth, as well as non-financial aspects such as health and safety and customer satisfaction are important criteria to be measured. Both financial and non-financial criteria need to be considered and included in an organisation's strategy; they are important considerations for any future strategy development. Findings of the interviews and the literature review suggest the best way to create an organisation's strategy as the following: understand the performance measurement process of organisations and identify the appropriate criteria, which need to be measured to improve business; identify strengths and opportunities, which in turn can create a way to maximise profits for an organisation. This led to the development of a Framework (also called the Performance Measurement Migration Path) (objective 4), which would help organisations target relevant performance measurements and embed them in their organisational strategy in a structured step-by-step manner. Its implementation in organisations can make performance measurement processes easy and smooth. Evaluation (objective 5) of the framework confirms its suitability and acceptability to industry players for the use in improving the implementation of performance measurement.

Keywords: Construction organisation, Performance measurement, migration path.

DEDICATION

This thesis is dedicated to my family: my father, Tuan Haji Ahmad Latiffi Bin Haji Yaacob and to all my brothers as well as my sisters. I also dedicate this work to my beloved husband, Mr Norazizi Halimi Bin Nordin for his love, care and courage during my journey to produce this thesis. He is never bored in giving me support and *dua* throughout my journey in producing the thesis.

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ACRONYMS / ABBREVIATIONS

BPO	Business Process Orientation
BSC	Balanced Scorecard
CIDB	Construction Industry Development Board
CII	Construction Industry Institute
CLEVER	Cross-Sectoral Learning in the Virtual Enterprise
CMM	Capability Maturity Model
EDP	Electronic Data Processing
EFQM	European Foundation For Quality Management
ISO	International Organisation for Standardisation
IT	Information Technology
KM	Knowledge Management
PM	Performance Measurement
PMPA	Project Management Performance Assessment
PMPAC	Project Management Performance Assessment for Construction
PMS	Performance Measurement System

QMS	Quality Management System
R & D	Research and Development
SEI	Software Engineering Institute
SCM	Supply Chain Management
STEPS	Start-up, Take-off, Expansion, Progressive and Sustainability
SW – CMM	Capability Maturity Model for Software
UK	United Kingdom
USA	United State of America

CHAPTER 1

INTRODUCTION TO RESEARCH

1.1 INTRODUCTION

This chapter introduces the background of the research project. It also presents the justification of the research and the aim and objectives of the project. The chapter also discusses the programme, the methodological approach and the structure of the thesis and it ends with a summary.

1.2 RESEARCH BACKGROUND AND MOTIVATION

For the past ten years, many construction organisations have been unsuccessful in their business. This trend is increasing and the business environment is becoming riskier in developing countries (Luu et al., 2008). This has been caused by the global economic situation that has brought tremendous changes in business practices, particularly the need and direction of organisations in the industry. This is in addition to challenges and obstacles, which can constrain an organisation's capacity to compete with others in the same industry and the same economic situation. The needs and criteria of measuring performance of organisations were largely ignored. However, they are necessary to assess the present situation of organisations and to chart their next direction in business, even though changes in the economy make measurement in the organisations difficult and requiring lots of effort. As such, it is advisable that construction organisations measure their performance to know their real positions so that relevant steps can be taken to achieve their aims and targets in business (Luu et al., 2008). Organisations need to make continuous improvement in their performance, but it is believed that improvement can only be assessed by measurement (Marr, 2007). Modern concepts of business management stress that continuity in improvement of organisations and accurate measurement lead to success (Marr, 2007).

Nowadays, performance measurement becomes necessary for organisations to bring them to the next level in business achievement. It has been proven that 95 percent of organisations have internal performance measurement systems (Andersen et al., 2002). Performance measurement is an issue within the business community (Wegelius-Lehtonen, 2001) because it is a critical factor for effective management. This may stem from the fact that without measuring something, it is difficult to improve it (Salaheldin, 2009). Organisations can benefit from performance measurement, using it, for example, as the driver of organisational change and renewal (Elg and Kollberg, 2009). Because of what organisations can gain from it, it could not be ignored by the industry as a way that can assist organisations to achieve success (Lee et al., 2000). In addition, it can be introduced at all levels in an organisation to identify problems and to improve the efficiency of specific tasks, to assess customer satisfaction and to deploy strategic objectives. It also can act as a means of controlling improvement initiatives and can facilitate the decision-making process (Sousa and Aspinwall, 2010).

In the United Kingdom (UK), the Government initiated the Latham Report (1994) and the Egan Report (1998), which recommended improving business performance of the construction industry. In Malaysia, the Construction Industry Development Board (CIDB) introduced the Construction Industry Master Plan (CIMP) 2006 – 2015 (a ten-year master plan) as an initiative to improve performance of the construction industry. CIDB is a government agency established to promote and stimulate the development, improvement and expansion of the construction industry. CIDB represents the construction industry in dealing with the government and the public. Construction organisations in Malaysia are required to register with the CIDB and are classified into seven grades (G1 to G7) according to their financial status, technical capabilities and track record (Chan, 2009). Performance measurement is seen as an approach to achieve the ten-year target. CIMP has been developed with the intention to rectify the weaknesses and to improve the industry's performance as well as the image of the construction industry (Sundaraj, 2007). The Master Plan helps to reshape the future landscape of Malaysian construction industry, enabling the construction industry to achieve its optimum size, capacity, capabilities and growth potentials. The Master Plan is expected to materialise in the year 2015 and will support the government's plan to build Malaysia into a successful industrialised nation by the year 2020 (Hasan, 2005). Awareness of

performance measurement in organisations of the UK and Malaysia has been increasing since it has been announced by the authorities of both countries. Since then, many organisations in the industry of both countries have become aware of performance measurement and the benefits they can gain from it.

As stated before, performance measurement is an approach that is used to improve performance and assist organisations to move forward to a better stage in business (Neely, 1999; Beatham, 2003; Robinson et al., 2005). The importance of business performance measurement across industries has been elevated in the last decade in what has been described as a revolution. Performance measurement is part of the important criteria in management that required to be undertaken by not only large sized organisations, but also medium and small sized enterprises. The statement, *'If you cannot measure it, you cannot manage it'*, is taken from Niven (2002) and cited by Yu et al. (2007); the quotation shows how important it is for organisations to measure performance. By doing that, organisations can know what actions they need to take based on results from measurement; they are able to answer the following management questions: what they need to do, how they are going to do it, when they are going to do it and who is going to do it. Therefore, performance measurement provides a sense of where we are and more importantly, where we are going (Ali and Rahmat, 2010).

Apart from that, the main reason why organisations need to measure performance is to identify their level of excellence in financial and non-financial aspects such as leadership, customer satisfaction and policy implementation as compared to their competitors. The results from measuring performance in those aspects will be used to create and develop strategies for the organisation. The organisation's ability to improve its performance is based not only on what has been made but also on what has been done. It has to be looked at, in the first place, in the initial stage of business management. This includes the process of creating and developing strategies (Sulaiman and Hashim, 2003). Although formulating strategies for long-term business to compete in markets is fundamental to the strategic management process, only a few construction contractors have adopted formal processes in the formulation of such strategies (Price, 2003).

As mentioned several times previously, performance measurement is used as a business tool in formulating corporate strategy (Yu et al., 2007). It is widely accepted that strategy intensively involves performance to attain goals (Luu et al., 2008). The creation of goals and objectives of an organisation not only relies on what the organisation wants to achieve in the long-term, but also needs to include elements of performance measurement as an additional means for making goals more realistic and achievable in the future. It has to be understood that every strategy developed must be evaluated and assessed critically to ensure that it is suitable for implementation by the organisation. A strategy has to be created and developed for an organisation to achieve goals and objectives and must be compatible with the organisation's current performance.

The most challenging part of measuring an organisation's performance is not only about knowledge and experience that the organisation has on performance measurement or understanding the use of the right tools or methods to measure performance, but also obtaining the correct sources of information or data on performance, especially when what has to be measured keeps changing (Hubbard, 2006). Therefore, an organisation has to be aware of all sources and data that might be used to measure its overall performance. The measurement can be classified along three broad dimensions, which are numerical or quantitative indicators, qualitative or subjective indicators and finally, measurement of what and whose performances (Takim et al., 2003). These indicators are similar to what has been described by Jusoh and Parnell (2008) as financial measures, market-based measures and qualitative measures. Financial measures include return on assets (ROA) and return on investment (ROI) while market-based measures include market value added (MVA). Qualitative measures cover subjective areas of performance such as ethical behaviour, stakeholder satisfaction with accomplishments, management satisfaction with achievements, employee satisfaction and process improvement (Jusoh and Parnell, 2008). An organisation also has to be clear enough about which type of tools or models it might believe can be used to measure its performance and at the end of the process, it will get and use the results to create and develop strategies for the organisation to compete in the global market.

Even though performance measurement gives benefit to those who implement it for purposes such as evaluation, control and improvement of business processes

(Wongrassamee et al., 2003), the maturity level of using it by many organisations are still on the low side (Verweire and Van Den Berghe, 2003; Sousa and Aspinwall, 2010). Factors that cause this low level of maturity are related to employees and knowledge workers or lean principles of an organisation. These factors can be utilised to put an organisation at the medium or higher maturity stage. Achievement of the highest level of maturity depends on the motives of implementation as well as the approach of implementation of performance measurement (Sousa and Aspinwall, 2010).

Since the end of the 1980's, the performance measurement systems (PMS) have been undergoing revolutions. The main causes for these transformations are the changing nature of work, increasing competition for achieving customer satisfaction, specific improvement initiatives such as Total Quality Management (TQM) and national and international awards, which require a new PMS. Other significant factors include: changing organisational roles, which means more people use PMS information; changing external demands, which means new stakeholders with different demands; and the acceptance of information technology (IT) in acquiring, analysing as well as disseminating PMS information (Araujo and Martins, 2009). Anderson and McAdam (2004) explain that many existing PMS used within organisations lack the flexibility to change as they focus on the past as opposed to the future. In today's highly dynamic environment, it is not appropriate to view the design and implementation of performance measurement systems as a sequential process. The design, implementation and use of measurements should be a simultaneous and continuously evolving process. The changes in the strategic direction and learning requirements of an organisation are constantly being accounted for; a speedy and effective implementation of the formulated strategy is to be achieved. Araujo and Martins (2009) state that, it is risky to think that the solution to inappropriate PMS is the implementation of a new tool or model. Bourne et al. (2002) mention that the implementation of new PMS tools is a difficult change process with many failures. Therefore, it is necessary to change other elements rather than tools or models (Araujo and Martins, 2009).

Therefore, this research is developed based on the following considerations: the need and importance of performance measurement for the industry as well as for organisations; the necessity for organisations to implement it in response to encouragement and

requirements from the government. The review concludes that the cooperation of all people at all levels in an organisation is necessary in implementing performance measurement (identify the suitable criteria to be measured, tools and models to measure performance and appropriate facilities to facilitate the performance measurement process). The changes in PMS caused by what has been known as revolutions cannot be met through development of new tools alone. This PhD research can therefore be viewed as an effort aiming to fill the knowledge gap through the development of a systematic approach. The approach can be used by organisations in the construction industry to assess their implementation of performance measurements, which are based on identification of the elements to be taken into consideration in the performance measurement process. The process can then be carried out until the organisations achieve their targets. The research is based on studies in two different countries, the UK and Malaysia. The knowledge, the needs, the requirements and the process of performance measurement of both countries were explored, discussed and taken into account in developing the approach for performance measurement implementation in organisations.

1.3 JUSTIFICATION OF RESEARCH

Performance measurement is currently attracting a great deal of interest from both industries and academics (Bourne et al., 2002; Wettstein and Kueng, 2002; Bititci et al., 2004; Tangen, 2004). It is an important and wide-ranging topic (Neely, 1999). It has been dealt with by researchers in aspects of performance measurement system design (Neely, 1999, 2005; Kagioglou et al., 2001; Yu et al., 2007), measuring and managing business performance perspective (Beatham, 2003; Bassioni et al., 2005; Bititci et al., 2005; Hampson et al., 2005) as well as research and development of performance measurement (Kulatunga et al., 2007).

According to The Training Resources and Data Exchange or TRADE (2005), performance measurement is a generic term encompassing quantitative basis by which objectives are established and performance is assessed and gauged. It includes performance objectives and criteria, performance indicators and any other means that evaluate the success in achieving a specified goal. The implementation and the use of

performance measurement are now common as they can give benefits and advantages to any organisation practising it as part of its business management (Beatham, 2003; Robinson et al., 2005; Santa et al., 2006). One of the benefits of performance measurement as mentioned by Beatham (2003) and Kulatunga et al. (2007) is that it can assist and lead managers to move in the correct direction for business, which can revise the business goals and reengineer the business process if necessary for better business in the future. Performance measurement can also be the driver of organisational change and renewal and the means for establishing new organisational forms (Elg and Kollberg, 2009).

Apart from that, it is used in the strategy development process of organisations. It appears in the phase of strategy formulation and in the implementation as well as evaluation phases. Lehtinen and Ahola (2010) state that the most widely mentioned motive for performance measurement was that it supports the implementation of strategy. The use of performance measurement has been seen to guide and help top management of organisations in formulating strategy and clearing it down to the level of individual employees (Lehtinen and Ahola, 2010). Most businesses are exposed to intensive competition, and therefore organisations are forced to improve their performance steadily. Organisations doing business in a competitive environment must measure their performance regularly and quantitatively to assess whether the set goals are met. In addition, they should measure different facets of performance such as sales revenue, service quality and employee motivation to understand the interrelationships between business-relevant aspects. This generated knowledge may be used to initiate appropriate action to improve the overall business performance (Wettstein and Kueng, 2002). As performance measurement is central to achieving the goals of corporate strategy, it is important for organisations to have the capacity to implement it in the business management of organisations.

The ability of organisations to manage projects and produce products is more likely to depend on the capability of organisations in industry, which includes the previous performance of the organisation in the industry. Discussing the level of performance necessary to be achieved by an organisation is a very subjective matter. To get a better understanding of this, we have to focus on three basic questions: what will be measured,

how it will be measured and why it is measured (Santa et al., 2006).

Study on performance measurement is not complete without discussing performance measurement tools or models used in organisations (Neely et al, 2003) for the purpose of measuring their financial and non-financial aspects. These are the important aspects considered by organisations in measuring performance of their businesses (Santa et al., 2006; Lehtinen and Ahola, 2010). Performance measurement tools and models have been developed since the 1980s by a variety of researchers in different areas (Bassioni et al., 2005; Lin and Shen, 2007). Many models have been developed in the interim and have coexisted despite their different approaches (Bassioni et al., 2005). A large number of different types of performance measures have been used to characterise systems, particularly in production, distribution and inventory systems (Wu and Song, 2005), as well as in construction. There are various ways in which these can be categorised, ranging from the strategic measurement analysis and reporting technique system by Cross and Lynch in 1988, the performance measurement questionnaire in 1990 and Kaplan and Norton in 1992 for the Balanced Scorecard (BSC). Other types include The European Foundation for Quality Management (EFQM) Excellence Model in 2002, which is known as the most popularly adopted quality management model for measuring and improving performance. It has been used widely in Europe and has been developed recently (Lin and Shen, 2007).

Furthermore, Lin and Shen (2007) mention that the use of tools and models depends on multi-perspective indicators needed and used to measure performance. The indicators based on characteristics of organisations or projects in different industries need to be developed. Added to that, continuous measurement of performance is encouraged to achieve the best practice, and real-time feedback is necessary to make on-course corrections. The tools and models must also be designed to reflect the most important factors influencing the productivity of the different processes that can be found in the organisation. The use of performance measurement tools and models encourages organisations to focus on different aspects of business performance issues relating to processes, people and product (Carrillo et al., 2003). Bourne et al. (2005) state that other factors influencing the use of a performance measurement tools and models are economic constraints and regulatory regimes. These are taken to mean what the condition of the

economy is and regulations made by organisations and stakeholders such as clients or customers. Added to that is also how widely the tools and models have been used in the industries. In agreement, Wettstein and Kueng (2002) state that the tools and models capable to track actual performance of an organisation, help identify weaknesses and support communication decision-making processes.

Performance measurement implementation cannot however be a success if it is not managed and implemented in a proper process. The cooperation of staff in an organisation is important for the best results in its implementation. They have to know their responsibilities and tasks to make sure that the process of implementation of performance measurement can succeed. Barr et al. (2005) mention that in order to compete successfully, organisations must not only have the best assets but also the best people and processes. Apart from that, Bititci et al. (2004) state that organisational culture and management styles have an impact on how performance measurement systems are implemented and used, thus affecting its success or failure. Furthermore, Sousa and Aspinwall (2010) agree that the culture is the most important factor in the use of strategic performance measurement system. Franco and Bourne (2003) also state that organisational culture that encourages action and improvement by implementing the performance measurement is very important. However, if the culture is not appropriate, the system may never achieve a level of good performance.

Although the concepts of performance measurement are developed to improve the performance of a business, it can sometimes give the wrong impression about management. This is because, if it is not appropriately designed and implemented for any business, it can be of no use and sometimes become a risk for the business. This can be more significant in businesses operating in the construction industry as they use complex supply chains with different clients achieving their own goals. Appropriate measures are required to control these complex relationships (Nudurupati et al., 2007). With the increasing number of organisations implementing and practising performance measurement in organisations, there is a need to look at how they can implement it in proper ways, creating a better effect for organisations, which can benefit not only the organisations but also the people who work in them.

Therefore, this research will introduce an approach to integrate components and elements to be taken into consideration in the performance measurement process. It is linked with the steps that can help those variables in carrying out performance measurement until the organisation achieves the results desired. In using performance measurement tools and models, the BSC and the EFQM Excellence Model will be emphasised in this research. The research will focus not only on how these tools and models can be used by organisations to measure their performance, but also on how the fundamental concepts of the EFQM Excellence Model can be used to identify the key elements that will be chosen by organisations to measure their performance. The elements will then be used as main components that need to be considered in the performance measurement process. The selection of the EFQM Excellence Model concepts is made because the Excellence Model is one of the well-known and most used performance measurement models (Neely et al., 2000; Marrewijk et al., 2004). Users of the model claimed it to be the appropriate performance measurement model. It covers and considers wider aspects of performance such as leadership, strategy, people, partnerships and resources as well as processes, products and services as enablers, and results in customers, people, society and key results of organisations (EFQM, 2009). Both, the BSC and the EFQM Excellence Model provide specific frameworks in which an organisation can establish a clear vision of its management processes and focus on improving its long-term performance (Wongrassamee et al., 2003).

1.4 AIM AND OBJECTIVES

For this research, the aim is to investigate potential tools for improving performance measurement practices in the construction industry.

To satisfy the research aim, the following research objectives were established:

1. To review the performance measurement concept;
2. To determine the extent to which construction organisations use the established performance measurement tools and models;

3. To investigate current practices of performance measurement within construction organisations;
4. To develop a tool that allows construction organisations to incrementally achieve performance measurement targets;
5. To evaluate the tool for its effectiveness in achieving performance measurement targets.

1.5 RESEARCH PROGRAMME AND METHODOLOGICAL APPROACH

The outline of the research programme and methodological approach for this research is presented in Figure 1.1., which contains the research activities and a list of methods used in undertaking each of them. These activities, as shown in the figure, are as follows:

- Research identification
- Review of research topic
- Research methodology
- Current studies of performance measurement
- Framework development (maturity level and migration path)
- Framework evaluation
- Conclusions and recommendations

At the first stage, a literature review is made to identify the area concerned for performance measurement study. The review includes the areas of performance

measurement, construction management, project management and business excellence. The purpose is to narrow the scope of the research. From the literature review, the background, justification of research, aim and objectives of the research are identified.

The second phase involves a review of literature on the research topic. This covers performance measurement concepts including definitions, its importance, performance measurement tools and models, financial and non-financial aspects, relationships of performance measurement with strategy development and its use in the construction area. The purpose is to explore the topic in-depth and clarify issues in performance measurement.

The third phase of research activities is the research methodology study. The literature review on this is to increase the researcher's understanding of the research methodology. It deals with the following aspects: the purposes of research methodology, research philosophy, research approaches, research design, research methods, data collection and data analysis.

Next, studies of current performance measurement are made to gain information from the industry players on its implementations in organisations. Data are obtained from one-to-one semi-structured interviews with key managerial staff in large organisations of the construction industry in both the UK and Malaysia. The data are then analysed and results are used in the formulation of the framework.

The fifth phase is the development of the framework. Besides data obtained from the industry players, a literature review is made to explore the existing framework that is suitable and related to developing the new framework. The literature helps in framework design.

In the sixth phase, the framework is evaluated through dialogues with key managerial staff in organisations in the construction industry of the UK and Malaysia. They include Chief Executive Officer (CEO), managing directors and senior managers. One-to-one semi-structured interviews as well as telephone interviews provide responses and feedback from the participants on the usability of the framework. The data collected from

the evaluation are analysed and discussed.

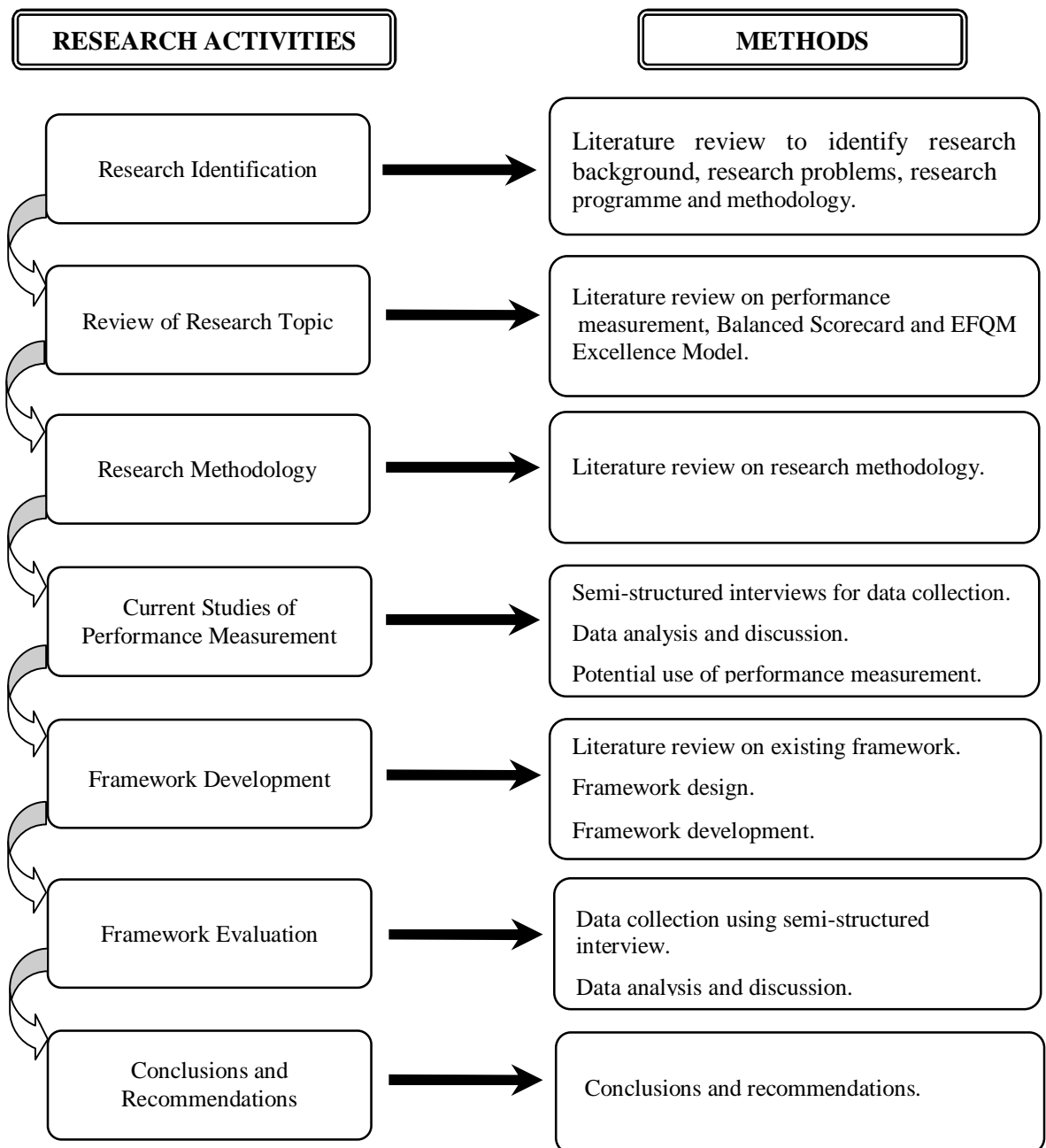


Figure 1.1: Research Programme and Methodological Approach

The last phase of the research is preparing conclusions and recommendations. The conclusions sums up all the findings of the research and recommendations are made based on the salient points of the findings.

1.6 STRUCTURE OF THESIS

This thesis is organised into eight chapters, which are summarised as follows:

Chapter 1: Introduction To Research

This chapter introduces the research project by providing the background and justification of the research. The chapter also includes the research aim and objectives along with a brief discussion on the research programme and methodological considerations. Structure of the thesis is also presented.

Chapter 2: Performance Measurement

This chapter reviews literature on performance measurement, including a discussion on key performance measurement concepts, its definitions and importance, tools and models used and various performance measurement criteria. A discussion on performance measurement in construction follows.

Chapter 3: Balanced Scorecard and European Foundation for Quality Management (EFQM) Excellence Model – In Use

This chapter reviews the various performance measurement tools and models used in the industry. The chapter is divided into two main parts. The first reviews literature on the balanced scorecard. It also includes an overview of the balanced scorecard and its use in the industry, and an in-depth discussion on how the tool works. Strengths and weaknesses of the tool are also discussed. The second part concerns the EFQM Excellence Model. Similar to the first part, it includes an overview of the Excellence Model and its use in the industry, and an in-depth discussion on how the model works. Strengths and weaknesses of the model are further discussed later in the chapter.

Chapter 4: Research Methodology

This chapter reviews and presents the research philosophies, approaches, strategies, choices, data collection and analysis available in doing a research. This is followed by methodology adopted for the research and discussion on the approaches, methods used for data collection and data analysis.

Chapter 5: Current Approaches To Performance Measurement

The focus of this chapter is on the current performance measurement practices within organisations in the construction industry of two countries, the UK and Malaysia. It discusses implementation of performance measurement in organisations in both countries. The trends in practising performance measurement are explored, which include understanding of performance measurement, performance measurement processes and selection of tools and models used in measuring performance by both countries. This chapter also discusses the current challenges and ways of improving performance measurement practices.

Chapter 6: A Framework for Performance Measurement Implementation

This chapter reviews, discusses and presents how the framework is established. It discusses the framework development process, starting with its design and followed by a description of the framework. It then presents and discusses the main features and content of the framework.

Chapter 7: Framework Evaluation

This chapter presents the framework evaluation process. It starts with an introduction, aim and objectives of the evaluation. Then the process of evaluation is discussed. This is followed by discussion on results and findings from the evaluation. The benefits and limitations of the framework are presented in the final part of the chapter.

Chapter 8: Conclusions and Recommendations

Chapter 8, the final chapter, contains the conclusions and recommendations of the research. It discusses the findings and limitations and provides recommendations for further research.

1.7 SUMMARY

This chapter has presented the main content of the research project. It shows the background of the research and justification of the research undertaken for PhD study.

The aim and objectives of the research are stated in this chapter, together with a brief discussion of the research programme and methodology used. The structure for the whole thesis is presented at the end of the chapter. In the next chapter, the literature review on performance measurement concepts will be discussed and presented.

CHAPTER 2

PERFORMANCE MEASUREMENT

2.1 INTRODUCTION

As it had been in the past, research in performance measurement is being undertaken by diverse groups of people from a wide range of disciplines (Neely, 1999). Performance measurement is not an exclusive field of any single party or discipline, for example human resource managers, accountants, operation managers, business strategists or civil engineers. What has been difficult to tell or explain about performance measurement is that most researchers did research in their areas and focused only on its use in their related fields. Therefore, researchers in operations management, for example, considered its suitability in that field only (Nelly, 1999).

This chapter therefore constitutes an introduction to performance measurement based on performance measurement in general and is not specific to construction. The chapter provides definitions of performance measurement and the importance of performance measurement to organisations and the need for it is discussed in detail. Apart from that, aspects or criteria to be measured and the relationship between performance measurement and strategy development are discussed. The elaboration gives a clear picture of what was measured and what is being measured by organisations to evaluate their business performance. The discussion also touches on connection of performance measurement in the process of developing organisational strategy. Performance measurement tools and models as well as their usage in industries are discussed at the end of the chapter where it closes with a summary.

2.2 PERFORMANCE MEASUREMENT

The performance measurement approach has been discussed since it appeared in industry in the mid-1950s (Bourne et al., 2005; Neely, 2005). It has been explored, studied and understood by different areas for almost 60 years. The past scholarly effort has led to the modern invention, exploration and development of new things such as varieties of performance measurement systems (Franco and Bourne, 2003; Bassioni et al., 2004; Debusk and Crabtree, 2006) and creation of new approaches for performance measurement practices (Parida and Chattopadhyay, 2007; Butcher and Sheehan, 2010). However, as Neely et al. (2005) point out, performance measurement is a topic, which is often discussed but rarely defined. It can be an integral part of management and thus may have been exercised for as long as management has existed (Bassioni et al., 2004).

The field of performance measurement has long been dominated by the concepts of management accounting procedures and techniques as well as management control systems (Sinclair and Zairi, 1995). It started when Peter Drucker in 1954 (Drucker, 2007) suggested that balanced measurement systems should be developed to quantify performance and the unanticipated consequences of quantification. Since then, throughout the 1980s and early 1990s, numerous authors suggested measurement frameworks that might be appropriate. The result was that a dominant research question was raised in the mid-1990s, at least among the operations' management community with an interest in performance measurement. This is the question: how could these so-called 'balanced performance measurement systems' be developed and deployed? A stream of research works followed on the design and deployment of such systems. It resulted in a research report on development of processes for designing measurement systems and barriers to their successful implementation (Bourne et al., 2000).

Performance measurement is seen as an opportunity to gain insight into the future. It allows an organisation to forecast its financial measures and to plan for the future. The procedure is by simply looking at an organisation's current innovation and learning processes and its achievements in business (Lehtinen and Ahola, 2010). Definitions of performance measurement will be discussed in the next section to provide a clear

understanding of performance measurement and its uses in an organisation.

2.2.1 Definitions of Performance Measurement

There is equivocal evidence on which definition to give to performance measurement. Table 2.1 shows definitions of performance measurement from a diverse range of people in different disciplines. The definitions vary according to the perspectives of accountancy, business strategy, human resources, operations and construction.

Table 2.1: Definitions of Performance Measurement

No.	Source	Definition
1	Mbugua et al. (1999)	A systematic way of evaluating the inputs and outputs in construction activities and it is known as a tool for continuous improvements.
2	Kagioglou et al. (2001)	A process of determining how successful organisations or individuals have been in attaining their objectives and strategies. To achieve this, the outputs of an organisation's strategic and operational processes are measured in a quantifiable form to monitor the organisation in detail, internally and externally.
3	Wegelius-Lehtonen (2001)	The feedback or information on activities with respect to meeting customer expectations and strategic objectives. It should answer two simple questions which are: <ul style="list-style-type: none"> • Are units or departments doing the right things? • Are they doing them well?
4	Bourne et al. (2003)	The use of a multi-dimensional set of performance measures. The measures include both financial and non-financial measures; they include as well both internal and external measures of performance and often both measures which quantify what has been achieved as well as measures which are used to help predict the future.
5	Cain (2004)	The initial stage in an improvement process that gives benefit to users as well as organisations.
6	Ankrah and Proverbs (2005)	A process of ensuring that an organisation pursues strategies that leads to the achievement of the overall goals and objectives.

No.	Source	Definition
7	Hampson and Best (2005)	A technique to enable assessments to be made as a result of the action, the effective use of resources and the degree to which actions meet policy goals and objectives.
8	Neely et al. (2005)	A process of quantifying the efficiency and effectiveness of past actions.
9	The Training Resources and Data Exchange (TRADE) (2005)	A generic term encompassing the quantitative basis by which objectives are established and performance is assessed and gauged. It includes performance objectives and criteria, performance indicators and any other means that evaluate the success in achieving a specified goal.
10	Santa et al. (2006)	A process of quantifying action, which encompasses the selection of what activities to measure, why and what are the performance standards and benchmarks to be referred.
11	Kulatunga et al. (2007)	The evaluation of efficiency and effectiveness of actions which determine the attainment of stakeholder satisfaction and factors which influence this attainment.
12	Elg and Kollberg (2009)	A process of collecting, computing and presenting quantified construct for the managerial purposes of following up, monitoring and improving organisational performance.
13	Ali and Rahmat (2010)	A process of evaluating performance relative to a defined goal.

Mbugua et al. (1999) define performance measurement as a systematic way of evaluating the inputs and outputs in construction activities. It is also known as a tool for continuous improvement. This has been agreed by Elg and Kollberg (2009) who stated that performance measurement is a process that involves collecting, computing and presenting quantified constructs for managerial purposes, which includes following up, monitoring and improving activities for organisational performance. Thus, performance measurement is seen as the whole measurement process from collection of data to the final usage in managerial work.

Ankrah and Proverbs (2005) define performance measurement as a process of ensuring that an organisation pursues strategies that leads to the achievement of the overall goals and objectives. It acts as a key factor in supporting and ensuring the successful implementation of an organisation's strategy. The Training Resources and Data Exchange (TRADE) (2005) define performance measurement as a generic term encompassing the quantitative basis by which objectives are established and performance is assessed and gauged. It includes performance objectives and criteria, performance indicators and any other means that evaluate the success in achieving a specified goal. This is similar to the definition by Kagioglou et al. (2001) that performance measurement is a process of determining how successful organisations or individuals have been in attaining their objectives and strategies. To achieve this, the outputs of an organisation's strategic and operational processes are measured in a quantifiable form to monitor the organisation in detail, internally and externally. Furthermore, Hampson and Best (2005) define performance measurement as a technique to enable assessments to be made as a result of the actions of the effective use of resources and the degree to which actions meet policy goals and objectives. Both definitions mention that performance measurement is about the processes or activities that occur in attaining objectives and goals. Similar to that are Ali and Rahmat (2010), which state that performance measurement is a process of evaluating performance relative to a defined goal. Added to that, Wegelius-Lehtonen (2001) states that performance measurement is an approach to meeting customer expectations and strategic objectives by understanding whether units or departments in organisations are doing the right things and whether they are doing all the things in proper and correct ways. This definition is similar to what has been stated by Kagioglou et al. (2001) as well as Hampson and Best (2005) that performance measurement is about achieving objectives.

Apart from that, Bourne et al. (2003) understand that performance measurement refers to the use of a multi-dimensional set of performance measures. The set of measures includes financial and non-financial as well as internal and external measures of performance. It often includes measures, which quantify what has been achieved and those, which are used to help predict the future. Furthermore, performance measurement has an impact on the environment in which it operates. Starting to measure, deciding what to measure, how to measure and what the target will be are all acts, which influence individuals and

groups within the organisation. Once measurement has started, the performance review will have consequences, as will the actions agreed upon as a result of that review. Performance measurement is therefore an integral part of the management planning and control system of the organisation being measured (Bourne et al., 2003).

Performance measurement can be identified as a process of quantifying the efficiency and effectiveness of past actions (Neely et al., 2005). Efficiency is a measure of how economically the organisation's resources are deployed when providing a given level of customer satisfaction while effectiveness refers to the extent to which customer or client requirements are met. In terms of effectiveness, achieving a higher level of product reliability and a very good service might lead to greater customer satisfaction. In terms of efficiency, it might reduce the costs incurred by the business through decreased field failure and warranty claims. Hence, the level of performance a business attains is a function of the efficiency and effectiveness of the actions it undertakes. It can also be described as the process of quantifying action, which encompasses the selection of what activities to measure, why and what the performance standards are and the benchmarks to be referred to (Santa et al., 2006).

Kulatunga et al. (2007) define performance measurement as the evaluation of efficiency and effectiveness of actions, which determine the attainment of stakeholder satisfaction and factors, which influence this attainment. Performance measurement effectiveness is contingent on the speed of change and the measurability of performance (Bourne et al., 2005). Cain (2004) states that performance measurement is the initial stage in an improvement process that gives benefit to users as well as organisations.

Considering the various definitions, performance measurement is a process that identifies efficiency and effectiveness by undertaking a critical evaluation of all aspects of management, such as leadership, planning, human resources, finance and workers. By the end of the process, it will help the managerial staff of organisation to formulate effective strategies that help towards achieving organisations' objectives and goals. This definition is used in this thesis to understand performance measurement. The thesis is to explore precisely the implementation of performance measurement activities by considering all aspects and criteria that may reflect and contribute to the overall performance of an

organisation in a systematic way. Performance measurement tools and/or models are required for assisting organisations in getting results from the activities for improvement purposes.

2.3 IMPORTANCE OF PERFORMANCE MEASUREMENT

The use of performance measurement has been acknowledged and there are reasons why it is important to organisations and industry. Over the past years, many organisations have been alerted to the importance of measuring performance of their businesses (Neely, 1999). They understand that measurement can help them to realise their business potential for sustaining long-term competitiveness. The changing nature of work such as increasing competition, specific improvement initiatives, national and international quality awards, changing organisational roles, changing external demands and the power of information technology have driven organisations from all sectors to search for ways of monitoring and improving their performance (Neely, 1999; Beatham, 2003; Robinson et al., 2005; Santa et al., 2006). These help to achieve continuous improvement of the organisation (Mbugua et al. (1999).

Performance measurement is used to assist managers to move in the correct direction, to revise the business goals and to re-engineer the business process if needed. Performance measurement improves customer satisfaction and organisation reputation (Kulatunga et al., 2007; Aspinwall and Sousa, 2010), increases productivity and improves business for a better future (Kulatunga et al., 2007). It is known as a management improvement system as well as a management control system (Bititci et al., 2004). Added to that, performance measurement can be both the driver of organisational change and renewal and the means for establishing new organisational forms (Elg and Kollberg, 2009).

In the complexity and changing environment of today, organisations look at performance measurement as a part of necessary ways to increase their profit, enlarge their market and strengthen their existence in industry. The expression, '*If you cannot measure it, you cannot manage it*' (Niven, 2002) really opens the eyes of top management in organisations to how important it is to apply performance measurement.

Understanding performance measurement can help organisations realise its importance for achieving business profitability and maintaining a long-term competitive advantage. This is because performance measurement is intended to be used and implemented to measure performance of organisations. The results from the measurement will show organisation performance and are the indicator of what the organisation has achieved and what will need to be achieved in the future. Apart from that, performance measurement is used as a business tool for evaluating management performance, managing human resources and formulating corporate strategy (Baldwin et al., 2001; Yu et al., 2007; Kulatunga et al., 2007).

Acceptance of performance measurement in the strategy development process is a way to ensure that organisations evaluate their own effectiveness and efficiency and take good consideration of all aspects of the organisation, internally and externally, when developing their objectives and goals (Kagioglou et al., 2001; Luu et al., 2008). An organisation has not only to consider what it intends to achieve in the future but also to accept performance measurement as a consideration for making its goals and objectives more realistic, achievable and accepted by everyone for a brighter business future. Performance needs to be measured in relation to the objectives or goals identified in the business planning processes (Dalrymple and Bryar, 2006). Jusoh and Parnell (2008) state that the reason organisations fail to translate strategy into action is due to performance measurement system in the organisations. The organisational management fail to collect the right information to monitor progress towards their strategic goals. The measurement of an organisation's current and past performance is an important issue. In saying that, performance measurement is important for organisations to evaluate their actual objectives against their predefined goals and to make sure that they are doing well in the competitive environment (Kagioglou et al., 2001).

Performance measurement is asserted as a means to improve internal as well as external aspects of organisation's business such as finance, people and processes and which leads to success. Sousa and Aspinwall (2010) state that performance measurement can act as a means of controlling improvement initiatives, which means it can be used to improve an organisation in the way that the organisation wants with the capabilities that the organisation has for success. Apart from that, it is seen as an important way of keeping

an organisation on track in achieving its objectives and as a monitoring mechanism for the owner of an organisation (Tapanya, 2004). In today's complex and ever-changing environment, organisations are looking to performance measurement as an additional way for increasing profits, enlarging markets and strengthening existence in industry (Theeranuphattana and Tang, 2008). It also reflects "organisational culture and philosophy and describes how well work is done in terms of cost, time and quality" (Lukviarman, 2004).

TRADE (2005) explains why organisations measure their performance in business. They do so because performance measurement in quantitative terms tells something important about products, services and processes that produce them. It is actually a tool to assist and help organisations to understand, manage and improve what they do. Performance measurement is used to identify whether organisations are meeting customer requirements. Apart from that, performance measurement does the following:

- Helps organisation to understand their own processes. This is to confirm that organisations know or reveal what they do not know.
- Ensures decisions are based on fact, not on emotion. It means that decisions by the organisation to take any action in improving business are based on measurement and standard of measurement of tools or models for measuring performance measurement.
- Shows where improvements need to be made either for the whole organisation, group or unit in organisation.
- Shows how to manage and what organisations need to do and expect if improvements actually happened.
- Reveals problems that bias and emotion cover up. Doing jobs for a long time without measurements can make an organisation assume incorrectly that things are going well. They may or may not be, but without measurements, there is no way to tell.

- Identifies whether suppliers are meeting the organisation's requirements, as the main purpose of performance measurement is to identify organisation performance in business.

Furthermore, performance measurement has been used to assess the success of organisations (Kennerley and Neely, 2003). It has also been used by a number of organisations with an intention to improve their performance in business management. Performance measurement is an additional way for identifying the strengths and weaknesses as well as opportunities and threats of organisations either in financial or non-financial aspects (Hoque, 2004). Takim et al. (2003) state that performance measurement is used to judge performance of projects in terms of financial and non-financial aspects and to compare and contrast the performance with others, in order to improve programme efficiency and effectiveness in their organisations. They look at performance measurement in the context of projects. The main reason why organisations measure their performance is to identify their level of excellence in financial terms such as return on investment (ROI) or net earnings and in non-financial such as leadership, customer satisfaction and policy compared to their competitors. The results gained from measuring performance in these two aspects will be used to create and develop strategies for the organisation in achieving its aims and objectives in business. It is used to attract future investment, increase share value and recruit high calibre employees (Kagioglou et al., 2001).

Performance measurement is being used to assess the impact of actions on the stakeholders of the organisation whose performance is being measured. Although this can be considered 'as quantifying the efficiency and effectiveness of action', in the case of measuring the impact of the organisation's performance on customer satisfaction, it is not as obvious in measuring the impact of the organisation's actions and performance on employee or local community satisfaction (Bourne et al., 2003).

Measuring performance is a means of creating and developing strong competitive strategies for an organisation. It is a top managerial responsibility to make sure that performance measurement is implemented and applied in the organisation. Therefore,

managers need to understand what the key resources and drivers of performance and values are in their organisations (Marr et al., 2004). To fully use performance measurement, the participation of all parties is required. Performance activities should evaluate group and not individual work (Tangen, 2005). An awareness of performance measurement will create opportunities for the organisation to operate competitively in other market environments. The question of how an organisation can survive in the world with many competitors can be answered with the implementation of performance measurement.

However, implementation of performance measurement can fail or be unsuccessful. Factors causing this are as follows (Bourne et al., 2003):

- The senior management team have failed to achieve consensus as to how the vision should be achieved. This leads to different groups pursuing different agendas and effort is neither coherent nor linked to strategy in an integrated way.
- Strategy is not linked to department, team and individual goals.
- Strategy is not linked to resource allocation. This often occurs when the processes of long-term strategic planning and annual budgeting are separated and may result in funding and capital locations becoming unrelated to strategic priorities.
- Feedback is tactical and not strategic. This occurs when feedback concentrates solely on short-term results (such as the financial measures) and little time is reserved for the review of indicators of strategy implementation and success.
- Difficulties in evaluating the relative importance of measures and the problems of identifying true 'drivers'.
- Metrics are too poorly defined and do not meet what the organisation wants.
- Goals are negotiated rather than based on stakeholder requirements.

- Improvement method is not used even though the organisation has facilities for its improvement.
- Time and expense factors. This means that the performance measurement activities take a long time and that can affect cost (cost factor). The cost of implementing performance measurement could be higher especially for organisations appointing external experts to do the measurement.
- Need to quantify results in areas that are more qualitative in nature. This means that it could be difficult and tough to analyse qualitative data such as non-financial aspects as measurement needs to be in quantitative terms.
- Difficulty in decomposing goals for lower levels of the organisation as they are not involved at the beginning of the performance measurement process and they are receivers and not decision makers in organisations.
- Need for a highly developed information system. Depending on the sophisticated information system or any advanced tools or technique for assessing performance and sharing the results of assessment with others in the organisation.
- Striving for perfection and denying results of measurement if they conflict with those expected by the organisation.

Most researchers have agreed that with performance measurement, organisations can improve their business in all aspects, financial and non-financial, such as leadership, profit margins and planning process and policy goals. It is clear that performance measurement is primarily managing the outcome and reducing or eliminating an overall variation in the work product or process. The goal is to arrive at sound decisions about actions affecting the product or process and its output.

Based on literature, although implementing performance measurement has positive impact and benefits for organisations or individuals, failure in its implementation can

bring difficulties and problems to the users. The causes of the problem and failure of the performance measurement process arise from lack of understanding of what performance measurement can bring to organisations. Knowledge and understanding of it can be increased and difficulty in implementing the process can then be repaired and fixed through communication in the organisation where the staff (top managerial level and others) understands what they need to do with performance measurement.

2.4 FINANCIAL AND NON-FINANCIAL PERFORMANCE MEASURES

Certain criteria need to be examined when planning and choosing suitable criteria to be used in measuring performance of an organisation. These must be chosen based on what organisations want to achieve as their objectives. They must make comparison with other organisations in the same business and explain clearly the purpose of each performance criterion being selected. The criteria should be selected through discussions with people involved in the business, for example, customers, employees and managers (Neely et al., 2000).

In earlier performance measurement, organisations tended to measure their performance by looking at financial aspects or measures, such as return on investment (ROI), sales per employee and profit per unit production, profit margins, turnover of stock, debt to equity ratio and cash flow (Kagioglou et al., 2001; Dalrymple and Bryar, 2006; Phang, 2006; Santa et al., 2006). The aspect of financial is what has been described by Wettstein and Kueng (2002) and Lehtinen and Ahola (2010) as traditional performance measurement. However, financial measures have been criticised for being short-term indicators, being too historical and backward-looking, for encouraging dysfunctional behaviours and for giving inadequate consideration to the development of intangible assets such as employee capabilities and customer satisfaction (Kagioglou et al., 2001; Marr et al., 2003; Lehtinen and Ahola, 2010). Being historically focused means they measured only what had happened and not what will happen in the future (Neely, 1999). Take, for example, sales turnover; it simply reports what happened last week, last month or last year, whereas most managers want predictive measures of what will happen next week, next month or

next year. Another problem with the performance measures used in many organisations is that they are rarely integrated with one another or aligned to business processes.

Financial alone are unlikely to be the most efficient means to motivate employees. Financial information is lagging in the sense that it describes the outcome of managerial actions or decisions after they occur by at least one reporting period. Robinson et al. (2005) agreed that financial measures alone are no longer sufficient and suitable for understanding performance in a dynamic and challenging business environment. It does not reflect performance in the new economy, which is in the global economy. It is important for organisations to move beyond financial performance indicators to consider non-financial measures that contribute to long-term value creation (Anderson and McAdam, 2004). Quality, speed and flexibility, in addition to cost, have emerged as the three most competitive attributes (Bititci et al., 2001). Managers need current and up-to-date non-financial information to be able to take better actions or decisions (Bassioni et al., 2004).

Neely (1999) and Kagioglou et al. (2001) have listed the following reasons why financial measures have been criticised as an indicator to measure performance of an organisation:

- Encourages short-termism, for example the delay of capital investment.
- Lacks strategic focus and fails to provide data on quality, responsiveness and flexibility.
- Encourages local optimisation, for example ‘manufacturing’ inventory to keep people and machines busy.
- Encourages managers to minimise the variances from standard rather than seek to improve continually.
- Fails to provide information on what customers want and how competitors are performing.

Furthermore, Tangen (2004) exposes limitations of the financial performance measures:

- Financial measures are concerned with cost elements and try to quantify performance solely in financial terms but many enhancements are difficult to quantify monetarily such as lead-time reduction, quality improvements and customer service.
- Financial reports are usually produced monthly and are results of decisions that were made one or two months previously.
- Financial measures have predetermined inflexible formats used across all departments, ignoring the fact that a department may have its own unique characteristics and priorities.

Therefore, financial performance measures should be supplemented or replaced by non-financial measures because they are more informative of employees' actions and can improve contracting (Marr et al., 2003). Viewing performance through non-financial measures can provide insight into organisational processes and outcomes that cannot be seen via financial measures (Jusoh and Parnell, 2008). Phang (2006) states that the inclusion of non-financial measures is typical to overcome the limitations of traditional financial measures such as short-term focus, emphasis on small groups of stakeholders and limited guidance on future actions. Added to that, they are internally rather than externally focused, lack strategic focus and often inhibit innovation (Kennerly and Neely, 2003). It was generally agreed that non-financial measures should be used to complement traditional financial measures (Lehtinen and Ahola, 2010).

Consideration of taking non-financial measures such as customer satisfaction and job satisfaction into account in measuring performance started in the 1990s (Neely, 1999; Kueng, 2000). After many industries revealed the limitation of financial measures, organisations tended to look at non-financial aspects to be measured and considered in evaluating performance of organisations. Business leaders agree that a successful business will better serve its shareholders by focusing on the needs of its customers, employees, suppliers and the wider community (Neely, 1999).

There has been an increased organisational use of non-financial measures for performance evaluations in the last few years (Hoque, 2004). In measuring performance of an organisation, not only the financial aspect is critical in identifying the effectiveness and efficiency of an organisation in business. Other aspects such as leadership, people commitment, customer satisfaction and the social aspect are considered in making an impact on an organisation. Nudurupati et al. (2007) mention that quality, cycle time and innovation are also recognised as non-financial measures. Added to that, Neely (1999) mentions that customer satisfaction, employee satisfaction, innovation and productivity are measured for consideration in order to understand the performance of an organisation. Aspects such as strategic approaches were important and had been measured and the new generation (current users) is more likely to look at this approach and converge to intangible and link explicit of business performance (Neely et al, 2002; Kulatunga et al., 2007).

Non-financial aspects were introduced in industries because it could not consider other non-financial aspects as mentioned earlier and the failure to relate performance to the process and to distinguish between control versus improvement (Kuong, 2000). Non-financial measures can include information on turnover of employees, market share, customer satisfaction, efficiency and productivity, product quality, employee satisfaction and number of products launched (Hussain et al., 2002; Phang, 2006). Dalrymple and Bryar (2006) identified the ten most important non-financial measures based on a case study by Ernst & Young (1997) as follows:

- i. Strategy execution
- ii. Management credibility
- iii. Quality of strategy
- iv. Innovativeness
- v. Ability to attract talented people
- vi. Market share
- vii. Management experience
- viii. Quality of executive compensation
- ix. Quality of major processes

x. Research leadership

Furthermore, there is a view that non-financial measures are a better predictor of an organisation's long-term performance and that they help managers to monitor and assess their firm's progress towards strategic goals and objectives (Hussain et al., 2002). They have a positive impact on business performance (Bourne et al., 2005) and the leading indicators of business performance such as project development, customer focus and leadership cannot be found in financial data alone as the non-financial acted as the leading indicators for the financial performance (Nudurupati et al., 2007).

Non-financial measures may help managers to recognise changes in the business environment, determine and assess progress towards business objectives and affirm achievement of performance goals (Hoque, 2004). Organisations relying on financial measures alone can identify their past performance but not what contributed to achieve it. The on-going basis of information ('how' that performance was achieved) should also be identified (Kagioglou et al., 2001). Added to that, Anderson and McAdam (2004) state that non-financial measures are timelier than financial measures as the measures are measurable and precise, meaningful to the workforce thus facilitating continuous improvement and they are consistent with organisational goals and strategies. Apart from that, the non-financial measures are flexible and dynamic and therefore are able to change, as market needs change.

Both financial and non-financial aspects are needed and are important in identifying an organisation's performance. The need to adopt a balanced range of financial and non-financial performance measures is now widely accepted. An organisation's performance can only be identified and well managed with an understanding of its level of achievement based on both aspects.

2.5 CONNECTION BETWEEN PERFORMANCE MEASUREMENT AND STRATEGY DEVELOPMENT

As previously defined, performance measurement can be used in formulating strategy of an organisation and it plays an important role to ensure that the organisation's objectives and goals can be achieved (Kulatunga et al., 2007; Yu et al., 2007; Luu et al., 2008). Therefore, there is a connection between performance measurement and strategy development. Performance measurement appears in the phase of strategy formulation and in the implementation and evaluation phases. Lehtinen and Ahola (2010) state that the most widely mentioned motive for performance measurement is that it supports the implementation of strategy. The use of performance measurement is seen to guide and help top management in formulating strategy and clearing it down to the level of individual employees.

There is an argument that performance measures are an integral part of the strategic control loop, without which managers or leaders cannot tell whether they will achieve their objectives or business objectives (Neely et al., 1996). It is widely accepted that strategy intensively involves performance to attain goals (Luu et al., 2008; Elg and Kollberg, 2009). The creation of goals and objectives of an organisation not only relies on what the organisation wants to achieve in the long-term, but also needs to include elements of performance measurement as an additional means for making goals more realistic and achievable in the future. Performance measurement is targeted to improve poor strategy executions (Jusoh and Parnell (2008).

It has to be understood that every strategy developed must be evaluated and assessed critically to ensure that it is suitable to be implemented by the organisation. The balanced scorecard is an example of a strategic management instrument used to clarify and translate vision and strategy, to communicate and link strategic objectives and to measure strategy. It is used to plan, set targets and align strategic initiatives and to enhance strategic feedback and learning (Kueng, 2000). The development of tools for measuring performance of organisations or individuals can be used to identify their ability in achieving their objectives, targets or strategy. The use of the tools and models affects the

implementation of strategies (Neely et al., 1996). It is generally accepted that measures affect managerial behaviour and actions that in turn drive the strategy implementation. This implies that the performance measurement system should evaluate the journey towards achieving the strategic goals (Marr et al., 2003).

Performance measurement is used to improve business performance by looking at the criteria to be measured and evaluated to get the results; this will be a guide for what organisations need to plan and do in the future. Action should be taken based on the results of evaluation. Criteria measured in the evaluation process are constituted by internal and external aspects of the organisation (Hoque, 2004).

Based on the literature, performance measurement is used in developing strategy. At the early phase, performance measurement is involved in identifying what can be achieved and what can be considered to achieve objectives and goals of the organisation in a project or a business as a whole. Internal and external aspects (internal and external resources) of the organisation are identified to make sure that the strategy that will be developed is suitable and relevant to current organisation capacities. The process of strategy evaluation is designed for the purpose of improvement. Plans can be made and the type of action can be identified after gaining evaluation results.

2.6 PERFORMANCE MEASUREMENT TOOLS AND MODELS

The creation and use of performance measurement tools and models started when people began to measure and assess financial performance. Since the 1980s, researchers have developed many performance measurement models (Lin and Shen, 2007; Bassioni et al., 2005) which have coexisted despite their different approaches (Bassioni et al., 2005). A good example is the strategic measurement analysis and reporting technique system of Cross and Lynch in 1988 (Lin and Shen, 2007). The tools of the early 1990s included activity based cost, activity based management, free cash flow analysis and shareholder value analysis (Wegelius-Lehtonen, 2001; Marr and Schiuma, 2003; Neely et al., 2003). At the beginning, most performance measurement tools and models overlooked key non-financial performance indicators (Wegelius-Lehtonen, 2001). Subsequently, many

researchers tried to supplement the traditional financial measures with non-financial ones. The mix of these two types of measures created more comprehensive measurement tools, models or frameworks such as the BSC and the Performance Prism (Neely et al., 2003) as well as the business excellence model (Marr and Schiuma, 2003).

Different researchers use different words to refer to the performance measurement instruments. Kaplan and Norton (2002) use the word 'method', some others use the words 'model', 'tool', 'approach' and 'framework'. The *Cambridge Advanced Learner's Dictionary of English (2008)* describes 'method' as a particular way of doing something, 'model' as something on which a copy can be based because it is an extremely good example of its type. 'Tool' is something that helps in a particular activity, 'approach' is a way of considering something and 'framework' can be understood as a system of rules, ideas or beliefs used to plan or decide something. A decision on which is the proper word to use depends on the perception of researchers. For the purpose of this research, the word 'tool' is used to refer to a performance measurement instrument or system.

A variety of different tools to measure performance have been created and developed by many researchers to complete the process of measuring. Each is unique, comprehensive and offers a different perspective on performance. These differences have mainly arisen from the different functional backgrounds of the researchers (Verweire and Van Den Berghe, 2004).

Choosing an appropriate tool to incorporate the business objectives of an organisation is actually a critical task and is certainly not easy. Robinson et al. (2005) state that there are several considerations in the implementation of performance measurement tools such as strategic planning, operating process and review. Strategic planning is a crucial part of performance measurement as it is very important for the business objectives to be defined. Tangen (2004; 2005) mentions that successful performance measurement tools are a set of performance measures (metrics used to quantify the efficiency and effectiveness of action) that provide an organisation with useful information that helps to manage, control, plan and perform its activities. The information retrieved from the tools must in turn be accurate, relevant, provided at the right time and easily accessible for the person who needs it. Furthermore, the tools must also be designed to reflect the most

important factors influencing the productivity of the different processes that can be found in the organisation.

In order to compete successfully, organisations must not only have the best assets but also the best people and processes (Barr et al., 2005). Organisations must have staff able to manage and handle the performance measurement process and implement it in a smooth and well-organised way. One of the processes in measuring performance is to build the performance measurement system by identifying individual measures (TRADE, 2005).

Performance measurement tools are increasingly being used to encourage organisations to focus on measuring a wider range of business performance issues relating to processes, people and product (Carrillo et al., 2003). They are used with the intention of measuring organisational actions (Neely et al., 1996). Bourne et al. (2005) state that other factors that can influence the use of a performance measurement system are economic constraints and regulatory regimes. Economic constraints means what the condition of the economy is and regulations are those made by organisations and stakeholders such as clients or customers. Added to that is also how widely the model has been used in the industries. This means the consideration of how popular and established a tool is for use to measure performance of organisation.

2.6.1 Criteria for Consideration in Selecting Appropriate Tools and models for Performance Measurement

Performance must be measured in ways that are easily understood by those whose performance is being evaluated. Furthermore, measures should also provide timely, relevant and accurate feedback and be a part of a closed management loop. Both financial and non-financial performance measures are used as well as the types of results and the short and long-term results are considered (Tangen, 2004; Tangen, 2005). Organisations should also consider other stakeholders besides the investors, such as employees, customers and suppliers when choosing a performance measurement system. However, not all requirements are always compatible with each other, which make compromise unavoidable. An example of this is that performance measures should be designed to be as exact as possible to the need of organisations, which may result in a very complex

formula difficult to understand by certain people in the organisation. On the other hand, performance measures should be easy to make and easy to comprehend, which are arguments for using simple methods and/or formulas (Tangen, 2005).

Apart from that, choosing the appropriate tools by an organisation is dependent on which measures an organisation should adopt and the ones most relevant to the organisation will change over time. The provision and existence of tools are dependent on the impact on an organisation of the tools previously used. For example, the performance prism is created and generated to overcome the shortcomings in the BSC where it deliberately takes a broader view of stakeholders and encourages organisations to address stakeholders (The tool satisfied and controlled stakeholders) (Neely et al., 2003).

Kueng (2000) states that the appropriateness of the performance measurement tools to an organisation depends not only on why the tools need to be used by an organisation but they should support a process-oriented view and organisations need a system which fulfils two requirements as follows:

- The system should be focused on processes, not on whole organisations or organisational units.
- The system should evaluate performance holistically by measuring quantitative and qualitative aspects.

From what has been listed above, the choice of performance measurement tool to measure performance of an organisation needs to consider the capability and effectiveness of the tool to measure the overall organisation, its quantitative as well as qualitative aspects, to gain results as needed.

The British Quality Foundation (BQF) (2000) has identified the criteria to choose a suitable tool or model to measure performance based on the answers to the following questions:

- What is the aim of the process of measurement?

- What is the scope or revised view of the process?
- Where does the activity start and end?
- What controls are to be put in place to manage the process?
- Who will manage and operate the approach or performance measurement activities?
- What are the required skills and experience level to operate the approach?
- What equipment and facilities are required to operate the approach?
- What are the steps of the process?
- What measures will be used to monitor the performance of the process and the approach?

With the questions listed above, the choice of an appropriate tool for measuring performance of an organisation is considered based on the elements of the purpose of doing the measurement. Two important questions need to be answered: how long will it take to go through the process until the organisation obtains the results and who will be responsible for the task. Other considerations include facilities or any equipment to be used, the process and people to be involved in the monitoring phase.

Furthermore, Hall and Davis (2006) point out there are some matters that need to be considered when selecting an appropriate tool for the measurement. These are as follows:

- Consistency of measurement
How efficient is the tool to be used for evaluating the organisation's performance?
- Time factor
Duration of the whole process of measurement.

- Frequency
How often can it be used to obtain results for performance measurement process?

- Cost of data collection
Overall cost of procuring data for measurement purposes.

- Vulnerability to falsification and error.
Possibility on a percentage of getting the results which are logical and relevant to the organisation for improvement purposes.

Cocca and Alberti (2010) state that considerations in choosing good performance measurement tools should be classified into two categories- performance measures and the design of tools as shown in Table 2.2.

Table 2.2: Considerations in Choosing Performance Measurement Tools

Performance Measures Characteristics	Performance Measurement Design Requirements
Derived from strategy	Evaluation of existing performance measurement system (tools)
Link operations to strategic goals	Strategic objectives' identification
Simple to understand and easy to use	Top management support and commitment
Clearly defined and explicit purpose	Key user's or employees' involvement and support
Stimulate continuous improvement or right behaviour	Facilitator
Relevant and easy to maintain	Maintenance structure
Provide fast and accurate feedback	Targets' or benchmarks' setting
Balanced and multidimensional pictures of business	Timescales' setting
Monitoring past performance	Someone responsible for the measure
Planning future performance	Performance monitoring process
All stakeholders considered	Alarm signal or corrective actions
Promote integration	Challenge strategy

Performance Measures Characteristics	Performance Measurement Design Requirements
Defined formula and source of data	Relationships between measure
	Linking performance to compensation process
	Procedures defined
	IT infrastructure support

Based on the table above, Performance Measures Characteristics show criteria from organisations that need to be measured for performance measurement purposes, and the characteristics of criteria to be measured that need to be considered in choosing the appropriate tools. The Performance Measurement Design Requirements show elements of performance measurement that need to be taken into account by organisations in selecting the appropriate tools for performance measurement. Some of the criteria listed are similar to others mentioned previously, such as simple to understand and easy to use and procedures defined in handling the tool for measuring purposes.

Tangen (2005) states that the way to deal with performance measurement requirements systematically is to answer the questions, “What should be measured?” and “How should it be measured?” These two questions should stand separately and they provide different categories of requirements for designing the system:

- System requirements (What should be measured)
 These represent criteria important from an overall system point of view such as support strategy and selection of both financial and non-financial performance.

- Measure requirements (How it should be measured)
 These represent criteria important when designing individual performance measure such as having an appropriate formula and including necessary specifications.

To design such a tool is not easy and what can be considered the optimal tool will also differ from case to case (Tangen, 2005). Otley (1999) mentions that five main issues need to be addressed in developing a tool for managing organisational performance and are

represented as a set of questions. The questions themselves appear to remain constant but organisations need to develop continually new answers to them, because the context in which the organisation is set is constantly changing. New strategies need to be developed to cope with new operating environments. The questions actually relate very closely to some of the issues of modern management. The questions are as follows:

- What are the key objectives central to an organisation's overall future success and how does it go about evaluating its achievement for each of these objectives?
- What strategies and plans has the organisation adopted and what are the processes and activities that will be required for it to implement these successfully? How does it assess and measure the performance of these activities?
- What level of performance does the organisation need to achieve in each of the areas defined in the previous two questions and how does it go about setting appropriate performance targets for them?
- What rewards will the managers and other employees gain by achieving these performance targets? On the other hand, what penalties will have to be accepted by failing to achieve the targets?
- What are the information flows (feedback) necessary to enable the organisation to learn from its experience and to adapt its current behaviour in the light of that experience?

The five main issues that need to be tackled in developing the tool of performance measurement are:

- i. Objectives of organisations and the way to measure each objective.
- ii. Plan or process required for performance measurement.
- iii. Target of the organisation on the objectives and plan mentioned before.

- iv. Rewards for staff at managerial level and other employees if they succeed in achieving targets.
- v. Necessary information on the experience of others in implementing certain tools.

To choose appropriate and suitable tools to measure performance, organisations have to consider many aspects, such as how the tool can measure stakeholders' needs and contributions, required strategies, processes and capabilities. Performance measures are not necessarily comprehensive, but should represent the critical success factors necessary for continuing organisational success or minimal failure (Otley, 1999; Bititci et al., 2005). The tools provide a basis to develop strategy for sustaining long-term business objectives and more construction organisations will adopt such innovative tools to facilitate continuous improvement, as the business benefits become clear (Robinson et al., 2005).

The right selection of performance measurement tools will give benefit to the organisation. It will show the value of projects to the organisation, recovering investment as soon as possible and ensuring the strategic nature of initiatives and projects in a timeframe, resolution and reach that make sense. It brings together the proper elements of finance, strategy and operations to measure performance effectively, provide timely feedback to the right people and enable performance improvement (Barr et al., 2005).

The acid test of a good performance measurement system is therefore, "Do the measures ultimately furnish organisations with the data needed to answer the questions that organisations need to answer in order to manage effectively?" (Neely et al., 2002).

2.6.2 Examples of Existing Performance Measurement Tools and Models

As mentioned in Section 2.6, Chapter 2, there are varieties of tools and models for measuring performance developed and used in industries (Bassioni et al., 2005; Lin and Shen, 2007;). The creation of the tools and models was based on the performance revolution started in the late 1980s. At the beginning, the tools and models were designed and developed to measure lagging indicators or financial aspects. Then, after many

organisations became aware of the importance of measuring leading indicators or non-financial indicators such as customer satisfaction, workers and innovation that reflect the overall performance, the tools and models were expanded for those indicators (Bititci et al., 2001; Nudurupati et al., 2007). Furthermore, Mar and Schiuma (2003) mention that the recognition of non-financial and intangible assets has led to the development of various frameworks which address this evermore important area.

Wongrassamee et al. (2003) mention that the revolution in performance measurement that had happened since the late 1980s brought to the development of varieties of tools and models that can be grouped into two categories: those emphasising self-assessment and those designed to help managers measure and improve business processes. Ritchie and Dale (2000) state that self-assessment is a comprehensive, systematic and regular view of an organisation's activities and results against a model of business excellence. Its process allows the organisation to discern clearly its strengths and areas in which improvements can be made and culminates in planned improvement actions which are monitored for progress. Self-assessment implies the use of a model on which to base the evaluation and diagnostics. Some examples of self-assessment as mentioned above are the European Foundation for Quality Management (EFQM) Excellence Model (widely used in Europe) and the Malcolm Baldrige National Quality Award (MBNQA) in the USA (Ritchie and Dale, 2000; Lee and Quazi, 2001; Wongrassamee et al., 2003; Williams et al., 2006). Some examples for the second category are Capability Maturity Matrices, The Performance Pyramid, The Effective Progress and Performance Measurement (EP²M) and The Balanced Scorecard (BSC) (Wongrassamee et al., 2003).

Apart from that, according to Toni and Tonchia (2001), the main tools and models of performance measurement can be referred to five typologies as stated below:

- Tools and models that are strictly hierarchical (or strictly vertical), characterised by cost and non-cost performance on different levels of aggregation, until they ultimately become economic financial. The first hierarchical model was that of gold, which connects productivity and ROI.
- Models that are balanced scorecard, where several separate performance measures, which correspond to diverse perspectives (financial, internal business processes,

customer, and learning and growth) are considered independently.

- Models that can be called “frustrum”, where there is a synthesis of low-level measures into more aggregated indicators, but without the scope of translating non-cost performance into financial performance. The close model to this apex is the performance pyramid.
- Models which distinguish between internal and external performances.
- Models that are related to the value chain. These models, in respect to the preceding ones, also consider the internal relationship of customer or supplier such as Sink and Tuttle model.

Explanations on each category that have been stated in this section as well as some examples of each category are as follows:

- **The EFQM Excellence Model**

The EFQM Excellence Model is a national quality award to recognise deserving organisations which have excelled in quality management practices (Hellsten and Klefsjo, 2000; Lee and Quazi, 2001). It has been developed by EFQM based on the practical experiences of organisations across Europe. Since its launching in 1991 (Yang et al., 2001; Bryde, 2003), thousands of European organisations have used the excellence model as a framework for assessment of their performance (Lee and Quazi, 2001; Yang et al., 2001).

The EFQM Excellence Model has mainly been used as part of total quality management (TQM) activities (Hellsten and Klefsjo, 2000; Yu et al., 2007). TQM is a management approach of an organisation, centred on quality, based on the participation of all its members and aims at long-run success through customer satisfaction and benefits to all members of the organisation and to society (Hellsten and Klefsjo, 2000). The EFQM Excellence Model can be used within self-assessment with the aim of improving organisational performance (Hellsten and Klefsjo, 2000; Lee and Quazi, 2001; Yang et al., 2001; Williams et al., 2006). The

Excellence Model is based on the concept that customer satisfaction, people (employee) satisfaction and impact on society are achieved through leadership driving policy and strategy, people management, resources and processes, leading ultimately to excellence in business results (Lee and Quazi, 2001). It encapsulates comprehensive and holistic management models and provides a mechanism for quantifying an organisation's current state of TQM development by means of a point score (Williams et al., 2006).

- **The Malcolm Baldrige National Quality Award (MBNQA)**

The MBNQA is a National quality award used in the United States of America (USA) (Lee and Quazi, 2001; Saunders et al., 2008). It was developed and used by the pre-1997 (Lee and Quazi, 2001) to stimulate western organisations to improve their quality so that they could compete better with the high levels of quality being attained by their Japanese competitors at that time. The Japanese developed the Deming Award to spur quality improvement (Williams et al., 2006). It is based on similar principles and methodologies of the EFQM Excellence Model (Williams et al., 2006), which has been used in self-assessment, a technique supporting many different core values (Hellsten and Klefsjo, 2000; Yang et al., 2001) and a tool of TQM (Williams et al., 2006). Hellsten and Klefsjo (2000) state that the most comprehensive list of actions needed to get to world-class quality is in the MBNQA. It consists of seven criteria: leadership, strategic planning, customer and market focus, information and analysis, human resource focus, process management and business results (Lee and Quazi, 2001).

- **The Performance Pyramid**

It is a tool that ties together the hierarchical view of business performance measurement with the business process view. It is useful for describing how objectives are communicated down to the troops and how measures can be rolled up at various levels in the organisation (Anderson and McAdam, 2004). Tangen (2004) also agreed that the purpose of it is to link an organisation's strategy with its operations by translating objectives from the top down (based on customer priorities) and measures from the bottom up. The performance pyramid is useful for monitoring performance at the corporate, the strategic business unit (SBU) and

the department and work centre levels of the organisation (Anderson and McAdam, 2004). The performance pyramid is its attempt to integrate corporate objectives with operational performance indicators (Tangen, 2004). It makes clear the difference between measures that are of interest to internal parties, customer satisfaction, quality and delivery and measures that are primarily of interest within the business's products, cycle time and waste. However, the performance pyramid does not provide any mechanism to identify key performance indicators, nor does it explicitly integrate the concept of continuous improvement (Tangen, 2004).

- **Sink and Tuttle Model**

This is a classical approach to a performance measurement system, which claims that the performance of an organisation is a complex interrelationship between seven performance criteria as follows (Tangen, 2004):

- i. Effectiveness, which involves “doing the right things, at the same time, with the right quality”. In practice, effectiveness is expressed as a ratio of actual output to expected output.
- ii. Efficiency, which means, “doing things right” and it is defined as a ratio of resources expected to be consumed to resources actually consumed.
- iii. Quality and it is measured at six checkpoints (to make it tangible).
- iv. Productivity, which is defined as the traditional ratio of output to input.
- v. Quality of work life, which is an essential contribution to a system which performs well.
- vi. Innovation, which is a key element in sustaining and improving performance.
- vii. Profitability or budgetability, which represents the ultimate goal for any organisation.

Furthermore, Tangen (2004) states that although much have changed in industry since the model was first introduced, the seven performance criteria are still important. However, like other models, it has several major limitations. For

example, it does not consider the need for flexibility, which has increased markedly during the last few decades and it is also limited by the fact that it does not consider the customer perspective (Tangen, 2004).

In addition, Nudurupati et al. (2007) state that some of the tools and models used to measure both financial and non-financial measures are the balanced scorecard, integrated performance measurement system (IPMS), quantitative models for performance measurement systems (QMPMS) as well as the performance prism. The tools and models mentioned for measuring performance are as follows:

- **Balanced Scorecard (BSC)**

It is constructed to complement measures of past performance with measures of the drivers of future performance (Nudurupati et al., 2007). The BSC includes financial performance measures giving the results of actions already taken and also complements the financial performance measures with more operational non-financial performance measures, which are considered as drivers of future financial performance (Tangen, 2004; Jusoh and Parnell, 2008). The objectives and measures of the scorecard are derived from an organisation's vision and strategy (Nudurupati et al., 2007). It translates an organisation's vision and strategy into a comprehensive set of performance measures that provides the framework for a strategic measurement and management system (Jusoh and Parnell, 2008).

The BSC allows managers to look at a business from four important perspectives, which are financial perspective, internal business perspective, innovation and learning perspective as well as customer perspective (Kagioglou et al., 2001; Kaplan and Norton, 2002; Anderson and McAdam, 2004; Tangen, 2004). It is a tool for focusing the organisation, improving communication, setting organisational objectives and providing feedback on strategy (Anderson and Mc Adam, 2004). Neely et al. (2000) clarify that although the BSC is a valuable framework and it suggests important areas in which performance measures might be useful, it provides little guidance on how the appropriate measures can be identified, introduced and ultimately used to manage business. They conclude that it does not consider the competitor perspective at all.

- **Integrated Performance Measurement System (IPMS)**

The IPMS project researched the structure and relationships within performance measurement systems and developed a reference model as well as an audit method for IPMS. The structure of this reference model is based on the viable business structure, which has emerged from the viable systems theory and the CIM-OSA business process architecture (Bititci et al., 2000). An audit method is proposed to assess the integrity and deployment of performance measurement system. The IPMS that had been proposed in 1997 argues that the performance management process is a closed loop by which the organisation manages its performance in line with its corporate and functional strategies and objectives (Taticchi and Balachandran, 2008).

It is known as a reference model to classify the structure of business at four levels: the business, business units, business processes and activities. At each level, the model puts more emphasis on developing the objectives based on stakeholder requirements and external monitoring (of that level), which are very important in volatile business environments. Performance measures are deployed from these objectives (Nudurupati et al. (2007).

- **The Quantitative Model for Performance Measurement System (QMPMS)**

Bititci et al. (2000) state that the QMPMS was born directly out of the IPMS project. The QMPMS uses an analytical hierarchy process to quantify effects of factors on performance (Bititci et al., 2000; Suwignjo et al., 2000; Nudurupati et al., 2007). It involves three main steps: identification of factors affecting performance and their relationships, structuring the factors hierarchically and quantifying the effect of the factors on performance (Suwignjo et al., 2000; Bititci et al., 2001). This model uses cognitive maps, cause and effect diagrams, tree diagrams and the analytical hierarchy process (Suwignjo et al, 2000; Bititci et al., 2001; Nudurupati et al., 2007).

In general, the QMPMS classifies the relationships between factors which affect performance into direct (vertical) effect, indirect (horizontal) effect and self-

interaction effect (Suwignjo et al., 2000; Bititci et al., 2001). Step or stage one of the QMPMS uses the cognitive mapping technique to identify factors, which affect performance and their relationship with one another. In step two, the cognitive maps are converted into a more formalised structure. Initially, cause and effect diagrams are used as a discussion tool to structure the factors, which affect performance hierarchically. Structure diagrams are then used to formalise the hierarchical nature of the performance measurement system. Final step, which is step three, the analytical hierarchy process is used to quantify the relationship of each factor with the others with respect to overall performance (Bititci et al., 2001). An important benefit gained from the QMPMS is that the interaction of the factors can be clearly identified and expressed in quantitative terms. This identification will bring organisations one step forward in understanding the dynamic behaviour of factors affecting performance. Another benefit is that the QMPMS facilitates the reduction of the number of performance measurement reports (Suwignjo et al., 2000; Bititci et al., 2001).

- **Performance Prism**

The Performance Prism is a thinking aid (Neely et al., 2002) and known as a multi-faceted framework (Anderson and McAdam, 2004). It is a comprehensive measurement framework that addresses the key business issues to which a wide variety of organisations, profit and not-for-profit, will be able to relate (Neely et al., 2001). The performance prism was developed to overcome the shortcomings in the balanced scorecard approach. It purposefully takes a broader view of stakeholders (Neely et al., 2001; Nudurupati et al., 2007; Taticchi and Balachandran, 2008) and encourages organisations to address the following questions. Who are our key stakeholders and what do they want and need? What strategies do we have to put in place to satisfy these needs? What processes do we need to have in place to execute our strategy? Which capabilities do we need to perform our processes? What do we expect from our stakeholders in return? (Neely et al., 2002; Neely et al., 2003; Anderson and McAdam, 2004).

It consists of five-faceted performance framework. Top and bottom facets are stakeholder satisfaction and stakeholder contribution respectively. The other three

facets are strategies, processes and capabilities (Neely et al., 2002; Neely et al., 2003; Tangen, 2004; Nudurupati et al., 2007; Taticchi and Balachandran, 2008). The performance prism has a much more comprehensive view of different stakeholders (such as investors, customers, employees and suppliers) than other models (Tangen, 2004). It includes a new dimension in identifying the stakeholders' contribution, required in order to maintain and develop these capabilities (Neely et al., 2003; Nudurupati et al., 2007).

The performance prism enables a balanced picture of the business to be provided, significantly highlighting external and internal measures as well as enabling financial and non-financial measures, and measures of efficiency and effectiveness (Anderson and McAdam, 2004). It considers new stakeholders (such as employees, suppliers and alliance partners) who are usually neglected when forming performance measures (Tangen, 2004). Although it is certainly valuable it has constraints. It suggests some areas in which measure of performance might be useful but provides little guidance on how the appropriate measures can be identified, introduced and ultimately used to manage business (Anderson and McAdam, 2004; Tangen, 2004).

Apart from what have been stated in the previous page, Bryde (2003) states that Project Management Performance Assessment (PMPA) model was used to measure performance measurement practices.

- **Project Management Performance Assessment (PMPA) Model**

Conforms to European Foundation for Quality Management Business Excellence Model (EFQM Excellence Model), which provides a tried and tested framework, an accepted basis for evaluation and a means to facilitate comparisons both internally and externally. Project management (PM) activities are grouped into six broad areas: PM leadership, PM staff, PM policy and strategy, PM partnerships and resources, project life cycle management process and PM key performance indicators. The first five enablers reflect activities which need to be undertaken to deliver high levels of PM performance. The final area in the PMPA is PM key performance indicators, which focuses on practises by which actual achievement is

measured (Bryde, 2003).

Furthermore, an addition has been made to the five PMPA enablers bringing it to six enablers. Din et al (2010) explain that the additional enabler was based on their research on the relationship between ISO 9000 and elements of performance in construction project environments. The sixth enabler is financial management practices incorporated as an enabling activity leading to enhanced PM performance and is adapted to suit the construction environment. The amended model is labelled Project Management Performance Assessment for Construction (PMPAC).

The choice of the appropriate tools for measuring organisation performances is dependent on the understanding and the capability of the organisations that use the tools. Together with that, more advanced organisations should choose their own relevant dimensions and weightings rather than use any standard one-size-fits-all tool with more attention being paid to the process by which their own business models and strategy are developed (Williams et al., 2006). Furthermore, all tools developed have the same purpose and intention that is, to help organisations identify areas in their organisations that need improvement for better future in business.

2.7 PERFORMANCE MEASUREMENT IN CONSTRUCTION

In construction, performance measurement is being used and implemented by most large construction organisations. Its implementation can help to improve their business performance (Khalfan, 2001; Nudurupati et al., 2007), which includes business processes, products and management of people for the purpose of facilitating continuous improvement (Robinson et al., 2005; Sullivan et al., 2008).

There is a growing awareness among organisations in the construction industry that measurement systems are important for monitoring and controlling their performance (Ankrah and Proverbs, 2005). Lin and Shen (2007) agree on the same idea. They state that performance measurement is developing in the construction industry. There are three reasons. First, the continuous rapid development of performance measurement in other

sectors during the 1990s created a massive interest in its development for the construction industry. The second reason is the increasing complexity of construction projects requiring appropriate measurement tools and models to improve performance and the third is the development and challenges of construction project management as well as building technology in recent years (Lin and Shen, 2007). Cain (2004) states that one of the six goals of Construction Best Practice is that the improvement and achievement of an organisation can be done and established through measurement. This shows that measuring performance is important and is recognised as one of the important criteria for Construction Best Practice.

The United Kingdom (UK) Government initiated the Egan Report in 1998, which recommended an improvement of the construction industry's business performance. It is an additional way for organisations to increase profits and be sustainable in the long-term. Since then, many organisations in the UK construction industry are now aware of performance measurement and its importance to organisations (Khalfan et al., 2001; Robinson et al., 2005; Lin and Shen, 2007).

The industry in Malaysia is championed by the Construction Industry Development Board (CIDB). It is a government agency established to promote and stimulate the development, improvement and expansion of the construction industry. CIDB represents the construction industry in dealing with the government and the public. Construction organisations in Malaysia are required to register with the CIDB and are classified into seven grades (G1 to G7) according to their financial status, technical capabilities and track record (Chan, 2009). The CIDB had published a 10-year master plan that was implemented in 2006. The plan will last through to 2015 with the objective of refocusing the strategic position and charting the future direction of the industry. The main consideration for the strategic plan was the fact that the industry had recorded an average annual growth of only 0.7% during the period between 2000 and 2007 compared to an average annual gross domestic product growth of 5.5% over the same period. There were concerns that the construction industry, being a main pillar of industrialisation and a major contributor to economic growth, was not performing at its best. Thus, the construction industry might not be able to meet the dual challenges of open markets and greater global competition. The master plan was therefore initiated to establish an

innovative, sustainable, professional, profitable and world-class construction industry. The aim would be achieved through the identification of eight critical success factors that were imperative to the success of the mission and the promotion of seven strategic thrusts (Chan, 2009). In order to compete in global markets and face challenges in the markets, performance measurement is used. The performance measurement is used to ascertain whether organisations have achieved their targets and plans according to what have been stated in the master plan. With performance measurement, organisations can identify their current situations in business, both financial and not-financial aspects (Hoque, 2004). Performance measurement aids organisations to take action to attain improvements based on the results from performance measurement carried out within the organisations (Sousa and Aspinwall, 2010). The eight critical success factors of the master plan are contained in Table 2.3 and the seven strategic thrusts are shown in Table 2.4.

Table 2.3: Eight Critical Success Factors Essential To Achieve The Mission of The Master Plan (Chan, 2009).

Eight Critical Success Factors (CSF)	Description
CSF 1 Productivity	Continuously improve throughout the value chain from project inception to facility management.
CSF 2 Quality	Emphasise quality in the use of manpower, materials, equipment and methods adopted.
CSF 3 Human Resources	Create a competent workforce through skill upgrading and knowledge enhancement.
CSF 4 Knowledge	Share best practices to upgrade the level of knowledge of the construction community.
CSF 5 Innovation	Carry out continuous research and development (R & D) to introduce new and creative methods, materials, tools and equipment.
CSF 6 Environment-friendly Practices	Engage sustainable practices to minimise its impacts on the environment.
CSF 7 Industry Sustainability	Generate new opportunities both in the domestic and overseas markets.
CSF 8 Professionalism	Enhance professionalism to improve the image of the industry.

Table 2.4: Seven Strategic Thrusts That Form The Basis of The Strategic Master Plan (Chan, 2009).

Seven Strategic Thrusts (ST)	
ST1	Integrate the value chain of the construction industry to enhance efficiency and increase productivity.
ST2	Strengthen the construction industry image.
ST3	Strive for the highest standard of quality, occupational safety and health and environmental practices.
ST4	Develop human resource capabilities and capacities in the construction industry.
ST5	Innovate through R & D and adopt new construction methods.
ST6	Leverage on ICT in the construction industry.
ST7	Benefit from globalisation and increase the export of construction products and services.

When discussing performance measurement, one has to realise that there are two kinds of measures: those used during development projects and those used to monitor day-to-day activities (Wegelius-Lehtonen, 2001). Traditionally, performance measurement in construction was approached in two ways: in relation to the product as a facility and in relation to the creation of the product as a process. When assessing the success or failure of construction projects, a common approach is to evaluate performance on the extent to which client objectives like cost, time and quality were achieved (Kagioglou et al., 2001; Chan and Chan, 2004; Ali and Rahmat, 2010). Cost means monetary cost, time means project duration and quality means project performance (Chan and Chan, 2004). Indeed, those are the three indicators of measuring project performance used in the UK construction industry as well as in Malaysia (Kagioglou et al., 2001; Ali and Rahmat, 2010). Apart from those three, other measures such as health and safety, functionality and satisfaction are attracting increasing attention (Chan and Chan, 2004; Ali and Rahmat, 2010). Added to that are high performing teams, learning, cultural issues and team integration, as all these are more along the lines of input factors (Butcher and Sheehan, 2010).

The level of success in carrying out construction project development activities will depend heavily on the quality of the managerial, financial, technical and organisation performance of the respective parties, while taking into consideration the associated risk management, the business environment and economic and political stability (Takim and Akintoye, 2002), all of which can be gained from performance measurement. Bassioni et al. (2005) and Kagioglou et al. (2001) found that performance measurement in construction has predominantly focused on project management as construction's main product involves development of a project. Wegelius-Lehtonen (2001) also mentions that the construction industry is a project-oriented industry.

As in other industries and disciplines, organisations in the construction industry measure financial and non-financial aspects. The common aspects of measurement are cost measurement, safety schedule, customer satisfaction and productivity (Sullivan et al., 2008). Similar to other industries, financial aspects are the most important criterion compared to others. The importance of 'profitability' is higher than customer satisfaction (Yu et al., 2007). Aras and Crowther (2010) state that profitability is defined as an adequate return for the level of risk undertaken or it can be considered to be a reward for entrepreneurship. Profitability, return on investment (ROI) and utilisation are examples of financial aspects in measuring performance of an organisation (Beatham et al., 2004).

Menches and Hanna (2006) state that several factors are mostly used in measuring performance of organisations. These are profitable project, customer satisfaction, good work relationships, safe worksite, schedule performance, budget performance, functionality, contractor satisfaction and project manager or team satisfaction. The changing environment and realisation of how important it is to understand non-financial aspects such as customer satisfaction, employee satisfaction and safety and health matters brought into consideration the measuring non-financial aspects.

Most performance measurement systems in the construction industry such as Key Performance Indicators (KPIs) and Construction Industry Institute (CII) Benchmarking and Metrics (BM & M) have concentrated on the performance measurement of the current level of a project. For example, the Construction Industry Institute (CII) benchmarking does not completely describe an organisation-level performance

measurement systems (Yu et al., 2007). KPIs are the UK construction industry's response to Egan's Report to measure project performances, based on ten identified parameters. These consist of seven project performance indicators and only three organisation performance indicators. The seven project performance indicators are construction cost, time, cost predictability (design and construction), time predictability (design and construction), defects, client satisfaction with the product and service. The three organisation performance indicators are safety, profitability and productivity (Takim et al., 2003).

Varieties of tools have been implemented since performance measurement was introduced into the industry in the late-1990s (Yu et al., 2007). The benchmarking method and the CII (BM & M) were developed then for performance purposes (Lin and Shen, 2007; Yu et al., 2007). These performance measures consist of cost, schedule, safety, change and rework. Some tools of performance measurement have been adopted and adapted for use in the construction industry. These models have been used in manufacturing industry and are known by players in other industries as established and good examples of performance measurement tools.

Apart from that, there are the balanced scorecard (BSC) and The EFQM Excellence Model (Beatham, 2003; Bassioni et al., 2005). The BSC is a widely accepted tool for measuring performance (Bassioni et al., 2005; Nudurupati et al., 2007) and the EFQM Excellence Model is a well-established performance measurement framework (Bassioni et al., 2005). Kagioglou et al. (2001) developed a framework to measure performance on the basis of the BSC and added project and supplier perspectives. Westerveld developed the project excellence model, adapted from the EFQM excellence model (Lin and Shen, 2007). In terms of using the proper tool to measure performance of organisations, factors considered are such as what the organisation can gain based on the results of using the tool, ease and suitability for use to measure criteria in organisations, as well as the requirements and suggestions from the client.

Many different tools have been developed to fulfil organisation needs and these have been claimed to overcome weaknesses in measuring performance. However, this did not stop researchers from developing new tools and models of performance measurement.

Factors such as environment, technology and innovation, design, quality, cost and time will influence researchers to develop and create new models (Sullivan et al., 2008).

For long-term success, both construction organisations and the industry depend on improving performance by continually acquiring and applying new knowledge (El-Masheleh et al., 2007). The complexity of managing projects and the fast growth in technologies will create ways to improve business and keep organisations on the right track to achieve goals.

In this research, the most well known and used tools, the BSC as well as the EFQM Excellence Model are explored. Most researchers, like what have been mentioned earlier in Chapter 2, carried out studies on redeveloping performance measurement system and tools for effective use in performance measurement activities. Therefore, this research will undertake investigations from other perspectives of performance measurement; it will guide and direct the users (people in organisations who are involved in formulating, implementing as well as evaluating activities in organisations for getting results on performance of organisations).

2.8 SUMMARY

This chapter has provided an overview of performance measurement definitions in a wider context. Performance measurement, as mentioned in the early part of the chapter, is being used by organisations as a process to determine how successful organisations have been in attaining their objectives and strategies (Kagioglou et al., 2001) and for quantifying the efficiency and effectiveness of past actions (Neely et al., 2005). The review also shows the importance of performance measurement to organisations and the benefits gained from implementing it as part of organisation management. Performance measurement is used to help organisations achieve their targets and goals and it is also important in formulating their strategy.

Apart from that, performance aspects were discussed in details in this chapter. Measuring performance of organisations or individuals involves financial and non-financial aspects.

This chapter also explored what the connection is between performance measurement and strategy development, how these two are connected and what the actual performance measurement function is in strategy development processes.

The later part of the chapter explained performance measurement tools and models. The needs of the tools or models and the criteria to be considered in choosing and using the appropriate tools or models have been discussed. Choosing the right tools or models to measure performance activities or processes involves an understanding of the tools and models needed. They must be easy to use, easy to understand and suitable for the main purpose of measuring performance. The most important thing is that they can give the results needed by the organisation. In addition, examples of performance measurement tools are given.

The final part of this chapter is an overview of performance measurement in construction. The main purposes of implementing performance measurement in the industry as well as the associated activities were discussed. Detailed discussion of the BSC and the EFQM Excellence Model are contained in the next chapter.

CHAPTER 3

THE BALANCED SCORECARD (BSC) AND EUROPEAN FOUNDATION FOR QUALITY MANAGEMENT (EFQM) EXCELLENCE MODEL – IN USE

3.1 INTRODUCTION

The Balanced Scorecard (BSC) and the European Foundation for Quality Management (EFQM) Excellence Model are tools that use measures of an organisation's performance to drive organisational improvement, generally by highlighting current shortfalls in performance to management teams. Both have been widely adopted in recent years (Shulver and Lawrie, 2007). These two tools of performance measurement are known as more comprehensive tools and have received wide publicity (Wongrassamee et al., 2003).

These two performance measurement tools, the BSC and the EFQM Excellence Model, are discussed in detail in this chapter as they are used for developing the research framework. The BSC is applied as a key aspect in developing the framework and the EFQM Excellence Model is used in shaping the improvement elements in the framework.

Furthermore, this chapter shows characteristics of the BSC and the EFQM Excellence Model that have been used by a variety of organisations to measure performance. All information shown in this chapter are based on books, journals and conference papers, as well as internet sources.

This chapter reviews the basic concepts of both tools including the origin of each tool, their purpose and their relevance in an organisation. The processes by which the BSC and EFQM Excellence Model work are discussed, together with their strengths and weaknesses and a comparison between the two. The two tools will be explained in turn, first the BSC and then the EFQM Excellence Model. To end this chapter, migration path and maturity model techniques in research are discussed. These two techniques are used to provide tools to assist organisations in implementing performance measurement.

3.2 BALANCED SCORECARD (BSC)

The BSC was devised to improve performance measurement, as sole financial aspects are not suitable to be measured in contemporary organisations and today's business (Kaplan and Norton, 2002). Therefore, the BSC has been proposed as a solution to a number of the most widely discussed managerial problems such as dysfunctional financial measures in organisations and the need to measure non-financial aspects to improve performance (Kaplan and Norton, 2001). BSC is a very commonly known synonym for a tool for measuring performance in industries (Neely et al., 2000).

3.2.1 Balanced Scorecard (BSC) Overview

The idea of the BSC came from the results of a multi-company research study called "Measuring Performance in the Organisation of the Future", in the year 1990. The study was sponsored by major USA corporations and was initiated as a reaction to the growing dissatisfaction with the traditional financial measures as the only ones for measuring corporate performance. It identified the need for improved management control systems based on an understanding of actual performance against important strategic goals (Wongrassamee et al., 2003; Shulver and Lawrie, 2007). The BSC was called upon as a system to deal with the problems identified. It was proposed as a mechanism to improve the strategy development process as well as to act as a communication tool. It is thus a tool for measuring performance of an organisation (Mustine, 2007).

3.2.2 Construction of Balanced Scorecard

The BSC is probably the most well-known method for performance measurement (Neely et al., 2000; Tangen, 2004) and is widely recognised among the performance measurement tools of today (Neely et al., 2000). Bassioni et al. (2004) mentioned that the BSC has been described as one of the most influential business ideas and has been cited in Harvard Business Review as one of the most important management tools of the last 75 years (Bourne et al., 2002, 2005; Bassioni et al., 2004). The BSC was suggested by

the Hackett Group as becoming a widely used performance measurement tool in the USA (Bourne et al., 2003).

The BSC was devised and invented by Professor Robert Kaplan from Harvard Business School and David Norton, a President of Renaissance Solutions, in 1992 (Kagioglou et al., 2001; Kaplan and Norton, 2001). The BSC was created because financial performances had become insufficient for contemporary organisations (Kaplan and Norton, 2002). Thus, the BSC was invented as a performance measurement tool for financial and non-financial measures that reflect a balance between lagging and leading indicators of performance and between outcome measures and measures that drive performance. The lagging indicators are financial indicators; the leading indicators are customer perspectives, internal business process, learning and growth (Kagioglou et al., 2001).

Research by Kaplan and Norton (1990) revealed that evaluating by focusing on the financial measures (the traditional performance measures) is based only on the financial aspects and matters such as control, linking operational performance to strategic objectives and communicating the objectives to achieve organisation's aim and target are not clearly measured. Realising at that time that no single measure can provide a clear performance target or focus attention on all the critical areas of business, Kaplan and Norton proposed the BSC for meeting these shortcomings (Pienaar and Penzhorn, 2000; Kaplan and Norton, 2002).

The idea of inventing the BSC is for it to be a strategic management system that enables organisations to translate strategic goals into relevant measures of performance (Kaplan and Norton, 2001; Bititci et al., 2005). It is a system for describing and managing strategy (Kaplan and Norton, 2002; Debusk and Crabtree, 2006; Wu and Liu, 2010). Kueng (2000) describes the BSC as a strategic management instrument used to clarify and translate vision and strategy, to communicate and link strategic objectives and measures, to plan, set targets and align strategic initiatives as well as to enhance strategic feedback and learning. It is a tool that has been developed to help organisations manage the strategy implementation process. To make it succeed and work well, the BCS needs sponsorship and commitment of the entire management team. This is a tool that needs

commitment and cooperation of managerial levels and functional levels working as a team (Kagioglou et al., 2001).

3.2.3 Balanced Scorecard – How it Works

The Kaplan and Norton BSC viewed the organisation as having four categories of perspectives (Kagioglou et al., 2001; Kaplan and Norton, 2002; Anderson and McAdam, 2004; Bassioni et al., 2004; Dalrymple and Bryar, 2006; Debusk and Crabtree, 2006; Goncalves, 2009; Wu and Liu, 2010). These perspectives are related to financial, customer, internal business processes, and learning and growth, which help management to gain an in-depth and comprehensive understanding of the organisation’s overall performance (Wu and Liu, 2010). Details of all the perspectives are shown in Table 3.1:

Table 3.1: Four Perspectives of Balanced Scorecard (BSC) (Debusk and Crabtree, 2006)

No.	Perspective	Description	Measures
1	Financial (How do we look to our shareholders?)	Strategy for growth, profitability and risk viewed from perspective of shareholder.	For example: Operating income, return on investment (ROI), economic value added and operating cash flow.
2	Customer (How do our customers see us?)	Strategy for creating value and differentiation from perspective of customer.	For example: Customer satisfaction, sales’ growth and market share.
3	Internal business (What must we excel at?)	Strategic priorities for various business processes that create customer and shareholder satisfaction.	Measures of operating efficiency and effectiveness. For example: Labour productivity, machine utilisation, process-cycle time, quality and on-time delivery.
4	Learning and growth (How can we continue to improve?)	Strategy for continuous improvement and creating value.	Often measured in terms of employee skill levels, training hours and employee turnover.

These four perspectives of the BSC are shown in Figure 3.1.

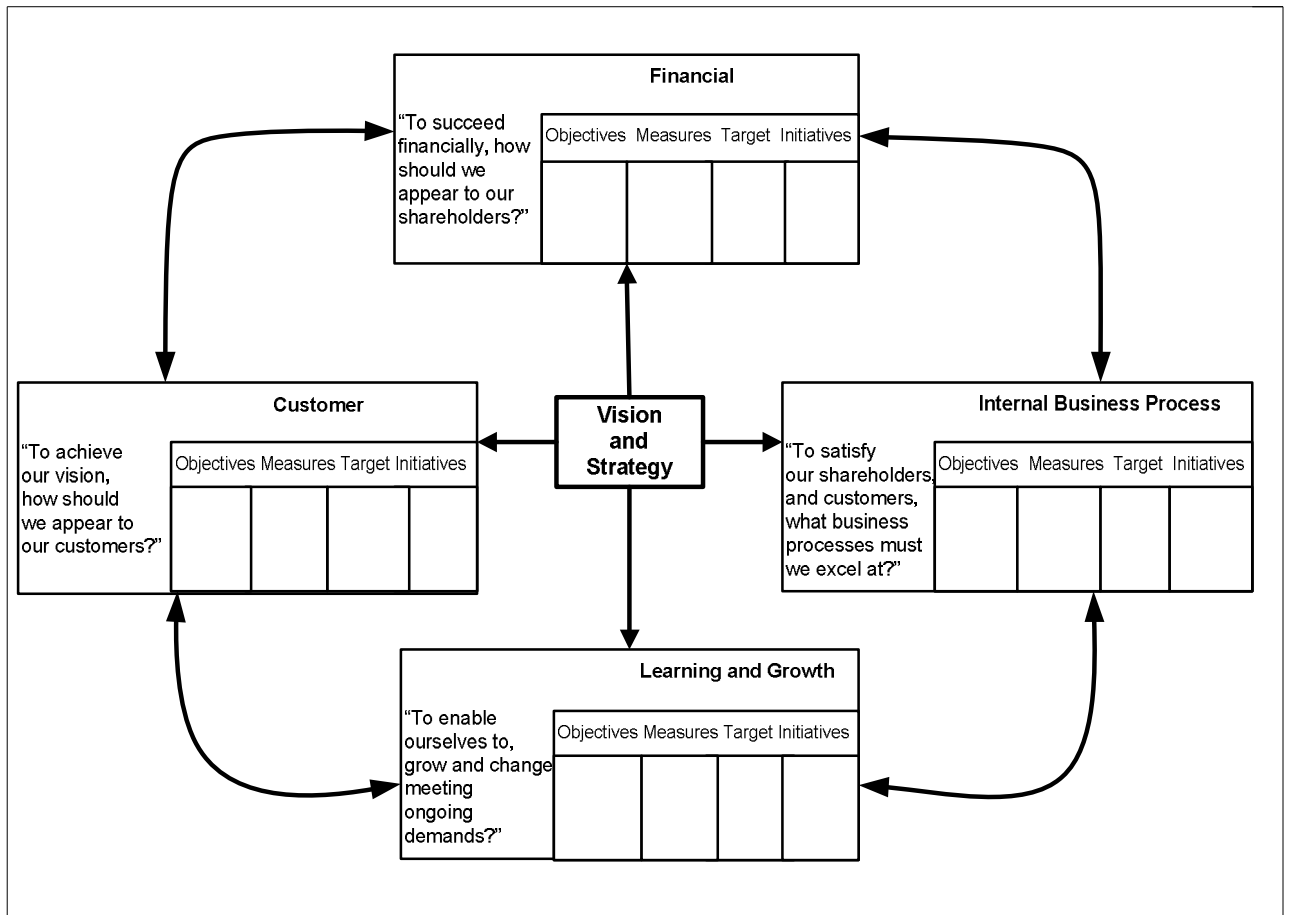


Figure 3.1: Balanced Scorecard Model (Niven, 2002)

By measuring the four perspectives of financial, customer, internal business process and learning and growth, the BSC complements traditional financial indicators, as all the four indicators of BSC are linked to the organisation’s strategic vision. All these perspectives aid the connection of long-term goals with short-term activities, the translation of these into visions and the achievement of strategic objectives. The BSC therefore coincides with this study’s goal, which is the assessment of an organisation’s total performance (Pienaar and Penzhorn, 2000: Wu and Liu, 2010).

To make the BSC work and be effective, the entire organisation must understand the strategies for their unit, division or department and the overall organisation (Kaplan and Norton, 2002). A good BSC reflects the strategic plan of the organisation, provides a framework that helps shape work behaviour, allows each person to measure his or her

individual performance and gives data to make changes immediately so that performance is enhanced (Pienaar and Penzhorn, 2000).

Debusk and Crabtree (2006) state that to implement the BSC in an effort to boost the performance of their organisation and employees, those designing their scorecards must:

- Identify the best strategy for the organisation (usually a specific business unit).
- Select specific business unit objectives to complement the strategy.
- Select twenty to twenty-five performance measures to track the business unit's progress in achieving those strategic objectives.
- Establish targets or goals for the performance measures, such as ROI is 15%, sales growth is 8% and market share is 35%.
- Communicate these targets to managers and employees.
- Encourage managers and employees to meet these goals by offering incentives.
- Communicate the BSC to all levels of the business unit by developing departmental and employee scorecards that complement the measures in the business unit scorecard.

To make the BSC succeed, it needs cooperation and commitment right from the Chief Executive Officer (CEO) down to the functional level of staff. The BSC is a top-down approach, which starts with the destination and then charts the routes that will lead there. Corporate executives must first review their mission statement and their core values. With that information, managers can develop a strategic vision of what the organisation wants to become in the future business. This vision would point to a clearer picture of the organisation's overall goal. An example is to become a profit leader in an industry. The strategy must then define the logic of how to arrive at that destination (Kaplan and Norton, 2000; Hubbard, 2006). It is an integrated, causal and linked system of measures

that helps an organisation achieve its business goals, which is a key to aligning organisational behaviour with stakeholder-expected outcomes (Hubbard, 2006).

3.2.4 Balanced Scorecard – Use, Strengths and Weaknesses

A variety of organisations and industries from manufacturing, construction to non-profit organisations have used the BSC to improve their performance (Debusk and Crabtree, 2006). It is also used by government bodies (Mustine, 2007). Since the introduction of the BSC, organisations using it have been able to implement new strategies rapidly and effectively as well as improve their performance. It is a tool that has changed performance practices (Kaplan, 2001). Organisations regularly using the BSC have understood that it improved their performance in operating. Apart from that, the use of the BSC increases profits of the organisations (Debusk and Crabtree, 2006).

The BSC is known as one of the performance measurement tools because it promotes equilibrium between short and long-term objectives, financial and non-financial measures, indicators of tendency and occurrences and between internal and external perspectives of performance (Goncalves, 2009). It is a measuring tool that includes all aspects in ensuring achievement of organisational success.

The BSC is also known as an integrated system. It is claimed as such because it is a fundamental tool in considering the relationship between cause and effect. An example is the relationship between the organisation's different areas; their objectives are all linked. When discussing quality, relationships are one of the important points. Relationships are not only important in linking up with the organisation's other areas but also in discussing quality of environments, inserted into the quality area (Goncalves, 2009).

Furthermore, the BSC is a tool for describing an organisation's overall performance across a number of measures on a regular basis. An important characteristic of the BSC is its focus on corporation or organisation units such as strategic business units and not on business processes. It looks at business processes only as far as they have a great impact on customer satisfaction and achieve an organisation's financial objectives (Kueng, 2000). The BSC can be seen as a management system that bridges the gap between

strategic objectives set at the senior level within an organisation and their operational execution (Pienaar and Penzhorn, 2000). In addition, the BSC also (Kagioglou et al., 2001):

- Guards against sub-optimisation by forcing senior managers to consider all the important operational issues.
- Communicates objectives and vision to the organisation.
- If implemented properly, focuses the organisation's efforts on a relatively small number of measures with relatively low costs.

Based on the points stated, BSC ensures that senior managers consider all the important issues related to operational functioning. Apart from that, it acts as a mover in the organisation in achieving its objectives and vision. A proper implementation of the BSC focuses the organisation's efforts on a relatively small number of measures with relatively low costs.

The BSC is widely accepted as it includes all measures, financial and non-financial measures elements and it has entered the management vernacular (Neely, 1999). Kagioglou et al. (2001) and Anderson and McAdam (2004) state that the BSC includes a range of leading and lagging indicators: financial measures are lagging (Kagioglou et al., 2001; Debusk and Crabtree, 2006) and the other three are leading (customers' perspective, internal business processes and learning and growth). The purpose is to evaluate whether a business is moving forward in its strategic goals. The leading indicators deal with issues that will eventually affect the financial performance but significantly provide the information before the issues have had time to have any effect (Kagioglou et al., 2001).

Even though the BSC has received favourable support from industry and academics, it has been criticised for its simplicity and for not providing a complete performance measurement system. (Kagioglou et al., 2001; Bassioni et al., 2004). Kagioglou et al. (2001) mention that there are a number of potential mistakes which can occur when implementing the BSC. For example:

- There will be the possibility of measuring the wrong things even if they are measured in the right way.
- Assuming that some of the criteria are un-measurable or the people undertaking those activities are pretending to be too 'smart' to measure (rather than measuring all necessary activity).
- Yielding to conflict between managers with functional levels or lines.

As BSC takes into consideration all elements to be measured, the possibilities of measuring the wrong things are higher. Criteria needing to be measured are based on the managerial level's intention to measure. The criteria will be passed to the functional level to measure. The confusion on what needs to be achieved and probably unclear purpose of measuring it can create misconceptions by functional level employees. Indistinctness in giving commands and instructions to employees will be misleading on what needs to be measured, and then on presenting results that the organisation really wants to see. This leads to breakdowns in communication and such breakdowns and difficulty in translating the strategy into action are common reasons for failure. It is often difficult for employees to know what to do to improve performance as measures and targets are often chosen by management and conveyed to the employees. Getting employees involved in picking measures and setting targets can help them to be more committed to reaching goals (Debusk and Crabtree, 2006). Anderson and McAdam (2004) mention that the lacknesses of the balanced scorecard is that it shows a lack of consideration to the measurement of human resources, employee satisfaction, supplier performance, product or service quality and environmental or community perspective. Failure of the scorecard to consider these dimensions, limits its comprehensiveness.

Bassioni et al. (2004) state that the majority of the BSC implementation initiatives in firms fail and the four perspectives of the BSC have been considered insufficient. Hubbard (2006) agrees on the failure of BSC and mentions that the BSC does not incorporate employee, supplier or community performance in organisation performance. Additional general perspectives have been identified such as competition and employee

(Bassioni et al., 2004). Added to that, a BSC should have a total of fourteen to sixteen performance measures, with no more than four to six in each of the four quadrants. These measures should be integrated and linked through cause and effect. However, most organisations have not reached this level of sophistication. They have not developed causal links between the factors nor have they found a systematic and consistent way of incorporating either new or less tangible organisational performance measures, such as those associated with environmental responsibility or community relationships (Hubbard, 2006).

Schneiderman (1999) states that the BSC can fail in six aspects, as follows:

- Independent variables (non-financial aspects) of the BSC are incorrectly identified as the primary drivers of future stakeholder satisfaction.
- Metrics are poorly defined.
- Improvement goals are negotiated rather than based on stakeholder requirements, fundamental process limits and improvement process capabilities.
- There is no deployment system that breaks high level goals down to the sub-process level where actual improvement activities reside.
- A state of the art improvement system is not used.
- There is not and can not be a quantitative linkage between non-financial and expected financial results.

To look at the strengths and weaknesses of the BSC, Table 3.2 shows its strengths and Table 3.3 its weaknesses.

Table 3.2: Strengths of Balanced Scorecard (BSC)

No.	Source	Strengths
1	Kaplan (2001)	Overcome lacks in the financial aspects, which fail to show changes in organisations in other aspects such as skills, motivation, employees' capabilities, customer satisfaction and information technology.
2	Pienaar and Penzhorn (2000), Kaplan and Norton (2002)	Effective tool for managing strategy.
3	Kaplan and Norton (2002)	Provides simple, clear message about organisational strategy that all employees can understand and internalise in everyday operations.
4	Wongrassamee et al. (2003)	More flexible for application in specific area or function of organisation.
5	Bassioni et al. (2004), Debusk and Crabtree (2006)	Provides managers with better performance measurement system (linked to organisation's strategy and does not suffer from problems of relying solely on financial measures).
6	Debusk and Crabtree (2006)	Useful tool equally applicable to not-for-profit organisations, state-owned organisations, government departments and even internal functions within commercial organisations.
7	Pienaar and Penzhorn (2000)	Can be implemented in many ways. One prerequisite, it must be adapted or changed to fit specific organisations.
8	Goncalves (2009)	Broad ranging (including strategy, customers, financial management, business processes and learning and development).
9	Kagioglou et al. (2001)	Sponsorship and commitment of entire management team.

Table 3.3: Weaknesses of Balanced Scorecard (BSC)

No.	Source	Weaknesses
1	Schneiderman (1999)	Tenacity and faith may be most important CEO attributes for successful BSC implementation.
2	BSC Institute (2007)	Useful only if applied correctly (potential benefits of BSC depend on what it is to be used for). Practical value of BSC can only be realised if it is successfully designed and implemented (while benefits of BSC are similar in large and small businesses).
3	Kagioglou et. al, 2001	Measuring wrong things even if measured in right way. Assuming some are un-measurable or that people undertaking those activities are too professional to measure (rather than measuring all necessary activities). Yielding to conflict between managers along functional lines.
4	Lawrie and Cobbold (2004).	Generally, BSC information not directly useful for cross-industry comparisons or other benchmarking activities.

3.2.5 Conclusion

The BSC is a widely used performance measurement tool in industries and as mentioned earlier, is a tool to manage the strategy implementation process in organisations. It measures and evaluates performance of organisations in financial as well as non-financial aspects (Kueng, 2000; Kagioglou et al., 2001; Kaplan and Norton, 2002). It is a tool used in the strategy management process. To implement BSC successfully, commitment and cooperation of all staff from top management level to bottom level staff is needed. The four perspectives of the BSC: financial, customer, internal business and learning and growth, must be linked to the organisation’s strategic vision.

3.3 EUROPEAN FOUNDATION FOR QUALITY MANAGEMENT (EFQM) EXCELLENCE MODEL

The EFQM Excellence Model is another wide ranging and popular measurement framework used to measure performance of organisations (Neely et al., 2000). It is the most widely used organisational framework, not only in Europe (Marrewijk et. al., 2004; Quality Scotland, 2007) but extends to global markets.

In Europe, the EFQM Excellence Model is being used by at least thirty thousand organisations in twenty-five countries (Saunders et al., 2008; EFQM, 2009), mainly as part of total quality management activities (Yu et al., 2007). It was developed by The European Foundation for Quality Management (EFQM) based on the practical experiences of organisations across Europe (Pyke et. al., 2001) to improve performance and increase their bottom-line (Quality Scotland, 2007).

3.3.1 European Foundation for Quality Management (EFQM) Excellence Model Overview

EFQM is a non-profit organisation founded in 1988 by fourteen leading European businesses. Its mission is to be a driving force for business excellence in Europe. It had a vision for European organisations to excel globally. The EFQM had the intention to develop a framework for quality improvement similar to the Malcolm Baldrige Model in the USA and the Deming Prize in Japan. Both of these awards had demonstrably improved service and manufacturing quality in organisations that used them (Marrewijk et al., 2004). The EFQM framework, then called a 'Model,' and other related evaluation formats appeared to them to be a breakthrough in management as well as quality improvement. Since it has been developed by EFQM and is based on the practical experiences of organisations across Europe, the model has been applied successfully among thousands of organisations, mostly all over Europe in both the private and public sectors since the launch of the model in 1991 (Pyke et al., 2001; Yang et al., 2001; Marrewijk et al., 2004).

As a model of national quality award, it promotes quality awareness, recognises quality achievements of organisations and provides a platform for sharing successful quality management initiatives. It includes criteria that seek to assess an organisation’s quality related performance. These criteria require organisations to show evidence of innovative approaches, widespread deployment of these approaches and a continuous improvement philosophy. These requirements are prerequisites for organisations to reinforce and improve quality in work processes, products and services. Recognising that organisations can pursue different paths on their quality journey, the criteria, however, do not look for specific practices but instead rely on a non-prescriptive perspective during assessment (Lee and Quazi, 2001).

The EFQM Excellence Model can be used for a diverse set of purposes, as shown in Figure 3.2. According to Quality Scotland (2007), 80% of organisations have used it for self-assessment of organisation performance, 66% for strategy formulation and 45% for visioning of the organisation’s future in business. Then, 37% confirmed their use of the model for project management and for supplier management and 15% for mergers and related activities.

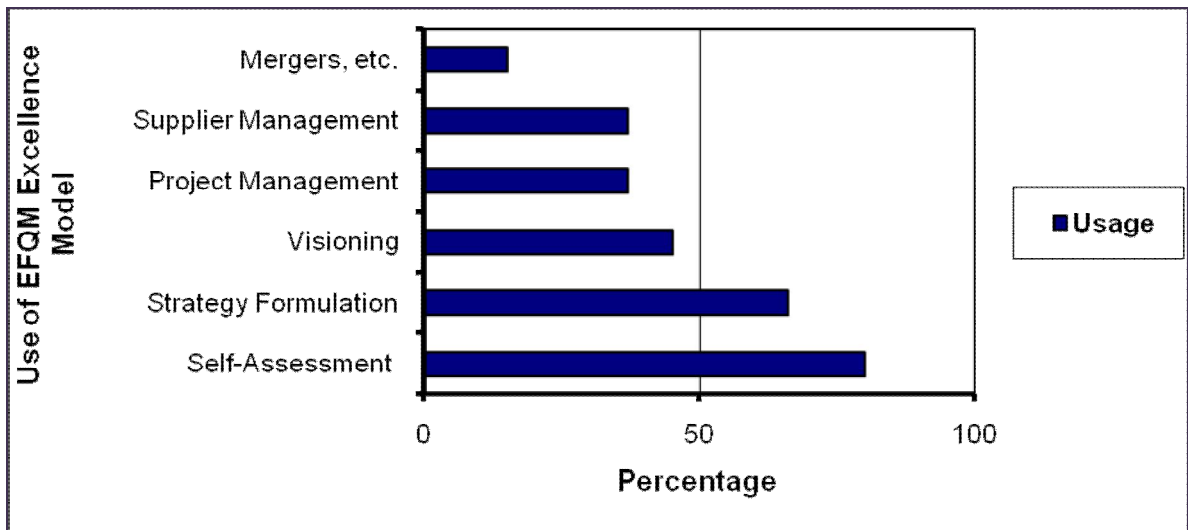


Figure 3.2: EFQM Excellence Model Usage (Quality Scotland, 2007)

3.3.2 European Foundation for Quality Management (EFQM) Excellence Model – How It Works

The EFQM Excellence Model has been created with the aim of being a reference model supporting the European Quality Award (Hellsten and Klefsjo, 2000; Wongrassamee et al., 2003; Yu et al., 2007). The basic of the model is the principle of Total Quality Management (TQM). Top managements of organisations have applied the model, which consists of the nine criteria of the Excellence Model to carry out self-assessment, which enables them to fully understand their organisational position and then use this benchmark data to pursue continuous improvement (Kanji, 2002; Wongrassamee et al., 2003).

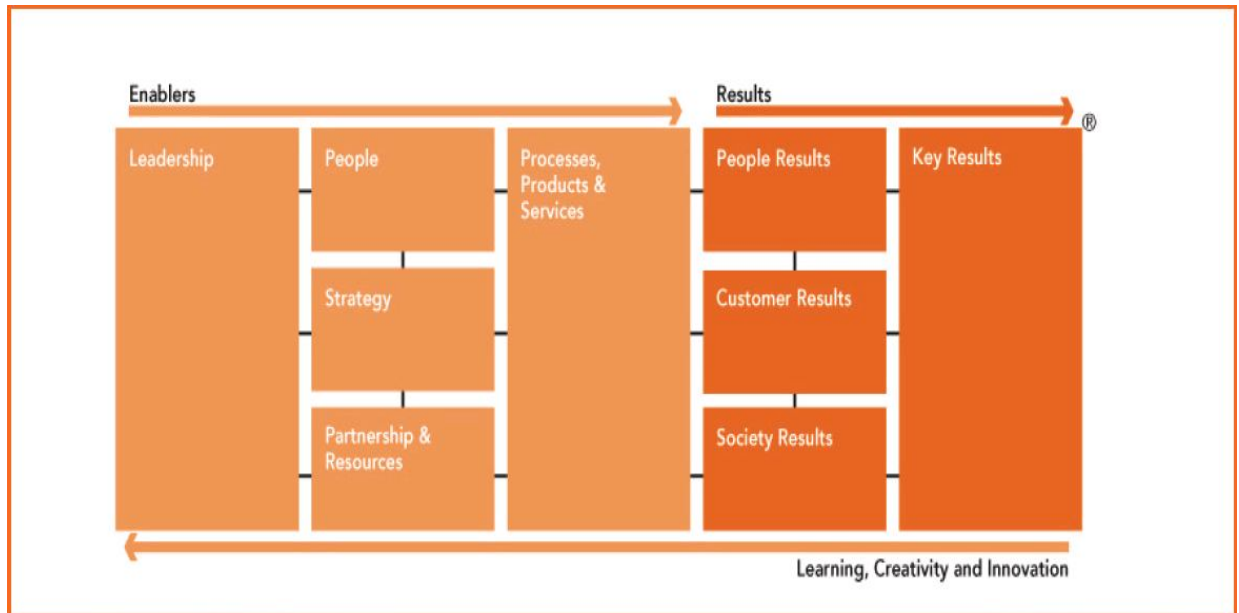


Figure 3.3: EFQM Excellence Model (EFQM, 2009)

The EFQM Excellence Model is shown in Figure 3.3 above. As mentioned before, the EFQM Excellence model is structured around nine basic criteria, which can be divided into ‘enablers’ and ‘results’. Five criteria are enablers and the other four are results (Pyke et al., 2001; Castilla, 2002; Marrewijk et al., 2004; EFQM, 2009). The enablers are leadership, strategy, people, partnerships and resources and processes, products and services. The results are people results, customer results, society results and key results

(EFQM, 2009). The Excellence Model not only provides nine weighted criteria but also gives more details of weighted sub-criteria for each criterion (Wongrassamee et al., 2003). For five criteria under ‘enablers’, number of sub-criteria for each criterion is around four to five. For ‘results’, each criterion has two sub-criterion. Details of all the nine criteria and their sub-criteria are shown in Table 3.4. The enablers’ criteria cover what an organisation does (how the organisation is run and operated) while the results concentrate on what is seen to be achieved by all those who have an interest in the organisation and how achievement is measured and targeted (Pyke et. al, 2001; Wongrassamee et al, 2003; Marrewijk et. al, 2004; EFQM, 2009). Results are generated by enablers and feedback from results helps to improve enablers (Marrewijk et al., 2004). The relationships between the enablers and the results criteria give strength to the model (Pyke et al., 2001).

The model is based on the premise that excellent results with respect to key results, customers, people and society are achieved through leadership driving strategy, delivered through people, partnerships and resources and processes, products and services. Those criteria allow evaluation of the positioning of an organisation in what refers to excellence (Lee and Quazi, 2001; Shulver and Lawrie, 2007). Each criterion is defined globally and then structured in a variable number of sub-criteria. Each criterion has two to five sub-criteria. The model has 32 sub-criteria detailing the scope and application of the model (Pyke et al., 2001; Shulver and Lawrie, 2007; EFQM, 2009). Each sub-criterion includes a number of guiding areas, which are neither prescriptive nor exclusive. It is necessary to point out that many of those areas are handled in parallel by several sub-criteria. The reason for this is the objective of analysing a reality (the organisation) from different points of view or reference perspectives, which, as a whole, compose the global reality of the organisation (Castilla, 2002).

The model flows from left to right. The arrows shown in the model, moving from the left, can be used to explain how the model works and how the different criteria are linked. It emphasises the dynamic nature of the model. They show innovation and learning help to improve enablers that in turn lead to improving results. The nine boxes in the model represent the criteria against which to assess an organisation’s progress towards excellence (Castilla, 2002; Marrewijk et al., 2004). The process also requires continuous

improvement through innovation and the learning process. The cycle is continuously repeated (Beatham, 2003). Like the BSC, the EFQM Excellence Model needs involvement of all the employees of the organisation in continuous improvement of their processes. Cooperation and commitment of all staff at all levels of the organisation are required for it to achieve better results in implementing improvement (Pyke et al., 2001).

Table 3.4: Nine Criteria of EFQM Excellence Model (EFQM, 2009)

Criterion	Sub-criteria
<p>1. Leadership How leaders shape future and make it happen, acting as role model for its values and ethics and inspiring trust at all times. They are flexible, enabling organisation to anticipate and react in a timely manner to ensure ongoing success of organisation.</p>	<ul style="list-style-type: none"> a. Leaders develop mission, vision and values and ethics and act as role models. b. Leaders define, monitor, review and drive improvement of organisation’s management system and performance. c. Leaders engage with external stakeholders. d. Leaders reinforce culture of excellence with organisation’s people. e. Leaders ensure organisation is flexible and manages change effectively.
<p>2. Strategy How organisation implements mission and vision by developing stakeholder-focused strategy. Policies, plans, objectives and processes developed and deployed to deliver strategy.</p>	<ul style="list-style-type: none"> a. Strategy based on understanding needs and expectations of stakeholders and external environment. b. Strategy based on understanding internal performance and capabilities. c. Strategy and supporting policies developed, reviewed and updated. d. Strategy and supporting policies communicated, implemented and monitored.

Criterion	Sub-criteria
<p>3. People How organisation managers develop capabilities of their people and promote fairness and equality. They care for, communicate, reward and recognise, in a way that motivates people, builds commitment and enables them to use skills and knowledge for benefit of organisation.</p>	<ul style="list-style-type: none"> a. People plan supports organisation’s strategy. b. People’s knowledge and capabilities developed. c. People aligned, involved and empowered. d. People communicate effectively throughout organisation. e. People rewarded, recognised and cared for.
<p>4. Partnerships and Resources How organisation plans and manages external partnerships, suppliers and internal resources in order to support strategy and policies and effective operation of processes. Organisation ensures effective management of environmental and society impact.</p>	<ul style="list-style-type: none"> a. Partners and suppliers managed for sustainable benefit. b. Finances managed to secure sustained success. c. Buildings, equipment, materials and natural resources managed in sustainable way. d. Technology managed to support delivery of strategy. e. Information and knowledge managed to support effective decision making and to build organisation’s capability.
<p>5. Processes, Products and Services How organisation designs, manages and improves processes, products and services to generate increasing value for customers and other stakeholders.</p>	<ul style="list-style-type: none"> a. Processes designed and managed to optimise stakeholder value. b. Products and services developed to create optimum value for customers. c. Products and services effectively promoted and marketed. d. Products and services produced, delivered and managed. e. Customer relationships managed and enhanced.

Criterion	Sub-criteria
<p>6. Customer Results What organisation is achieving in relation to its external customers.</p>	<p>a. Perception measures: overall images, products and services, sales and after-sales support, loyalty and engagement.</p> <p>b. Performance indicators: overall images, products and services, sales and after-sales support, loyalty and engagement.</p>
<p>7. People Results What organisation is achieving in relation to its people.</p>	<p>a. Perception measures: satisfaction, involvement and engagement, pride and fulfilment, leadership and management, target setting, competency and performance management, training and career development, effective communications and working conditions.</p> <p>b. Performance indicators: involvement and engagement, target setting, competency and performance management, training and career development and internal communications.</p>
<p>8. Society Results What organisation is achieving in relation to local, national and international society as appropriate.</p>	<p>a. Perception measures: environmental impact, image and reputation, society impact, workplace impact, award and media coverage.</p> <p>b. Performance indicators: environmental performance, regulatory and governance compliance, society performance, health and safety performance, responsible sourcing and procurement performance.</p>
<p>9. Key Results What organisation is achieving in relation to its planned performance.</p>	<p>a. Key performance outcomes: financial outcomes, performance against budget, volume of key products or services delivered and key process outcome.</p> <p>b. Key performance indicators: financial performance indicators, project costs, key performance indicators, partner and supplier performance, technology, information and knowledge.</p>

3.3.3 European Foundation for Quality Management (EFQM) Excellence Model – Use, Strengths and Weaknesses

The EFQM Excellence Model was introduced in 1991 as the primary framework (labelled as a 'Model' by EFQM and others) for assessing and improving organisations in order that they might achieve a sustainable advantage. It is used widely as a management system and in the associated growth in the key management discipline of organisational self-assessment (Marrewijk et al., 2004; Williams et al., 2006). It is used as the basic reference model for those organisations that aim for excellence, by offering an integral and integrating approach to the most relevant dimensions of the reality of the organisation and allowing establishment of a framework that can be objective, rigorous and structured for its diagnostic application (Castilla, 2002). It is used as a tool for assessment and it delivers a picture of how well the organisation compares to similar or very different kinds of organisation. It is used as a management model and defines aspirations for the organisation's capability and performance (EFQM, 2009).

The model consists of two distinct subsets of performance factors, which are known as 'enablers' and 'results'. The enablers are the levers that management can pull to deliver future results (Neely et al., 2000) and the results criteria cover what an organisation achieves (EFQM, 2009). As mentioned in Section 3.3.2 of this chapter, the enablers consist of five criteria: leadership, strategy, people, partnerships and resources as well as processes, products and services. The results consist of four criteria, which are customer results, people results, society results and key results. One of the major reasons why many organisations consider using it in self-assessment is the hypothesised relationships between the enabler criteria (how results are achieved) and the results criteria (Williams et al., 2006).

The EFQM Excellence Model was created to provide assistance to management on how to change their organisations using the concepts of total quality, which not only helps managers increase the effectiveness of their decision making and leadership capabilities but also enables them to know where to focus their change initiatives for maximum impact on stakeholder satisfaction (Wongrassamee et al., 2003). Hellsten and Klefsjo

(2000) explain that total quality concept is a management approach of an organisation, which is centred on quality, requiring the participation of all organisation members and aiming at long-run success through customer satisfaction and benefits to all members of the organisation and to society.

Beatham (2003) states that the EFQM Excellence Model is a comprehensive model to assess not only what is achieved (the results) and how it is achieved, but also where it can be improved. It contains three elements, which are approach, deployment and assessment, as well as review (Mcdougall et al., 2002). It is being used by businesses to deliver total business improvement (Pyke et al., 2001; Marrewijk et al., 2004) and the holistic approach of the model ensures that all aspects of the business are covered. This total business improvement is being recognised by investors. The EFQM Excellence Model is a practical tool to help organisations achieve this improvement by measuring where they are on the path to excellence, helping them understand the gaps and then stimulating solutions (Beatham, 2003; BQF, 2008).

Furthermore, the EFQM Excellence Model is a non-prescriptive model for understanding the connections between what an organisation does and the results it is capable of achieving. It is used to structure a logical and systematic review of any organisation and permitting comparisons to be made with high performing organisations. It is also used to define what capabilities and resources are necessary in order to deliver the organisation's strategic objectives (Lee and Quazi, 2001; Beatham, 2003; EFQM, 2009).

As a model used to help define and assess continuous improvement of an organisation, it is based on eight fundamental concepts of excellence (Castilla, 2002; Beatham, 2003; Marrewijk et al., 2004; Shulver and Lawrie, 2007) as follows (EFQM, 2009):

- Achieving balanced results
- Adding value for customers
- Leading with vision, inspiration and integrity
- Managing by processes

- Succeeding through people
- Nurturing creativity and innovation
- Building partnerships
- Taking responsibility for a sustainable future

In achieving balanced results, excellent organisations meet their mission and progress towards their vision through planning and achieving a balanced set of results that meet both the short and long-term needs of their stakeholders and, where relevant, exceed them. It means that the needs of stakeholders are met and balanced. Stakeholders may include employees, customers, suppliers, shareholders and society. Excellent organisations know that their customers are the key for them to be more creative and innovative. There is a clear understanding of the needs of both current and potential customers and a passion for meeting needs and exceeding expectations. Excellent organisations have leaders as a role model who can shape the future and make it happen. Leaders have a clear sense of direction and purpose which they communicate effectively throughout the organisation. For an excellent organisation, all activities are managed in a systematic and effective way, taking into account all stakeholders' perceptions.

Apart from that, excellent organisations value their people and create a culture of trust and empowerment that allows all employees to develop and contribute to their full potential. Knowledge is shared to maximise performance, with learning, innovation and improvement encouraged. In terms of building partnerships, there are mutually beneficial relationships with all partners. Excellent organisations have to embed within their culture an ethical mindset, clear values and the highest standards for organisational behaviour, all of which enable them to strive for economic, social and ecological sustainability.

Considering the importance of the EFQM Excellence Model, it can be understood that it is a performance measurement model used to identify the performance of an organisation and what needs to be improved in it to increase profits and achieve success in business.

Organisations can identify and understand the good and the bad about their own business and then justify what is important for them to achieve success and excellence. Organisations will create solutions for unnecessary barriers for an organisation to be excellent.

Even though the Excellence Model is popular in industry for performance measurement activities, its use is also in operation and application. The terms used in the model are so open and can be interpreted in so many ways, that any single organisation could decide to capture any one of several dozen different measures of performance under each of the headings (Neely et al., 2000).

Apart from that, the self-assessment process needs to be applied rigorously in order to be effective. EFQM (2009) recommends a graduated approach starting with use of simple questionnaires to workshops as the organisation becomes more familiar with the approach. The use of external assessors is often in connection with an actual or simulated European Quality Award application process. Relative complexity of the criteria statement scoring system and the need for comparability between implementations (to allow benchmarking) requires the process to be conducted by suitable trained and experienced personnel (assessors). This encourages the use of a self-assessment process run by 'project teams' rather than managers themselves and legitimises the use of external consultants (Shulver and Lawrie, 2007).

For the purpose of illustrating the strengths and weaknesses of the EFQM Excellence Model, Table 3.5 shows the strengths of the EFQM Excellence Model and Table 3.6 its weaknesses. All the details mentioned earlier in this section (Section 3.3.3) can be seen in the Tables as well.

Table 3.5: Strengths of EFQM Excellence Model

No.	Source	Strengths
1	Wongrassamee et al. (2003)	Used as an award assessment framework and usually applied to an organisation as one large framework but more prescriptive (based on all key objectives and TQM principles).
2	Beatham (2003), Shulver and Lawrie (2007)	Helps define and assess continuous improvement of organisation.
3	Beatham (2003)	Used by organisations to deliver total business improvement. Holistic approach of model ensures all aspects of business are covered. Can be used to define aspirations for organisation's capability and performance. This total business improvement is being recognised by investors.
4	BQF (2008)	Self-assessment has wide applicability to organisations, large and small, in public as well as private sectors. Increasingly, organisations are using outputs from self-assessment as part of business planning process and use model as basis for operational and project review.
5	Marrewijk et al. (2004), Quality Scotland (2007)	Non-prescriptive framework allows for enough flexibility to be adapted to any type of organisation, size and sector.
6	Marrewijk et al. (2004).	Model recognises eight fundamental concepts and nine criteria for achieving sustainable excellence in all aspects of performance.
7	EFQM (2009)	Provision of 'best practice' checklists for use within Business Planning and Review activities. Identifies areas of poor/low performance against prior years and competitors. Broad ranging (leadership, people, employees, customer and society and organisation's resources, partnership development and policy and strategy).

No.	Source	Strengths
8	Pyke et al. (2001)	Sponsorship and commitment of entire management team involving all employees of organisation in continuous improvement of their processes. Relationships between enabler and results criteria give strength to model.

Table 3.6: Weaknesses of EFQM Excellence Model

No.	Source	Weaknesses
1	Shulver and Lawrie (2007)	Self-assessment process needs to be applied rigorously in order to be effective.
2	D & D (2008)	Self-assessment does not improve organisation by itself - subsequent improvement activity needed to do that. Therefore, there must be follow-up to get benefit. Does not tell you how to do everything because it is not 'prescriptive'.

3.3.4 Conclusion

The EFQM Excellence Model is another widely used performance measurement model in industries. It is a non-prescriptive framework for understanding the connections between what an organisation does and the results the organisation is capable of achieving (EFQM, 2009). It is self-assessment done by an organisation and is known as a continuous improvement model that guides organisations to be excellent by focusing on nine criteria.

With the advantages and useful purposes of both tools and models in industries, the BSC and the EFQM Excellence Model are appropriate to be implemented in varieties of businesses of organisations. The criteria and elements of both tools and models cover financial and non-financial aspects for measuring performance of organisations. There is necessity to assist organisations to really understand the concepts and elements of both the BSC and the EFQM Excellence Model before the implementation. This is to ensure

adequate preparation so that the organisations are capable of carrying out activities in measuring performance to achieve better positions in business from their current positions. It is necessary to assist those organisations in step-by-step manner in implementing performance measurement which covers all aspects of management such as leadership, strategy, people, partnerships and resources as well as processes, products and services of organisations. Therefore, for the purpose of aiding and assisting the implementation of activities, several techniques known as migration path and maturity models are introduced. The migration path and maturity model techniques are discussed in the following section.

3.4 MIGRATION PATH AND MATURITY MODEL TECHNIQUE IN RESEARCH

The Oxford Dictionaries Online (2011) defined migration as:

‘Movement from one part of something to another’.

The same resource (Oxford Dictionaries Online, 2011) defined path as:

‘A course of action or way of achieving something’ and it can be defined as well as ‘the course or direction in which a person or thing is moving’.

Based on the above definitions, it can be understood that migration path is a movement from one part to another for achieving something more and better from its current position. Kamara et al. (2002a; 2005) agree with the definition, which they state that migration path is how the user should proceed from the current situation to the desired position. In construction, CLEVER is an example of migration path framework that is developed for selecting a knowledge management (KM) strategy that is appropriate to the organisational and cultural context of an organisation (Kamara et al., 2002a). It is a project funded by the Engineering and Physical Sciences Research Council (EPSRC), accelerated by Gatsby Innovation Fellowship, DTI and Loughborough University (Kamara et al., 2002a; Innovation Express, 2004).

Furthermore, based on Araujo and Martins (2009), maturity is “a very advanced or

developed form or state”. Lockamy III and McCormack (2004) state that maturity model means progress towards goal achievement that comes in stages. Paulk et al. (2003) define maturity model as a structured collection of elements that describes certain aspects of maturity in an organisation. It may provide a place to start, the benefit of a community’s prior experiences, a common language and a shared vision, a framework for prioritising actions and a way to define what improvement means for an organisation. Becker et al. (2009) explain that a maturity model consists of a sequence of maturity levels for a class of objects. It represents an anticipated, desired or typical evolution path of these objects shaped as discrete stages. Typically, these objects are organisations or processes. The bottom stage stands for an initial state that for instance, can be characterised by an organisation having little capabilities in the domain under consideration. In contrast, the highest stage represents a conception of total maturity. Advancing on the evolution path between the two extremes involves a continuous progression regarding the organisation’s capabilities or process performance. The maturity model serves as the scale for the appraisal of the position on the evolution path. It provides criteria and characteristics that need to be fulfilled to reach a particular maturity level. During a maturity appraisal, a snapshot of the organisation regarding the given criteria is made. The characteristics found are evaluated to identify the appropriate organisation and individual maturity level. In IT management, maturity models have proved to be an important instrument because they allow for a better positioning of the organisation and help find better solutions for change. Over a hundred maturity models have been developed to support IT management (Becker et al., 2009). Some examples are SW – CMM (Wettstein and Kueng, 2002), BPO Maturity Model (Lockamy III and McCormack, 2004) and Capability Maturity Model Integration (CMMI) (Niazi et al., 2005).

Both, migration path and maturity model are used with the same intention in research to point out the current position to the desired position with the intention of giving benefits to the subject matters (it could be an organisation, a group of people or community). These techniques have been used in different areas of research and examples of the techniques are given below.

3.4.1 Examples of Migration Path and Maturity Model Techniques

In different area of information systems, the maturity model has been used in developing the Nolan Model and Capability Maturity Model (CMM) as these are the classical maturity model. The Nolan Model describes four distinct stages. These are as the following: Initiation, Expansion, Formalisation and Maturity (Wettstein and Kueng, 2002). Figure 3.4 shows the stages.

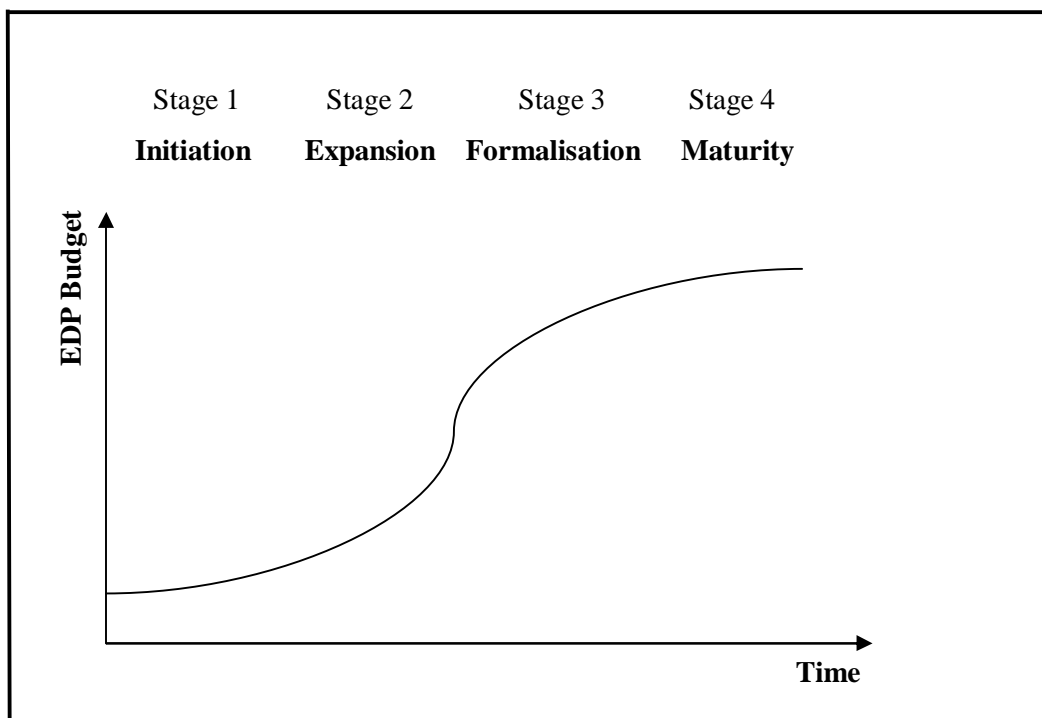


Figure 3.4: Four Stages of Growth (Wettstein and Kueng, 2002).

The Nolan Model is based on organisations' spending for electronic data processing (EDP). Based on Wettstein and Kueng (2002), the model is the recent discovery that the EDP budget for a number of organisations, when plotted over time from initial investment to mature operation, forms an S-shaped curve. The turnings of this curve correspond to the main events- often crisis – in the life of the EDP function that signal important shifts in the way the computer resource is used and managed. There are three such turnings and consequently, four stages. The model is based on three underlying types of growth, which are the first, a growth in computer applications (from simple

payroll applications to complex management system, second, a growth in the specialisation of EDP personnel and the third, a growth in formal management techniques and organisation (from lax management practices to resource-oriented planning and control. Later, the model has been transformed into six-stage model by adding two new stages. The stages Integration and Data Administration were put in between Formalisation and Maturity (Wettstein and Kueng, 2002).

Another classical maturity model is called Capability Maturity Model (CMM). It is known as the earliest complete maturity model, released in August 1991 and well known in the industry (Harter et al., 2000). It is a good example of a maturity model developed for software as a tool to improve software development processes (Paulk et al., 1993; Bamberger, 1997; Harter et al., 2000). The model was developed by Watts Humphrey and his team at the Software Engineering Institute (SEI) (Paulk et al., 1993; Wettstein and Kueng, 2002). The SEI applied the concept of process maturity to the software development process in the form of CMM. The concept of process maturity proposes that a process has a lifecycle that is assessed by the extent to which the process is explicitly defined, managed, measured and controlled (Lockamy III and McCormack, 2004). CMM provides a general approach for assessing the ability of an organisation to manage its business processes (Meng et al., 2011). The SEI has introduced maturity models for different purposes, for example, People Capability Maturity Model, Software Acquisition Capability Maturity Model, Systems Engineering Capability Maturity Model and Integrated Product Development Capability Model.

The classical CMM, now known as Capability Maturity Model for Software (SW-CMM) is a model for judging the maturity of the software processes of an organisation. It is used for identifying the key practices that are required to increase the maturity of the underlying process. It is organised into five maturity levels: Initial, Repeatable, Defined, Managed and Optimising (Paulk et al., 1993; Wettstein and Kueng, 2002). The five levels are shown in the Figure 3.5.

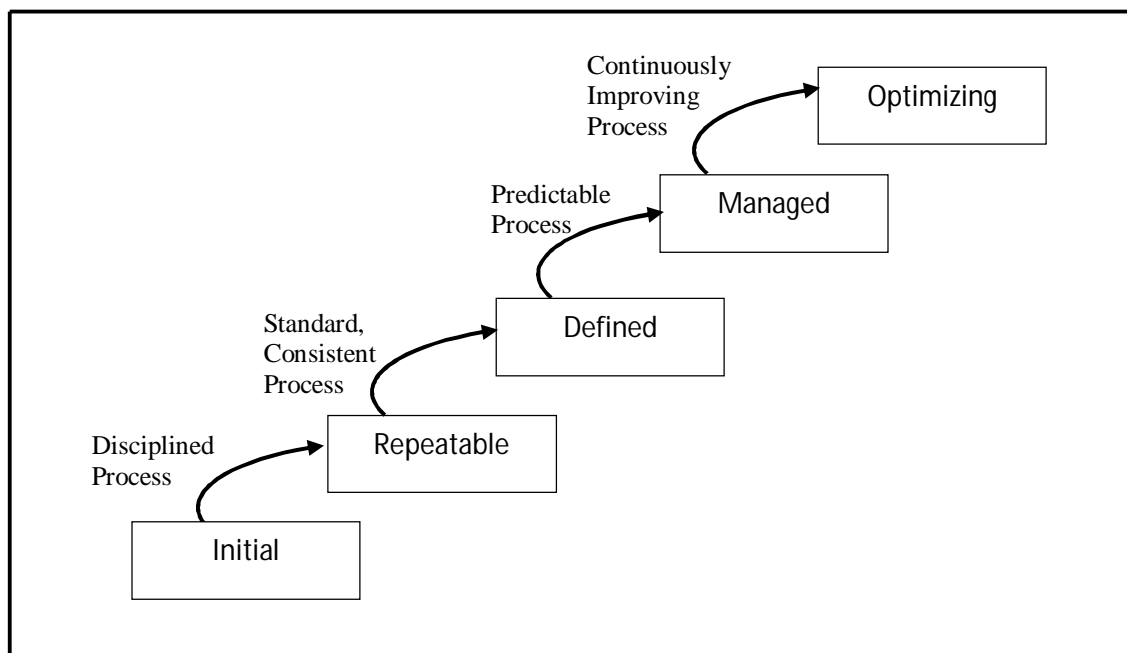


Figure 3.5: The Five Levels of Software Process Maturity (Paulk et al., 1993; Wettstein and Kueng, 2002)

The differences between the two maturity models, the Nolan model and CMM are the Nolan model looks at a particular organisational unit (the EDP unit or IT function) whereas the CMM is focused on processes carried out within the IT function. Apart from that, the Nolan model describes the changes of four dimensions (EDP budget, computer applications, EDP personnel and management techniques). The CMM considers solely the quality of processes. However, the CMM addresses different so-called key practices – themes that must be taken into consideration when process maturity is to be incremented from one stage to the next (Wettstein and Kueng, 2002).

Furthermore, Wettstein and Kueng (2002) state that another maturity model called a Maturity Model for Performance Measurement System is developed with the intention for judging performance measurement system, in place and used as an instrument for improving running performance measurement system as well. The model was developed based on inspiration of the two classical models mentioned before. The evolution of performance measurement system (scope of measurement, data collection, storage of

data, communication of results, use of measures and quality of measurement processes) can be described by four stages or steps: Ad-hoc, Adolescent, Grown-up and Mature. Figure 3.6 shows these four stages.

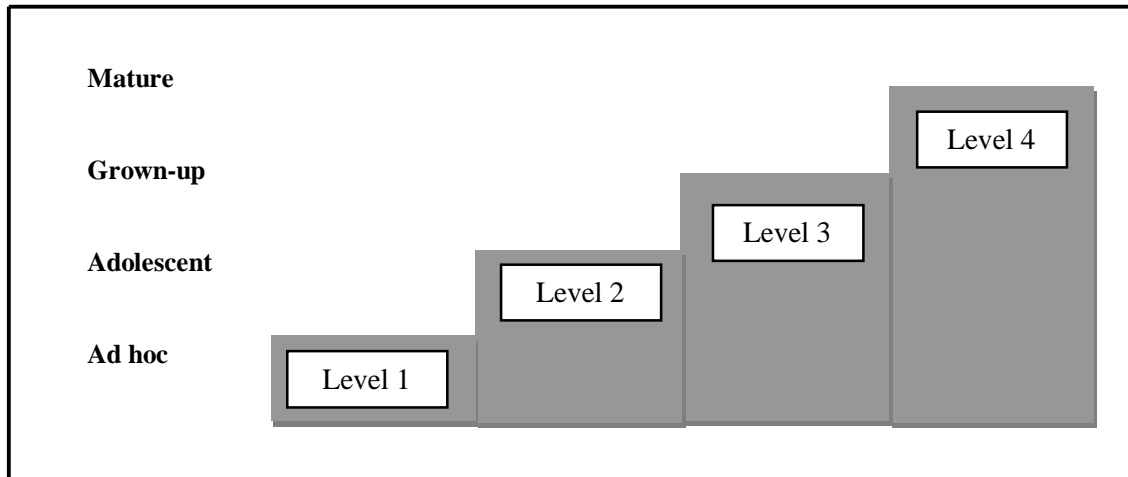


Figure 3.6: The Maturity Levels of Performance Measurement Systems (Wettstein and Kueng, 2002)

At a higher level of details, the characteristics of each maturity level can be described along the six dimensions of evolution of performance measurement system. A detailed description of the maturity model and its building dimensions is shown in Table 3.7.

Table 3.7: Details of A Four Stage Maturity Model for Performance Measurement Systems (Wettstein and Kueng, 2002).

	Maturity Level 1 Ad hoc	Maturity Level 2 Adolescent	Maturity Level 3 Grown-up	Maturity Level 4 Mature
Scope of Measurement	Only financial performance indicators are considered.	Financial performance management indicators are measured. In addition, a few non-financial indicators are measured as well.	Both financial and non-financial performance indicators are measured. Performance measurement takes place at different organisational levels.	Financial and non-financial indicators are measured on a regular basis. The indicators in place reflect the stakeholders' interests. Key processes are measured in an integral way.

	Maturity Level 1 Ad hoc	Maturity Level 2 Adolescent	Maturity Level 3 Grown-up	Maturity Level 4 Mature
Data Collection	Most performance relevant data is collected manually.	Financial performance data is collected from operational IT systems; however, some manual intervention is needed.	Collection of financial performance data is fully automated; collection of non-financial data needs some manual handling.	Internal and external data sources are exploited. The various operational IT systems are integrated. Thus, data collection does not require manual intervention.
Storage of Data	Performance data is stored in various formats (ring binder, spreadsheets, databases etc).	Financial performance data is stored in a central database; non-financial data is dispersed over different units.	Performance relevant data is stored in local data warehouses using different formats.	Performance data is stored in an integrated IT system.
Communication of Performance Results	Performance results are disseminated on ad-hoc basis.	Performance results are disseminated periodically to the upper and middle management.	Clear communication structures are established. Non-financial figures are integral part of reported data. Most results are communicated via push mechanism.	Financial and non-financial performance results are transmitted to the stakeholders electronically (push option) at different level of aggregation.
Use of Performance Measures	The use of the performance results is not defined.	Performance data is used primarily for internal reporting.	Performance data is used primarily for analysis purposes and for communication strategy and goals to staff.	Performance results are used (1) as a central managerial and planning instrument, (2) to support organisation-external communication and (3) to get people involved.

	Maturity Level 1 Ad hoc	Maturity Level 2 Adolescent	Maturity Level 3 Grown-up	Maturity Level 4 Mature
Quality of Performance Measurement Processes	The measurement processes are not defined; success depends on individual effort.	A certain degree of process discipline exists; successful execution of the measurement processes can be repeated.	The measurement processes are documented and standardised. The execution of the processes is compliant to the description.	Quantitative goals for the measurement processes are set. Continuous improvement of the measurement processes takes place. New technologies and practices are identified.

Most of maturity models were developed based on the CMM by the SEI. For example, Business Process Orientation (BPO) maturity model was developed based on the CMM, BPO as well as the concept of process maturity. BPO is critical in reducing conflict and encouraging greater connectedness within an organisation, while improving business performance. Organisations with strong measures of BPO showed better overall business performance (Lockamy III and McCormack, 2004). The concept of process maturity has been developed and tested relative to the software development process and the project management process. It is proposed that a process has a lifecycle that is assessed by the extent to which the process is explicitly defined, managed, measured and controlled and it also implies growth in process capability, richness and consistency across the entire organisation (Lockamy III and McCormack, 2004).

In construction research, the maturity model concept has been used in the concept of supply chain (SC). Meng et al. (2011) state that six models related to the SC that focus on supply chain relationships are show in Table 3.8. The six models are Supply chain position matrix, the partnering positioning matrix by the Best Practise in Partnering Group (BPiPG) and the supply chain maturity assessment grid by the Strategic Forum for Construction. These three models are from the UK. Three other models from the USA are the Client-contractor working relationship model, the model of partnering and the Construction Industry Institute’s (CII) partnering continuum. The purpose of these models is to describe the change in supply chain relationships from the traditional to the collaborative. The table also includes the focus, scope, type of relationship, number of

maturity model and measurement criteria descriptions of all the six models.

Table 3.8: The Six Models (Meng et al., 2011)

	The Supply Chain Position Matrix	The Partnering Positioning Matrix	The Supply Chain Maturity Assessment Grid	The Client-contractor Working Relationship Model	The Model of Partnering	CII Partnering Continuum
Focus	Generic customer-supplier relationship	Partnering practice in social housing	Supply chain management in construction	Working relationship in construction	Problem solving in construction	Partnering practice in construction
Scope	Any customer-supplier relationship	Whole supply chain	Whole supply chain	Client-contractor	Client-contractor	Client-contractor
Type of Relationship	One-to-one	Multiparty	Multiparty	One-to-one	One-to-one	One-to-one
Maturity Levels	4	4	3	4	4	4
Criteria Descriptions	Detailed descriptions of 29 criteria at each maturity level.	General descriptions of main characteristics at each maturity level	Detailed descriptions of 20 criteria at each maturity level	General descriptions of main characteristics at each maturity level	General descriptions of main characteristics at each maturity level	General descriptions of main characteristics at each maturity level.

All six models follow the principles of the capability maturity model (CMM) by the SEI. These six models consist of a number of assessment criteria and several maturity levels. An assessment criterion reflects a key area of the supply chain relationship. Furthermore, maturity levels are collection of key process areas. A maturity level defines the major characteristics of key business processes of an organisation (Meng et al., 2011).

Apart from the six models, Meng et al. (2011) have come out with another model called the Supply Chain Relationship Maturity Model. The model is developed based on the

general principles of the CMM for the specific requirements of key relationships in a construction supply chain, similar to those six models mentioned earlier. The model consists of four maturity levels, eight assessment criteria and 24 detailed sub-criteria. The eight assessment criteria are procurement, objectives, trust, collaboration, communication, problem solving, risk allocation and continuous improvement. The four maturity levels of supply chain relationships are generally shown as in Figure 3.7. The model has been proposed to assess both the upstream and the downstream relationships in a construction supply chain. Assessment using this model not only helps to position an existing relationship on the maturity scale but also helps to identify areas where improvement is needed to achieve a higher maturity (Meng et al., 2011).

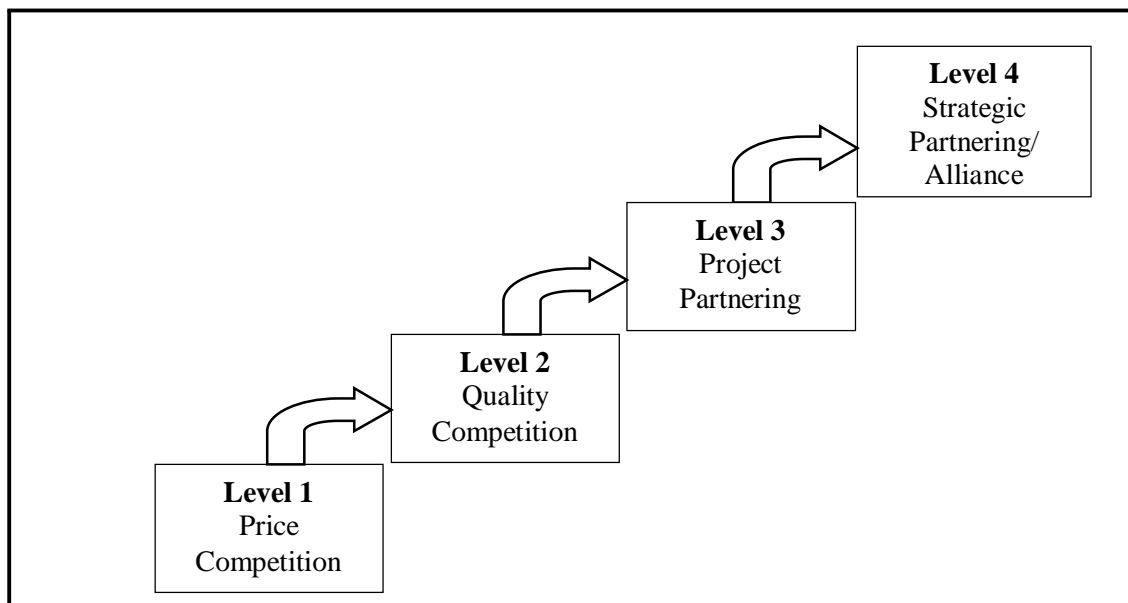


Figure 3.7: Construction Supply Chain Maturity Levels (Meng et al., 2011)

The four maturity levels of supply chain shown the Figure 3.7 are explained as follows:

- Level 1 represents an extreme position dominated by self-interest and mistrust. At this stage, mutual objectives do not exist at all. The parties only pay attention to achieving their own objectives and maximising their own profits, with no regard to the impact on others.

- At level 2, the parties are mainly interested in their own objectives and interests. The mutual objectives are not established.
- Level 3 relationships means that the alignment of objectives is achieved in a single project. Everyone's interests will be served by concentrating on the overall success of the project. To achieve the mutual project objectives, the partners work together collaboratively as an integrated project team.
- Level 4 is characterised as the alignment of objectives over a series of projects, which focuses on the long-term relationship. Fair gain sharing ensures that the partners collaborate most closely in the whole supply chain.

STEPS is another example of model created and developed for the construction industry. The model was developed as part of a three year UK – government funded project that investigated the relationship between knowledge management and business performance (Chinowsky and Carrillo, 2007). STEPS represents five key aspects, which are **Start-up**, **Take-off**, **Expansion**, **Progressive** and **Sustainability**, and it reflects varying levels of Knowledge Management (KM) maturity (Robinson et al., 2006): Start-up – Stage 1, Take-off – Stage 2, Expansion – Stage 3, Progressive – Stage 4, and Sustainability – Stage 5.

The five stages or steps in the maturity roadmap, STEPS, reflect varying levels of KM maturity. Each level is characterised or associated with certain attributes and attribute dimensions (Robinson et al., 2006; Chinowsky and Carrillo, 2007). Even though it was created for KM, its purpose is similar to that of the model created for this research and its purpose is to provide a mechanism for organisations to benchmark their KM activities and to develop a KM strategy that would improve them. The key aspects of STEPS are shown in Figure 3.8, reflecting different emphasis at various stages (Robinson et al., 2006).

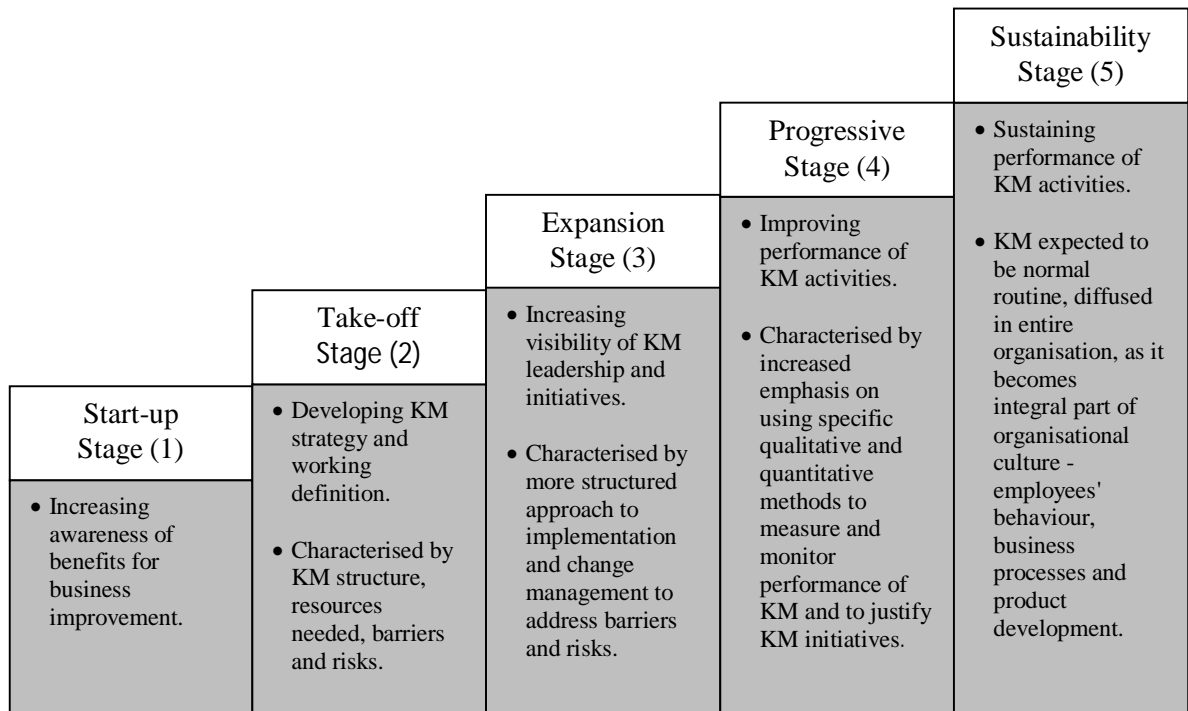


Figure 3.8: The STEPS Model (Robinson et al., 2006)

Furthermore, SPICE, based on the CMM (Sarshar et al., 2000), developed a stepwise process improvement framework for the construction industry. It is similar in concepts and framework to CMM but not identical. SPICE helps immature organisations to reach process maturity (Sarshar et al., 2000) and its purpose is suited for development of the maturity model for this research. This means that SPICE leads immature organisations in the construction industry to be mature in structured ways.

As has been discussed, varieties of examples of migration path and maturity models techniques shown have similarities in terms of purposes, which show targets and aims can be achieved in stages or in step-by-step manner, even though some of the examples focus on different areas such as information system and construction. The movement from bottom position (the lowest stage) to the highest stage show the progression of organisations in achieving their targets. In addition to that, some researchers have combined these two concepts, migration path and maturity model as one tool or framework. However, both are usually carried out together in a research as both have similar purposes that show the movement or changes from the lower stage to the higher stage or from the current stage to the desired stage with the elements required.

3.5 SUMMARY

This chapter has provided an overview of the BSC and the EFQM Excellence Model, both of which are widely used as performance measurement instruments in industries. They are used by a variety of organisations to measure performance in order to drive organisational improvement. The BSC is a tool to manage the strategy implementation process in organisations. It is a performance measurement tool that measures and evaluates performance of organisations in financial as well as non-financial aspects (Kueg, 2000; Kagioglou et al., 2001; Kaplan and Norton, 2002). The EFQM Excellence Model was designed to assist organisations to achieve business excellence through continuous improvement in management and deployment of processes to engender wider use of best practice activities. It enables the calculation of scores against a number of criteria that can be used for internal or external 'benchmark' comparisons. It is envisaged that the results of these relative comparisons will lead to increased focus on improving key process performance and thus generate business excellence (EFQM, 2009). Using the EFQM Excellence Model is about thinking about - and improving one's organisation.

Based on studies, both the BSC and the EFQM Excellence Model are quite similar. The only major difference is that the Excellence Model is assigned based on the TQM principles whereas in the BSC, the key objectives are based on the desired corporate strategy. Wongrassamee et al. (2003) state that both seem to be developed from similar concepts. Both require the users to select a set of appropriate metrics to implement them and both provide specific frameworks in which an organisation can establish a clear vision of its management processes and focus on improving its long-term performance.

The chapter explored the history of the BSC and the EFQM Excellence Model, the use of the tools, their effects on organisations and their strengths and weaknesses. Furthermore, the process of how the BSC and the EFQM Excellence Model work was discussed. The success of implementing these two performance measurement tools requires commitment and cooperation from top management level as well as bottom level of staff.

Furthermore, the chapter also discussed on the migration path and maturity model

techniques. Migration path and maturity model show movement from one part or stage to another of an organisation, individual or system for achieving something more and better from its current position. They come in stages and indicate that the lowest stage of an entity is poor. When the entity moves up to a higher stage, the model shows that the entity is getting better in position. For this research, both techniques are considered in creating and developing the tool for improving implementation of performance measurement in organisations. The details on the development process of the tool will be discussed later in Chapter 6 of this thesis.

In the next chapter, the research methodology adopted will be explained.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 INTRODUCTION

Methodology is the principles underlying the methods by which research can be carried out (Creswell, 2007; Fellows and Liu, 2008) and Silverman (2008a) states that it is a general approach to studying research topics. The research methodology thus covers the entire process of the study. It demonstrates how research can be carried out and how data can be gathered and analysed to achieve its aims and objectives. It refers to the principles and procedures of logical thought processes, which are applied to a scientific investigation (Fellows and Liu, 2008). Description of the research methodology allows people to know about the research methods and techniques employed in any research project.

This chapter provides an introduction to research methodology. It presents and justifies the methodology adopted throughout various stages of the research project. The research 'onion', a concept of research methodology, which is used to guide the development of methodology for this research, is defined and explained in this chapter. The research onion comprises of a range of layers which consider the research philosophies, approaches, strategies, choices, data collection methods as well as data analysis. The review of these items is necessary as it gives understanding to the researcher in helping to make the realistic and appropriate choice of techniques to accomplish this research. The second part of this research presents the adoption and justification of the research methodology for this research. It explains the techniques and approaches used in conducting the research to achieve the aim and objectives of this research. The structure of Chapter 4 is illustrated in Figure 4.1. A chapter summary concludes the discussion.

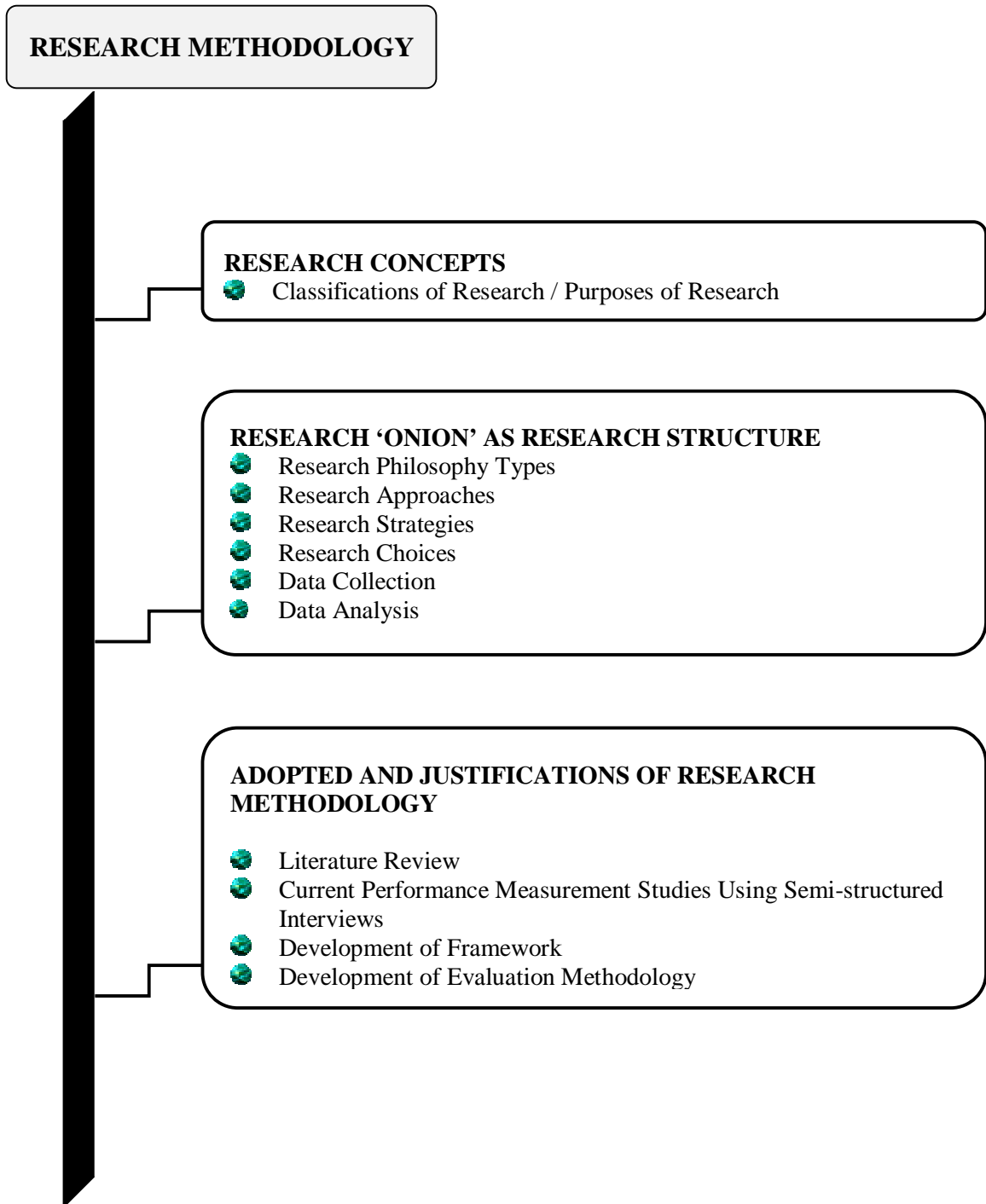


Figure 4.1: Research Methodology Structure

4.2 RESEARCH CONCEPTS

Saunders et al. (2007) define research as something that people undertake in order to find out things in a systematic way, thereby increasing their knowledge. Systematic here means research is based on logical relationships and not just beliefs. Fellows and Liu (2008) state that what is of more concern in research is what is being studied and how to study the subject in detail. The right techniques and procedures have to be chosen for getting the appropriate and accurate information for the research. This process of research has been claimed by Fellows and Liu (2008) to be a dynamic process.

In developing a research, there are six matters needing to be considered and identified by a researcher, which are discussed by Willis et al. (2007) as follows:

1. **Epistemology.** This means which philosophy of science, world view or ideological perspective a researcher has adopted for the research.
2. **Purpose.** What is the purpose of doing a research? For example, to develop a theory of explanation, to describe a setting or something else.
3. **Research methods.** What research methods will a researcher use? Is it case study, ethnographic, survey or observation?
4. **Research framework.** There are a number of well-established qualitative research frameworks that include procedures for analysing data, for example, grounded theory, analytic, deduction and induction.
5. **Data analysis strategies.** In addition to frameworks there are also sets of data analysis strategies in common use.
6. **Audience for researchers' ideas and form used to communicate them.** Researchers must decide in what form their work is to be disseminated.

4.2.1 Classifications of Research / Purposes of Research

Researchers need to think of questions and objectives of research when they want to start doing research. The way research questions are answered would determine the nature of investigation: exploratory, descriptive or explanatory (Saunders et al., 2007).

Research can be categorised as pure or ‘blue sky’ research (Fellows and Liu, 2008). This is also known as basic research (Patton, 2002). This type of research discovers theories and laws of nature (Patton, 2002; Fellows and Liu, 2008). Most academics are encouraged to undertake research of this category, pure research. This is because it is undertaken to develop knowledge, to contribute to the existing body of theory, and to aid the search for truth (Fellows and Liu, 2008). Researchers engaged in this type of research want to understand how the world operates. Researchers do this type of research work to generate new theories or test existing ones (Patton, 2002).

Another type of research is applied research. This is a type of research, which is directed to end users and practical applications. It is normally conducted by practitioners or industrialists who tend to pursue development work and applications (Fellows and Liu, 2008). The purpose of those undertaking such research is to address issues of application, to help solve technical and practical problems. It means that the addition to knowledge is ‘secondary’ to the main purpose (Fellows and Liu, 2008). Applied researchers are often guided by the findings, understandings and explanations of basic research. It means that they conduct studies that test applications of basic theory and disciplinary knowledge to real-world problems and experiences (Patton, 2002).

The distinctions among the classifications of types of research are not absolute and a research project may involve more than one type of research design (Fellows and Liu, 2008). Apart from pure and applied researches, there are other research types as discussed by Fraenkel and Wallen (2006) and Fellows and Liu (2008), as follows:

- **Exploratory Research**

Exploratory research aims to find out what is happening, to seek new insights, to ask questions and to assess phenomena in a new light (Robson, 2002; Saunders et al., 2007). This type of research is to test and explore aspects of theory. A central feature of this research is the use of hypotheses. Saunders et al. (2007) state that there are three principal ways of conducting this type of research: a search of literature, interviewing experts in the subject and conducting focus group interviews.

- **Descriptive Research**

This type of research is to systematically identify and record a phenomenon, process or system. Such identification and recording will be done from a particular perspective and often for a specified purpose. However, it should always be done as objectively (accurately) and as comprehensively as possible (this is important for later analysis). The research may be undertaken as a survey (possibly of the population identified) or as a case study work. Such research is carried out to enable the subject matter to be categorised (Fraenkel and Wallen, 2006; Fellows and Liu, 2008).

- **Explanatory Research**

Explanatory research is a research that establishes connecting relationships between variables. The purpose of this research is to study a situation or problem in order to explain the relationships between variables (Saunders et al., 2007). Theory can be used to develop the hypotheses, which the research will test. This could be a follow-on from exploratory research which has produced hypotheses for testing (Fellows and Liu, 2008).

Mixed types of research could happen in construction research. Research on construction management tends to be process oriented (for example, organisational culture of construction firms) or both process and product (the impact of different procurement approaches on project and project management performance). Process is defined as a sequence of events that describes how things change over time (Fellows and Liu, 2008).

4.3 RESEARCH 'ONION'

The research 'onion' (Figure 4.2) contains important information that has to be considered when creating a research design. This 'onion' has been used as a guide for research in business and management (Saunders et al., 2007). For this research, it will be used to structure the research methodology. The research 'onion' has been chosen because it reveals in its layers everything from research philosophies to techniques and procedures of undertaking research and data analysis in a proper strategic manner. It assists researchers to develop research methodology by giving more easily understandable steps in a logical sequence as the onion shows what needs to be considered first and so on in developing the research methodology. Apart from that, it shows everything graphically and putting everything in place. It makes things easy to understand and use by researchers.

The important information of the research 'onion' is contained in six layers as shown in the figure. These layers are research philosophies, research approaches, research strategies, choices, time horizons, data collection and data analysis for research. The way researchers choose to answer research questions will be influenced by their research philosophy and approaches. The research questions will then confirm choices of research, strategy and choices of collection techniques or procedures and analysis types, as well as time horizons within which researchers undertake their research (Saunders et al., 2007). The contents of each layer of the research 'onion' are now discussed.

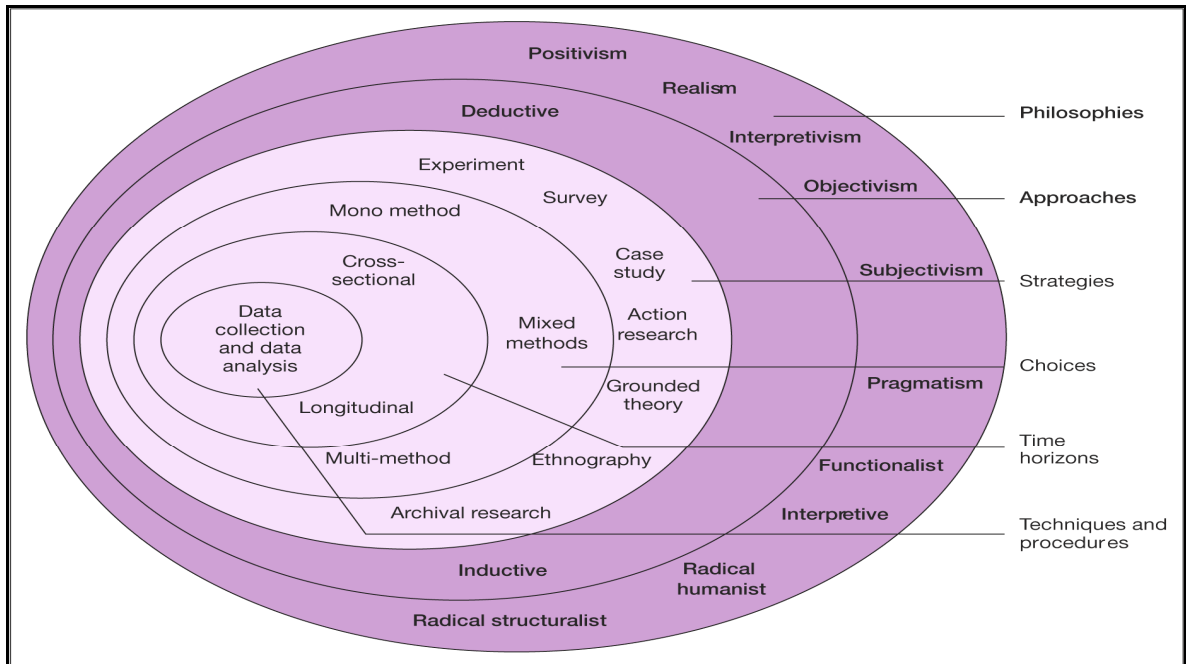


Figure 4.2: The Research 'Onion' (Saunders et al., 2007)

4.3.1 Research Philosophy Types

The first, outer layer of the onion is research philosophies. These relate to the development of knowledge and the nature of that knowledge (Saunders et al., 2007). In other words, it describes research development and interpretation of research by a researcher. Researchers must consider and know to which research community they believe they belong (Fellows and Liu, 2008) and to which research philosophy they therefore subscribe.

Saunders et al. (2007) state that there are three major ways of thinking about research philosophies. The three major ways are epistemology, ontology and axiology. Epistemology is the branch of philosophy that concerns the origins, nature, methods and limits of human knowledge (Willis et al., 2007; Fellows and Liu, 2008). It is how the researcher knows what she or he knows (Creswell, 2007). Ontology is concerned with the nature of reality (or being or existence) (Creswell, 2007; Saunders et al., 2007; Willis et al., 2007). Axiology studies judgements about values (Creswell, 2007; Saunders et al., 2007). Values here mean the process of social enquiry (Saunders et al., 2007). The

following research philosophies are ones frequently encountered:

- **Positivism**

Physical and natural science mostly take a positivism approach (Fellows and Liu, 2008). This is the approach in which the researcher will probably adopt, the philosophical stance of natural science (Saunders et al., 2007).

- **Realism**

Realism relates to scientific enquiry. Realism is opposed to idealism, the theory that only the mind and its contents exist but is similar to positivism in that it assumes a scientific approach to the development of knowledge (Saunders et al., 2007).

- **Interpretivism**

Interpretivism advocates that it is necessary for the researcher to understand differences between humans in our role as social actors. This emphasises the differences between conducting research among people rather than objects such as trucks and computers (Saunders et al., 2007).

- **Objectivism**

Objectivism portrays the position that social entities exist in reality external to social actors. (Saunders et al., 2007).

- **Subjectivism**

Subjectivism's view is that social phenomena are created from the perceptions and consequent actions of social actors. Social actors in management and business are customers or clients. This is a continual process in that through the process of social interaction, these social phenomena are in a constant state of revision (Saunders et al., 2007).

- **Pragmatism**

Pragmatism focuses on the outcomes of research; the actions, situations and consequences of inquiry (Creswell, 2007). Pragmatism argues that the most important determinant of research philosophy adopted is the research question (Creswell, 2007;

Saunders et al., 2007), instead of methods (Creswell, 2007).

- **Research Paradigms**

A paradigm is a way of examining social phenomena from which particular understandings of these phenomena can be gained and explanations attempted. Functionalist, interpretive, radical humanist and radical structuralist paradigms are in a group of research paradigms. The purpose of the four paradigms as stated by Saunders et al. (2007) is to help researchers clarify their view of the nature of science and society and to offer a useful way to understanding how other researchers approach their work.

The **functionalist paradigm** is involved when researchers are probably more concerned with a rational explanation of why a particular organisational problem is occurring, and with developing a set of recommendations set within the current structure or the organisation's current management. In **interpretive paradigm**, researchers have to understand the fundamental meanings attached to organisational life (Saunders et al., 2007). Working with the **radical humanist paradigm**, researchers would be concerned with changing the status quo or in words to articulate ways in which humans can go beyond the spiritual bonds and fetters which tie them into existing social patterns and thus realise their full potential. The **radical structuralist paradigm** is involved with structural patterns in work organisations such as hierarchies and reporting relationships and the extent to which these may produce dysfunctionalities (Saunders et al, 2007).

The adoption of the most appropriate research philosophy depends on the research questions that researchers seek to answer. The practical reality is that, research rarely falls neatly into only one philosophical domain. For example, business and management research is often a mixture between positivist and interpretivist (Saunders et al., 2007). However, it is not possible for research to have only one philosophy. Fellows and Liu (2008) state that research in construction management reflects an interpretivist approach.

4.3.2 Research Approaches

Saunders et al. (2007) describe that research approaches can be divided into two. These are deduction (deductive approach) and induction (inductive approach).

4.3.2.1 Deduction

In deduction, a researcher develops a theory and hypothesis (or hypotheses) and designs a research strategy to test the hypothesis. In testing it, a researcher uses another element, the collection of quantitative data although this does not mean that this approach excludes use of qualitative data. An additional important characteristic is that concepts need to be operationalised in a way that enables facts to be measured quantitatively. It is necessary to select samples of sufficient numerical size to enable statistical generalisation about regularities in human social behaviour. It is more related to positivism (Saunders et al., 2007).

4.3.2.2 Induction

In induction, a researcher collects data and develops theory as a result of data analysis. Research using this approach is likely to be particularly concerned with the context in which such events are taking place. For that, the study of a small sample of subjects is more appropriate than a large number. Researchers with this approach are more likely to work with qualitative data and use a variety of methods to collect the data in order to establish different views of phenomena. Induction is more related to interpretivism (Saunders et al., 2007).

Fellows and Liu (2008) state that research approaches could be based on quantitative or qualitative study or a combination of both, known as triangulation. The decision on which type of approach to use depends on the purpose of the study and the type and availability of the information required (Naoum, 2006; Fellows and Liu, 2008).

4.3.2.3 Quantitative approach

The quantitative approach studies relationships between facts and how such facts and relationships accord with theories and the findings of any research executed previously (reported in literature). Scientific techniques are used to obtain measurements and to collect data. Analyses of the data yield, quantified results and conclusions are derived from their evaluation in the light of the theory and literature (Fellows and Liu, 2008). Quantitative is predominantly used as a synonym for any data collection technique such as a questionnaire or a data analysis procedure, such as graphs or statistics, that generates

or uses numerical data (Fraenkel and Wallen, 2006; Saunders et al., 2007). Quantitative research requires imagination, patience and discipline at the planning and design stages. Data collection may present technical problems and requires tenacity but is often straightforward. The tasks of data analysis and write-up are largely, although not entirely, determined by the way the project was set up (Davies, 2007).

4.3.2.4 Qualitative approach

In contrast, the qualitative approach seeks to gain an insight into people's perceptions of the world and to understand them whether as individuals or groups (Davies, 2007; Fellows and Liu, 2008). Dainty (2004) describes qualitative research as research that produces descriptive data such as an individual's own written words or observable behaviour. In qualitative research, the beliefs, understandings, opinions, views, etc. of people are investigated. In other words, qualitative is used predominantly as a synonym for any data collection technique, such as an interview or data analysis procedure such as categorising data that generates or uses non-numerical data. Analytic techniques for qualitative data may be highly laborious, involving transcribing interviews and analysing the content of conversations (Fellows and Liu, 2008). Qualitative can therefore refer to data other than words such as pictures and video clips (Saunders et al., 2007).

Some researchers are drawn to the qualitative research approach by practical considerations. They see it as smaller scale, more manageable in a limited time frame and offering the temptation of 'doing research' without having to 'do measurement' or learn about statistics. There is an undeniable tendency for qualitative methods to be perceived as more human and even, perhaps, more in tune with contemporary social thinking (Davies, 2007). More perceptions and understanding by other researchers of these two approaches, quantitative and qualitative, are shown in Table 4.1. Added to that, the characteristics of the approaches are shown in Table 4.2.

Table 4.1: Perceptions of Quantitative and Qualitative Approaches.

Authors / Researchers	Quantitative	Qualitative
Greene et al.(2005)	Quantitative proponents aspire to realism, objectivity, causal explanation and universal truth.	Qualitative advocates emphasise interpretive, value-laden, contextual and contingent nature of social knowledge.
Barbour (2008)	Quantitative excels at identifying statistically significant relationships between variables and frequently produces diagrams, which show the distribution and strength of this association.	Qualitative can make visible and unpick mechanisms, which link particular variables by looking at explanations or accounts provided by those involved.
Kumar (2005)	To quantify variation in a phenomenon, situation or issues. Information is gathered using predominantly quantitative variables with analysis geared to ascertain magnitude of variation.	To describe phenomenon or situation or issues. Information is gathered through use of variables measured on nominal or ordinal scales (qualitative measurement scales).
Holliday (2007)	Quantitative research concerns accounting.	Qualitative research develops from aspects of anthropology and sociology. Represents broad view that to understand human affairs it is not sufficient to rely on quantitative survey and statistics and necessary, instead, to go deep into subjective qualities that govern behaviour.
Allan and Skinner (1993)	Quantitative research assumes interval or ordinal data amenable to statistical manipulation.	Satisfactory explanations of social activities that require substantial appreciation of perspectives, culture and ‘world-views’ of actors involved.

Table 4.1 shows that most researchers agree that quantitative research involves statistics and accounting elements. Qualitative research is sociological, and involves obtaining textual information and has been used for social activities, opinions, views and phenomena and perceptions related to the research question.

Table 4.2: Quantitative and Qualitative Approaches (Holliday, 2007)

Quantitative	Qualitative
<p><u>Activities</u> Count occurrences across large population.</p> <p>Uses statistics and replicability to validate generalisation from survey samples and experiments.</p> <p>Attempts to reduce contaminating social variables.</p>	<p>Looks deep into quality of social life.</p> <p>Locates study within particular settings, which provide opportunities for exploring all possible social variables and set manageable boundaries.</p> <p>Social setting leads to further, more informed exploration as themes and focuses emerge.</p>
<p><u>Criteria</u> Conviction about what it is important to look for.</p> <p>Confidence in established research instruments.</p> <p>Reality not so problematic if research instruments adequate and conclusive results feasible.</p>	<p>Conviction that what it is important to look for will emerge.</p> <p>Confidence in ability to devise research procedures to fit situation and nature of people in it, as they are revealed.</p> <p>Reality contains mysteries to which researcher must submit and can do no more than interpret.</p>
<p><u>Process</u> First, decide research focus (for example; testing specific hypothesis).</p> <p>Then, devise and pilot research instruments (for example, survey questionnaire or experiment).</p> <p>Then, go into the field.</p>	<p>First, decide subject is interesting (for example, in its own right or because it represents area of interest).</p> <p>Go into the field to see what is going on.</p> <p>Let focus and themes emerge.</p> <p>Devise research instruments during process (such as interview or observation).</p>
<p><u>Rigour</u> Disciplined application of established rules for statistics, experiment and survey design.</p>	<p>Principled development of research strategy to suit scenario being studied as it is revealed.</p>

Leavitt (2001) states that there are several characteristics, which differentiate the qualitative approach from the quantitative as follows:

- Qualitative research designs are much less structured than quantitative. Research questions, data collection strategies and data analysis evolve as the researcher learns more about what is being studied.
- Quantitative researchers use the same subjects for an entire study. Qualitative researchers deliberately pick subjects to help them focus on the relevant issues and change subjects to extend, test and fill in information. They may pick extreme or deviant cases, typical cases or politically important cases. Samples are usually small and size is not predetermined.
- Although both qualitative and quantitative researchers observe and describe, the latter emphasise contextual details such as physical setting, nonverbal communication, pauses and word choices. They may note their feelings, reactions, prejudices and emotional states. Their goal is not just to hear the subjects' answers but to see the world through the subjects' eyes.
- Qualitative researchers regard data analysis as an ongoing process. Unlike quantitative, qualitative researchers typically work in teams and use several data sources, more than one method for gathering data and different perspectives for interpreting it.

However, most qualitative researchers do not make falsifiable predictions. Furthermore, they have no agreed-upon empirical method for resolving controversies about interpretations. Thus, although qualitative research may suggest areas of scientific study, most of it as practised today is outside the area of science.

4.3.2.5 Triangulation / Multi-methods approach

Although most researchers apply either deduction or induction, or quantitative or qualitative approaches in their work, some have suggested combining one or more research approaches or methods in one study. The combination of these two approaches is known as multi-methods (Saunders et al., 2007) or triangulation (Fellows and Liu, 2008). This approach is used to reduce or eliminate disadvantages of each individual

approach whilst gaining the advantages of each and of the combination (Fellows and Liu, 2008). The approach tends to be popular with students and it can be used to good effect. However, with limited time at researchers' disposal, it may be preferable to use one method and get it spot-on rather than risk delivering second-rate material from two or more different methods (Davies, 2007).

Whatever approach, style or category of research is adopted, it is not important in designing research because the most important aspects needing to be considered are the validity and applicability of results and conclusions that are appreciated and understood. It may well be preferable to carry out a research with reduced scope thoroughly than a larger study superficially; both approaches have validity but achieve different things (Fellows and Liu, 2008).

4.3.3 Research Strategies / Designs

Choices of research strategy will be guided by research questions and objectives (Saunders et al., 2007; Fellows and Liu, 2008), the extent of existing knowledge, the amount of time and other resources available, as well as researchers' own philosophical position (Saunders et al., 2007). Various research strategies can be used to achieve the aim and objectives of research. Research strategies are classified by Saunders et al. (2007) into seven types: experiment, survey, case study, action research, grounded theory, ethnography and archival research. Fellows and Liu (2008) identify action research, ethnographic research, surveys, case study and experimental as research strategies. Yin (2003a) agrees with them, as there are five common research strategies in the social sciences: surveys, experiments, archival analysis, histories and case studies. Willis et al. (2007) mention that ethnography, interviews, case studies and historical are forms of the research strategies. The following discussion covers all the above types of research designs.

4.3.3.1 Experiments

Experiment owes much to natural science, although it features strongly in much social science research (Saunders et al., 2007). It is suited best to bounded problems or issues in which variables involved are known or at least hypothesised with some confidence

(Saunders et al., 2007; Fellows and Liu, 2008). Usually, experiments are carried out in laboratories to test relationships between identified variables; ideally, by holding all except one of the variables constant and examining the effect on the dependent variable of changing one independent variable (Fellows and Liu, 2008; Gibson and Brown, 2009). Experiments tend to be used in exploratory and explanatory research to answer ‘how’ and ‘why’ questions (Saunders et al., 2007). Experiments can involve a wide range of methods of data collection including interviews, questionnaires and observation (Gibson and Brown, 2009).

4.3.3.2 Surveys

The survey strategy is usually associated with a quantitative or deductive approach. Quantitative data will be collected and analysed quantitatively using statistical methods. Surveys are popular as they allow the collection of a large amount of data from a huge population in a highly economical way (Saunders et al., 2007). They are usually carried out as part of a non-experimental fixed design. They are probably most suitable for descriptive research (Robson, 2002). Surveys operate on the basis of statistical sampling as only extremely rarely are full population surveys possible, practical or desirable. The principles of statistical sampling to secure a representative sample are employed for economy and speed. Commonly, samples are surveyed through questionnaires or interviews (Robson, 2002; Fraenkel and Wallen, 2006; Fellows and Liu, 2008) and structured observation (Saunders et al., 2007). This is a type of research strategy, which obtains data to determine specific characteristics of a group.

A survey strategy should give more control to a researcher’s study and cost and time factors can be controlled during the process. When sampling is used, it is possible to generate findings that are representative of the whole population at a lower cost rather than by collecting data for the whole population. The researcher can plan time for analysis as long as data have been collected (Saunders et al., 2007).

4.3.3.3 Case Study

The case study has been a common research strategy in a variety of fields such as psychology, sociology, social work, business, economics and even in engineering (Yin, 2003a). The case study is the method of choice when the phenomenon under study is not

readily distinguishable from its context. Such a phenomenon may be a project or programme in an evaluation study (Robson, 2002; Yin, 2003b). It encourages in-depth investigation or rich understanding of particular instances within the research subject (Saunders et al., 2007; Fellows and Liu, 2008).

Creswell (2007) defines case study as a qualitative approach in which the researcher explores a case or cases over time, through detailed, in-depth data collection involving multiple sources of information such as observations, interviews, audiovisual material, documents and reports. The case study has considerable ability to provide answers to the questions of 'why', 'what' and 'how'. The case study is most often used in explanatory and exploratory research (Saunders et al., 2007).

Case study research may combine a variety of data collection methods, with the vehicle or medium of study being the particular case, manifestation or instance of the subject, such as a claim, a project, a batch of concrete (Fellows and Liu, 2008). It usually involves multiple forms of data of quantitative and qualitative components (Gibson and Brown, 2009). They may include, for example, interviews, observations, documentary analysis, questionnaires (Yin, 2003a; Saunders et al., 2007), audiovisual material (Creswell, 2007), archival records and physical artefacts (Yin, 2003a).

The strength of the case study is that it can take an example of an activity and use multi-methods and data sources to explore it and analyse it. The weakness of the case study is that with case study it is not possible to generalise statistically from one or a small number of cases to the whole population (Stark and Harry, 2005).

4.3.3.4 Action research

The action research strategy is most often used in education, international development and health care to address professional practice problems (Willis et al., 2007). It can be defined as a disciplined process of inquiry conducted by and for those taking the action (Sagor, 2005). The action research involves active participation by the researcher in the process under study, in order to identify, promote and evaluate problems and potential solutions (Sagor, 2005; Fellows and Liu, 2008; Gibson and Brown, 2009). Two types of action research are quasi-experimental research and descriptive research (Sagor, 2005;

Fraenkel and Wallen, 2006; Fellows and Liu, 2008). The consideration of quantitative and qualitative categories may be equally useful (Fellow and Liu, 2008).

Action research is complex (Fellows and Liu, 2008) and differs from other research strategies because it unambiguously focuses on action, in particular promoting change within the organisation (Saunders et al., 2007). The observer (who should provide a systematic perspective, relatively objectively) is involved and has the main role of creating a field for discussion and interpretation of the process and products. As change or innovation is the subject matter of the research (and the processes continue in parallel), coordination and evaluation mechanisms are necessary which involve both the researcher and the participants (Patton, 2002; Saunders et al., 2007; Fellows and Liu, 2008). It is therefore particularly useful for 'how' questions (Saunders et al., 2007).

The strengths of an action research strategy are a focus on change, the recognition that time needs to be devoted to diagnosing, planning, taking action and evaluating, as well as the involving of practitioners (participants of research) throughout the process (Saunders et al., 2007). Problems can arise if the researcher does not deliver the results that conform to or confirm the activist's desired policy (Davies, 2007).

4.3.3.5 Grounded Theory

Grounded theory is a specific highly developed, rigorous set of procedures for producing a formal, substantive theory of social phenomena (Schwandt, 2001). Creswell (2007) and Saunders et al. (2007) agree that the grounded theory is used for a type of research needed to predict and explain behaviour, where the emphasis is on developing and building theory. The theory is developed from data generated by a series of observations. These data lead to the generation of predictions which are then tested in further observations that may confirm, or otherwise, the predictions. Constant reference to the data to develop theory and test leads this research strategy to be called inductive and deductive approaches (Saunders et al., 2007).

4.3.3.6 Ethnography

This strategy is firmly based on the qualitative or inductive approach (Saunders et al., 2007). Ethnography is a particular kind of qualitative inquiry distinguishable from case

study research and descriptive research and by the fact that it is the process and product of describing and interpreting cultural behaviour (Schwandt, 2001; Creswell, 2007). The emphasis in this type of research is on documenting or portraying the everyday experiences of individuals by observing and interviewing them and others who are relevant (Fraenkel and Wallen, 2006). An ethnography strategy focuses on an entire cultural group and sometimes this group may be small e.g. a few construction workers, but normally it is large, involving many people who interact over time (Creswell, 2007). It can be used whether the researcher needs to understand the workings of an entire culture or how specific tasks are routinely accomplished in a particular setting (Barbour, 2008). Ethnography is very time consuming because the researcher needs to put herself or himself in the social world being researched as completely as possible. This can extend the time for carrying out research (Saunders et al., 2007; Gibson and Brown, 2009).

Ethnography usually involves observational work but is often supplemented with other methods, such as interviews and documentary analysis (Gibson and Brown, 2009). The researcher becomes part of the group under study and observes subjects' behaviours (participant observation) and statements to gain insights into 'what', 'how' and 'why' their patterns of behaviour occur. Determination of cultural factors such as value structures and beliefs may result but the degree of influence exerted by the presence of the researcher and the existence of the research project, will be extremely difficult (if not impossible) to determine (Fellows and Liu, 2008).

4.3.3.7 Archival research

This type of research strategy means some aspects of the past is studied either by pursuing documents of the period or by interviewing individuals who lived during the time. The researcher then attempts to reconstruct as accurately as possible what happened during that time, and to explain why it did (Fraenkel and Wallen, 2006). Archival research means making use of administrative records and documents as the principal source of data for research. Using an archival research strategy therefore necessitates the researcher's establishing what data are available and designing the research to make the most of it (Saunders et al., 2007).

4.3.3.8 Interview strategy

The interview strategy is an approach used in qualitative research (Wolcott, 2009). An interview refers to any person-to-person interaction between two or more individuals with a specific topic in mind (Kumar, 2005; Saunders et al., 2007). According to Marshall and Rossman (2006), interviews involve personal interaction and participants' cooperation is essential. Interviews can help researchers to gather valid and reliable data relevant to their research questions and objectives (Saunders et al., 2007). Interviews also allow other people to enter into the other person's perspective. It is a way that a researcher can explore someone else's experience (Patton, 2002; Richards, 2009). Based on the several definitions, an interview can be understood as a performance involving a two-way encounter (two parties). It is essential that the researcher has his or her own questions, which enables the interview to work in a way similar to regular conversation.

Interviews can be very flexible. An interviewer has the freedom to formulate questions related to the issue under investigation. It also can be inflexible, when the interviewer has to keep strictly to the questions previously decided (Kumar, 2005). An interviewee (or participant) is invited to comment on the relevance of the questions posed and is encouraged to expand at length on the chosen topics or issues (Barbour, 2008). It can be done either in one-to-one or face-to-face conversation with a person in any form or format of group interviewing (Silverman, 2008b; Richards, 2009). The selection of which way reflects the questions that are going to be asked, types of people to be involved in the interview and their number (Richards, 2009).

The use of this approach is closely related to its advantages and benefits (Kumar, 2005):

- **More appropriate for complex situations.** This is the most appropriate approach for studying complex and sensitive areas.
- **Useful for collecting in-depth information.** An interviewer can obtain in-depth information by probing.
- **Information can be supplemented.** An interviewer is able to supplement information obtained from responses with that gained from observation.

- **Wider application.** An interview can be used with almost any type of population such as children, handicapped or very old people.

There are different types of interviews, which depend on the types of information the interviewer is trying to obtain and the degree of flexibility. They can be categorised as unstructured, semi-structured and structured (Kumar, 2005; Willis et al., 2007; Gibson and Brown, 2009), as shown in Figure 4.3.

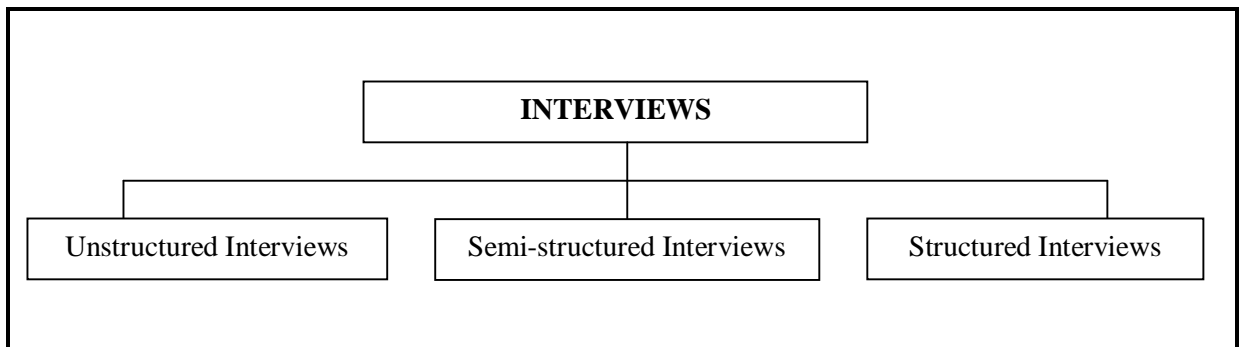


Figure 4.3: Types of Interviews

1. Unstructured interviews

Unstructured interviews bring almost complete freedom to the interviewer in terms of content and structure because they are informal. The interviewer has complete freedom in wording to use and the way to explain questions to the respondent (Kumar, 2005; Saunders et al., 2007). This type of interview is useful to cover topics in great detail. There are several types of unstructured interviews. Kumar (2005) states in-depth interviewing, focus group interviewing, narrative interviewing and oral histories are unstructured interviews.

2. Semi-structured interviews

Semi-structured interviews consist mainly of open-ended questions based on topics that need to be covered. The interviewer has the opportunity to explore answers more widely or other areas of discussion introduced by the interviewee (participant) (Barbour, 2008). Some probing or additional questions may be required to explore research questions and objectives of researchers, given the nature of events within particular organisations (Saunders et al., 2007; Silverman, 2008a).

This approach might involve a sample involving between six and twenty people. The questions should not be of a kind which invite simple 'Yes' or 'No' answers. The aim of the researcher is to stimulate reflection and exploration. This approach is often concerned with people's feelings, such as about living in the flight path of a planned new airport runway. At its best, the method can lead to significant advances in our theoretical understanding of social reality; more routinely, it is particularly good at enabling the researcher to learn, at first hand, about people's perspectives on the subject chosen as the project focus (Davies, 2007).

3. Structured interviews

According to Kumar (2005), structured interviews mean use of a predetermined set of questions, using the same wording and order of questions as specified in the interview schedule. An interview schedule is a written list of questions, open-ended or closed-ended and prepared by an interviewer for the purpose of interaction (this may be face-to-face with participants, by telephone or by other electronic media such as video conferencing). Structured interviews provide uniform information and require fewer interviewing skills than unstructured interviews (Kumar, 2005). Structured interviews are used to collect quantifiable data; hence, they are also referred to as quantitative research interviews (Saunders et al., 2007).

Whatever the strategies that are going to be used for research, researchers have to consider the relevance of all strategies around them. Factors of time, cost, capabilities of the researcher in handling respondents and respondent behaviours need to be considered in choosing the appropriate strategies for obtaining data for research (Fellows and Liu, 2008). It is dependent on whether what a researcher chooses as the most suitable and appropriate strategies can meet her or his research objectives.

4.3.4 Research Choices

In choosing research methods, researchers can use a single data collection technique and corresponding analysis procedures, known as mono method, or use more than one data collection and analysis procedure for answering research questions, known as multiple methods (Saunders et al., 2007). These two methods are shown in Figure 4.4.

4.3.4.1 Mono method

The mono method is where the researcher combines either a single quantitative data collection technique such as questionnaires with quantitative data analysis or a single qualitative data collection technique such as in-depth interviews with qualitative data analysis (Saunders et al., 2007).

4.3.4.2 Multiple methods

In contrast to the mono method, multi-methods involve combinations of more than one data collection technique (either quantitative or qualitative) with associated analysis techniques (Patton, 2002; Saunders et al., 2007). For collection of data using quantitative technique and analysis using quantitative (statistical) procedures, it is known as a multi-method quantitative study. With qualitative data collection, for example by in-depth interviews and diary accounts, and analysis using qualitative technique, this is called multi-method qualitative study. This technique would not mix quantitative and qualitative techniques and procedures (Saunders et al., 2007).

Combination of both data collection techniques and analysis procedures, quantitative and qualitative, is known as mixed methods (Fraenkel and Wallen, 2006; Saunders et al., 2007). Greene et al. (2005) state that mixed methods are uniquely able to generate better results than studies bounded by a single or mono method. The mixed approach can be divided into two categories: mixed-method research and mixed model research (Saunders et al., 2007).

Mixed method research uses quantitative and qualitative techniques and analysis procedures at the same time or one after the other, but does not combine them. This means that although this method uses both a quantitative and qualitative approach, data will be analysed separately: quantitative data are analysed quantitatively and qualitative data qualitatively (Saunders et al., 2007). The mixed model research combines both techniques for data collection and analysis procedures as well as at other phases of the research, such as generating research questions. This means that quantitative data can be qualities and qualitative data can be analysed quantitatively (Saunders et al., 2007). By using multi-methods, researchers are better able to gather and analyse considerably more

and different kinds of data than by using just one approach. This type of studies can emphasise one approach over the other or give each approach roughly equal weight (Fraenkel and Wallen, 2006).

Whatever approach or style of research is adopted, it is important that the validity and applicability of results and conclusions are appreciated and understood. Researchers however take account of the fact that there are workload and timescale implications in such a choice (Davies, 2007). Apart from that, it depends on the nature of the questions they are seeking to answer. In large-scale projects, investigators may use a circular sequence in which exploration is followed by measurement, which is in turn followed by a qualitatively analytical phase in order to throw more light on aspects of the scientific findings (Davies, 2007).

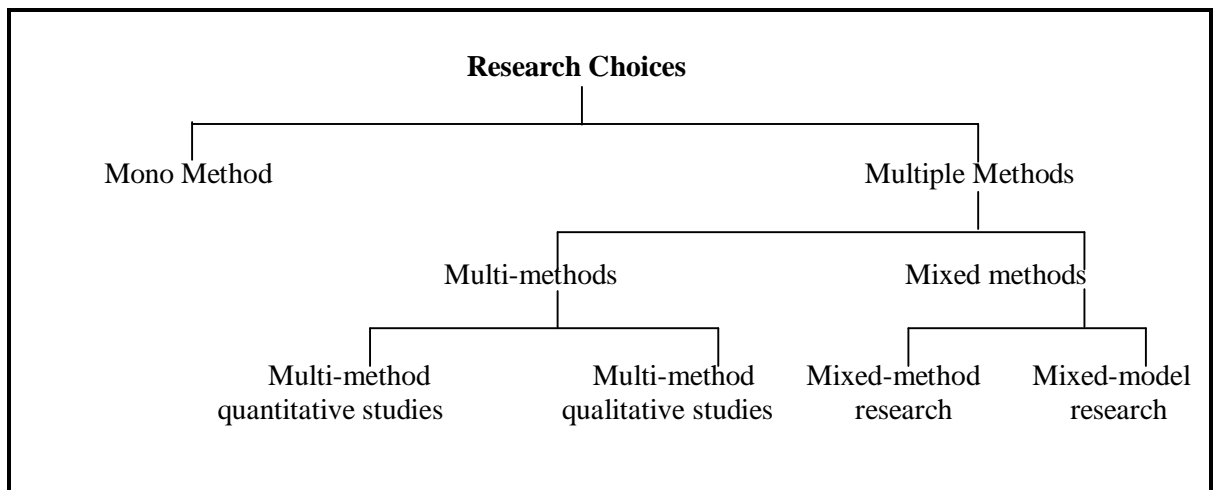


Figure 4.4: Research Choices (Saunders et al., 2007).

4.3.5 Data Collection

Data collection is a communication process, which involves transfer of data from one person to another (from researcher to respondent) and data gathering (vice versa) (Fellows and Liu, 2008). There are many ways to obtain information for research such as consulting experts, reviewing books and articles, asking people questions or observing colleagues with relevant experience (Fraenkel and Wallen, 2006; Schmuck, 2006; Gibson and Brown, 2009). The most important aspects to be considered in choosing the method

of data collection is whether they are appropriate to the research topic and how each method can be used. Most research methods are based on either qualitative or quantitative approaches (Silverman, 2008a), as shown in Table 4.3. The suitability of all the methods for the research approaches is also included in the table.

Table 4.3: Data Collection Methods.

Method	Approaches	
	Quantitative	Qualitative
Observations	Preliminary work such as prior to framing questionnaire.	Fundamental to understand another culture.
Textual Analysis	Content analysis such as counting in terms of researchers' categories.	Understanding participants' categories.
Interviews	'Survey research', mainly fixed choice of questions to random samples.	Open-ended questions to small samples.
Transcripts	Used rarely to check accuracy of interview records.	Used to understand how participants organise their talk and body movements.

Fellows and Liu (2008) state that methods of collecting data, generally, may be categorised as either one-way or two-way communications. One-way communication, for example, is postal questionnaires (survey approach), completely structured interviews, diaries, archives or documents and observations by researchers. One-way methods mean either acceptance of data provided or their rejection, clarification, checking and others. Two-way communication such as semi-structured interview and participant observation permits feedback and gathering of further data by probing (Fellows and Liu, 2008). Details of each example from both one-way and two-way communications are discussed as follows:

4.3.5.1 Surveys / Questionnaires

Surveys are usually used to gather information from large numbers of people (Fraenkel and Wallen, 2006; Fink, 2008; Gibson and Brown, 2009). A face-to-face also known as

personal interview, telephone, mail survey, email and web-based or electronically distributed surveys are examples of survey techniques (Fraenkel and Wallen, 2006; Fink, 2008). The purpose of using a survey is that it produces information and describes the characteristics of a population (Fraenkel and Wallen, 2006; Fellows and Liu, 2008). However, because populations tend to be too widespread and large for a full population survey to be possible, it is usual for surveys to employ sampling so that the size structure of the sample is sufficient to yield enough reliable data for inferences to be drawn about the population at a required and specified level of confidence. The objective is statistical validity.

Much research in social sciences and management spheres involves asking and obtaining answers to questions through surveys of people using questionnaires, interviews and sometimes case studies. Survey techniques such as questionnaires and interviews are highly labour intensive on the part of respondents and particularly on the part of the researcher. This method can also give bias and distortions because respondents give answers, which they believe should be given rather than providing true answers. They give answers to please the researcher, which could well be self-perceptions by the respondents (Fellow and Liu, 2008).

A questionnaire, as an example of survey techniques, is a printed list of interrogative or declarative statements that individuals respond to in writing (Schmuck, 2006). It works best with standardised questions that the researcher can be confident will be interpreted the same way by all respondents. Questionnaires can therefore be used for descriptive and explanatory research, to collect data about opinions, behaviours and attributes (Saunders et al., 2007). The questions are of two forms: open and closed questions (Schmuck, 2006; Fellows and Liu, 2008).

Open questions are designed to enable the respondent to answer in full, to reply in whatever form with whatever content and to whatever extent the respondent wishes (in interviews, the researcher may probe). The questions are easy to ask but may be difficult to answer, the answer may never be filled in or completed and often the answers are very difficult to analyse. It is essential that the answers to open questions are recorded (Fellows and Liu, 2008). Closed questions have a set number of responses as determined

by the researcher. However, the rigidity of available responses may constrain the responses artificially. Hence a response opportunity of ‘other, please state’ should be provided wherever possible for cases which are not relevant to respondents (Fellows and Liu, 2008). Although the technique speeds respondents through the survey and maintains relevance of the questions answered, extensive use of filter questions can be annoying. The questions should be unambiguous and easy for respondents to answer. Questions concern facts, knowledge and opinion (Fellows and Liu, 2008). Advantages and disadvantages of questionnaires are shown in Table 4.4 below.

All questionnaires should be piloted initially, completed by a small sample of respondents. The piloting will test whether the questions are intelligible, easy to answer and unambiguous, through obtaining feedback from respondents (Saunders et al., 2007; Fellows and Liu, 2008). There will be an opportunity for improving the questionnaire, filling in gaps and determining the time required for and ease of completing the exercise (Fellows and Liu, 2008).

Table 4.4: Advantages and Disadvantages of Questionnaires (Schmuck, 2006)

Advantages	Disadvantages
Open-ended questions can be created easily and quickly.	Responses to open-ended questions can be ambiguous or unclear.
Respondents can complete questions quickly.	Analysis of open-ended responses takes time.
Open-ended responses offer rich quotations that are useful for data feedback.	If questions with rating scales include two or more ideas, results will be unclear.
Questions with rating scales can be scored quickly and results can be clearly presented in graphic tables and figures.	Researcher has little opportunity to establish trust and rapport with respondents.

4.3.5.2 Interviews

Schmuck (2006) states that interviews are oral conversations, which bring to the meaning of interviewers, pose questions to interviewees. Patton (2002) mentions that interviews are open-ended questions and probes, which yield in-depth responses about people’s experiences, perceptions, opinions, feelings and knowledge. The purpose is to research

other persons' world (their views, behaviour and characteristics) and try to describe in depth and reveal details of other people's experiences. Interviews differ in how informal and formal they are (Schmuck, 2006). They can be structured, semi-structured and unstructured. Differences in all of them are the constraints placed on the respondent and the interviewer (Fellows and Liu, 2008). A recorder is needed for recording interview session as it can be an instrument to assist researchers in saving data received from interviewees (Schmuck, 2006; Fellows and Liu, 2008) but interviewee consent is needed on this.

Structured interviews mean that the interviewer administers the questionnaires and perhaps by asking the questions and recording the responses. The interviewer has little scope for probing those responses by asking supplementary questions to obtain more details and to pursue new and interesting aspects. Semi-structured interviews involve some probing of a list of topical areas on which the respondent's views are recorded. In unstructured interviews, the interviewer introduces the topic briefly and records the replies from interviewees or respondents (Fellows and Liu, 2008; Gibson and Brown, 2009). Table 4.5 shows advantages and disadvantages of interviews.

Table 4.5: Advantages and Disadvantages of Interviews (Schmuck, 2006)

Advantages	Disadvantages
Researcher can probe for clarification and elaboration.	Time consuming (i.e., lengthy process involved in transcribing voice recordings or audiotapes).
Researcher can build rapport and closeness with respondents.	Challenge of proper sampling arises when everyone cannot be interviewed.
Researcher can help in collecting data from respondents who cannot or will not write about their thoughts and feelings.	Lack of respondents' haziness.
Respondents are secret when they pool answers outside earshot of researcher.	Researcher physical characteristics and social position may lead to bias in respondents' answers.
Data can be gathered using voice recorders or audiotapes: permanent record for others to use.	Respondents may fear that what they say will be used against them.

4.3.5.3 Observation

Observation involves noting how people act or how things look in a specific setting (Fraenkel and Wallen, 2006; Schmuck, 2006). It is a fieldwork description of activities, behaviours, actions, conversations, interpersonal interactions, organisational or community processes or any other aspects of observable human experience (Patton, 2002; Fink, 2008). Observational research requires the researcher to collect data or participate with others in data collection. It involves the researcher in analysis and interpretation of those data (Patton, 2002).

There are two types of observation: participant observation and structured observation (Schumck, 2006; Saunders et al., 2007). Participant observation is where researchers participate in the situation or setting they are observing (Fraenkel and Wallen, 2006; Saunders et al., 2007). Opposite to this is non-participant observation, where researchers do not participate in the activity being observed but rather sit and watch. It means that researchers are not directly involved in the situation they are observing (Frankel and Wallen, 2006). The other type of observation is structured observation, which is concerned with the frequency of events. It is characterised by a high level of predetermined structure and quantitative analysis (Saunders et al., 2007). Table 4.6 shows advantages and disadvantages of observation.

Table 4.6: Advantages and Disadvantages of Observation (Schmuck, 2006)

Advantages	Disadvantages
Researcher can gain data on behaviours rather than perceptions and feelings.	Researcher’s presence can alter respondents’ behaviour.
Researcher can see things that some respondents will not be able to report.	Researcher might have to wait a long time before seeing what they can see and get what they observe.
Data can be gathered using video.	Different researchers might see different things while observing same events.

4.3.5.4 Documents

Written materials and other documents from organisational, clinical or programme records, memoranda, correspondence, official publications and reports, personal diaries, letters, artistic works, photographs and memorabilia and written responses to open-ended surveys are documents used in undertaking research. Data consist of extracts from documents captured in a way that records and preserves context (Patton, 2002). Table 4.7 shows advantages and disadvantage of documents.

Table 4.7: Advantages and Disadvantages of Documents (Schmuck, 2006)

Advantages	Disadvantages
Data unaffected by researcher presence.	Records or documents might be incomplete or collective in biased ways.
Historical events can be studied objectively.	Difficult to check on validity of information.

Whatever methods are adopted in conducting a research project, it is important that they are implemented as rigorously as possible to try to avoid bias and to obtain appropriate amounts of accurate data (Fellow and Liu, 2008).

4.3.6 Data Analysis

Analysis is always ‘about’ something or ‘of’ something and the ‘thing’ that it is ‘about’ or ‘of’ is fundamental for understanding how that analysis works and it refers quite specifically and narrowly to systematic procedures followed in order to identify essential features and relationships (Gibson and Brown, 2009). Data gained from instruments or methods of data collection need to be analysed. It is appropriate to begin analysis by examining raw data and then using scatter plots to search for patterns. A pattern or relationship may be found from the review of theory and literature. This is for the case of one where it may have been hypothesised. For fundamental studies where theory and literature do not exist to any great degree, the search for patterns and relationships in the data and the identification of major variables may constitute the total analysis for the research project (Fellows and Liu, 2008). For data sets in topics, which have an extensive

body of theory and literature, it is good to search the data for themes and categories. The researcher must be prepared to discover differences in the data from what theory and previous findings suggest will occur. Changes over time should be expected and data collection methods and analysis must be sufficient to detect the changes (Fellows and Liu, 2008). Data gained can be processed and analysed in two ways: quantitatively and qualitatively (Saunders et al., 2007, Fellows and Liu, 2008).

4.3.6.1 Quantitative analysis

Data for quantitative analysis can be collected and subsequently coded at different levels of numerical measurement. Data can be entered for computer analysis (Saunders et al., 2007; Fellows and Liu, 2008). With few exceptions, all data should be recorded using numerical codes to facilitate analyses and, where possible, the researcher should use existing coding schemes to enable comparisons. Apart from that, codes for all data values including missing data should be entered and data must be checked for errors. Results from analysing data can be explored using tables and diagrams (Saunders et al., 2007). The Statistical Package for the Social Sciences (SPSS) is an example of tools used in analysing data gathered in research (Fellows and Liu, 2008).

4.3.6.2 Qualitative analysis

Data for qualitative analysis are known as non-numerical data and do not need to be quantified. This type of data results from the collection of non-standardised data that require classification and are analysed through the use of conceptualisation (Saunders et al., 2007). Fellows and Liu (2008) state that analysis of qualitative data can be difficult. This is because it needs to be handled systematically. Methods include strategies for analysing talk and text, structured techniques for the interpretation of observed behaviour and the use of computer software programs to reduce some of the repetitive tasks that qualitative methods can require (Davies, 2007). The process of qualitative analysis involves the development of data categories, allocating units of the researcher's original data to appropriate categories, recognising relationships within and between categories of data and developing and testing propositions to produce well-grounded conclusions (Saunders et al., 2007; Fellows and Liu, 2008). The use of computer-assisted qualitative data analysis software (CAQDAS) (Saunders et al., 2007) and Nvivo software can help researchers during qualitative analysis.

4.4 ADOPTED RESEARCH METHODOLOGY

As mentioned earlier in section 4.3, this research uses the research ‘onion’ to develop its methodology. The research onion has been chosen as it shows research methodology as layers moving progressively inwards from research philosophies to approaches, strategies, choices, techniques and procedures, which include data collection and analysis, in a structured proper manner. Apart from that, it puts everything in sequence and shows every element that needs to be considered in the methodology of research in a graphic way. The research ‘onion’ makes items easy to understand by researchers. Based on references to the layers of the research ‘onion’, the methodology of the research is shown in Table 4.8.

Table 4.8: Research methodology Adopted

Research Methodology Adopted	
Item	Choices
Research Philosophy	Interpretivist and functionalist paradigm
Types of Research	Exploratory
Research Approaches	Inductive / Qualitative approach
Research Design	Interview Strategy
Research Choices	Mono method (Single method)
Data Collection	Literature review and semi-structured interviews
Data Analysis	Qualitative analysis

The research philosophy combines the interpretivist and functionalist paradigms. The research is developed to understand differences between human perceptions (as social actors) in different places in studying a similar topic. It makes suggestions for better implementation of the performance measurement processes based on study of two countries’ current performance measurement process in organisations of the construction industry.

This research adopts qualitative approaches in collecting data as well as in analysing them to produce results. Qualitative research is chosen because it gives more freedom for

the researcher to go in-depth into the topic of study. Qualitative findings are longer, more detailed and variable in content. However, analysis of qualitative data could be difficult because responses are neither systematic nor standardised (Patton, 2002). Respondents' perceptions tend to be different even though they are in the same group. Qualitative data analysis is a search for general statements about relationships and underlying themes (Gibson and Brown, 2009). The qualitative data analysis involves creativity, intellectual discipline, analytical rigour and a great deal of hard work (Patton, 2002). Qualitative data come from open-ended questions and reviews. The data may be summarised into individual narratives or the content of the data may be analysed to find common thoughts among the answers produced by groups of individuals (Fink, 2008).

This research begins with an exploratory study based on literature to identify the existing studies on performance measurement in general and in construction in particular. A literature review has been made of the performance measurement concept, which includes definitions, its importance, criteria, tools and models. Sources of literature are books, journals and conference papers.

In addition to the critical analysis of the literature on the theoretical data of performance measurement, the current study uses semi-structured interviews as an approach to gain information from the construction industry. This gives the researcher an opportunity to explore answers more deeply or other areas of discussion introduced by the interviewees. Semi-structured interviews mainly consist of open-ended questions based on topics needing to be covered in the interview (Barbour, 2008). The semi-structured interviews were selected as a style of interviewing for this research as they give form to the interviews whilst allowing probing (Bassioni et al., 2005; Fellows and Liu, 2008). The same method (semi-structured interviews) was used by Butcher and Sheehan (2010) to gather information from construction customers, who were senior within the customer organisations, on what excellent contractor performance meant to them as customers.

Data from the literature and results from the interviews were brought into the development of a new framework for performance measurement. The framework, to be named 'Performance Measurement Migration Path' contains performance measures and key elements derived from the BSC and EFQM Excellence Model criteria. The purpose

of developing the framework is to guide organisations in the processes of performance measurement implementation. Apart from that, the framework demonstrates steps that can be followed in performance measurement processes. The migration path technique is used as it meets the purpose of research. The technique assists organisation in structured manner in undertaking performance measurement process, which involves different levels of people and processes in organisations. The technique is used to integrate components and elements to be taken into consideration in the performance measurement process. They are linked with the steps that can help these variables in carrying out performance measurement until the organisation achieves the results desired.

The complete framework then was tested and evaluated by industry players in both the UK and Malaysia to determine whether the framework can provide efficient information and services to its users. Data were obtained from semi-structured interviews. Evaluation means the acquisition and assessment of information that provides useful feedback and responses about something or objects, for example a programme, an object or a product and activity (Trochim, 2006). A literature review on evaluation concepts was also made. Table 4.9 shows the research methods and their connection with research activities discussed previously. After the table, details are given for discussing the research activities as well as methods used for data collection, showing how objectives of research could be achieved.

Table 4.9: Research Methods of this Research

No.	Activities	Data Collection		Data Analysis
		Literature Review	Semi-structured Interview	Content Analysis
1	Review performance measurement concepts.	√		
2	Explore current performance measurement practices within organisations in construction industry of UK and Malaysia.		√	√

No.	Activities	Data Collection		Data Analysis
		Literature Review	Semi-structured Interview	Content Analysis
3	Develop framework for implementing performance measurement.	√	√	√
4	Evaluate and assess framework.		√	√

This section will discuss the methods used and applied to achieve the research objectives. The discussion is under the following headings:

- Literature Review
- Current Performance Measurement Studies Using Semi-structured Interviews
- Development of Framework for Implementing Performance Measurement
- Development of Evaluation Methodology

4.4.1 Literature Review

Saunders et al. (2007) state two reasons for reviewing the literature. First, it is a preliminary search that helps a researcher to generate and refine research ideas. Second, it is part of research work, meaning that it is essential. Fellows and Liu (2008) mention that a literature review provides readers with a summary of the ‘state of the art’, the extent of knowledge and the main issues regarding the topic which inform and provide a rationale for the research which is being undertaken. A research literature review must be a highly systematic, explicit and reproducible method for identifying, evaluating and synthesising one or more studies or reports that make up the existing body of completed and recorded work about programmes and work produced by researchers and scholars (Fink, 2008).

For this research, the literature review involved a detailed review of performance measurement concepts in general as well as in construction. Definitions, importance, tools and models of performance measurement and its use in industries including in construction were selected, reviewed and discussed. The literature review was conducted to achieve Objectives 1 and 2 of the research and was presented in Chapters 2 and 3. The primary data came from books, journal articles, international conference and seminar papers and materials available on the Internet. The extensive literature review was a continuous process until the end of the research.

4.4.2 Current Performance Measurement Studies Using Semi-structured Interviews

The current studies in the construction industry are an important step in the development of a new framework for this research and are made to achieve Objectives 2 and 3. A set of semi-structured interview questions has been produced to obtain data on the current studies of performance measurement within organisations in the construction industry. The interviews took place in two countries, the UK and Malaysia, with key personnel in large organisations involved in the process of creating and developing organisation strategy and performance measurement activities. The key personnel are Chief Executive Officers (CEO), Managing Directors, Senior Managers and Heads of Department or Units in organisations. The detailed semi-structured interviews with participants in both countries were in one-to-one or face-to-face settings. Twelve large construction organisations related to building, civil work and services were involved, six from each country. Two countries were chosen in order to identify the differences or gaps in implementing performance measurement for running businesses, to understand the loop from performance measurement and to identify the needs of both countries in performance measurement practices for organisations. Additional information about the organisations was gathered from organisational websites and reports given by the participants.

Questions asked were on current approaches of performance measurement within organisations, performance measurement processes, performance measurement tools and models and connections between strategy and performance measurement, as well as

potential improvements in implementing performance measurement. The purpose of the interviews in the two countries was to understand the implementation in organisations and identify the differences, which could be advantages or disadvantages or lack in implementing performance measurement by both countries. Lessons learnt from each other in performance measurement help more effective implementation. Comparison of both leads to the development in this research of a new framework for implementing performance measurement. As mentioned in Chapter 1, development of the framework is proposed as it is a method to assist organisations in implementing performance measurement in a proper structured manner. It shows step by step what organisations should do in the implementation process. Some elements or criteria, identified for making the implementation process in each step, are easy to run and follow by organisations. Data from respondents or interviewees were recorded during the interview sessions and then analysed. All the data obtained from the respondents were direct transcriptions, which involved checking all data by listening to the recordings (voice recorder) as the researcher read them (Patton, 2002).

Qualitative content analysis was applied to the data. Content analysis is the process of systematically reviewing, analysing and interpreting data from open-ended questions, observations and records from all types of human communication (Fink, 2008). It is used to determine the main facets of a data set by simply counting the number of times an activity occurs and a topic is mentioned (Fellows and Liu, 2008). Fink (2008) states that a content analysis relies on trained personnel to search the data from consistently occurring 'themes'. It is a tool used to determine the presence of certain words or concepts within texts or sets of texts.

A pilot study was also carried out for the interview questions, which resulted in their further refinement and improvement. The pilot study was carried out with a small number of people involved in construction practices and researchers who are academics, research associates and managers in the construction organisations. The academics were lecturers in the area of construction management from both countries, the UK and Malaysia and the research associates were among researchers in the department of civil and building engineering of Loughborough University, UK who had undertaken a variety of researches in the construction management. Some of the researchers involved in the pilot study have

had experience working in the industry either in the UK or in their native countries (Malaysia, India, Sri Lanka, China and Kenya). Meanwhile, the managers involved came from different organisations in the two countries, Malaysia and the UK. A senior manager from the public works department in Malaysia and others from construction organisations in the UK were also among the practitioners involved with the study. They were informed of the purpose of the questions and the research being undertaken before the pilot study. The purpose of the latter was to validate the questions and to check whether they were applicable and suitable for gaining data from the industry for the purpose of the research. Feedback received from the participants has been used to improve the interview questions.

The interview questions were pre-issued and sent to the respondents in order to allow them to think over the questions and be more prepared in their responses during the interviews. Butcher and Sheehan (2010) state that the purpose of pre-issued questions for the purpose of interviews of participants or respondents is to allow them to gather their thoughts about the subject in advance of the interview.

4.4.3 Development of Framework for Implementing Performance Measurement

The development of the framework was based on data from the literature review on developing migration path as well as the detailed semi-structured interviews. Apart from that, the development was referenced to inherent models generated in industry. The initial concept of the new framework was based on the Capability Maturity Model (CMM). CMM has been developed to improve software systems and introduced for implementation in the computerising of industry (Paulk et al., 1993). Added to that, reference has also been made to similar frameworks developed in the construction industry. Fewer references can be made to the construction industry on the related framework. In developing the framework, the BSC and EFQM Excellence Model concepts were taken into account. Both are tools in performance measurement. Details for the framework were taken from the EFQM Excellence Model.

As have been mentioned before, the framework was developed with the aim to guide and assist organisations in implementing and practising performance measurement in a

structured, step by step manner. When organisations succeed in implementing the framework, the organisations will see positive results of their performance based on the process in implementing performance measurement. Criteria taken into consideration were the facility and suitability of the framework to be accepted and used by organisations in the construction industry and the ability of the framework to help launch performance measurement in organisations.

A set of assessment questions based on literature review on performance measurement and data from the current studies in both countries has been produced as part of the framework. The assessment questions, consisting of 'Yes' and 'No' answers, were developed to assess organisational success in fulfilling key aspects of each level in the framework. It acts as indicator to achievement of an organisation in implementation performance measurement, which is from primary or low level to the highest level, based on the usage of the framework. The assessment questions were then distributed to directors and managers of large organisation in the construction industry for evaluation, together with the framework.

4.4.4 Development of Evaluation Methodology

A good research must be available for evaluation. Evaluation means that the findings of the researcher can be observed, replicated and tested or verified by others (Fellows and Liu, 2008). Results from evaluation can then be used to refine and improve research (Carrillo et al., 2003). There are two types of evaluation: formative and summative. Patton (2002) and Trochim (2006) describe formative evaluation as being to strengthen or improve the object being evaluated. Summative evaluation is used to examine the effects or outcomes of some objects (Trochim, 2006). For this research, summative evaluation was used to assess the framework for its effectiveness in terms of its content, capability and usability.

For the evaluation in this research, the same method to obtain data for current studies of performance measurement is used. The proposed framework is evaluated through a series of expert interviews. A set of evaluation questions was compiled and distributed to directors and managers involved in performance measurement processes. These

personnels were from large organisations in the construction industry in both countries, the UK and Malaysia, similar to the stage of gathering data for current studies of performance measurement. The questions were related to content, effectiveness, capability and use of the framework. To obtain feedback from the framework, one-to-one detailed semi-structured interviews were held with users in the UK. Some of this feedback was obtained by telephone. The same approach was used with participants in Malaysia. All users were provided with the information about the proposed framework and assessment procedures prior to the interviews. Twelve organisations in the UK and Malaysia were involved in the evaluation of the framework. Out of the twelve organisations, eleven are industry practitioners in the UK and Malaysia and one is a UK consultant on business performance and excellence. All organisations from the construction industry are large and undertake performance measurement in their businesses. Another organisation is a consultant company that has a role of helping and assisting organisations including construction organisations, in implementing performance measurement and measuring business performance. Selection of evaluators may be made based on their impartiality and expertise in the area of the research made (Bamberger et al., 2006). After that, all data were recorded and transcribed. The evaluation was made in both countries to seek views and suggestions from experts in performance measurement on the usability and capability of the framework to be implemented in organisations. The data were used as well for framework improvement.

4.5 SUMMARY

This chapter has reviewed, described and presented research philosophies, research approaches, research strategies, research choices, time horizons, research techniques and procedures, as well as methods of data collection and data analysis for use in the research. The inductive or qualitative approach was adopted to carry out this research project. The qualitative approach was used for gathering data for analysis. This chapter also described in detail the methodology and methods adopted for each task during the research. This includes literature review on performance measurement, current studies on performance measurement using semi-structured interviews, development of a framework and methodology of evaluation for the framework. The process of undertaking semi-

structured interviews for current studies in the industry will be the focus of the following chapter.

The next chapter will discuss in detail the current studies of performance measurement based on semi-structured interviews in the UK and Malaysia.

CHAPTER 5

CURRENT APPROACHES TO PERFORMANCE MEASUREMENT

5.1 INTRODUCTION

The previous chapter explained how this research was conducted; this chapter now explores current performance measurement practices in the construction industry. The intention of the chapter is to give a clear understanding of current approaches in two countries: the United Kingdom (UK) and Malaysia. It therefore describes data from both countries on implementing performance measurement in organisations. Critical data analysis has been made and is discussed in this chapter. Data include respondents' background, knowledge and understanding, the process, tools and models used, relationship between performance measurement and strategy development, challenges to its implementation and potential improvements. Added to that is a consideration of ways of helping organisations in their measurement of performance. A summary closes the chapter.

5.2 OVERVIEW OF PERFORMANCE MEASUREMENT IMPLEMENTATION IN THE UNITED KINGDOM (UK) AND MALAYSIA

Performance measurement is practised by most large organisations in the construction industry. The UK Government initiated the Latham Report in 1994 and the Egan Report in 1998; both reports recommended improving business performance of the construction industry. Since then, many organisations in the UK have been aware of performance measurement needs for their businesses (Khalfan et al., 2001; Latiffi et al., 2009).

In Malaysia, performance measurement is not a new thing for industries, including construction. The concept has grown since the former and fourth prime minister, Tun Dr Mahathir Mohamad, announced the aim to declare Malaysia a developed country in the

year 2020 (Mohamad, 1991). Many organisations from various sectors of industry have since become aware of performance measurement as they believe it can bring organisations to an international level in line with Vision 2020. This world-class organisational status could be attained due to involvement with international projects, which encourages enlarged businesses and growth in markets. Even though industries are aware of it, there is no standard or guidance for industry for its implementation of performance management. For that reason, many organisations do not consider measuring performance to improve business and mitigate risks. As globalisation is a dream of success for all types of organisations including construction, performance measurement is implemented by those who recognise the benefits to be gained. From time to time, many construction organisations have implemented and are implementing performance measurement as an additional way to improve and sustain business in the long term.

The Construction Industry Master Plan (CIMP) 2006 – 2015 is an initiative by the Construction Industry Development Board (CIDB) to improve the performance of the Malaysian construction industry over a ten year period. The CIMP will be able to chart the course for government agencies and the private sector involved in construction directly or indirectly. More importantly, it will accommodate a methodology for self-evaluation and evaluation of the performance of the industry with respect to some of the key performance indicators as outlined therein. The CIMP has been developed with the intention to rectify the weaknesses such as low productivity of organisations competing to gain international projects and less capability to undertake international projects and to improve the industry's performance and its image (Sundaraj, 2007; Chan, 2009).

5.3 DATA ACQUISITION FROM UK AND MALAYSIA

Data on current performance measurement practices in both countries were collected. These were based on interviews in twelve large organisations, six from each country, which were involved in building and civil work and services. The UK organisations were taken from a list of Top 150 Contractors and Housebuilders, categorised by turnover in 2008 (Building, 2008). All Malaysian organisations are listed as G7 Class, as categorised

by the CIDB in the year 2008. G7 under CIDB means the organisation can be awarded projects of unlimited value, starting from as low as RM 100 thousand up to billions (CIDB, 2010). All organisations have either recently implemented performance measurement or implemented it more than two years ago.

For the purpose of the current studies of performance measurement, invitations were sent to potential participants in the categories as described by post, email and telephone. All invitations had a set of interview questions attached for reference. Because of time constraints, a time limit was fixed for accepting responses from potential participants. As a result, twelve organisations, which all implemented performance measurement activities, agreed to participate in the current studies.

Brief information on the participants' background is shown in Table 5.1. Interviews took place in the two different countries in order to identify the differences in implementing performance measurement for running businesses to understand the loop from performance measurement and identify the needs of both countries in performance measurement. In the table, UK1 to UK6 are representative participants from the UK and M1 to M6 are those from Malaysia.

All participants involved in the study are managerial level staff in organisations. They have had experience in performance measurement for many years (only one with just two years' experience) in the industry. These senior managers are responsible for the development of performance measurement in their respective organisations. They are also involved directly in arranging, managing, implementing and evaluating organisations' performance.

Table 5.1: Background of Participants.

No.	Organisation	Discipline	Role	Performance Measurement Experience (years)
UK				
1	UK1	Contractor	Process Improvement Manager	10
2	UK2	Contractor	Head of Business Excellence	26
3	UK3	Contractor	Performance Improvement Director	22
4	UK4	Infrastructure Services	Business Improvement Director	2
5	UK5	Contractor	Business Improvement Manager	7
6	UK6	Contractor	Director of Strategy Development	25
Malaysia				
7	M1	Contractor and building consultant	Technical Director	> 10
8	M2	Contractor	Executive Director	11
9	M3	Contractor	Senior Manager	14
10	M4	Trading services	Chief Executive Officer (CEO)	12
11	M5	Contractor	Chief Executive Officer (CEO)	20
12	M6	Mechanical and electrical services	Managing Director	28

Semi-structured interviews were conducted with the participants to assess their construction organisational experience and understanding of performance measurement. One-to-one semi-structured interviews using a set of questions, developed from the extant literature, took place with all participants in their office. Topics covered included reasons for implementing performance measurement, the processes, tools and models used and the connection between strategy development and performance measurement, challenges

to implementing performance measurement and approaches to addressing them. The interview questions can be referred to in Appendix A. Most of the interviews lasted at least an hour and a half and all were recorded by agreement and transcribed for data analysis.

Pilot interviews with academics, research associates and managers in the construction organisations took place in both countries before the actual interviews. The UK pilot interviews were held in the Department of Civil and Building Engineering, Loughborough University. The ones in Malaysia were by telephone, made in the same department stated before. The purpose was to examine whether the interview questions were well developed and suitable for obtaining data for the study. Fellows and Liu (2008) mention that piloting will test whether the questions are intelligible, easy to answer, unambiguous and will obtain feedback from respondents.

The information gathered from the interviews was then analysed, evaluated and presented to produce accurate findings relevant to the objectives of the research.

5.4 OBJECTIVES OF INTERVIEWS

The interviews are a major part of the data collection for this research and had four objectives:

1. To identify knowledge and understanding of performance measurement in construction organisations.
2. To assess current practices and effectiveness of performance measurement in construction organisations.
3. To identify performance measurement tools and models used in the organisations.
4. To identify the connection between performance measurement and strategy development.

5.5 INTERVIEW QUESTIONS

To obtain feedback from practitioners on current practices of performance measurement in organisations in the construction industry, a set of interview questions was developed. The development of the questions was based on the aim and objectives of the interview stated above. All participants received and responded to the same questions in four parts, as follows:

- **Part 1: Respondents' Background**

The aim of this part was to elicit information on respondents' background. It requested information on working experiences of participants in the organisation, role in performance measurement and years of involvement in performance measurement.

- **Part 2: Current Approach of Performance Measurement within Organisation**

This part required knowledge and understanding of performance measurement and assessed current practices and effectiveness of performance measurement in participants' organisations. It covered development of performance measurement practices in organisations such as understanding of performance measurement and resources for performance measurement.

- **Part 3: Performance Measurement Processes**

This part required information from participants on evaluating performance measurement in organisations. It covered processes of their performance measurement, performance criteria measured as well as indicators of performance measurement results.

- **Part 4: Performance Measurement Tools and Models**

This part covered selection of performance measurement tools used including types of the tools used. The aim of this part was to evaluate the performance measurement tools and models used in organisations.

- **Part 5: Role of Strategy**

This part covered the relationship and connection between performance measurement and strategy development.

- **Part 6: Potential Improvements**

This part required information on participants' experiences of the barriers to implementing performance measurement and ways of improvements. Justification on negative and positive impact of performance measurement on organisations is covered in this part.

Responses received constituted qualitative feedback. The following section is a discussion of the outcome of the interviews.

5.6 DISCUSSION ON DATA FROM INTERVIEWS

The interviews were used to investigate the knowledge and understanding of organisations in both the UK and Malaysia on performance measurement, their performance measurement processes, the tools and/or models used to assess performance of organisations, the challenges faced when implementing performance measurement and the approaches adopted to tackle the challenges. Data from the interviews on these aspects are now discussed in the following sections.

5.6.1 Current Approaches of Performance Measurement in Organisations

The aim of this part is to identify knowledge and understanding of performance measurement and assess current practices and the effectiveness of performance measurement in organisations. Generally, all participants shared a similar understanding that performance measurement was to 'improve business' and 'maximise profits'. 'Improve business' was used in the sense of making improvement in the process of projects and overall organisational business. As Beatham (2003), Robinson et al. (2005) and Santa et al. (2006) claim, performance measurement is a way to improve performance. Added to that, Kulatunga et al. (2007) mention that with performance measurement, productivity of organisations could be increased and business improvement could be even better in the future. Performance measurement helps in identifying weaknesses and decision-making processes (Wettstein and Kueng, 2002).

Two participants from the UK mentioned that performance measurement is an ongoing process in their organisations. It is involved in the process of planning, operations and review.

UK1 stated,

'Performance measurement is used as it gives information in improving organisation's businesses. We required it in planning, operational and review processes'.

And another UK participant (UK2),

'Here, performance measurement is a cycle. We used it to identify weaknesses that need to be improved in all processes, starting from inception phase until the completion phase'.

Furthermore, all participants believed that performance measurement is an approach to maximise opportunities for organisations and mitigate risk. All participants also agreed that performance measurement has benefits rather than a negative impact on an organisation. The benefits gained from performance measurement of participants are listed below and they are based on the experience of the performance measurement process in organisations and knowledge of performance measurement:

- Identifying potential areas to be improved by organisations.
- Improving productivity in work.
- Assisting in managing projects, knowing what can help to deliver projects (what gets measured, gets done).
- Managing resources such as providing guidance in planning resources to be used in undertaking projects, running the business, as well as for future business plans. Resources here mean financial, staff and materials.

- Enhancing organisational reputation and market position by making it sustain and increase the potential of the organisation in business. Performance measurement is used to attract future investment, increase share value and create high quality employees (Kagioglou et al., 2001).
- Improving employers' efficiency in delivering their tasks.
- Reflecting high passion of staff in commitment to their organisations.

UK participant (UK1) remarked,

'It allows us to manage our resources...it allows you to make quality decision-based'.

A Malaysian participant (M1) said,

'We used it for helping us to identify weakness in business that needs to be improved and to give direction for the future to our businesses.'

Furthermore, all participants agreed that performance measurement helps them in the process of creating and developing strategies for their organisations. They mentioned that performance measurement is involved in the beginning stage of developing the strategies. It is used as a tool at the stage of formulating strategy (Baldwin et al., 2001; Yu et al., 2007; Kulatunga et al., 2007),

Another comment from a Malaysian participant (M6) was,

'It is necessary for you to measure your performance. It does not really matter how you measure it. It is about knowing where you are and where you want to be and put them in the action plan'.

This illustrates that how to measure performance is not a major issue but what matters most then is that using performance measurement would guide organisations in identifying organisational needs for strategy development.

Apart from that, some participants in the UK and Malaysia mentioned that resources are allocated for implementing the performance measurement process in organisations. Examples of the resources are people and finance, as well as technology. The purpose of planning resources for performance measurement is to make sure that the process of implementation will run smoothly.

One participant from the UK (UK3) explained,

'An accounts department has a computerised system as support to performance measurement activities in the organisation'.

Another participant from the UK (UK2) stated,

'We increase the use of technology for performance measurement implementation. Apart from that, we have people that are capable and well understand it in running performance measurement'.

Added to that is a statement by one participant from Malaysia (M1) that,

'We appointed an expert, a consultant, for assisting this company in identifying its performance in business. The appointment of the consultant who is an expert in this is because we are not capable to assess and evaluate our business performance yet as this company is still new in performance measurement but this is temporary as the company will conduct performance measurement activities when it is ready'.

One participant from Malaysia (M5) mentioned that his organisation did not reserve or divide present resources for the performance measurement process. He explained that even though the organisation is really ambitious and keen to implement performance measurement, it is not worth allocating money to implement it. The most important thing that needs to be considered in implementing performance measurement is the understanding and readiness of organisations to implement it instead of looking at resources as the first thing to be considered.

Malaysia participant (M5) explained,

'No particular amount is allocated for the purpose of performance measurement implementation. Staff responsible for performance measurement processes knows what they have to do'.

Based on the interviews, there are some similarities in current practices of performance measurement in organisations in both countries. Similarities were in the knowledge and understanding of performance measurement. Performance measurement has brought positive impacts and benefits to organisations by maximising profits and improving organisations' performance to be better in the future. Apart from that, allocating resources such as people (staff from organisations or experts from outside organisations in assisting implementation of performance measurement) are required for making the performance measurement process run smoothly, even though one of the participants from Malaysia does not see the importance of doing it.

Regarding maturity of implementing performance measurement in organisations, Malaysia is shown to be lagging behind in comparison to the UK, even though awareness of the importance of implementing performance measurement for businesses emerged eight years ago and it was embraced again by CIDB in 2006. This is happening because there was no enforcement of implementation by the government previously. Apart from that, most organisations at one time were used to playing safe by not focusing on global business but sticking to extending business in local markets. Currently performance measurement has started to appear critically in organisation management. From time to time, economics keep changing and lots of organisations focus on embracing success and expanding business in the global market. Performance measurement is thus becoming important and needs to be implemented to identify what should be improved by organisations and what their position is in business.

Even though there are differences in the length of respondents' direct involvement with the performance measurement process and in position (see Table 5.1), these are not shown in their interpretation of performance measurement. Ten had more than 10 years of direct performance measurement experience and the other two had less.

5.6.2 Performance Measurement Processes

The aim of obtaining information on performance measurement processes from participants is to evaluate those processes used and implemented in their organisations. The interviews revealed that all participants in both countries agreed that staff with a wide spectrum of responsibilities are involved either directly or indirectly in the performance measurement process. Direct involvement means staff are involved in the process of arranging, managing and evaluating performance measurement in their organisations. Indirect involvement is that staff understand the organisation's implementation of performance measurement and undertake their responsibilities and do their tasks to make sure that the organisation can achieve what has been planned and its targets. Staff in this type of involvement participate indirectly in the performance measurement process. Cooperation by all staff is required for implementing performance measurement as successful implementation depends on cooperation and commitment of all parties involved in the performance measurement process (Tangen, 2005).

M1 from Malaysia stated that,

'It is top-down approach, the board of directors came out with directions, aims to be achieved by the organisation in business. All staff will be informed about the directions and aims. Managers of each department will take action based on their responsibilities to achieve the directions and aims. Other staff in departments then do their work in helping the organisation to achieve the objective and aims'.

UK6 from the UK commented similarly,

'Involvement of all staff, from managerial level to functional level is required for the success of performance measurement implementation in this organisation. Top managerial assist their staff in undertaking performance measurement. Other staff will do their tasks that align with organisation objectives. Instructions come from board of directors, monitoring will be done by senior managers and managers'.

As discussed with the participants, employees (functional staff) play a vital role by supporting managerial staff in doing their tasks and roles to create efficient and effective

ways of management. Managerial staff are responsible for assisting business and staff of functional units in doing their tasks and aligning these with the organisation's target.

The managerial staff decide organisational targets needing to be achieved every year. Every individual has his or her own objectives and targets to achieve those of the organisation. The main objectives come from the main board or Chief Executive Team (CET) (the term used by one respondent, UK3) and are cascaded to everybody. The individual objectives and targets then need to be aligned with organisational needs. Senior managers will monitor individual objectives and targets to make sure they are suitable to be used and practised to achieve those of the organisation. Any individual objective and target not meeting the organisation's targets or are contrary to the organisation's targets will be reset.

To make the process a success, all parties must understand their roles and responsibilities in handling and implementing performance measurement. Communication and reporting must be better. The word 'better' here means it must be clear, simple, regular, honest, and as good as formal communication and reporting processes. Franco and Bourne (2003) claim that these 'better' elements provide better management understanding. It means that leaders such as managers of departments and organisations must be informed of the measures that are communicated. The measures must be available and understood by everyone. Furthermore, Franco and Bourne (2003) state that the process of measuring performance is completely wasted unless the performance data produced are used for management's actions. Therefore, information is crucial in the performance measurement process.

One UK participant (UK6) said,

'A good way of communication in delivering information related to the activities involved in performance measurement will make the activities run smoothly. It is important that everybody in organisations get the right information and instruction in undertaking their jobs'.

M6 from Malaysia remarked'

'As a leader, I have to give good command and clear instruction to my staff for them to take action on their parts for undertaking the process. This is included in report writing and any notes taken during the performance measurement process'.

Apart from that, interviews also indicated that all participants (UK and Malaysia) mentioned that the performance measurement process could be delegated and divided at organisation, department or unit level as well as small group or team level. As mentioned earlier in this chapter, performance measurement implementation in an organisation requires cooperation and accountability of all in the organisation. Wegelius-Lehtonen (2001) states that performance measurement can be instituted at national, organisation and team level and it involves top management, middle management, as well as foremen and workers. A statement on this issue was voiced by participants as follows:

One UK participant (UK2) said,

'The same rules and processes were used as in other organisations under this organisation. This is to facilitate the decision and action that will be made later'.

M4, participant from Malaysia reported,

'To make it standard and easy to monitor, we implement the same procedure and rules with main office in undertaking performance measurement'.

Another participant from Malaysia (M5) stated,

'The same procedure and process were implemented and used at other branches'.

These quotations illustrate that the organisations use the same processes in implementing performance measurement. The same processes made it easier for the organisation in taking decisions and actions based on results gained from the processes. Apart from that, the consistent use of the performance measurement system that has been practised and used by the main organisation and its subsidiary will form a better understanding and enhance knowledge in the system.

5.6.2.1 Performance Criteria Measured

There is not much difference in choosing appropriate performance measurement criteria. All aspects, both financial and non-financial, have been measured by participants in identifying areas needing to be improved in their organisations. Financial and non-financial are the main aspects measured in performance measurement activities (Marr et al., 2003; Phang, 2006; Lehtinen and Ahola, 2010).

Based on Wegelius-Lehtonen (2001), the two aspects (financial and non-financial aspects) can be divided at organisation levels. Figure 5.1 shows how performance criteria are used in different organisation levels.

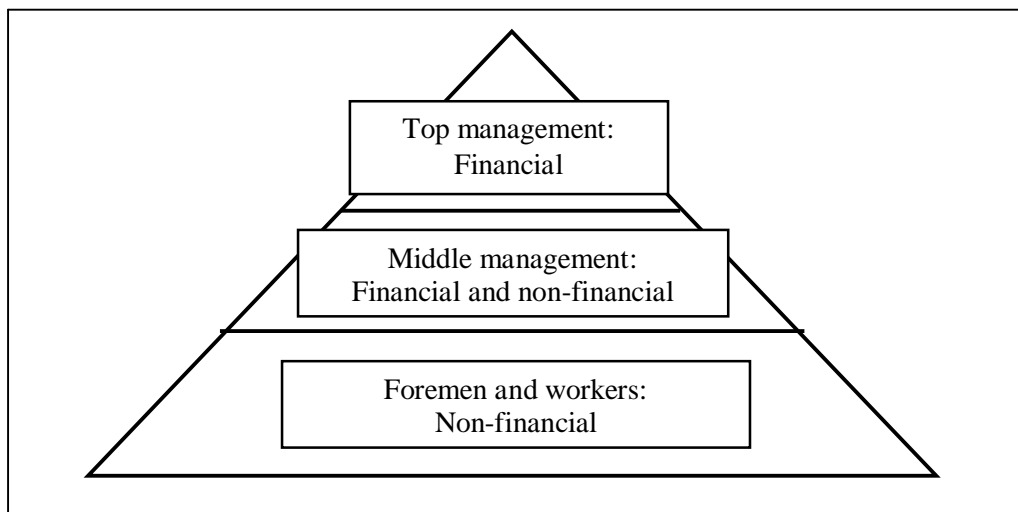


Figure 5.1: Different Measures on Different Organisation Levels (Lehtonen, 2001).

There are measures that are global in nature, covering a wide scope of activities. Global measures provide top management with a sense of whether strategic objectives are being achieved. They are monitored month-to-month or quarter-to-quarter. In a sense, they keep management in touch with the outside world. The other kinds of measures are more specific to the internal flow. They represent day-to-day measures of operating effectiveness and efficiency (Wegelius-Lehtonen, 2001).

Based on the interviews, one participant from the UK (U4) mentioned that the serious intention to measure non-financial aspects started ten years ago. Until then, financial aspects were the only necessary criteria measured by any organisation.

Thus,

'If we went back more than ten years, there was very little measurement of anything other than financial performance'.

This illustrates that the financial aspect is the long-standing one to be measured by industry. Financial aspects such as return on investment (ROI), sales per employee and profit per unit production and turnover of stock were used as the earliest criteria measured in performance measurement (Kagioglou et al., 2001; Dalrymple and Bryar, 2006). Nowadays, the criteria have been changed to align with the changes in the economy, trends and needs in the industry. People are interested not only in the financial aspects, but also the non-financial aspects such as leadership, staff performance and customer satisfaction. Robinson et al. (2005) agreed that financial measures alone are no longer appropriate and suitable for understanding performance in a dynamic and challenging business environment. Din et al. (2010) state that financial measures are poor predictors of tomorrow's performance. Organisations need current and up-to-date non-financial information to be able to take better actions or decisions on results in performance measurement (Bassioni et al., 2004). No matter what criteria have been, and are being measured, the overall target of all participants is to make a profit in their businesses. Many organisations in the construction industry nowadays are relying on profitability (Beatham et al., 2004).

There are many criteria used to measure the results of business performance. Those used by participants in both countries are business performance, staff or workers, customer or client and society feedback. Business performance means profit margins, turnover and organisation budget. Staff or workers are measured by looking at their performance in doing their tasks and playing their roles in achieving the organisation's target and aim in business. Customer or client satisfaction is measured to gain information on the level of satisfaction with services delivered as well as the product. Society feedback means information is gained from the public by understanding the needs of the organisation

related to local people, environment, economy and social impact on others. All these criteria have been measured with performance measurement tools and models suitable for the organisation's need.

Apart from that, UK1 (from the UK) explained,

'Project evaluation is counted in assessing our organisation's performance as our performance is also based on project.'

Another participant (M2) from Malaysia said,

'Most of our performance is based on project success. Project success means project is done on time, in budget and achieves the standard that the client needed.'

Both of them, UK1 and M2 indicate that the project uses criteria that are considered and measured as another indicator of performance of the organisation. Chan and Chan (2004) mentioned that project success was considered to be tied to performance measures. Project success includes not only time, cost and quality but also project psychosocial outcomes, which refer to the satisfaction of interpersonal relationships with project team members, safety and functionality (Chan and Chan, 2004; Ali and Rahmat, 2010).

Moreover, all participants from the UK as well as Malaysia agreed that identification of criteria that should be measured is based on organisation needs such as core business of the organisation and organisation aim.

M1 from Malaysia stated that,

'We measured the criteria that reflect the organisation's core business, aim and objectives'

M2, also from Malaysia commented,

'Project.....Building, construction and project management are the principal activities of this organisation. Organisation performance and achievement are based on the criteria'.

One participant from the UK (UK5) agreed with participants M1 and M2 that,

'Criteria that have been measured in this company are criteria that can show company performance level in achieving its objectives that have already been set, such as corporate profitability, project achievement and effect of our service to the client'.

Regardless of criteria that have been used or are being used, the overall target of all participants is to make a profit in their businesses, as what has been stated earlier. Added to that is to achieve positive improvement not only in financial but in non-financial aspects as well, that could have an impact on business. Gunasekaran et al. (2004) state that, for effective performance measurement and improvement, measurement goals and metrics selected should reflect a balance between financial and non-financial measures that can be related to strategic, tactical and operational levels of decision making and control.

5.6.2.2 Indicators For Performance Measurement Criteria Of Organisations

Based on the interviews, indicators used to identify targeted organisational achievements based on performance measurement are different, from one criterion to another. Generally, indicators for financial aspects are identified in appropriate currency or money. For non-financial aspects, most of the indicators can be identified by time and number (month and year), such as staff performance attributed to their roles or tasks for daily works and society activities. Another indicator is by percentage, for example project completion and staff turnover. The higher percentage shows the organisations are closer to the target of completing a project. Different types of indicators are based on what criteria are measured and in what way data can be most easily understood by organisations and then the representative data required.

Based on the performance measurement processes as discussed, there are no differences between the two countries, the UK and Malaysia, as commitment and cooperation of all staff in different positions need to be involved. Managerial level of staff such as senior managers and managers report to the Board of Directors on what have happened in the organisation and give instructions to junior staff or functional level of staff in undertaking their tasks and responsibilities. Functional level staff do their tasks to help organisations

achieve its aim and targets in business. Apart from that, the criteria to measure performance of organisation are related to the organisation's aim and objectives. If the organisational core business is project performance, then the performance of organisation is measured by the project outcome.

5.6.3 Performance Measurement Tools and Models

All participants in the UK and Malaysia agreed that performance measurement tools and models are needed to measure performance. They mentioned that the type of tools and models is not important as long as they can measure things that need to be measured correctly. It also depends on what organisations need to see in the results of performance measurement. Tangen (2005) mentions that successful performance measurement tools provide an organisation with useful information that helps to manage, control, plan and perform its activities. Furthermore, the tools must also be designed to reflect the most important factors influencing the productivity of the different processes that can be found in the organisation.

One UK participant (UK6) stressed that the most critical things are what action can be taken after measurement and delivering the right choice for the organisation to improve business. Another participant (UK2) added that the use of performance measurement tools and models is also influenced by clients.

All participants also justified that the best and appropriate tools and models to measure performance must be best suited to the organisation's business, the simplicity of the tools and models and the action to put in place for the measurement element.

One UK participant stated (UK3),

'In terms of what tools and models we want to use, I guess it will be looking at what is out there, what benefit different things give us and then how they fit with what works for us and how easy they are'.

And by a participant from Malaysia (M6),

‘The tool is understandable to be used by others in the organisation and it can show what needs to be seen by us in terms of identifying performance. Then, it will be easy for us to take further action based on the results’.

This illustrates that it is not about measurement but about what you do with the information and how to improve it. Table 5.2 shows the performance measurement tools and models used by each participant.

Table 5.2: Performance Measurement Tools and Models Used by Participants

Types Org.	KPIs	Balanced Scorecard (BSC)	EFQM Excellence Model	Quality Management System			Others (Own Creation)
				ISO 9000/1	ISO 14001	ISO 18001	
UK							
UK1		√					√
UK2			√	√	√	√	
UK3	√						√
UK4		√	√				
UK5	√						√
UK6	√						
MALAYSIA							
M1				√			
M2	√			√	√	√	
M3	√	√		√			
M4	√						√
M5	√			√			
M6	√			√			

* Org. = Organisation

* KPIs = Key Performance Indicators

Table 5.2 shows that the UK participants use a wider variety of tools compared to Malaysia. None of the Malaysian participants uses the EFQM Excellence Model. However, one participant (M1) had heard about it.

'We in this company never use the Excellence Model but I heard about it and know basically what the model is capable of doing'.

All participants mentioned that the board of directors made the decision on what type of tools or models will be used to measure performance of their organisations. Other factors influencing the selection of tools and models are requirements of clients and government.

UK2, participant from the UK clarified,

'We have been informed by our client on the suitable tool to measure our organisation's performance'.

In Malaysia, it is compulsory for all construction organisations to be registered with the Construction Industry Development Board Malaysia (CIDB). There are seven grades or categories (G1, the lowest to G7, the highest). By 1 January 2009, new regulations required Grade G7 to be certified with the ISO 9000 Quality Management System (QMS). Furthermore, failure to comply with the regulation would enable CIDB to lower their grade from Grade G7 to an appropriate grade (it could be to grade G6 or to as low as G1). This adversely affects the ability to get and do business (Din et al., 2010).

A participant from Malaysia (M1) stated,

'We have no choice, government requirement. If you do not have the ISO, you cannot tender for a government project'.

The standards of the International Organisation for Standardisation, widely known as ISO, need to be implemented by construction organisations if they want to tender for projects, especially those from the government. The ISO 9000 is a necessity to be implemented by those who want to get such projects. The ISO 9000 standard originated from the manufacturing sector and it is now adopted by the construction industry. The ISO 9000 was introduced in the construction industry in the 1990s because of poor

performance of the industry. Some examples are, lack of project management experience, skills and knowledge and poor change and communication. Because of the poor performance, Egan challenged the construction industry to learn from the manufacturing sector. The construction industry took Egan's challenge, and adopted the QMS and applied it to construction (Din et al., 2010). ISO 9000 provides enhanced functionality and is able to satisfy projects clients (Ali and Rahmat, 2010; Din et al., 2010).

Another participant from Malaysia (M2) stressed the need for ISO 9000. He recently stressed that, ISO is a prerequisite, as announced by CIDB. Every construction organisation must get ISO 9000 certification to qualify for construction projects. For the participant, ISO is not new, as his organisation has used it for seven years. Three more participants have used it for nearly ten years. Another participant (M1) has just started to use it and M1 stated that the ISO 9000 is used to ensure that things are done in sequence.

M1 stated that,

'The benefit of ISO 9000 is that its implementation helps organisation keep everything in a proper and structured way. All documents and files are managed and easy to refer to'.

All participants (UK1 to M6), in any case, mentioned that they were considering the use of any performance measurement tool or model to measure performance even though it has not been made compulsory by the government or any other bodies in the countries. They believe that if they want to grow, they have to measure performance of organisations and the right and appropriate tools and models can help them.

When the participants were asked whether they have a plan to change the tools and models they use, all of them were of the same view that nothing more needs to be changed. They stressed that they need to determine what they have to establish first rather than thinking about using different types of tools and models. They need to fully utilise the existing tools and models and be confident enough to use what they have now. They prefer to explore the existing tools as well as to learn to use these and understand their procedures rather than thinking of changing or exploring different tools or models.

One participant from Malaysia (M3) said,

'We have used the tool for more than three years and have no plan to change or replace the tool to the new one or add another tool for measuring organisation performance. We keep learning about the tool and just need to establish it'.

Another UK participant (UK2) stated that,

'We do not have any plan to change the tool that we used at the moment'.

Based on information of performance measurement tools and models used, both countries revealed some similarities as well as differences. In the area of similarities, both countries use performance measurement tools and/or models to obtain results on performance of organisations. Selection of tools and models used depends on several factors: types of performance measurement results organisations want to see and characteristics of the tools or models such as 'easy to use' and 'wider use in industry'. Other factors include, decision from managerial level and proposals from clients in choosing the tools and models for performance measurement.

The other similarity shared by both countries was types of tools and models used for measuring the process. Even though most participants from both countries use similar tools for measuring performance, they still have differences in using the tools. None of the participants in Malaysia uses the Excellence Model to measure performance activities. Moreover, enforcement from government also contributed to the selection of tools and models of performance measurement in Malaysia. The summary of the similarities and differences of both countries in the performance measurement tools and/or models can be seen in Table 5.3.

Table 5.3: Similarities and Differences in Using Performance Measurement Tools and/or Models by UK and Malaysia Participants.

Item	Similarities and Differences
1. Purpose of using performance measurement tools and/or models.	<ul style="list-style-type: none"> • To gain results on performance of organisations.
2. Selection of tools and/or models.	<ul style="list-style-type: none"> • Depends on what organisations want to see as results from performance measurement. • Characteristics of tools and/or models. • Decision from managerial level. • Client suggestion.
3. Types of tools and/or models used.	Most use similar tools and/or models for measuring performance.
4. Use of EFQM Excellence Model.	Two (2) participants from the UK use it and none of the Malaysian participants use it to measure performance.
5. Enforcement.	No enforcement has been made to construction organisations in the UK but encouragement in practising it is increased after the declaration of Egan Report 1998. In another part, enforcement from government has brought selection of tools and/or models for participants in Malaysia.

5.6.4 Connection Between Performance Measurement and Strategy Development

All participants shared their views about the relationship between performance measurement and strategy development. Eleven participants, five from UK (UK1, UK2, UK3, UK5 and UK6) and six from Malaysia (M1 to M6), believed that there is a direct relationship between performance measurement and strategy development. Performance measurement appears in the phase of strategy formulation and in the implementation and evaluation phases. They all had similar thoughts that performance measurement influences strategy development at all levels of the process. It involves everything, from the planning stage or where their project should go to what the organisation needs to do in the implementation and evaluation stages. Lehtinen and Ahola (2010) state that the performance measurement is necessary in creating strategy and it supports the implementation of strategy.

UK3 said,

'Performance measurement is aligned with strategy development. It relates to each other for gaining organisation's mission and vision'.

One participant (M4) from Malaysia mentioned,

'There is a connection between these two. To develop suitable strategy for organisation in gaining profits in the business, performance measurement is used to identify what and where it needs to be improved in organisation to ensure that the best strategy can be developed for organisation'.

Organisations need to measure their performance based on the specific criteria or areas for getting the results for improvement (if needed) and identify the target for the following years. All participants were aware that an organisations' strategy needs to be revised annually, even though some of the participants have made long-term strategic plans for more than three years. One participant from the UK (UK4) expressed the belief that performance measurement does not have any relationship with strategy development. The participant understood that performance measurement is needed for getting information on what needs to be improved by the organisation. Added to that, the participant does not see that performance measurement has been involved directly in developing strategy.

Even though only one participant did not believe in any connection between performance measurement with business strategy, all participants agreed that performance measurement is one of the key success indicators for organisations to achieve their objectives and strategy.

5.6.5 Challenges to Implementing Performance Measurement

The interviews revealed that there are barriers and challenges to implementing performance measurement. The information of barriers and challenges from interviews with the participants are shown in the Table 5.4.

Table 5.4: Findings from Interviews with Participants on Barriers and Challenges to Implementing Performance Measurement

Barriers and Challenges	
1.	Staff afraid of evaluation of their performance by leaders.
2.	Staff justify measurement rather than understand how to achieve targets.
3.	Negative perception of performance measurement.
4.	Performance measurement means additional tasks or responsibilities for staff.
5.	To learn the performance measurement process of organisation for those new to performance measurement.
6.	Using numerous performance measurement systems in an organisation can create difficulty for staff.
7.	Unclear performance measures and performance measurement system.

All participants agreed that its implementation is not as easy as thought. The most challenging part is changing people’s mindset about performance measurement.

It was stated by one participant from Malaysia (M3) that,

‘Based on my observation and experience, I can say that one of the barriers to implementing performance measurement is changing the way people think about performance measurement and helping them to accept it’.

This illustrates that changing the way people think about performance measurement and then accepting it as organisation management everyday is challenging. Performance measurement can be easily ignored by staff especially those who pretend not to understand the benefits of implementing it within the organisation. They tend to follow organisation’s regulation on the performance measurement but they sometimes carry out the activities of performance measurement mechanically without real interest and keenness to do it.

Some staff is afraid of the existence of fallibility in evaluation and assessment of their performance by their manager. The manager has a tendency to evaluate their performance and devalue it based on interpersonal relationships. Many employees think that through implementing performance measurement in organisations, they have to work much harder than they should. Staff try to justify the measurement (justify what we are) rather than understand how to achieve the target.

A comment from a UK participant (UK2) was,

'The perception about this is because of lack of understanding and thinking it is more complicated than it should be'.

Furthermore, all participants look at performance measurement as criticism levelled against them and their staff, as everything would be revealed and measured, including individual performance. If they are interested in doing the work, they are willing to do it without any pressure. If not, they will not perform in their work.

It was shown by one participant from Malaysia (M3) that,

'It is a challenge for us in managerial level to convince and persuade other staff to implement the performance measurement. They see performance measurement as another way to criticise them, everything can be revealed individually by it'.

Two participants, one from the UK (UK5) and another from Malaysia (M6), explained that employees' lack of awareness of performance measurement is a real problem in measuring performance. Employees tend not to look at performance measurement as part of their responsibility to which they must give full commitment. For them, performance measurement means additional work for them and it is not in their normal tasks or responsibilities.

M6 from Malaysia stated,

'Even though we have implemented performance measurement activities for quite some time, there are still staff who seem not to understand the performance measurement process in this organisation. They do not know what performance measurement is, what they must do with it, who is involved with performance measurement and how to measure performance of an organisation'.

For organisations new to performance measurement, one of the challenges is to really understand in depth the performance measurement process of the organisation. It will be a challenge to make it easy to be implemented and followed by all staff and to align with the existing management practices in the organisation.

M1 explained,

'We are still learning about performance measurement approaches in this organisation as the organisation has just implemented it'.

Another challenge is using numerous performance measurement systems in an organisation. It can create difficulty for staff. Performance measurement systems (PMS) is a system that tracks the performance of an organisation or part thereof, supports internal and external communication of results, helps managers by supporting both tactical and strategic decision-making and facilitates organisational learning (Wettstein and Kueng, 2002). Araujo and Martins (2009) define PMS as a set of processes an organisation uses to manage its strategy implementation, communicate its position and progress and influence its employees' behaviours and actions. It requires the identification of strategic objectives, multidimensional performance measures, targets and the development of a supporting infrastructure. Using too many systems is giving challenges to staff in the organisation. One participant from the UK (UK3) mentioned that her difficulty was in the way of delivering information to the right person in the fastest way. Not all the systems can be accessed and used by all staff. An accounting system can be accessed and read only by staff working in that area. Not everybody, especially for those who are not related to accounting system in the organisation, can easily access or even gain access to the system. Even though it gives benefit to the person needing the system, it does not do so for several staff who have to get all data and

information every time from other staff that need the information in undertaking their tasks.

Thus,

'We have support systems for implementing performance measurement process in this organisation. Some of the departments have the systems but the systems could not be accessed and used by certain staff. Only staff who work in that department that have the system can access it. It brings hassle to other staff who need the information from that department and makes the process become complicated'.

Based on the experience of three participants from Malaysia (M1, M5 and M6), unclear performance measurement is one of the main challenges to its implementation. Many employees are unaware about what they have to measure and what they can get from what they measure. It is easy for managerial staff to create a list of criteria needing to be measured by the organisation. Although they might not have any problem or difficulty in understanding what needs to be measured, it can be a problem and difficult for functional unit staff, especially new staff not familiar with performance measurement. Making mistakes in measuring performance and fully understanding the criteria needing to be measured will reflect different points of view on the relationship between these two. Ankrah and Proverbs (2005) mention that one of the causes that has been attributed to the inadequacy of measures with construction organisations is claiming to have difficulties in identifying and selecting adequate performance measures related to strategies and critical processes. But all agreed that performance measurement is one of the key success indicators for organisations to achieve objectives or targets and strategy. Nevertheless, many organisations struggle to transform their performance information into accurate understanding that helps to translate into effective actions. Managers may become swamped with measures and information and spend their time increasing performance measurement activity rather than improving management decision and action (Franco and Bourne, 2003).

In terms of challenges in implementing performance measurement in organisations, participants in both countries revealed the same. Dealing with people's minds and changing people's perceptions to receive and do something is not as easy as people think,

especially for those who always think negatively and are not willing to change for improvement. Surprisingly, this is faced not only by organisations that are new to performance measurement but it also happens to organisation, which have implemented it for more than ten years. Changes could be hardest for some people, especially for staff new to performance measurement, as it will involve learning factors and additional commitment from them to really understand the performance measurement process.

5.6.5.1 Approaches to Addressing Challenges

There are several approaches to addressing barriers and challenges in implementing performance measurement in organisations. Table 5.5 shows the approaches on how to do so.

Table 5.5: Overcoming Challenges in Implementing Performance Measurement

Approaches to addressing challenges	
1.	Early understanding by all staff in organisation on performance measurement.
2.	Awareness on performance measurement by undertaking training.
3.	Improved storage and delivery of information in an organisation.
4.	Good leadership on performance measurement process.
5.	Enforcement on implementation of performance measurement in organisations.
6.	Time is needed to familiarise with performance measurement.

Based on the interviews, the ways to overcome challenges in implementing performance measurement have been revealed and shown in Table 5.5. It is important to educate staff to understand performance measurement implementation in organisations at the early stage of the process of performance measurement. This is important as with the understanding, staff can be more prepared on what they need to do to achieve targets of organisation and to know their responsibilities in achieving the targets. Everybody works to achieve targets of organisations. It is not an individual’s agenda but the responsibility of all staff. Achieving organisational targets brings benefits to both parties (Tangen, 2005).

Improvement should be made in the level of awareness of performance measurement. Two participants from Malaysia (M1 and M6) mentioned that majority of lower level staff are not aware of it. The best way to make them understand about performance and quality is by imparting training that will benefit them in their career and at the same time, benefit the organisation. Fance and Bourne (2003) state that education and training are critical activities for instilling understanding into people's mind. Educating people in the area of performance measurement as well as people's participation in training related to the same area will build into people better understanding of performance measurement. Awareness of performance measurement undertaken in the organisation must also be extended to stakeholder and client, as their information is used as part of the indicators in measuring performance of the organisation.

M1 (participant from Malaysia) stated,

'Training is the best approach to give understanding to staff on performance measurement'.

M6 from Malaysia added,

'I will agree on taking courses and training related to performance measurement as an approach to give knowledge and awareness to staff on performance measurement'.

A suggestion has been made by one participant in the UK (UK3) to improve the storage and delivery of information in an organisation. All information gathered from all departments or units can be put in one system. Creating a 'central system' or 'warehousing facility' can be a good idea for storage of information gathered and putting it all in one system will make it easy to be accessed by all staff in the organisation. Details of the data can also be referred to by the staff (if needed for their roles and tasks). Furthermore, telephone use can be avoided if the system exists as it was claimed by the participant that the telephone could be an inconvenience and it takes time for information to be disseminated to others. With the created system, telephone use can be decreased as a medium of interaction for delivering information. Franco and Bourne (2003) mention communication and reporting among the factors that seem to have greater impact on the way organisations manage their measurement processes. The suggestion made by the

UK3 participant shows that improvement can be made by including information technology. Wettstein and Kueng (2002) explain that the use of information technology (IT) is required to make a performance measurement system more efficient and effective even though it is not necessary to include the IT principally in the system. Araujo and Martins (2009) express that one of the main causes of PMS facing a revolution is the power of IT in acquiring, analysing and disseminating PMS information. The acceptance of IT in performance measurement process is crucial to facilitate dissemination of information in PMS.

The view of UK3 (participant from UK) was that,

'This organisation needs an appropriate delivery system and storage system for undertaking performance measurement activities as with these, it would make it easy for staff to access data related to them for the activities. Dependence on telephone as a medium of communication for transferring information can be reduced as telephone communication takes longer time for delivery of information which cannot be recorded for reference'.

Leaders in every unit or department have to play their role in assisting their staff to run activities in performance measurement in the organisation. The leaders need to have the knowledge and understanding to make them capable of assisting and conducting performance measurement activities with staff in their unit or department. The leaders have to play their role as a mentor to their staff. Management leadership and commitment are important because they affect the keenness of senior managers and managers to use the system. They are among the crucial factors that can give greater impact to organisation on the way it manages through measures (Franco and Bourne, 2003).

The view of one participant from the UK (UK5) was that,

'Leaders need to take action in guiding and assisting their other staff in undertaking the performance measurement process. They have to know exactly the performance measurement process in the organisation'.

Enforcing the implementation of performance measurement in organisation can be a way to encourage performance measurement practices in organisations. The enforcement by

government has been mentioned earlier in Section 5.6.3. Even though most organisations know the benefit they can gain from performance measurement and are keen about it, they refuse to accept it in practice as they think it is difficult, troublesome and involves a long process in its implementation.

M1, participant from Malaysia asserted that,

'Enforcement to implement the performance measurement by Ministry and CIDB will help to make the approach be used and expanded in organisations'.

Apart from that, M2, also from Malaysia stated,

'Enforcement from CIDB could be a good way to spread performance measurement in organisations. It could bring difficulty and dissatisfaction to the organisation due to its having to be comprehended and skill is needed in running the performance measurement process but only for a short period. Then eventually everything will be fine'.

M2 illustrated that enforcement from CIDB could be the best way to implement performance measurement even though it could be tough for some organisations as they never had any intention or plan to implement it. It is probably difficult and could cause dissatisfaction in the organisation at the beginning but from time to time, when organisations have become used to it, it will no longer be hard to implement. As mentioned earlier in 5.5.3, ISO 9000 is necessary for organisations who want to get government projects in Malaysia. Many organisations do not bother about this, as they have alternatives to acquire projects and make profit.

Apart from that, four Malaysian participants (M1, M2, M3 and M6) said that more time needed to be given to them to use performance measurement and become familiar with it for the benefit of the organisation. They are still in the learning process in performance measurement even though all of them have the relevant experience.

M1 commented,

'We need time to get familiar with the performance system that we have in this organisation'.

M2 also stated that,

'The organisation has implemented performance measurement for quite some time and we are still learning to understand it and use it'.

Knowledge sharing on performance measurement practices in organisations is necessary continuously because it is good for an organisation, especially for the leaders (managers). If this approach is shared and mutually understood in the organisation, confusion and lack of understanding on the practices could be reduced, especially for staff who are new to performance measurement.

5.7 KEY FINDINGS FROM INTERVIEWS

Performance measurement is being practised by organisations because it is an important way of improving and sustaining business in the long-term. The selection of the appropriate and necessary criteria to be measured brings a massive impact on an organisation in achieving its aims, objectives and strategy for achieving success in the future. Studies of performance measurement in the two countries revealed both similarities and differences in implementing performance measurement. The similarities are as follows:

- Performance measurement is being practised in organisations to help improve business and make more profits. All participants agreed that performance measurement is one of the key success factors for organisations to achieve objectives or targets and strategy.
- Staff with a wide spectrum of responsibilities are involved either directly or indirectly in the performance measurement process.
- Knowledge and understanding of leaders and staff on performance measurement are important in implementing performance measurement process and activities.
- All participants measured financial and non-financial aspects of their organisations as the criteria to be considered in getting to know their business performance. The

criteria from both aspects are in business performance (financial), staff performance (individual performance), customer and society feedbacks.

- A variety of tools and models were used for measuring performance of organisations. Thus, tools such as the BSC, KPIs and ISO 9000 as well as in-house methods are used in measurement.
- The selection of type of tools and models for measuring performance of an organisation is not important as long as the organisation can measure things that need to be measured correctly. It also depends on what organisations want to see in the results of performance measurement.
- The main barrier to implementing performance measurement is to change people's mindset about it.
- There are more advantages to performance measurement than disadvantages. Performance measurement shows an organisation which areas need to be improved, and it enhances organisational reputation and market position. However, it is difficult for organisations to implement if the understanding and awareness of performance measurement is lacking in organisation. Staff see performance measurement as a difficult task which involves a long process and is time consuming to implement before any results can be seen.

The differences between these two countries in implementing performance measurement are the duration of implementing performance measurement and the tools and models used to measure performance. Details of both are as follows:

- Duration of implementing performance measurement.
Organisations in the UK have formally implemented performance measurement for a much longer time. They have done it earlier than organisations in Malaysia. UK organisations have practised performance measurement since it was initiated in the 90s. Since then, many organisations view performance as an important subject to be understood and implemented. Performance measurement is believed to be a way for

organisations to improve their performance and help towards identifying areas of improvement.

In Malaysia, the situation is different. At the beginning, performance measurement was considered an additional approach to the organisation. There is no enforcement or support from any parties such as the government to implement it. Performance measurement is understood by many as a means to help organisations to expand their business in global markets.

- Tools and models used in measuring performance of organisations. Organisations in the UK used different performance measurement tools and models to measure performance in the performance measurement process. Some organisations used the Excellence Model while other organisations devised their own tools to fit their needs and the suitability of their business.

In the Malaysian construction industry, organisations used different types of tools and models to measure their performance measurement as well, but Malaysian organisations do not use the Excellence Model. ISO 9000 is a prerequisite to qualify them for construction projects, especially government projects. If they fail to follow the rules, their grade in business would be downgraded. There is no necessity for using any particular type of tools or models in measuring performance of UK organisations.

The similarities and differences in implementing performance measurement show that there are lessons which can be learnt by one another. The long duration of implementation of performance measurement in UK organisations resulted in several advances in application, which can be learnt by Malaysia. Performance measurement is becoming important to organisations in Malaysia in gaining opportunity to further business locally and globally. Suggestion for improvements should be made in assisting organisations in the performance measurement process. They need to be guided in implementing performance measurement so that they can achieve success in their implementation of performance measurement. Direction to Malaysian organisations on the basic requirements needed in the process of implementing performance measurement

is necessary. Lessons learnt from the UK will help them in improving their performance measurement processes and make them easy to be understood and followed by staff in organisations. Several elements and criteria that must come together for executing positive performance measurement can be identified. These can be illustrated by using a pragmatic migration path that builds capability rapidly. The migration path is a way of guiding an organisation from the current situation to the desired and better position in the future. What needs to be achieved and what process needs to go through can be shown in the path.

5.8 SUMMARY

This chapter presented the current studies of performance measurement in large organisations in two countries, the UK and Malaysia, which revealed similarities and differences. The similarities are understanding and knowledge of performance measurement, benefits gained from performance measurement, processes involved for implementing performance measurement, criteria measured in performance measurement and tools and models used for measuring performance of organisations. The differences between them are duration of implementing performance measurement, use of the Excellence Model in the performance measurement process and enforcement in using certain tools for performance measurement. Implementing performance measurement also brought challenges to organisations. Both countries revealed changing people's mindset to accept performance measurement as part of management of organisations is complicated. This is caused by people's perception that performance measurement is a burden to them; they tend to think of it as a separate task apart from normal management. Some approaches to address these challenges are also discussed. There are similarities in challenges they faced as well as approaches to address challenges.

This chapter forms the basis for increasing the development of performance measurement approach. The next chapter will touch on development based on the discoveries from the current studies.

CHAPTER 6

A FRAMEWORK FOR PERFORMANCE MEASUREMENT IMPLEMENTATION

6.1 INTRODUCTION

This chapter discusses a strategic approach that can be used as a framework by organisations wanting to improve their implementation of performance measurement and it is a Performance Measurement Migration Path. The chapter begins with the purposes of developing the framework and then continues with the elements and the key features of the framework, the migration path. A description follows the framework functionality for users. Data from literature review on related approach to develop the framework and data from the current studies of performance measurement that have been discussed in Chapter 5 are used to develop the Performance Measurement Migration Path. The chapter ends with a summary of discussion.

6.2 INTRODUCTION TO DEVELOPMENT OF FRAMEWORK

Chapter 5 revealed that there are similarities and differences between UK and Malaysia organisations regarding performance measurement. Some advances in terms of duration of implementing performance and tools used in measuring performances as well as application of it have been identified in the UK studies on practising performance measurement. A country like Malaysia could learn from the experience of UK organisations. As many organisations in the construction industry in Malaysia are keen on performance measurement, it should be implemented because it can give benefits to organisations. Encouragement should be given to organisations in the construction industry to implement performance measurement. It must be emphasised that performance measurement is the way that can be used to assess performance of organisations. Relevant authorities such as CIDB and Public Work Department should

inform organisations what they can do to improve their performance. Encouragement and requirements from government for organisations to improve their performance to ensure excellence and increased profits in business are a sign that performance measurement is needed in managing business.

To achieve success in performance measurement, it must be easy to implement with minimum challenges and barriers in the implementing process. Organisations need to be guided and assisted in a proper manner and in appropriate stages. To overcome the challenges discussed in Chapter 5, there is no necessity to build a new tool for measuring performance of organisations. The problem faced by most organisations is sharing knowledge on performance measurement. Hence, the solution is to set up an appropriate information system accessible by all parties in an organisation. Everyone in the organisation can retrieve the desired information from the system and there will be increased understanding pertaining to performance measurement processes. Improvement needs to be made in implementing the process. Therefore, the idea of developing the migration path for improving the performance measurement process in organisations is an appropriate method to lead organisations in Malaysia, especially for performance measurement implementation.

Sousa and Aspinwall (2010) state that the maturity of an organisation affects the deployment of appropriate processes and the success of performance measurement system. The migration path must be ideally developed with the intention to guide and assist organisations in the steps of the performance measurement process. The migration path shows a number of levels involved in the process and the criteria needed to be fulfilled by organisations at each level of implementation. The rationale of showing the levels is to know the current position of organisations in performance measurement, and to which level they need to go in order to succeed in their implementation of performance measurement.

The next section discusses in detail the concept of the framework and its features, content and function.

6.3 FRAMEWORK DEVELOPMENT PROCESS

The development of the framework starts with a literature review on related frameworks, already discussed in Chapter 3. The review has also covered the established tools of performance measurement, which are the BSC and the EFQM Excellence Model in developing the framework. Data from the current studies in the two countries mentioned earlier in this chapter as well as in Chapters 5 are used in developing the framework so that it is more relevant and can be used in the current situation. Based on these two methods, the framework can then be developed and tested to identify any failure. The advantages, effectiveness, capability and usability of the framework to be used and implemented by organisations are also identified later in this chapter.

The framework development involved three steps as follows:

1. Step 1: Develop maturity model of performance measurement.
2. Step 2: Identify critical migration paths.
3. Step 3: Develop appropriate performance measurement migration path.

Each step will now be discussed in detail.

6.3.1 Step 1: Develop Maturity Model of Performance Measurement.

In this section, the definition of maturity and purposes of developing it are stated. The basic concepts of the development of maturity as well as the procedure of maturity model development are also stated and discussed. The final part of this section discusses details of elements of the model.

6.3.1.1 Maturity Model Purposes

Lockamy III and McCormack (2004) describe a maturity model as that progress towards goal achievement that comes in stages. It is intended as stages that lead towards success

and progress. Becker et. Al. (2009) also state that a maturity model consists of a sequence of maturity levels for a class of objects; typically, the objects are organisations or processes. It represents an anticipated, desired or typical evolution path of these objects shaped as discrete stages. Each level comprises a set of process goals that, when satisfied, stabilise an important component in the construction process. Achieving each level of the maturity model establishes a different component in the construction process, resulting in an increase in the process capability of the organisation (Sarshar et al., 2000).

Based on the purposes of the maturity model, it is used as part of the framework developed to help organisations to structure and organise their performance measurement activities. The maturity shows the current position of organisations in the performance measurement process and the next level to be achieved by them. This helps an organisation to make a plan and strategy before implementing the process to ensure that the organisation will succeed in it. Apart from that, the proposed maturity model is developed as follows:

- To classify the maturity of an organisation's performance measurement development.
- To guide organisations towards an effective performance measurement process.
- To meet the need for a structured approach to facilitate and benchmark implementation efforts.

6.3.1.2 Maturity Model Concepts

The maturity model for the research is developed based on reference to the Capability Maturity Model (CMM), STEPS and Standardised Process Improvement for Construction Enterprises (SPICE). The reason for choosing these three existing models as guides for the framework development is that their purpose is similar to that for the research, even though one of them, CMM, was created for a different area. Details of these models are shown in section 3.4.1, Chapter 3 of this thesis.

6.3.1.3 Procedure in Maturity Model Development

There are several things to be considered before the model can be developed as follows:

- Identify criteria to be considered in implementing performance measurement.
- Identify number of levels needed for the model.
- Identify what should be in the first level and later, giving consideration to what should be achieved at each level, time needed to complete each level and action taken by whom.
- The lowest level of the model should demonstrate an understanding of performance measurement concepts. The highest level should show that the organisation has awareness of expanding performance measurement to other business units and offices.

6.3.1.4 Maturity Model Details

The model could help organisations to structure and implement performance measurement to benchmark their implementation efforts and guide them in improving their businesses to achieve their business targets. It will take time to see results from using the model. Different organisations have different periods or durations for success at each level. Therefore, the time needed for completing the whole model depends on each organisation. Factors influencing the differences are the organisations' ability to conduct performance measurement such as support from staff (managerial and bottom level) and awareness of performance measurement. Added to that is resources such as finance and information systems. The maturity model for the research is shown in Figure 6.1.


No. of Level	Level 1	Level 2	Level 3	Level 4	Level 5
Theme	Awareness of Performance Measurement (PM)	Develop Strategy of Performance Measurement (PM)	Implement Performance Measurement (PM)	Evaluate Performance Measurement (PM)	Expand Performance Measurement (PM)
 <p>Increasing Maturity</p>					

Figure 6.1: Maturity Stage of Performance Measurement

The maturity model as shown in Figure 6.2 moves from Level 1 (the lowest) to Level 5 (the highest). The five levels are Level 1-Awareness of Performance Measurement (PM), Level 2-Develop Performance Measurement (PM) Strategy, Level 3-Implement Performance Measurement (PM), Level 4-Evaluate Performance Measurement (PM) and Level 5-Expand Performance Measurement (PM). Each level comprises several key aspects that need to be addressed. Level 1 is the initial and the lowest level for the model, the Performance Measurement Knowledge Level. At this level, readiness of the organisation for using performance measurement in its management is identified. The highest level, Level 5, is where an organisation has awareness to expand performance measurement to other business units and offices. Details of all levels are shown in Table 6.1.

Each level needs to be assessed to make sure that the model’s purposes can be achieved. An organisation can be considered to be at a particular level in the model only if all the key aspects are deemed complete at that level. A set of assessment questions was prepared for this purpose. It is important to note that no level can be left out or not committed, as the purposes of the model cannot then succeed. Each level contains different characteristics to achieve success of each level. Different organisations need

different time scales to accomplish each level as every organisation has a different time period for implementation of performance measurement, different plans, strategies, aims and objectives it needs to achieve.

Table 6.1: Details of Key Aspects of Performance Measurement Maturity Model

Maturity Level	Description	Characteristics
<p>LEVEL 1: Awareness of Performance Measurement (PM)</p>	<p>This level focuses on identifying organisation awareness of performance measurement. Organisation understands its direction in future business and tendency to achieve success with performance measurement. At this level, organisation identifies level of performance measurement knowledge and preparation for using performance measurement in organisation's management.</p>	<p>Leaders in organisation will take action to identify organisation's needs for performance measurement and how ready organisation is to undertake it.</p>
<p>LEVEL 2: Develop Strategy of Performance Measurement (PM)</p>	<p>This level focuses on developing and creating performance measurement activities. Strengths, weaknesses, opportunities and threats of organisations in their business are justified for smooth performance measurement processes.</p>	<p>Aspects such as staff commitment (from top managerial level to bottom level staff) and organisation's policy will be needed in generating performance measurement activities.</p> <p>Resources aspects (internal and external), such as financial and people, will be considered in identifying organisation's capability in implementing performance measurement.</p>

Maturity Level	Description	Characteristics
LEVEL 3: Implement Performance Measurement (PM)	This level requires managing performance measurement in the organisation. At this level, all plans and strategies made for performance measurement will be implemented. This level will involve systematic structure for monitoring and controlling performance measurement process.	Cooperation of all staff in managerial and functional units required throughout implementation stage of performance measurement.
LEVEL 4: Evaluate Performance Measurement (PM)	This level characterised by assessing performance measurement process, improving action of performance measurement and organisation's action on performance measurement implementation.	Cooperation of all staff in managerial and functional units for success of performance measurement at this level. Criteria for performance measurement are measured.
LEVEL 5: Expand Performance Measurement (PM)	At this level, awareness of performance measurement expanded or extended to other business units and offices. This will be a way to increase scale of performance measurement processes.	Leaders' responsibilities for increasing performance measurement implementation in organisations. Results of staff, partnerships, customers and society will be counted as part of identifying organisation's success.

The five stages to achieve success in performance measurement implementation are shown in Table 6.1 are as follows:

LEVEL 1: Awareness of Performance Measurement (PM)

The first level of the maturity model focuses on how to increase awareness of performance measurement implementation in the organisation. At this level, the organisation will answer questions on 'How can performance measurement be practised in the organisation and benefits gained from practising it?' The organisation at this level has to understand that performance measurement is getting ready to be implemented in

the organisation. To increase knowledge and get prepared for undertaking performance measurement, leaders and staff as well as other parties such as partners involved with organisation businesses undertake training related to performance measurement. Training is required as well for staff that are new to performance measurement, as a way to increase performance measurement knowledge.

LEVEL 2: Develop Strategy of Performance Measurement (PM)

At this level, a performance measurement team is built to carry out the performance measurement process. At this level, the organisation has established performance measurement goals. All staff involved must be aware and understand their responsibilities in the process from the beginning to the end. A cordial environment among staff for accepting performance measurement is built to make sure the process is easy to adopt by others. In this stage, interaction of all levels is important (managerial with functional units). At this level, the organisation has to:

1. Understand business strategy, aim and objectives for staff to know their roles and responsibilities in achieving the organisation's goals. Staff understanding of organisation's target and future plans can help to bring about smooth achievement of its targets and make it easy to manage.
2. Refine business aims and objectives necessary to achieve the organisation's target if the present aims and objectives are difficult to achieve or the organisation is having a problem to achieve them.
3. Establish resources (internal resources such as staff and equipment, external resources such as support from other organisations and an expert in the area of performance measurement). The organisation has to know the opportunities to be seized in the global market and the support it may gain from other parties (government and competitors).

LEVEL 3: Implement Performance Measurement (PM)

This level is where the organisation implements performance measurement based on the strategy and plans made. The organisation has to make sure that all strategy and plans made are implemented by all parties involved in the performance measurement process.

For example, members of performance measurement team have to carry out their tasks and responsibilities to make certain the plan can succeed. Leaders need to ensure that all activities of performance measurement are implemented by parties such as staff and business partners. At this level, the organisation must:

1. Establish a support system in running performance measurement to make it easy to be implemented by the organisation.
2. Increase cooperation and interaction during the performance measurement process between managerial level and functional level staff in the organisation as well as between the organisation and partners.
3. Establish criteria that need to be measured and targets for measuring impact on potential increase in profits and opportunities for the organisation in local and global markets.
4. Identify how best to measure organisation performance.

LEVEL 4: Evaluate Performance Measurement (PM)

This is the level where senior managers assess performance measurement activities. At this level, the organisation has to:

1. Measure or evaluate activities involved in the process of performance measurement. The selected criteria to be measured must be evaluated for identifying performance of organisations in the process. Measurement or evaluation is by using performance.
2. Assess the efficiency of measurement tools or model such as the BSC and the Excellence Model. Results will be used to identify ways of improving the activities.
3. Take action to measure or evaluate results.

4. Identify actions to be taken for generating results. Actions taken on results must be achievable and suitable for the organisation's capability in all aspects (resources and strengths).
5. Refine performance measurement strategies or plans and link them to organisation's targets.
6. Give marks to performance evaluation of every work done. Record them for reference.

LEVEL 5: Expand Performance Measurement (PM)

This level focuses on expanding performance measurement implementation to other units of business of the organisation. At this stage, the organisation plans to introduce awareness of performance measurement to other business units and offices. This will be a way to increase the scale of performance measurement processes.

As performance measurement becomes institutionalised, sustainability of performance measurement appears in each level of its cycle in the maturity model. Sustainability level appears in each level after all five levels have been assessed. Sustainability of performance measurement means:

1. Performance measurement becomes necessary in developing strategy.
2. Performance measurement is widespread in the entire organisation.
3. Performance measurement is well understood by the entire organisation.
4. Performance measurement becomes embedded in organisational culture, employees and managerial behaviour as well as style, social impact on the organisation, business processes and decision-making.
5. Performance of the organisation is reported for revision and educating others in the future.

6.3.1.5 Level Assessment

As mentioned earlier, no level can be left out, as the purposes of the model cannot then succeed. To make sure that organisations can move from one level to another, a set of questions was prepared to assess organisation's success in fulfilling key aspects of each level. Becker et al. (2009) state that the application of maturity models can be supported by predetermined procedures, for example, by questionnaires. Based on the results of the as-is analysis, recommendations for improvement measures can be derived and prioritised in order to reach higher maturity levels. Added to that, the assessment tool necessary for organisations to conduct an assessment to establish which level of maturity they are at as an organisation can only be at one level of maturity at any stage (Sarshar et al., 2000).

The assessment questions were developed with reference to the BSC and the EFQM Excellence Model sub-criteria. The elements of the latter pose questions to be considered when assessing the progress of an organisation towards the goal of business excellence (EFQM, 2009). Apart from that, they were based on the literature review on the importance and need of performance measurement. The assessment scale of the questions is a 'Yes' and 'No' answer. Only leaders in charge of performance measurement activities are to complete the questions. A set of the assessment questions is shown in Appendix B.

The maturity model shows organisation benchmarks in the performance measurement implementation process that would improve the organisation's performance measurement activities. The development of the model could help organisations in running performance measurement in a more organised and systematic way. A migration path is then developed to help organisations to improve their level of maturity with respect to performance measurement.

6.3.2 Step 2: Identify Critical Migration Paths

This section discusses the definition of migration path and its purposes developed for the research. The basic concepts of the migration paths development as well as the procedure

of developing it are stated and discussed. The details of its elements are also given in this section.

6.3.2.1 Migration Path Purposes

Migration path defines how the user should proceed from the current situation to the desired position (Kamara et al., 2002a; 2005). The migration path was developed here based on reference to **Cross-Sectoral Learning in The Virtual Enterprise (CLEVER)**. CLEVER framework was designed for use in the construction industry. The migration path provides a mechanism for organisations to improve their performance measurement practices in a step-by-step manner, depending on their starting point. It does this by recommending actions to move from one maturity level to another.

6.3.2.2 Migration Path Concepts

As mentioned, the migration path of this research is developed based on reference to CLEVER. CLEVER describes a framework for selecting a knowledge management strategy appropriate to the organisational and cultural context of an organisation (Kamara et al., 2002a). It is a PC-based knowledge management (KM) system that delivers results in any industry sector, whatever stage of knowledge management development the organisation is at (Innovation Express, 2004). It has been developed following a detailed study of current KM processes in the construction and manufacturing sectors (Kamara et al., 2002a). Based on Kamara et al. (2002a), the aim of CLEVER was to clarify a ‘vague’ set of KM problems into a set of specific KM issues, within a business context in order to provide appropriate and relevant processes to solve the identified KM problems by:

1. Defining the KM problem and linking it to business drivers or goals.
2. Creating the desired characteristics of the ‘to be’ KM solution.
3. Identifying the critical migration paths to achieve the ‘to be’ model.
4. Selecting appropriate KM processes to use on those paths.

As the proposed migration path is intended to provide an almost similar aim as CLEVER but with a different scope and problem. CLEVER is the appropriate and relevant

framework that has been produced to be referred to and followed in developing the critical paths for improving the performance measurement process in organisations.

CLEVER is split into four main stages, which take the user from an initial definition of a knowledge problem, an identification of where he or she wishes to get to, including the critical migrations required, through to the provision of appropriate KM processes to aid in the resolution of the user’s knowledge problem (Anumba et al., 2005). The features and application of each stage in CLEVER are shown in Table 6.2.

Table 6.2: Stages in CLEVER (Anumba et al., 2005)

Stage	Aim	Outcomes
1. Define KM problem	To define overall KM problem within business context	<ul style="list-style-type: none"> • Clarification of KM problem • Distillation of a set of KM issues from overall problem
2. Identify ‘to be’ solution	To identify required status on a range of knowledge dimensions and to highlight areas of future focus	<ul style="list-style-type: none"> • A set of concerns or specific KM components of overall problem on which focus is required
3. Identify critical migration paths	To identify critical migration paths for each specific KM problem (or dimension of interest)	<ul style="list-style-type: none"> • A set of key migration paths for each specific KM problem • Overall set of migration paths for whole KM problem
4. Select appropriate KM processes	To help in selecting appropriate KM process to move along each migration path	<ul style="list-style-type: none"> • A set of appropriate KM processes which, when tailored to a particular organisation’s needs, will address stated KM problem

6.3.2.3 Procedure in Developing Migration Path

There are several things to be considered before the migration path can be developed, as follows:

1. Identify aspects or criteria to be considered and developed in guiding organisations to move from the current situation to a better one. The criteria used are taken from the nine criteria of the EFQM Excellence Model.
2. Identify migration path from one level to another (movement from the lowest level to the highest based on levels in the performance measurement maturity model).
3. Identify current position and situation and where the organisations want to be in performance measurement.

6.3.2.4 Criteria of Migration Path

To accomplish the purposes listed in section 6.3.2.3, five of nine criteria of the EFQM Excellence Model were used in developing the migration path. The nine criteria are leadership, strategy, people, partnerships and resources and processes, products and services, people results, customer results, society results and key results (EFQM, 2009). The five criteria selected are leadership, strategy, people, partnerships and resources, and processes, product and services. As stated in Chapter 3, the EFQM Excellence Model can be divided into two categories: the first is 'Enablers' and the second is 'Results'.

The five criteria chosen and selected for developing the migration path of performance measurement are 'Enablers' and the balance are 'Results'. 'Enablers' criteria were chosen as the enablers are about action of what an organisation does (how the organisation is run and operated) and 'Results' show the results seen to be achieved from action taken on enablers (Pyke et al., 2001; Marrewijk et al., 2004; EFQM, 2009). Results are generated by enablers and feedback from results helps to improve enablers (Marrewijk et al., 2004). Improvement can only be changed to enablers and results will be seen after implementation. Furthermore, the five criteria chosen represent financial and non-financial aspects that are used to measure performance in organisations and to show the performance of organisations. Data from the interviews also showed that managerial

factors (leadership, people, professionalism, system used, process involved) contributed to the challenges and difficulties in implementing performance measurement in organisations. Contribution of all staff (managers and other staff), culture and management styles (Bititci et al., 2004), best processes (Barr et al., 2005) and strategy factors (Bourne et al., 2003) are amongst the factors that would determine the failure or success of performance measurement implementation. Those five criteria namely leadership, strategy, people, partnerships and resources, as well as processes, products and services are the elements that represent those factors. They need to be dealt with to make sure that performance measurement process in organisations can run smoothly and then achieve the intended purpose of implementing it.

Definitions of the five criteria used in developing a migration path are as follows (EFQM, 2009):

1. Leadership

How leaders develop and facilitate the achievement of the mission and vision, create values required for long-term success and implement these by appropriate actions and behaviours and are personally involved in ensuring that the organisation's management system is developed and implemented.

2. Strategy

How the organisation implements its mission and vision by a clear stakeholder-focused strategy supported by relevant policies, plans, objectives, targets and processes.

3. People

How the organisation manages, develops and releases the knowledge and full potential of its people at an individual, team-based and organisation-wide level and how these activities are planned in order to support its policy and strategy and the effective operation of its processes.

4. **Partnerships and Resources**

How the organisation plans and manages its external partnerships and internal resources in order to support its policy and strategy and the effective operation of its processes. The organisation ensures that it effectively manages its impact on the environment and society.

5. **Processes, Products and Services**

How the organisation designs, manages and improves its processes to support the policy and strategy and effective operation of processes. The organisation ensures that they manage effectively their environmental and societal impacts.

Details of all nine criteria are discussed in Chapter 3 and the criteria chosen are discussed in detail in the next section.

6.3.3 **Step 3: Develop Appropriate Performance Measurement Migration Path**

This section discusses how the framework, named ‘Performance Measurement Migration Path’, works. The content and functionality of the framework are presented.

6.3.3.1 **Migration Path – How It Works**

In Table 6.3, Column 2 lists the five ‘enablers’ criteria. The levels indicate the maturity of performance measurement implementation within organisations. Details of the maturity model development are discussed above in Section 6.3.1.4. An organisation moves up from one level to another until it reaches the highest, Level 5 (L5). All levels need to be followed in sequence by organisations; otherwise, they are unable to start at certain levels based on their current situation and position in implementing performance measurement. The lowest level, Level 1 (L1), is the preliminary stage and the starting point on the migration path. L5 is the highest level to be achieved. An organisation needs to fulfil all criteria in one level before it can move up to the next. That means the organisation needs to fulfil all five criteria by referring to the description in its position before it can move to another higher level. An organisation can only be considered to be at a particular level in the model if all the key criteria are deemed capable at that level

(Sarshar et al., 2000). Lockamy III and McCormack (2004) state that it is important to note that trying to skip maturity levels is counter-productive, since each level builds a foundation from which to achieve the subsequent level. An organisation must evolve through these levels to establish a culture of process excellence.

Furthermore, all the migration path levels are the same as those in the performance measurement maturity model. Justification of each level is based on what can change an organisation from its current situation to a better one in the future and put it in a better position in implementing its performance measurement.

Table 6.3: Criteria Considered in Improving Performance Measurement in Organisations

NO	CRITERIA	LEVEL 1 (L1): AWARENESS OF PM	LEVEL 2 (L2): DEVELOP STRATEGY OF PM	LEVEL 3 (L3): IMPLEMENT PM	LEVEL 4 (L4): EVALUATE PM	LEVEL 5 (L5): EXPAND PM
1	Leadership	Leaders are aware of PM needs.	Leaders create a task force to carry out PM.	Leaders ensure PM activities are implemented.	Leaders evaluate PM activities and identify improvements.	Leaders continuously improve and expand PM to other units and/or offices.
2	Strategy	Organisation is aware of need to develop PM strategy.	Organisation develops PM strategy.	Organisation implements PM strategy.	Organisation evaluates PM strategy.	PM strategy implemented within other units and/or other offices.
3	People	Staff are aware of PM needs.	Staff develop knowledge of PM.	Staff implement PM activities.	Staff performance in implementing tasks evaluated. Refine as necessary for improvement.	Staff continue to improve their knowledge in PM and share with others.
4	Partnerships and Resources	Partnerships are aware of need for PM.	Organisation develops measures to assess supply chain.	Organisation measures performance of supply chain.	Partnerships' performance and resources evaluated. Refine PM used in supply chain.	PM expands to other supply chain members.
5	Processes, Products and Services	Organisation is aware of need for processes within PM.	Organisation develops processes to undertake PM.	Processes implemented systematically.	Quality of products and services evaluated by organisation.	PM processes expanded to other units and/or offices.

6.3.3.2 Performance Measurement Migration Path

Table 6.4 shows the migration path. The levels indicate the movement of each criterion from the lowest degree to the highest of performance measurement maturity. Decisions on maturity level from one level to another are determined from current studies in large organisations in the construction industry of two countries, the UK and Malaysia. The information on the current studies is discussed in Chapter 5. Data gathered from the organisations were analysed and then used to create and develop descriptions and details of the migration path.

As mentioned, in generating the migration path, matters to be taken into account are the current performance practices in the organisations and ways to improve practice. Every movement from one level to another is unique to guide organisations to achieve the excellence they desire. Details of the migration paths are discussed. This section also discusses details of migration path of each criterion. Discussion is made separately based on one level to another.

1. Leadership

Leadership can be understood as the process of influence. It not only influences others but also does so in a manner that enables an organisation to attain its goals (Vroom and Jago, 2007). For leadership, Level 1 (L1) is where leaders are aware of the performance measurement needs of the organisation, why it is important for the organisation to implement performance measurement and how it can achieve success (as shown in Figure 6.2). To move from L1 to L2, leaders need training in performance measurement and areas related to it, as this can be the best possible way to increase leaders' understanding of performance measurement and will later guide them to create and develop the needs to strategise performance measurement by developing a performance measurement task force. Training such as workshops, seminars or conferences can increase leadership skills in implementing performance measurement as well as increase knowledge of performance measurement and related areas. The training can be participated and joint by leaders either internally (in-house training) or externally (outside the organisation).

Table 6.4: Performance Measurement Migration Path

NO	CRITERIA	L1	MIGRATION PATH	L2	MIGRATION PATH	L3	MIGRATION PATH	L4	MIGRATION PATH	L5
1	Leadership		Leaders undertake training related to PM.		Leaders provide resources to ensure PM activities can be done.		Leaders identify evaluation format and results required.		Knowledge sharing through direct and indirect communication by leaders to others.	
2	Strategy		Organisation identifies current and future needs of PM.		Organisation identifies and allocates resources needed to implement PM strategy.		Organisation identifies success factors for PM.		Knowledge transfer by organisation to communicate results to other units and/or offices.	
3	People		Staff undertake training related to PM.		Staff undertake PM activities.		Staff competence in undertaking tasks assessed.		Ongoing training and development on PM for staff.	
4	Partnerships and Resources		Partnerships undertake training related to PM and ongoing dialogues on PM with organisation.		Partnerships cooperate with organisation in undertaking PM activities.		Organisation identifies supply chain success factors for PM.		Knowledge transfer to communicate results to existing and potential partnerships.	
5	Processes, Products and Services		Organisation develops PM processes map.		Organisation provides support systems to implement PM.		Organisation develops checklist of procedures.		Knowledge sharing through direct and indirect communication by organisation to others.	

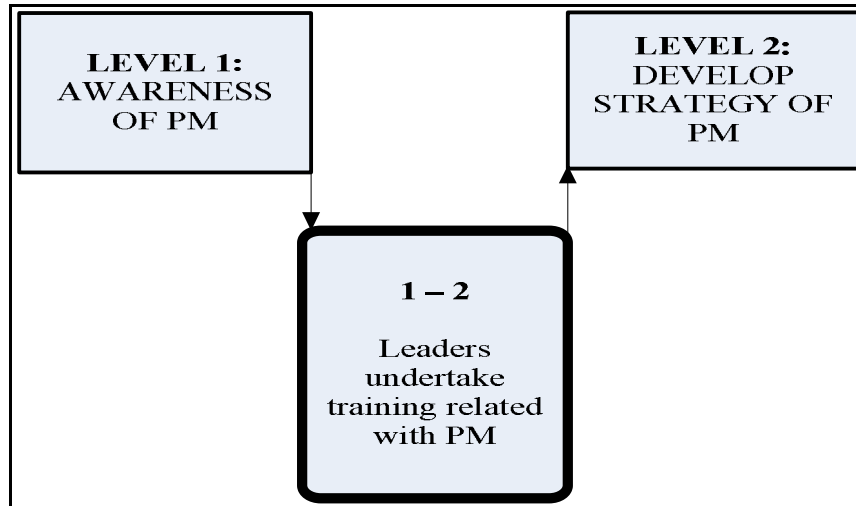


Figure 6.2: Leadership - Level 1 to Level 2

On moving to Level 2 (L2), leaders take into consideration the development of a strategy for implementing performance measurement with a task force created to carry out performance measurement and ensure its plan is aligned with the organisation's management. In the process of developing the strategy, team commitment is highly recommended, as performance measurement is easier to implement and manage through participation of staff from a range of different responsibilities or positions. Performance measurement needs commitment and cooperation of all staff to be successful. The goal is to make performance measurement activities in the organisation understandable to all staff, either directly or indirectly. To move from L2 to the next level, Level 3 (L3), leaders have to provide resources and they must be sufficient to ensure that performance measurement activities can occur as planned. Resources are, for example, staff, finance, systems and technology (as shown in Figure 6.3).

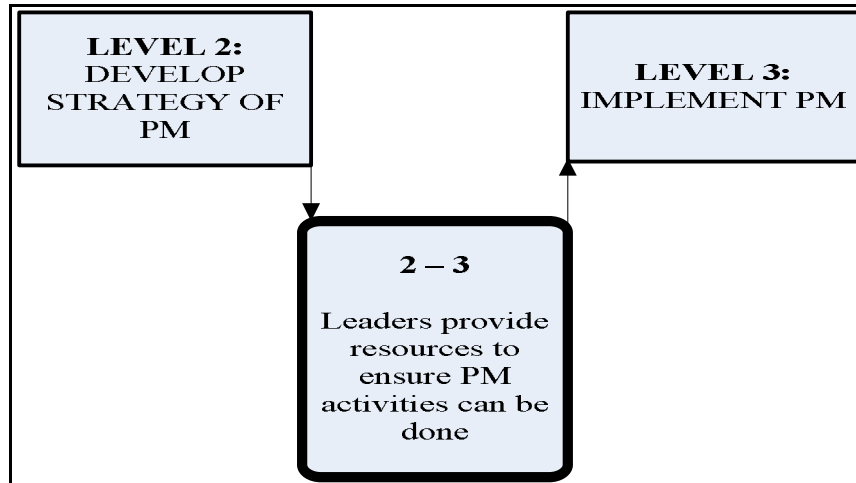


Figure 6.3: Leadership - Level 2 to Level 3

Level 3 (L3) is where leaders monitor performance measurement activities to ensure that they are implemented as agreed through meetings and discussion with other staff and done successfully. The performance measurement plan has to be followed to obtain results expected by the organisation. After that, leaders have to identify an evaluation or measurement format to assess all performance measurement activities in the organisation. In this matter, leaders have to make sure that the criteria which need to be measured by the organisation are measured methodically. Leaders have to consider tools for performance measurement that suit the organisation and can show the results required. The selection of tools and models also depends on knowledge as well as the ability of the organisation to use them. Results of evaluation are required to make the move from L3 to Level 4 (L4) (Figure 6.4).

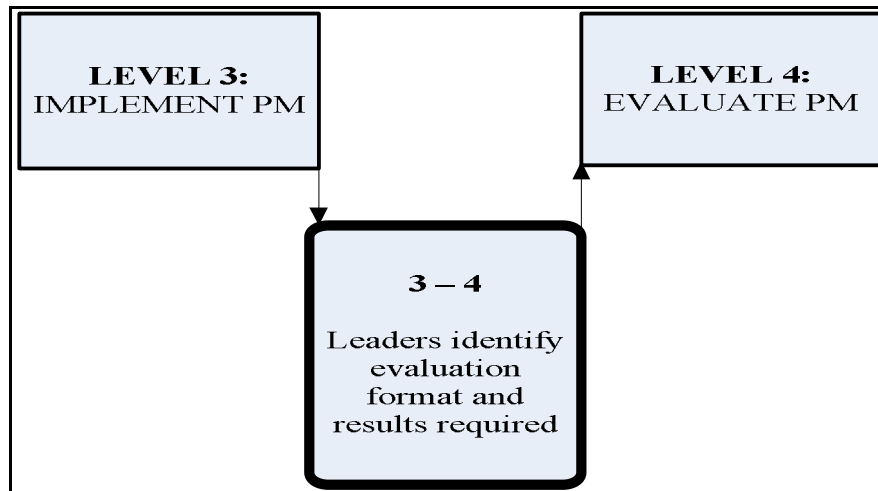


Figure 6.4: Leadership - Level 3 to Level 4

L4 is where leaders are responsible for evaluating the performance measurement activities in the organisation. This is to make certain that the degree of excellence in managing performance of the organisation can be identified and action taken to bring the organisation to a higher position in business and markets. To maintain and sustain performance measurement implementation as decided, leaders have to ensure that performance measurement is used and continuously improved. Performance measurement knowledge can be expanded to other units and/or offices for sharing and possibilities to strengthen the leadership's skill. Level 5 (L5) is about ensuring leaders' need and help, so that they can assist in expanding performance measurement. A possible way to guide an organisation to move from L4 to L5 is through communication (as shown in Figure 6.5). Furthermore, knowledge sharing through direct and indirect communication is useful as a means to expand performance measurement to others. Direct communication means face-to-face interaction or by phone. Indirect communication is, for example, through e-mails, reports and memos. Information is gained and spread through the communication by leaders to other staff in other units.

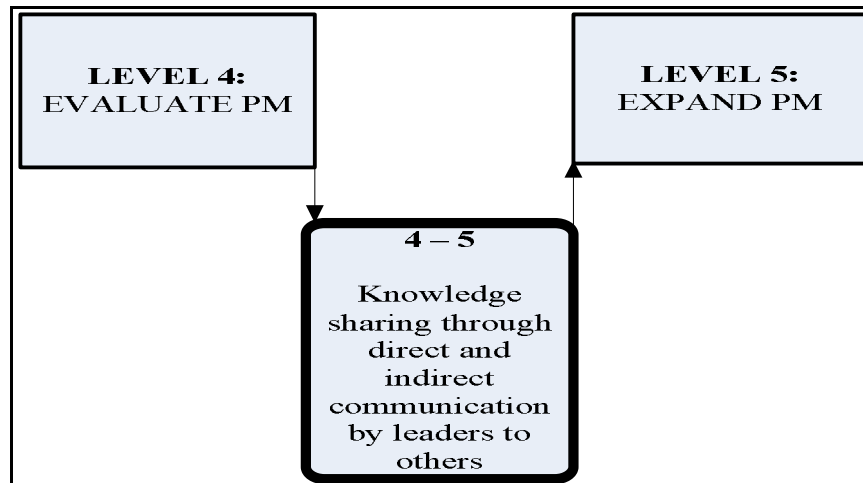


Figure 6.5: Leadership - Level 4 to Level 5

2. Strategy

A strategy helps to guide organisations in implementing their mission and vision. As strategy is also known to be an important factor in attaining success for organisations, people in organisations must be aware that its development is based on the present and future needs as well as expectations of stakeholders and information from performance measurement. Awareness of the need to develop a performance measurement strategy by the organisation is positioned at the first level (L1) under strategy. This awareness facilitates the process of implementing performance measurement in the organisation as well as in the inception stage before implementing further performance measurement activities. Added to that, at this level, the organisation has to be aware of what needs to be measured and to identify the criteria.

To move to the next level, L2, the performance measurement strategy and supporting activities are developed to ensure that performance measurement can be implemented and conducted systematically, smoothly and easily by the organisation. At this level, the organisation identifies what sort of activities can be done to achieve success in performance measurement. For example, the activities could be meeting with stakeholders, a SWOT analysis of the organisation, as well as improving and/or increasing the use of technology within it. To bring L1 to L2, the organisation needs to identify its current and future needs in implementing performance measurement (as

shown in Figure 6.6). Information on what is important in the current situation, what needs to be achieved in the future, what needs to be done and how it can be done are taken into consideration for adopting performance measurement in the organisation. Added to that, the organisation has to consider how to make it robust and embedded permanently in the organisation.

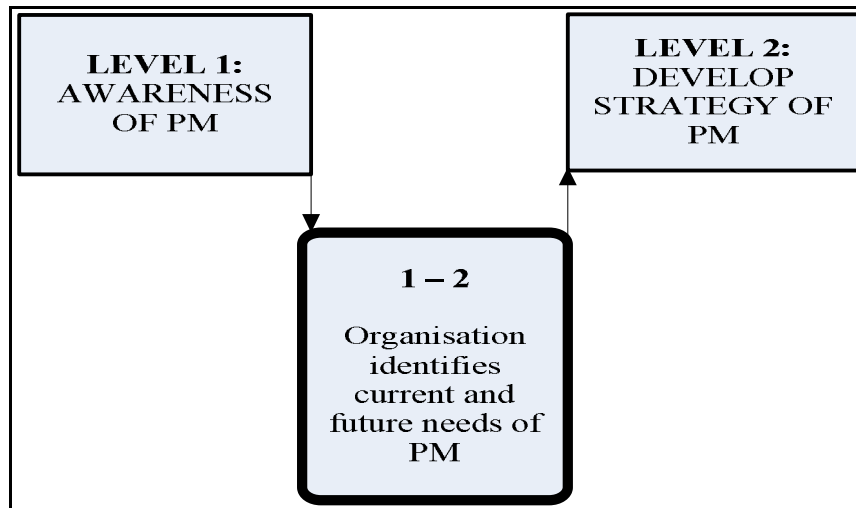


Figure 6.6: Strategy - Level 1 to Level 2

To progress to L3, performance measurement activities are implemented. To move from L2 to L3, the organisation has to identify and allocate resources needed for implementing the performance measurement strategy and activities identified (Figure 6.7). Identification is to ensure that the strategy and all activities can be implemented and achieved. Staff, technology and finance are necessary resources in implementing performance measurement. Furthermore, outsourced expertise or getting help and cooperation from an expert in the area of performance measurement could be a resource for the organisation.

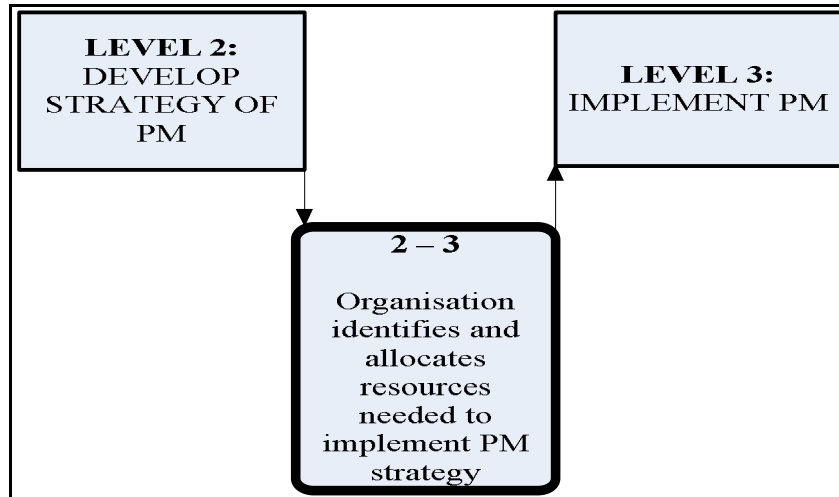


Figure 6.7: Strategy - Level 2 to Level 3

To move from L3 to L4, the performance measurement strategy and activities implemented are evaluated. The purpose of this evaluation is to get results and understand the degree of excellence of the organisation in achieving the strategy and probability of success of the performance measurement implemented and practised in the organisation. Success factors in implementing performance measurement will need to be identified, as they will be used to evaluate the strategy and activities. Information such as the need to be successful and capacity to produce by the organisation is needed for evaluating performance measurement strategy.

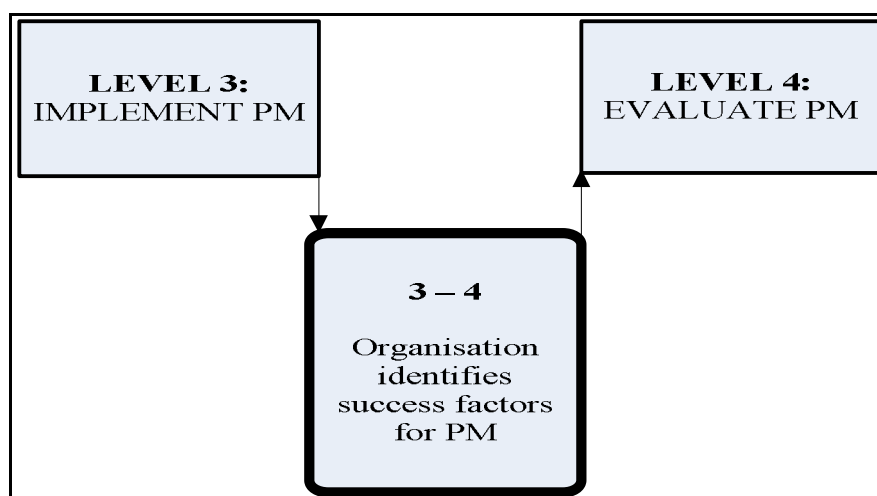


Figure 6.8: Strategy - Level 3 to Level 4

The highest level, L5, is where strategy is finally communicated and implemented within the organisation and/or other offices. Appropriate knowledge transfer approaches, an area of increasing interest (Carrillo et al., 2006), will be used to communicate results to other offices. Knowledge transfer in organisations is the process through which one unit (for example, group, department, division or unit) is affected by the experience of another (Argote and Ingram, 2000). Organisational experience in implementing the formation process of PM strategy can be adapted as well as applied by other units within the organisation and/or offices. The migration path is shown in Figure 6.9.

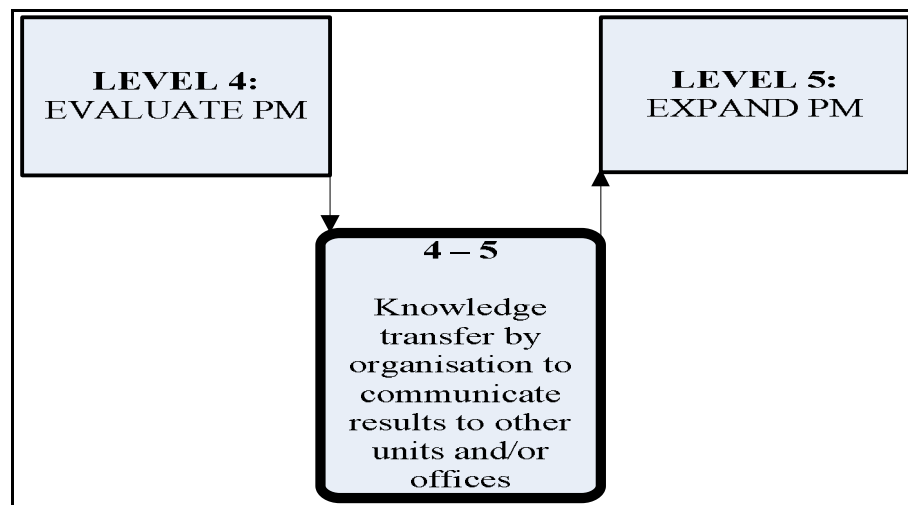


Figure 6.9: Strategy - Level 4 to Level 5

3. People

People are a main resource of an organisation, who carry out organisation activities. In L1, staff (as people) are aware of performance measurement needs in the organisation and they know performance measurement is important for the organisation. Information on performance measurement is communicated through middle and senior managers. In L2, staff develop their knowledge of performance measurement. This is important as they have to understand their duties and responsibilities, as well as the importance of their commitment to achieve success in implementing performance measurement in the organisation. To move from L1 to L2, training is required to increase and strengthen their understanding of performance measurement (Figure 6.10). Training related and relevant to performance measurement is needed as preparation for all staff to fully grasp how to run and conduct performance measurement activities in the organisation smoothly and

intelligently. Training, for example, workshops, seminars or conferences, can increase knowledge and understanding of performance measurement. The training can be in-house as well as external.

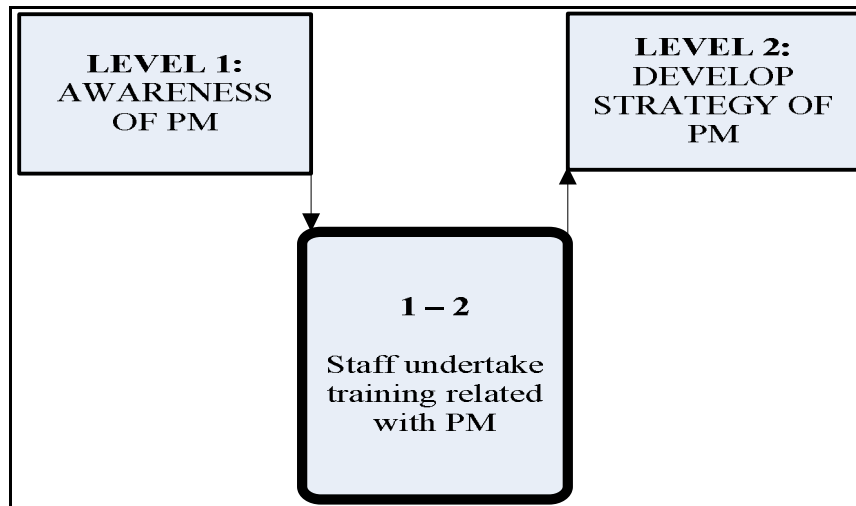


Figure 6.10: People - Level 1 to Level 2

L3 is where staff implement the performance measurement strategy and activities that have been agreed. At this level, staff carry out their tasks. Their feelings in doing their tasks can be expressed and their commitment to performance measurement activities can be deduced. They work together as a team to make performance measurement processes run smoothly. To make sure that every performance measurement task is done as planned, all members of the team have to undertake performance measurement activities, run and conduct them as they are asked by leaders (Figure 6.11). The success of implementing those activities depends on staff knowledge and understanding of performance measurement.

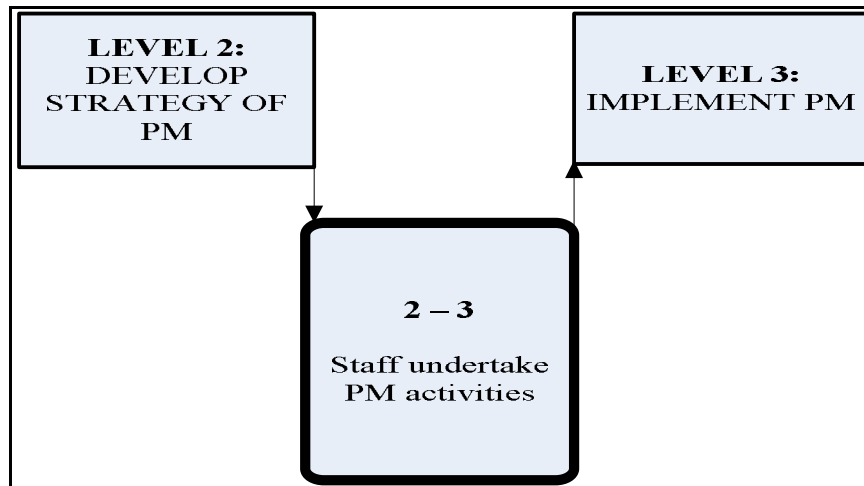


Figure 6.11: People - Level 2 to Level 3

L4 is where staff performance in delivering tasks is evaluated. The commitment and capabilities of the staff are reviewed. The purpose of this exercise is to know who is giving the best in delivering his or her tasks, and putting high effort into responsibilities for organisation success in performance measurement. Staff competence in undertaking their tasks will be assessed by leaders (Figure 6.12). This is to identify who shows good commitment and is fully committed in carrying out tasks and duties. Recognition and rewards are given to those who show the best commitment and achievement for the organisation. However, refining staff responsibilities and participation in performance measurement activities are necessary to improve performance measurement and ensure its feasibility in the future.

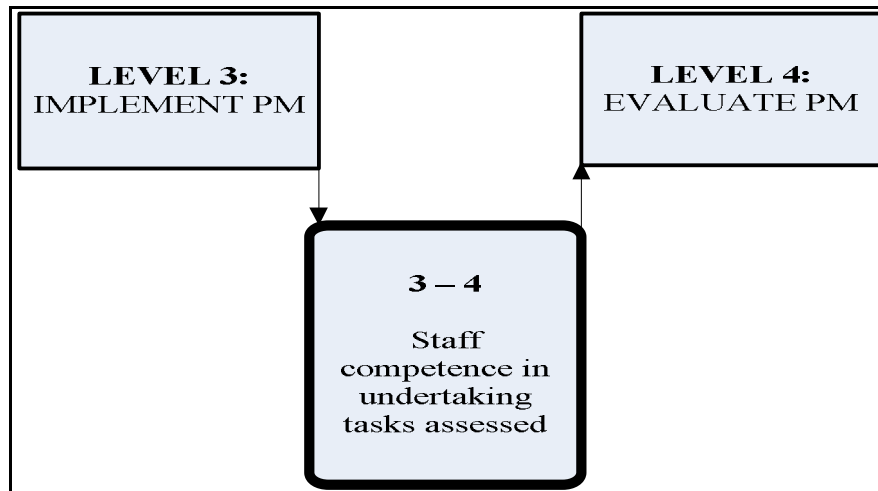


Figure 6.12: People - Level 3 to Level 4

The highest level, L5, is where staff continue to improve their knowledge of performance measurement and share it with other staff in other units and/or offices. This can be achieved by following and attending ongoing training and development courses on performance measurement and knowledge sharing through direct and indirect communication (as shown in Figure 6.13).

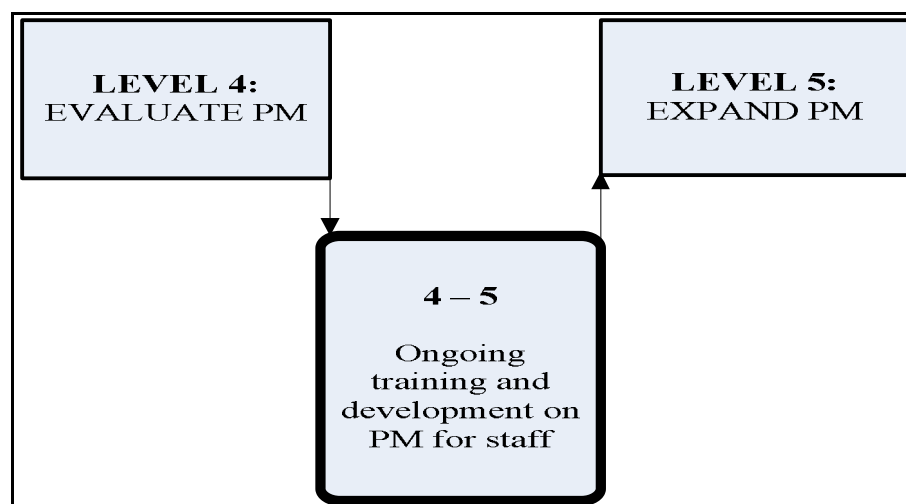


Figure 6.13: People - Level 4 to Level 5

4. Partnerships and Resources

Partnership is defined as an inter-organisational relationship to achieve shared goals of the participants (Lee, 2001). Resources refer to assets or inputs to production that an organisation owns, controls or has access to on a semi-permanent basis (Helfat and Peteraf, 2003). Both partnerships and resources are elements for consideration in measuring performance. At L1, partnerships are aware of the need for performance measurement. It means that they understand that performance measurement is important for the organisation. Performance measurement helps not only the organisation but also partnerships to deliver good services and creates good relationships. Performance measurement identifies what is necessary to be done by those who implement it.

At L2, the criteria for assessing the supply chain will be developed by the organisation. A supply chain is defined as a set of three or more entities (organisations or individuals) directly involved in the flows or processes of products, services, finances and/or information from a source to a customer (Mentzer et al., 2001). All the resources used in generating the organisation performance measurement are clearly positioned and well structured to secure success in running the performance measurement. The resources are, as mentioned earlier, staff, finance, technology and equipment. For migration from L1 to L2, performance measurement training is needed. The training includes workshops on understanding performance measurement, seminars on performance measurement and ongoing dialogue on performance measurement between the organisation and partnerships (Figure 6.14). This is important, as the organisation can keep the partnership informed of how important performance measurement is to the relationship. Training will increase the understanding of the partnership on performance measurement. Ongoing dialogue with a face-to-face approach will keep the partnerships informed as to where the organisation stands on performance measurement and to what extent organisational performance is improving.

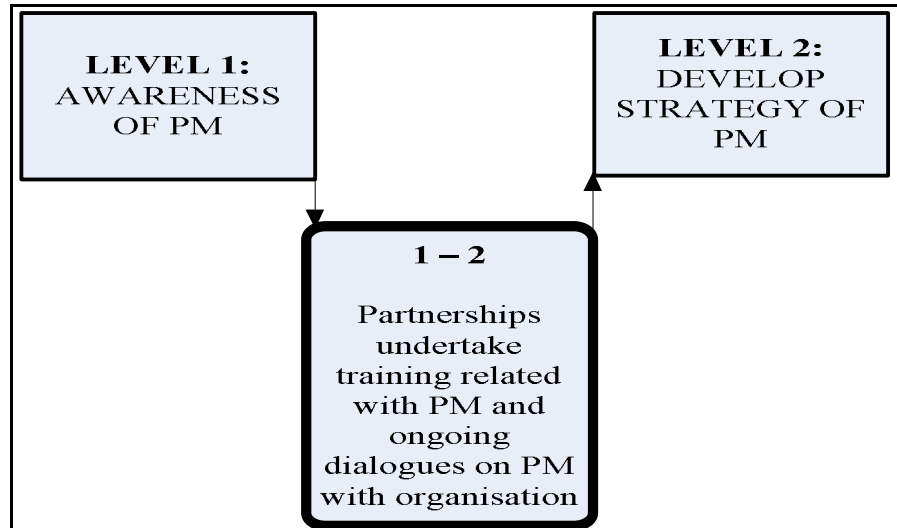


Figure 6.14: Partnerships and Resources - Level 1 to Level 2

The move to L3 is where the performance of the supply chain is measured. The purpose of this exercise is to identify the degree of commitment and cooperation within the supply chain. To migrate from L2 to L3, partnerships cooperate with the organisation in undertaking performance measurement activities (Figure 6.15). This is to make sure that planned performance measurement can be fully applied and used by all parties. It also shows support and commitment of partnerships on performance measurement activities of the organisation. That commitment helps the organisation in its implementation of performance measurement.

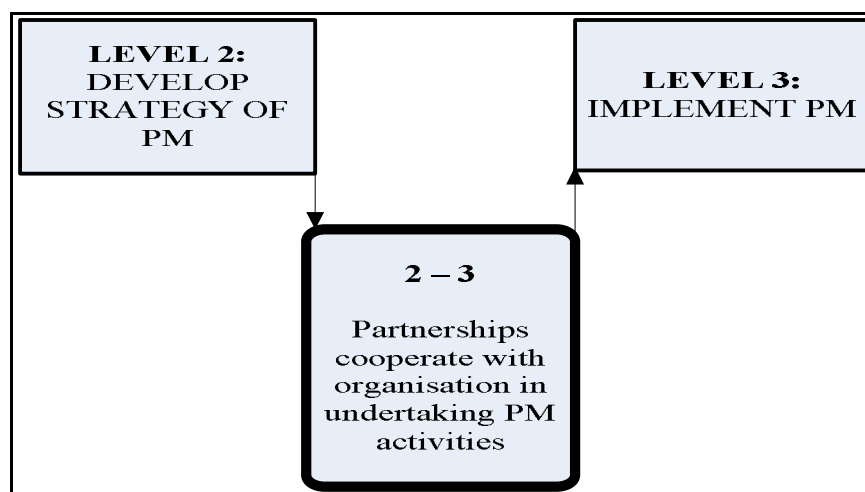


Figure 6.15: Partnerships and Resources - Level 2 to Level 3

L4 is the stage in which partnerships' performance and resources are evaluated and reviewed. This is to get an understanding of how the criteria are being managed and used. However, refining is necessary for future improvement in managing performance measurement and the supply chain. To move from L3 to L4, the organisation identifies supply chain success factors for performance measurement (Figure 6.16). For identifying those factors, a set of standards is used as a point of reference for evaluating performance or level of quality. The standards are created and prepared by the organisation for the supply chain. The purpose of the standards is to make the reviewing process easier. The results from the evaluation can be used for refining the performance measurement used in the supply chain.

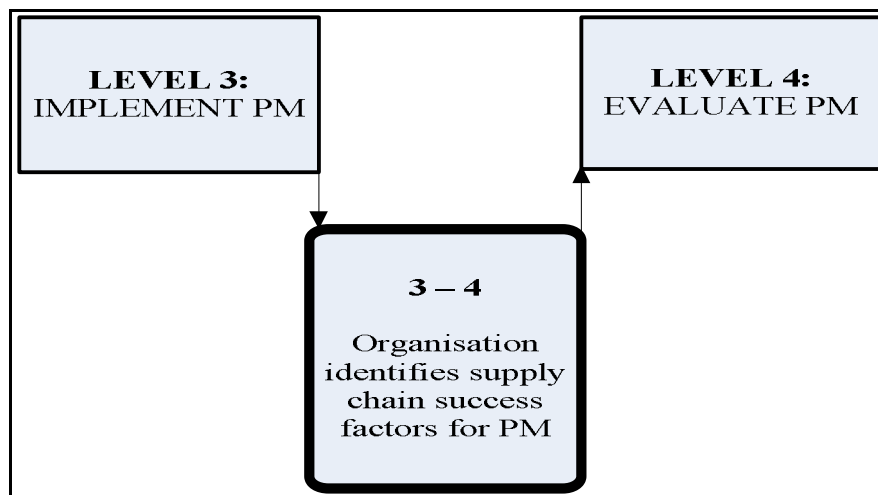


Figure 6.16: Partnerships and Resources - Level 3 to Level 4

At the highest level, L5, all the information and results gained from all the processes can be shared and extended to other supply chain members. They can be recorded and become a reference for others. To migrate from L4 to this highest level, knowledge transfer approaches will be used to communicate results to the existing partnerships as well as to potential ones (as shown in 6.17).

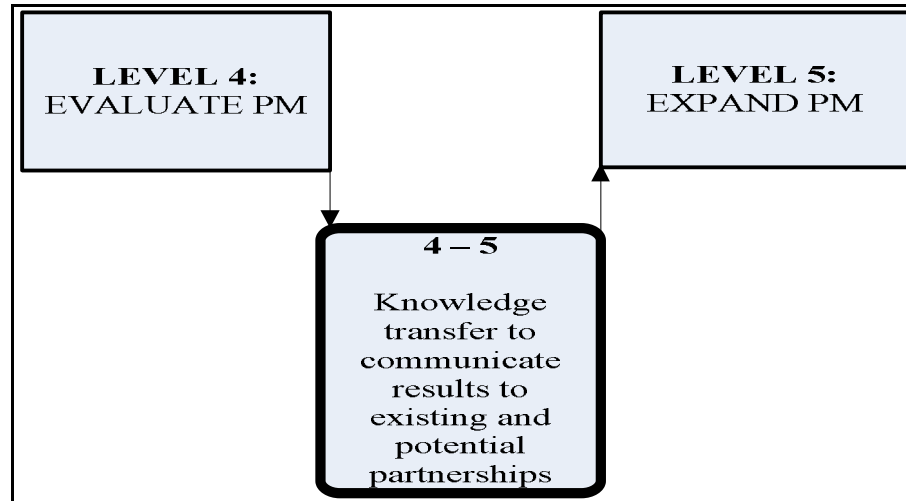


Figure 6.17: Partnerships and Resources - Level 4 to Level 5

5. Processes, Products and Services

Organisational processes used to generate products and services are another criterion to be taken into consideration in creating the ideal and complete performance measurement process. The process, a sequence of steps (Sampson and Froehle, 2006), together with products and services, needs to be viewed and measured to identify strengths and weaknesses as well as to understand the performance of an organisation. L1 of this criterion is where there is an awareness of the need for processes within performance measurement. This means that the organisation is aware of the importance of performance measurement processes, which include producing good products and providing good services to clients and customers. The next level, L2, is where the processes are developed and built to undertake performance measurement. Developing processes requires resources as well as the facilities. To migrate from L1 to L2, a process map needs to be created by the organisation to facilitate process development (Figure 6.18).

Constant involvement of clients and customers is important throughout this process. Their support helps the organisation to come out with a proper, reasonable and logical map or plan.

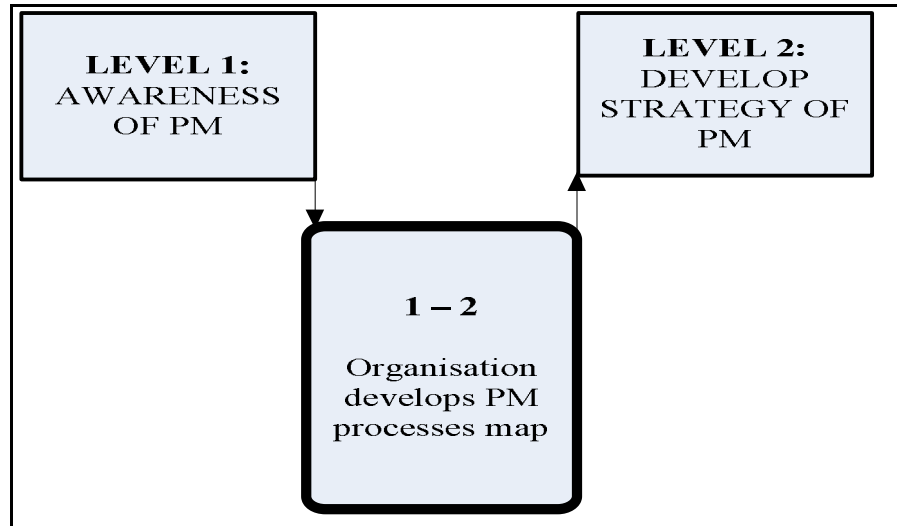


Figure 6.18: Processes, Products and Services - Level 1 to Level 2

L3 is where the processes are implemented systematically. The use of support systems together with resources would help to implement the processes in the entire organisation and lead to further development of products and services. The support systems include special tools and/or models, special software to reduce time and cost, and outsourcing of expertise. It then can help to improve the quality and increase the value of the products and/or services of the organisation.

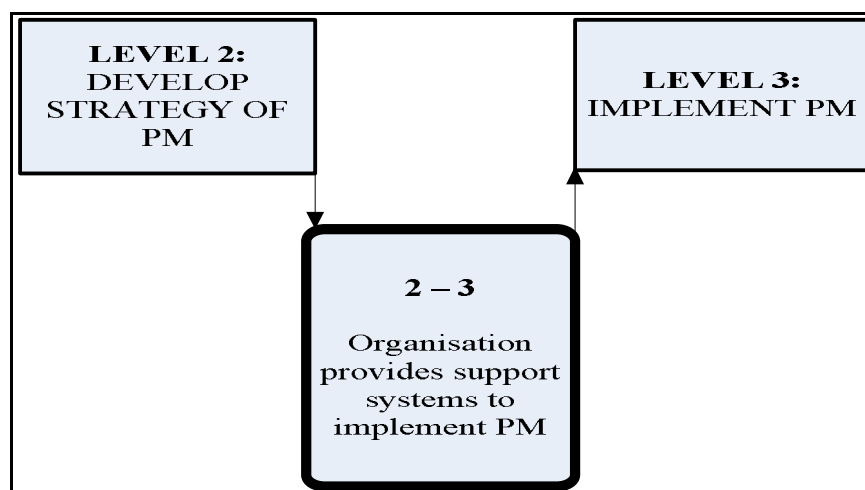


Figure 6.19: Processes, Products and Services - Level 2 to Level 3

L4 is where the quality of products and services is evaluated and then reviewed and improved. Review of the criteria is necessary as it can improve the business processes as well as development of products and services. If, after evaluation, products and services do not achieve the satisfaction level required, improvements should be made for the benefit of the organisation. To move from L3 to L4, a checklist of the procedures needs to be developed and created to check progress of work done (Figure 6.20). The checklist developed by the organisation can be used as a reference and guide in checking and monitoring processes, product and services delivered. The checklist shows procedures needing to be followed, roles and responsibilities of the members of performance measurement team, time needed for each step or process involved, marks on work done based on the organisation's standard and requirements and levels, as well as indicators of each measure.

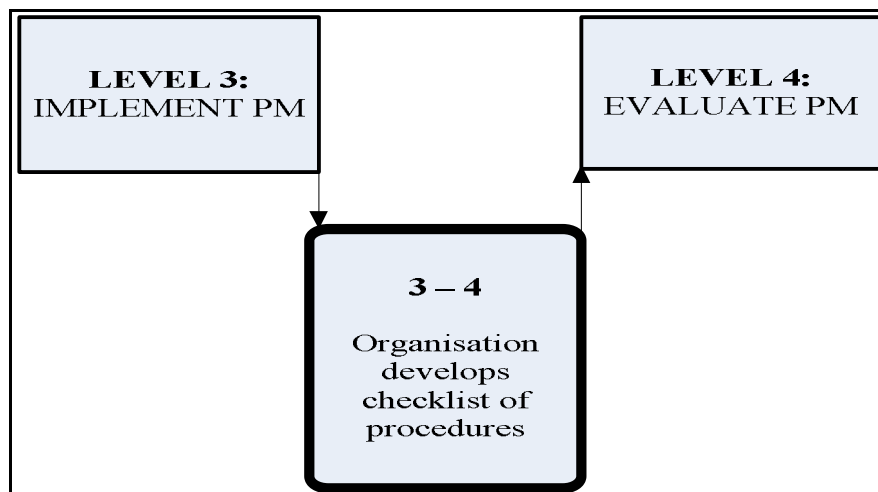


Figure 6.20: Processes, Products and Services - Level 3 to Level 4

The highest degree of excellence under this criterion is that the processes are managed, enhanced and expanded. Such expansion helps an organisation to increase organisation business by getting new customers or clients and building a network with existing and new customers or clients. Effective communication needs to exist for expanding the success in processing products and services to other units and/or offices. Figure 6.21 shows the movement from L4 to L5.

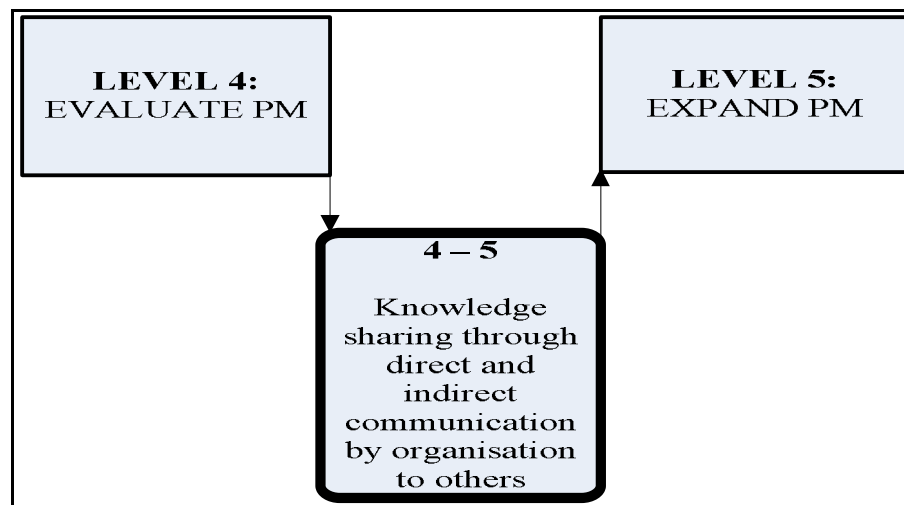


Figure 6.21: Processes, Products and Services - Level 4 to Level 5

6.4 FRAMEWORK USERS

As mentioned earlier in this chapter, the purpose of the framework is to assist organisations in implementing the performance measurement process in a structured manner. Activities and processes involved in measuring performance of organisations can be done in a proper structured manner from the beginning until they complete the whole process and succeed in it. Organisations involved with the performance measurement process will benefit from it, especially those, which had difficulty to complete it. The framework would work for organisations with understanding of performance measurement benefits and importance to the organisation. Managers involved in formulating, implementing and evaluating process of strategy will benefit from the framework. Furthermore, staff involved with the performance measurement process, not only managerial level but including functional level staff, can use it for the purposes of assisting as described. Functional level staff are those who take the responsibilities by undertaking all instructions from managers to achieve targets that have been planned by organisation. The proposed framework can be introduced in organisation at the early stage of every task that needs to be done by the staff involved. It gives reminders to the staff on what is important and what is to be considered in running performance measurement. The five criteria in the framework are the key elements that need to be alerted by organisation for easiness in implementing performance measurement process.

The criteria do not only represent the use of them in measuring business of organisations but also for measuring the process of project performance. All the criteria are important to make sure the organisations achieve what have been targeted in business and/or in projects. This is to make sure that the staff involved are capable of implementing activities related to the process and the performance measurement will produce results. The framework can be continuously used by the organisation as reference and guidance in undertaking performance measurement process. As performance measurement has an important agenda in the construction industry in Malaysia, the framework would benefit mainly its organisations of large size. The organisations of this scale are eager to expand business in wider markets, locally and globally. They have the capability in terms of resources such as finance, people and facilities. The framework can be introduced to organisations in the construction industry, which intend to improve their business for making better profits and gaining better positions in business for local and global markets.

6.5 SUMMARY

To ensure that performance measurement can be implemented successfully and effectively, a strategic approach to improve performance measurement has been proposed, which involves development of a maturity model and a migration path. The development of these two tools was based on framework and models that have been used in the industry. The purpose of developing a maturity model is to identify the maturity of an organisation in performance measurement development. This could help organisations to benchmark their implementation efforts in performance measurement. The migration path is developed to identify what needs to be done by organisations to improve performance measurement and show their current position and the desired position or what organisations aspire to be (which is much better than the current situation) in the future. The process of developing the migration path, the framework and how the framework works have been discussed. The next chapter will look into the perceptions of industry players or practitioners concerning the framework.

CHAPTER 7

FRAMEWORK EVALUATION

7.1 INTRODUCTION

This chapter discusses and presents an evaluation of the framework of the research. It begins with the evaluation approach, and explains definitions, purposes and types of evaluation. The next part presents the aim and objectives of the framework, the evaluation process and the evaluation made on the framework. Methods used for the evaluation are discussed as part of the evaluation process. Findings from the evaluation are then discussed before a summary of the chapter is presented. The outline and flow of this chapter on framework evaluation can be seen in Figure 7.1.

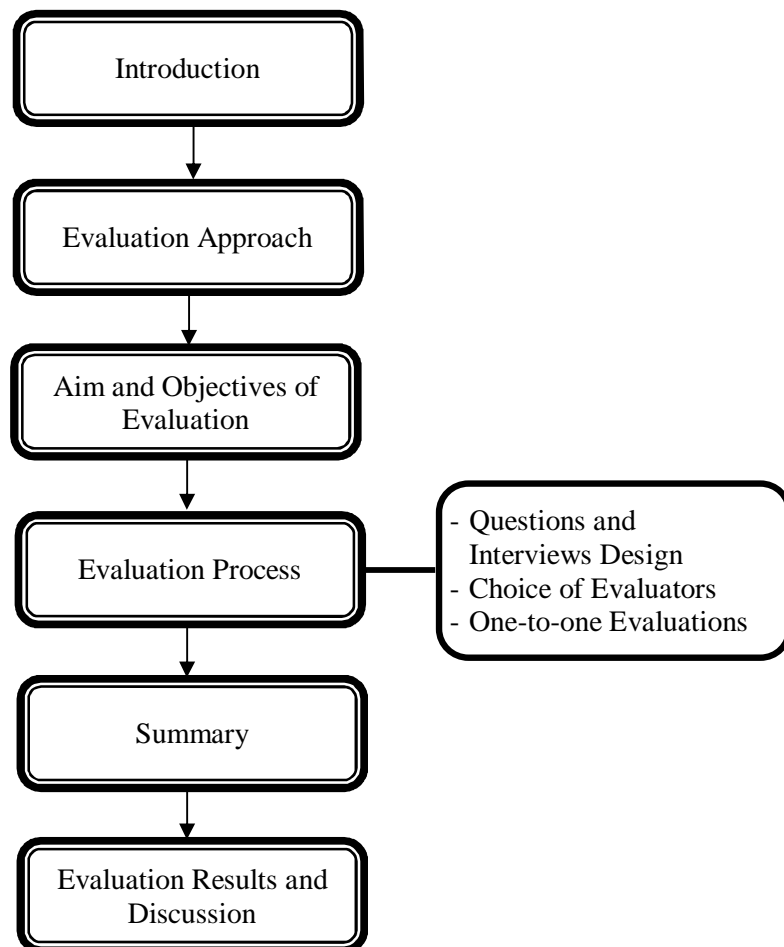


Figure 7.1: Outline of Framework Evaluation

7.2 EVALUATION APPROACH

Evaluation can be defined as the systematic assessment of the operation and/or the outcomes of a programme or policy, compared to a set of explicit or implicit standards, as a means of contributing to the improvement of the programme and policy (Powell, 2006). Trochim (2006) also mentions evaluation as the systematic acquisition and assessment of information to provide useful feedback about some objects. Objects here could refer to a programme, policy, technology and activity. Willis et al. (2007) understand evaluation as believability, how information and findings of research can be understood as believable and valid. Fellows and Liu (2008) state that evaluation is appraising the effectiveness of what exists. It means assessing something that exists to know its effectiveness in actual use. All evaluation work involves collecting and sifting through data, making judgements about the validity of the information and inferences researchers derive from it, whether an assessment is of worth or merit (Trochim, 2006). The goal of most evaluation is to provide 'useful feedback' to the audience (depending on what types of product or programme need to be evaluated) and other constituencies. The major purpose of evaluation should be to influence decision-making or policy formulation through the provision of empirically-driven feedback (Powell, 2006; Trochim, 2006).

7.2.1 Types of Evaluation

Patton (2002) and Trochim (2006) classify evaluation into two types: formative and summative, which are now discussed as follows:

1. Formative Evaluation

Formative evaluation is described by Patton (2002) and Trochim (2006) as being to strengthen or improve the object being evaluated. It serves the purpose of improving a specific programme, policy, group of staff (in a personnel evaluation) or product. Formative evaluation aims at forming or shaping the thing being studied. No attempt is made in formative evaluation to generalise findings beyond the setting in which the evaluation takes place and it relies heavily on process studies, implementation evaluations, case studies and evaluability assessments. Formative evaluation often relies heavily, even primarily, on qualitative methods and its findings are context specific

(Patton, 2002).

2. Summative Evaluation

Summative evaluation contrasts in being used to examine the effects or outcomes of some objects. The researcher summarises it by describing what happens subsequent to delivering the programme or product and assessing whether the object can be said to have caused the outcome, determining the overall impact of the causal factor beyond only the immediate target outcomes and estimating the relative costs associated with the object (Trochim, 2006). This type of evaluation is used to judge programme success or to determine programme effectiveness. It is for summing up judgements about a programme to make a major decision about its value, whether it should be continued and whether the demonstrated model can or should be generalised and replicated for other participants or in other places (Patton, 2002).

For evaluating the framework, summative evaluation was used to assess the effectiveness of the framework for its content, capability and usability. This resulted in recommendations for strengthening the elements of the framework to improve and refine the Performance Measurement Migration Path. The main aim of doing a summative evaluation is to test whether the framework is efficient and appropriate enough to be accepted and used by practitioners in the construction industry to implement performance measurement in organisations.

7.3 AIM AND OBJECTIVES OF EVALUATION

The framework, the Performance Measurement Migration Path, is designed to identify critical migration paths for each specific performance measurement area. This is expected to raise the performance of organisations from their current position to a better one.

The specific objectives were:

- To assess the content, effectiveness, capability and usability of the framework.
- To identify strengths and weaknesses of the framework.

- To obtain comments and recommendations for improving the framework.
- To make recommendations for widespread use of the framework.

7.4 EVALUATION PROCESS

The Performance Measurement Migration Path was evaluated by using the methodology described in Chapter 4 (sub-section 4.4.4). Evaluation was based on the functionality of the framework design, its content and elements, its capability and use, errors and its relevance to its target users, which are large organisations involved in the construction industry. The evaluators were given standard evaluation questions covering three parts (see Appendix C for questions) and were encouraged to include any additional suggestions for further improvement of the framework.

The peer review from the industry sample comprised eleven construction industry practitioners currently involved with the performance measurement process in organisations. Apart from that, the evaluators included one business excellence consultant, as he is an expert in performance measurement. Peer review can provide second thoughts from experts in the researcher's field, and is basically a selection process. Serious research work is always subject to review by other professionals in the field and this review perhaps gives the most basic standard to ensure the quality of the research. The peer review concept is relevant to researchers because it is the single most important criterion that can help them to distinguish between work which scientists and scholars regard as serious research and works which are not looked on in that way (Bailin and Grafstein, 2010). The details of the questions for evaluation, methods used for evaluation and choice of evaluators are discussed in the next page and are also illustrated in Figure 7.2.

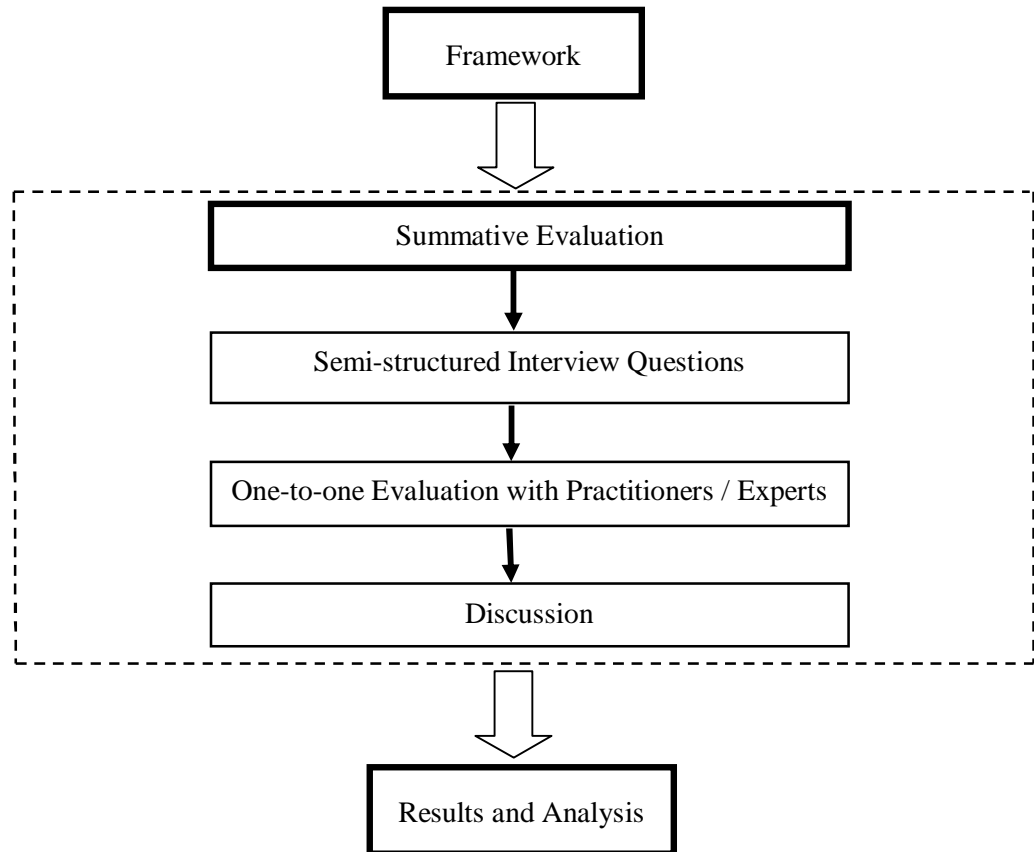


Figure 7.2: Framework Evaluation Process

7.4.1 Questions and Interview Design

To obtain feedback from construction practitioners on the framework, a set of interview questions was produced. The development of the questions was based on the aim and objectives of the evaluation, as stated in section 7.3. The questions can be referred to in Appendix C. The same questions were distributed to all evaluators and contained three parts as follows:

- Part 1: Background Information

This part requested information on the evaluator's name and position as well as job description, name and address of evaluator's organisation, type of evaluator's organisation and evaluator's contact details.

- Part 2: Framework Elements

This part required evaluators to verify the need for the framework and to assess its usefulness for organisations. The items covered content, effectiveness, capability and use of the model. The purpose of this was to ensure that the framework is understandable and easy to use by industry practitioners.

There were four sections intended to assess the following aspects of the framework:

Section 1: Framework content.

Section 2: Framework effectiveness.

Section 3: Framework capability.

Section 4: Framework usability.

Evaluators were asked to give answers to all questions in this part by ticking the box that best represented their assessment and agreement with each statement on the framework. Their assessment and agreement were on a Likert scale of SD (Strongly Disagree), D (Disagree), N (Neutral), A (Agree) and SA (Strongly Agree), graded as 1 to 5 where 1 represented SD and 5 represented SA.

- Part 3: General Comments

This part required evaluators to make comments and recommendations on the framework. The purpose was to identify possible ways to improve the framework in its content, effectiveness, capability and usability by an organisation.

Questions included benefits of the framework, barriers and improvements for the framework. Questions developed allowed qualitative and quantitative feedback. Qualitative feedback came from Parts 1 and 3 and quantitative feedback came from Part 2.

Twelve semi-structured interviews were held with evaluators in the UK and in Malaysia to gain feedback on the framework. Semi-structured interviews were selected as a style of interviewing to give form to the interviews while allowing probing (Bassioni et al., 2005; Fellows and Liu, 2008). One-to-one semi-structured interviews were used for evaluation

with most of the interviews conducted through telephone and e-mail. However, one face-to-face interview was held in the evaluator's office in the UK and others took place at the researcher's place in Loughborough, UK. Each interview lasted between forty minutes and one hour.

During the interviews, qualitative feedback was obtained from all the evaluators. Discussion during each interview involved the improvement of the framework. The interviews were recorded with the full consent of the evaluators and the data were then transcribed and documented. Analysis of the data was carried out qualitatively. The results of the interviews are presented in section 7.5.

7.4.2 Choice of Evaluators

Selection of the appropriate evaluators is important, as the evidence and justification from the right person are important to confirm the ability and capability of the framework. If the methods are inadequate or the data are insufficient, faulty evidence is produced and this evidence can be discounted (Fink, 2008).

For the evaluation, twelve organisations in two countries, the UK and Malaysia were involved. Out of the twelve, eleven are industry practitioners in the UK and Malaysia and one is a UK consultant in business performance and excellence. All organisations from the construction industry are large and undertake performance measurement in their businesses. The other organisation, even though not from the area of construction, has a role of helping and assisting organisations including construction organisations, in implementing performance measurement and measuring business performance. All evaluators chosen were experts in the area of performance measurement. Bamberger et al. (2006) state that evaluators may be selected for their impartiality and professional expertise.

Evaluation was done in the UK to acquire views from experts there as they have more experience in performance measurement implementation, which has applicability in evaluating the framework to be used in organisations. Evaluation in Malaysia was conducted to determine the usefulness and acceptability of the framework in the

construction industry. Information on all evaluators and on the method of collecting data from them is shown in Table 7.1.

Table 7.1: Evaluator Information

Evaluator	Role	Business Type	Data Collection Method
United Kingdom (UK)			
UK1	Business Improvement Manager	Contractor	Interview through face-to-face
UK2	Technology Division Manager	Contractor	Interview through telephone and e-mail
UK3	Research Manager	Civil and Structure Consultant	Interview through telephone and e-mail
UK4	Director	Business Performance and Excellence Consultant	Interview through telephone and e-mail
UK5	Director of Strategy Development	Contractor	Interview through e-mail
Malaysia			
M1	Managing Director	Contractor	Interview through telephone and e-mail
M2	General Manager	Developer	Interview through telephone and e-mail
M3	Chief Executive Officer (CEO)	Contractor	Interview through e-mail
M4	Chief Executive Officer (CEO)	Mechanical and electrical services	Interview through e-mail
M5	Technical Director	Contractor	Interview through telephone and e-mail
M6	Head of Department	Project Management Consultant	Interview through e-mail
M7	Head of Organisation	Housing and Project Consultant	Interview through telephone and e-mail

Evaluators were selected on the basis of their involvement with performance measurement processes in organisations. They are all managerial staff and have experience in implementing performance measurement and they understand the goals of their organisations. They were known as experts in implementation of performance measurement in their organisations and represented different types of business in the construction industry in both countries.

For the framework evaluation, invitations to participate were sent through e-mail and telephone to potential evaluators. Firstly, invitations were sent to all those who were involved in the early stage of the research. Then the invitations were also sent to other potential managerial level staff in selected large organisations in the construction industry in both countries. An explanation of the framework and the purpose of the evaluation were given to all potential participants. Due to the time constraint, a time limit was fixed for accepting responses from people who were invited to participate. As a result, twelve managerial level staff, five from the UK and seven from Malaysia, agreed to be involved and to participate in the evaluation. Seven were the same people involved at the data collection stage. The rest were new to the research. As a result of the interviews with the experts, feedback was obtained on using the framework for assisting implementation of the performance measurement process.

7.5 EVALUATION RESULTS AND DISCUSSION

Data from the semi-structured interviews with the twelve evaluators were analysed and results are presented below.

7.5.1 Background Information

As shown in Figure 7.3, six out of twelve evaluators worked in contracting organisations. Of these, five were amongst those interviewed in the preliminary stage of data collection. The remaining six were from other types of business. The other types of business were consultants of civil and structure, project management, housing and project, as well as business performance and excellence, developer and mechanical and electrical services organisations.

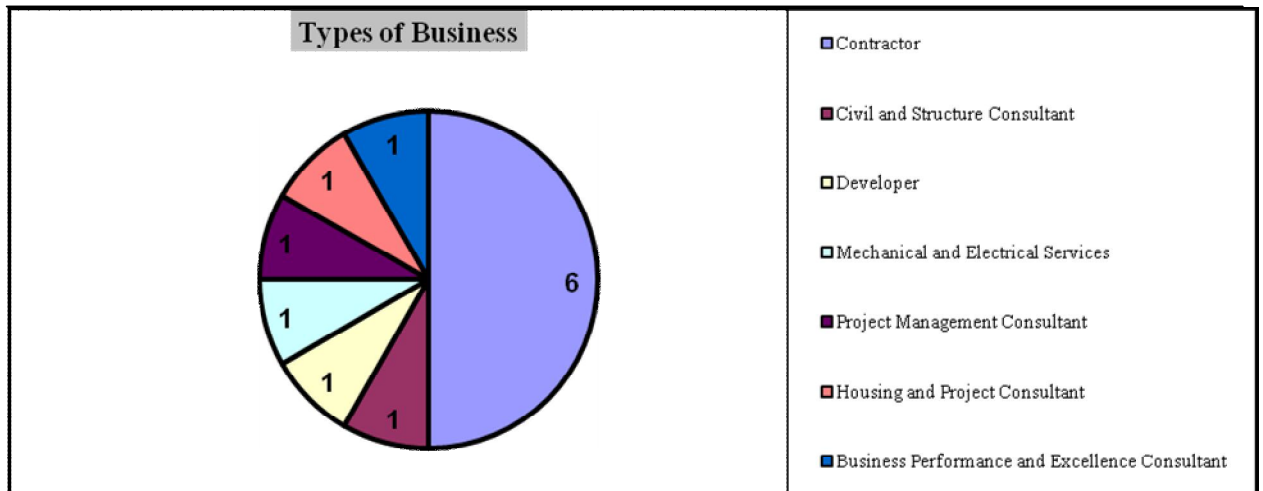


Figure 7.3: Evaluator Types of Business

All evaluators have experience in arranging and managing activities for performance measurement in their organisations. When asked about their experience in performance measurement activities, almost all evaluators revealed possession of more than 2 years’ experience. Apart from that, almost all evaluators were involved in the evaluating phase of organisation performance. One evaluator in the category of business performance and excellence consultant had no direct experience in the construction industry. However, that evaluator’s job is to assist organisations in making plans and strategies for improving businesses and implementing performance measurement.

7.5.2 Framework Elements

The information on the elements was divided into four parts, as mentioned in section 7.4.1. Table 7.2 shows the results for framework content, effectiveness, capability and usability by the two countries. The table shows the mean scores where Strongly Disagree (SD) is awarded 1 and Strongly Agree (SA) is awarded 5. An analysis of responses is presented under the specific elements, which is discussed after this section.

Table 7.2: Responses to Framework Elements

Evaluation Questions (EQ)		Average (UK)	Average (Malaysia)
Section 1: Framework Content			
To what extent do you agree that the model content is suitable in so far as:			
EQ1	Words and terms used are understandable.	4	4.14
EQ2	Words and terms used are important for performance measurement implementation.	4	4.29
EQ3	Format is easy to navigate.	4.4	4
Section 2: Framework Effectiveness			
To what extent do you agree that the model is effective for:			
EQ4	Improving performance measurement practices.	3.8	4
EQ5	Improving performance measurement implementation processes in an organisation.	4.4	4.14
EQ6	Assisting the beginner in understanding performance measurement processes.	3.8	3.57
EQ7	Addressing important elements of managing organisation performance.	4	4
EQ8	Assisting an organisation to improve implementation of performance measurement.	4.8	4
Section 3: Framework Capability			
To what extent do you agree that the framework is capable of:			
EQ9	Providing a practical solution to improve performance measurement practices by identifying maturity of performance measurement activities.	3.8	3.57
EQ10	Providing a practical solution to improve performance measurement practices by identifying migration of performance measurement activities from the current to a better situation.	4.2	4
EQ11	Fostering learning and increasing the awareness of performance measurement.	3.4	4.29
EQ12	Cultivating a cooperative spirit and helping to improve communication between employees.	3.2	4.14
EQ13	Achieving performance measurement targets.	3.8	4.14
Section 4: Framework Usability			
To what extent do you agree that:			
EQ14	The framework is simple and user-friendly.	4.4	3.57
EQ15	The organisation would use the framework for guidance in performance measurement processes.	4	3.86
EQ16	The organisation recognises the importance and benefits of using the framework.	3.6	3.57
EQ17	Considerable training will be required for effective use of the framework.	3.6	4.14

Based on the table, there was a consensus amongst evaluators in the UK and Malaysia that the framework content is suitable to be used in implementing the performance measurement process of organisations. All of them (evaluators from the UK as well as Malaysia) agreed that the elements of the framework such as words and terms used and its format are understandable and show the importance of performance measurement. The average score by the UK evaluators on understandability of words and terms used and its importance for performance measurement implementation is 4.00. For Malaysia, average score is 4.14 to 4.29. Apart from that, many evaluators agreed that the format shown for the framework is easy to navigate, as scores from both countries are more than 4.00.

On the effectiveness of the framework, many agreed that the framework is effective for improving performance measurement practices of organisations. Effective here means that the framework can improve the practices of performance measurement and the implementation process in an organisation (EQ4 to EQ5, average scores between 3.80 and 4.40). The framework also received a good response even though it is not high on its effectiveness in assisting the beginner in understanding performance measurement processes. Average score for this is 3.80 in the UK and 3.57 in Malaysia. This is because there are evaluators in both countries who think that the framework could work for the user who has at least a basic understanding of performance measurement and it could be difficult to be implemented by organisation, which has no knowledge in performance measurement. The framework also addressed the importance of elements of managing the organisation with an average score of 4.00. Evaluators in both countries agreed, in fact some evaluators strongly agreed that the framework can be used in assisting organisations to improve implementation of performance measurement, with an average score of 4.80 in the UK and 4 in Malaysia.

The framework demonstrated its capability in providing a practical solution to improve performance measurement practices with average scores of 3.57 to 4.20. There is a huge gap in responses of evaluators in both countries on capability of the framework in fostering learning and increasing the awareness of performance measurement and to improve communication between employees, with average scores of 3.20 to 3.40 in the UK but higher in Malaysia, an average of 4.14 to 4.29. However, most evaluators agree that the framework is capable of achieving performance measurement targets, with average scores of 3.80 to 4.14.

For usability, the evaluators agreed that the framework is simple and user-friendly and organisations would use it for performance measurement. The average scores for this are in the range of 3.57 to 4.40. The UK evaluators gave an average of 3.60 in recognising the importance of the framework and benefits they can gain from it. Malaysia scored 3.57. To strengthen understanding of the framework, training is required for its effective use, with average scores between 3.60 and 4.14.

7.5.2.1 Framework Content

This part discusses the content of the framework from the perspective of the evaluators. Figure 7.4 shows the overall ratings from evaluators in both countries, the UK and Malaysia. EQ1 to EQ3 represent questions related to the framework content.

The majority of responses from evaluators assessed the framework content as ‘Agree’ and ‘Strongly Agree’. For EQ1, all 5 UK evaluators considered the words and terms used in the framework easy to understand and 6 out of 7 in Malaysia shared the same view. They also agreed and strongly agreed with EQ2 that words and terms used are important for performance measurement implementation. All evaluators in the UK again put ‘Agree’ for EQ2. The number is similar to that given by evaluators in Malaysia, with additional 2 ‘Strongly Agree’. Regarding the format of the framework, 3 out of 5 UK evaluators ‘Agree’ that the format is easy to navigate and additional 2 ‘Strongly Agree’ with the easiness of the format. Of the Malaysian evaluators, 5 out of 7 ‘Agree’ on the format of the framework, 1 selected ‘Neutral’ and another selected ‘Strongly Agree’. Discussion on specific elements follows Figure 7.4.

As the majority of responses are more on ‘Agree’ and ‘Strongly Agree’ to all questions for framework content, it shows the strength of agreement on the suitability of the framework content with regard to words and terms used and their importance for implementing performance measurement and how easily the framework can be used and put into practice in organisations.

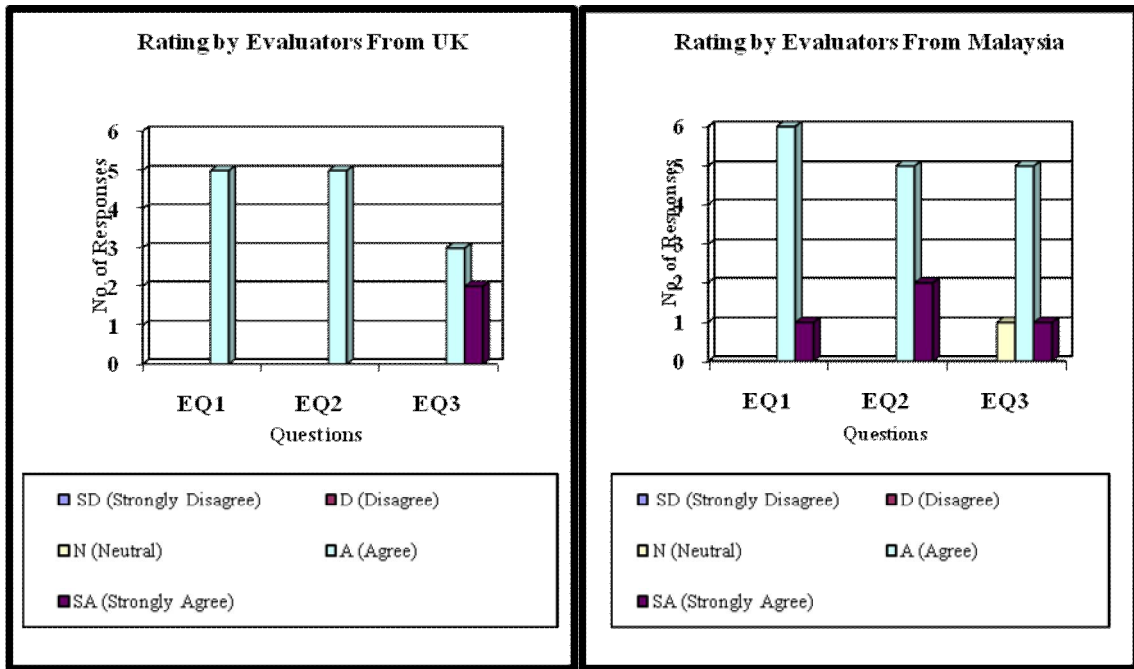


Figure 7.4: Overall Rating for Framework Content

7.5.2.2 Framework Effectiveness

Figure 7.5 shows overall ratings from the evaluators from both the UK and Malaysia on the effectiveness of the framework. The findings show that most evaluators' feedback is for 'Agree'. Other feedback for EQ4 to EQ8 is in the category of 'Neutral' and 'Strongly Agree'. The evaluators in both countries 'Agree' with EQ4 that the framework can be used to improve performance measurement practices. 4 out of 5 evaluators in the UK agree; 5 out of 7 in Malaysia agree where 1 evaluator selected 'Strongly Agree'; and 1 in the UK and Malaysia each selected 'Neutral'. They responded 'Neutral' as they think that improving the performance measurement practices does not only depend on a method such as the framework, but it should come from the eagerness of the organisation to change. It should come from the internal motivation and not by simply depending on a method or approach. A method probably might work for certain organisations or people but would give contradictory results in other organisations if they implement it. They also indicated that the framework can be used to improve the process of implementation of performance measurement in organisations. 3 evaluators chose 'Agree' and 2 'Strongly Agree' in the UK; 6 out of 7 evaluators in Malaysia chose 'Agree' and 1 'Strongly Agree' for the same statement and EQ5.

The framework is seen as effective for assisting the beginner in understanding the performance measurement process (EQ6). Beginner here means organisations that know about performance measurement. They have an understanding of what performance measurement is, but have just started to implement it in their management. 3 UK evaluators selected 'Agree' and 1 selected 'Strongly Agree' that the framework can assist the beginner in understanding performance measurement processes. Another evaluator selected 'Disagree' for EQ6 because of understanding that a complete beginner with no knowledge of performance measurement would find the framework difficult. However, 4 evaluators in Malaysia 'Agree'; 3 evaluators in the UK also 'Agree' and the balance of 3 more evaluators chose 'Neutral' for EQ6.

The evaluators also agreed that the framework addresses important elements of managing organisation performance (EQ7). 3 out of 5 in the UK chose 'Agree'; 1 chose 'Strongly Agree' and another 1 chose 'Neutral'. For EQ7, 3 evaluators in Malaysia selected 'Agree'; 2 chose 'Strongly Agree' and 'Neutral'. The evaluators gave 'Neutral' as some elements might be suitable for certain types of business. The framework was also claimed by evaluators as a framework that can assist organisations to improve implementation of performance measurement. 4 evaluators in the UK selected 'Strongly Agree' (EQ8) and 1 selected 'Agree'. Evaluators in Malaysia also stated the same, as 5 chose 'Agree', 1 'Strongly Agree' and 1 'Neutral'.

Based on the selection of answers from all the evaluators, it shows that the framework is considered effective in assisting the performance measurement process.

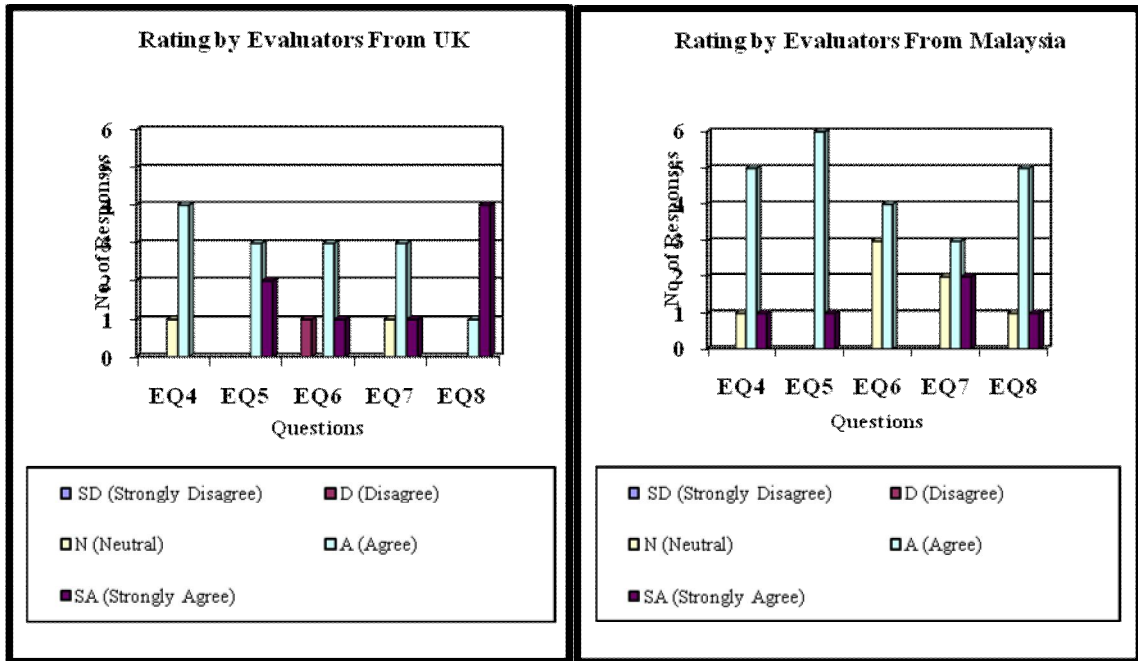


Figure 7.5: Overall Rating for Framework Effectiveness

7.5.2.3 Framework Capability

All evaluators were asked about the capability of the framework. For this purpose, five questions were prepared (EQ9 to EQ13). The number of responses for each question is shown in Figure 7.6. The majority of evaluators assessed the framework capability as ‘Agree’ as well as ‘Strongly Agree’. For EQ9 and EQ10, 3 evaluators from the UK indicated ‘Agree’ that the framework provides a practical solution to improve performance measurement practices by identifying the maturity of performance measurement activities; 4 ‘Agree’ that it provides solutions by identifying migration of performance measurement activities from the current to a better situation. 1 evaluator chose ‘Strongly Agree’ for EQ9. Even though the majority chose ‘Agree’ and 1 ‘Strongly Agree’, there is 1 evaluator who indicated ‘Disagree’. This is because, from his point of view, improvement cannot be made only by identifying the maturity level of performance measurement activities; but it has to start from the willingness and preparation of all parties and staff involved with organisations. He understood maturity as a way, which can only be implemented successfully if everybody and all parties understand and are ready for performance measurement. For EQ9, 4 out of 7 evaluators in Malaysia selected ‘Neutral’, 2 selected ‘Agree’ and 1 selected ‘Strongly Agree’. ‘Neutral’ was chosen

because some people might not even care about the maturity of performance measurement. They feel it needs time to learn it to make it useful in order to get results. They are interested in immediate results rather than having to wait to see results.

For EQ10, all evaluators chose 'Agree' on the framework's ability to provide a practical solution to improve performance measurement activities by using maturity methods of performance measurement activities. For EQ11, whether the framework is capable of fostering learning and increasing the awareness of performance measurement, 3 out of 5 evaluators in the UK selected 'Agree' and 1 selected 'Neutral' and 1 chose 'Disagree'. This is because the evaluator thought that the use of only a framework or tool was not adequate to foster learning and increase the awareness of performance measurement. To increase this awareness, it needs preparation of all staff involved in performance measurement implementation in the organisation. Apart from that, commitment of everyone in the organisations helps to increase awareness and foster learning of performance measurement. For EQ11, 5 Malaysian evaluators selected 'Agree' and the rest selected 'Strongly Agree'.

EQ12, concerns the framework's capability of cultivating a cooperative spirit and helping improve communication between employees. 2 evaluators in the UK selected 'Agree'; 2 others selected 'Neutral' but 1 selected 'Disagree'. The framework needs to be implemented and only time will tell whether it can create a cooperative spirit as well as help in improving the communication system between employees. Added to that, the evaluator could not predict if cooperative spirit and communication can be improved among employees by depending only on the use of the framework. Success can be achieved through commitment of each individual or staff member involved with the organisation and the performance measurement process. It can be improved at the senior level, the leaders/managerial level, but as it cascades to other staff, it could not be seen how it can help to improve communication between employees, as that is not a direct focus of the framework. For the same question, EQ12, 4 evaluators in Malaysia selected 'Agree', 1 selected 'Strongly Agree' and another chose 'Neutral'. Most evaluators in both countries assessed the framework as 'Agree' for its capability in achieving performance measurement targets (EQ13). 4 out of 5 evaluators in the UK selected 'Agree' and 6 in Malaysia did the same. 1 Malaysian evaluator selected 'Strongly Agree' and 1 from the UK selected 'Neutral' for the same question.

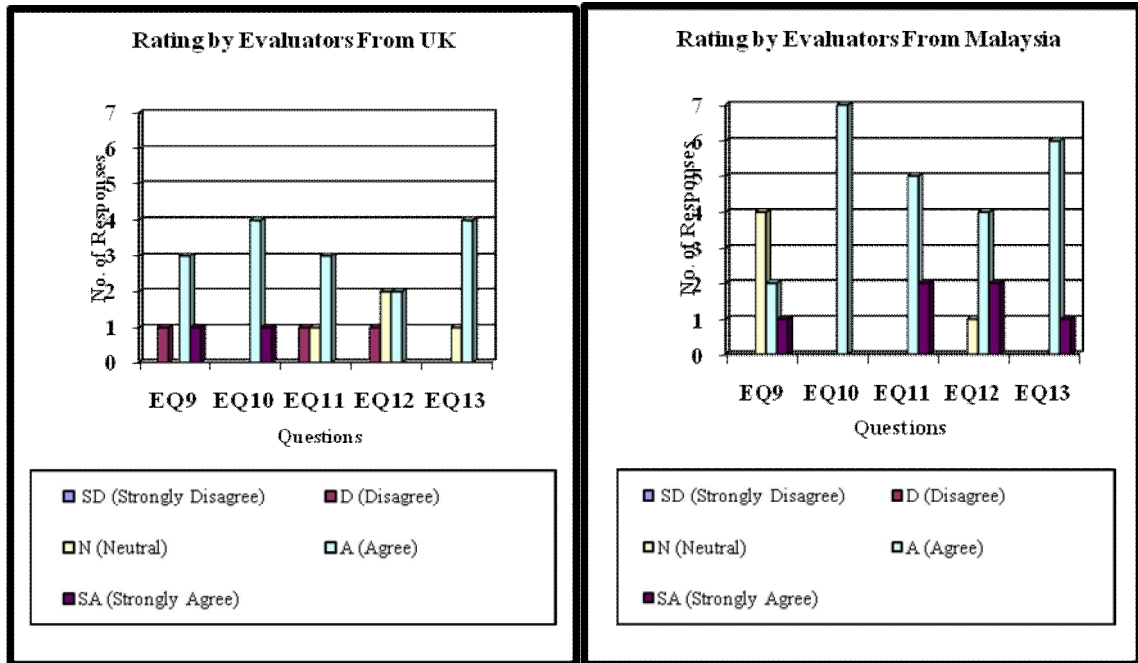


Figure 7.6: Overall Rating for Framework Capability

7.5.2.4 Framework Usability

Figure 7.7 (next page) shows overall rating of responses on the usability of the framework with regard to questions EQ14 to EQ 17. Based on the feedback from evaluators in both countries, it shows that the majority of evaluators assessed the framework as ‘Agree’ and ‘Neutral’. They generally agreed that the framework is simple and user-friendly. 6 evaluators, 3 from each country, gave ‘Agree’ response for EQ14. 3 other evaluators, 2 from the UK and 1 from Malaysia, assessed EQ14 as ‘Strongly Agree’. 2 evaluators in Malaysia selected ‘Neutral’ but 1 selected ‘Disagree’ for EQ14. This shows that among the people experienced in performance measurement, some think that the use of the framework with the maturity level and migration path approaches is complicated for staff involved, especially those who are new to the process. Responses to EQ15 confirmed that the framework can also be used by organisations to guide them in performance measurement processes. 11 evaluators, 5 from UK and 6 from Malaysia, indicated ‘Agree’.

Apart from that, most evaluators agreed that they recognised the importance and benefits of using the framework in improving performance measurement implementation. 7

evaluators from both countries indicated ‘Agree’ in EQ16. To strengthen the understanding and eligibility in using the framework, users require training. 4 evaluators in Malaysia and 2 in UK ‘Agree’ that training is required for effective use of the framework. Additional 3 evaluators from both countries selected ‘Strongly Agree’ for EQ17; 1 from the UK selected ‘Neutral’. Only 1 evaluator from the UK chose ‘Disagree’ for EQ17. This shows that training is not necessarily required if the person has confidence to use the framework, which is justified as simple and easy to understand and hence can be used by most people.

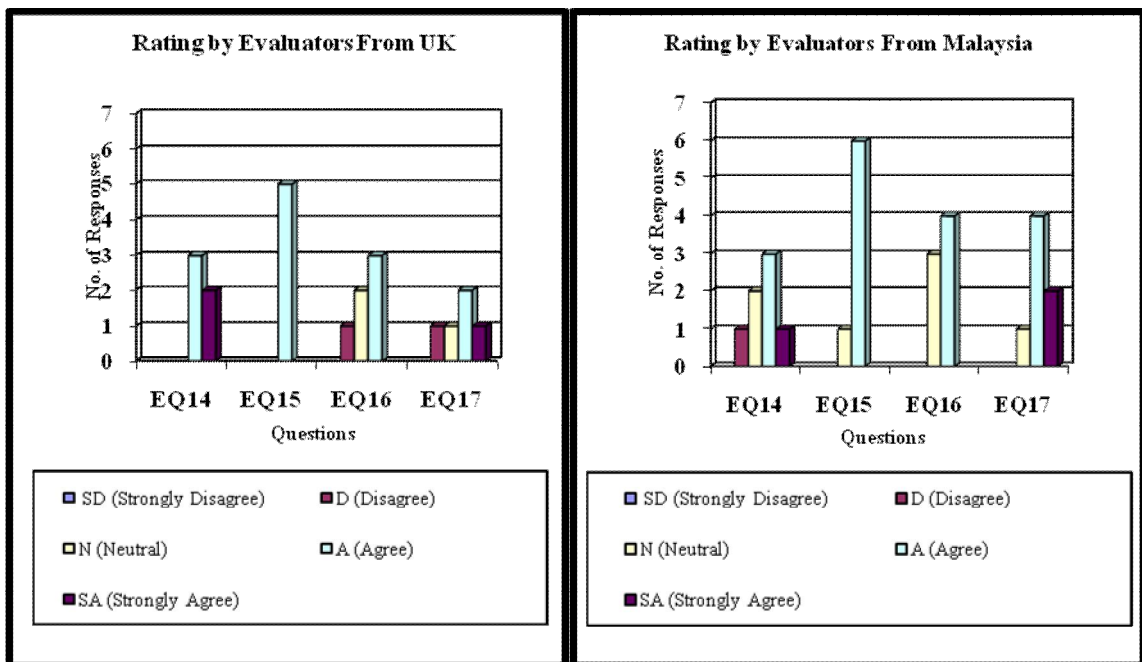


Figure 7.7: Overall Rating for Framework Usability

Based on feedback received on the framework elements, most evaluators were satisfied with the content. They believed the elements namely effectiveness, capability and usability of the framework could assist organisations in implementing performance measurement, although there were some who expressed disagreement. The evaluation results show that the evaluators agreed that the framework is easy to use and offers a good and systematic approach, as well as being useful for improving the performance measurement process in construction organisations. It shows that the Performance Measurement Migration Path can be a platform to guide and assist organisations in implementing performance measurement. The process of performance measurement could be smoother with the assistance of the framework.

Another part of the evaluation questions was about the general comments on the framework, its benefits, barriers to its use, as well as suggestions for its improvement. The responses are discussed in the following section.

7.5.3 Benefits of Framework

According to the evaluation, the following are the benefits of using the framework. All information was obtained from the responses of the evaluators in both countries:

1. The framework, the Performance Measurement Migration Path, guides the organisation in the performance measurement process in a strategic and structured manner. It shows the various positions of the organisation in the process: the current position, the past position of what it has achieved and the future position of where the organisation will go. It is like a route map for the organisation and makes it easy to use and follow, especially for new comers.
2. The framework highlights the possible stages for organisations in the performance measurement process. It contains the current position of the organisation and what it will be in the next level. It shows what the organisation needs to do and cascades down what has to be done for implementing performance measurement.
3. The framework allows organisations to stop and think where they are in performance measurement. It does not stick only with analysis of performance.
4. The framework could help organisations in making a plan on what they need to do next in performance measurement. It puts on the table what organisations need to do for better performance and it shows information on what needs to be improved and how.
5. The framework helps organisations to understand what their performance requirements and targets are.

6. The framework gives benefit to people who are directly involved with performance measurement activities and processes. As an example, the managerial level staff will gain more benefits in using the framework compared to others. The managerial level comprises the parties involved at the early stage of the process of developing strategy (formulation, implementation and evaluation or assessment of strategy). They are involved in the process, starting from the initial stage until the final stage, from identifying needs and targets, making a plan to achieve them, arranging and managing activities of the organisation to achieve them and indicating criteria to be measured. For other employees, it will be a challenge for them to understand the framework, where the organisation stands and starts in the performance measurement process.
7. The framework can be used in strategic management; it can be such a guide in evaluating process of strategy in the management.
8. The framework improves the capability of human resources. Participants or staff involved in the performance measurement process in the organisation can be more reactive towards tangible measurements and this means dynamic responses can be received from them.
9. The framework is suitable for those organisations that have implemented performance measurement and want improvement. It is beneficial to those that have started implementing performance measurement but are looking for ways to improve that process. The framework will be of tremendous help for organisations that are new to performance measurement and are looking for a way or method to strengthen its use.
10. The framework's five criteria, which are leadership, strategy, people, partnerships and resources as well as processes, products and services are accepted as important. They reflect organisations' performance and are suitable for use in measuring performance of organisations.
11. The framework is easy to use and easy to understand. In short, the framework is user-friendly, according to all evaluators (except one).

7.5.4 Barriers to Use of Framework

The following are the evaluators' perspectives on the barriers to the framework:

1. The use of the framework is more profitable for leaders than for other employees. It could be difficult to explain and understand if the staff are not involved in the performance measurement process.
2. Most evaluators agreed that there are no immediate barriers to the use of the framework. The potential barriers could be avoided by taking the following steps: ensure that the activities of the assessment and the framework criteria suit the organisation plan and policy; the framework is implemented and fits in with the organisation's aims, targets and processes.
3. Evaluators think that the framework is another tool used to measure performance. It is similar to the existing established tools and models for performance measurement. They felt it was a burden to implement it, as they have to learn and understand it.
4. It does not translate into specific action, which the organisation can take to achieve strategic targets. It shows what organisations need to do for implementing performance measurement. Then, it leads to what organisations need to do at a strategic level. However, it does not show what organisations have to do after making strategic decision.
5. People have to be aware and learn all five levels of the framework.
6. New procedures will take a while to be accepted by organisations.
7. Training is required for full use and understanding of the framework and that has an effect on time and finance aspects.

7.5.5 Improvements of Framework

Some suggestions for improvements given by the evaluators based on the content of the framework, its effectiveness, capability and usability by organisations are as follows:

1. To make the framework look attractive, consider adding colours for appeal that is more commercial and attract users. Make the framework look practical and more interesting. Some of the users are visual learners and it would be helpful and interesting to consider graphic and colour elements in the framework.
2. For guiding and assisting purposes, there is a need to consider inclusion of initial information in the assessment level questions. The information would give understanding to the users on the purpose of the assessment.
3. To strengthen the usability of the framework, an element of action on how to do the activities can be considered instead of only presenting the criteria needed to move in the performance measurement process. It would be more helpful if the framework can show not only what organisations need to do to move in the performance measurement process but also how to do it.
4. Avoid the use of confusing acronyms such as PM; it can be misunderstood by the user as Project Management instead of Performance Measurement. The explanation of the acronyms has been put in the framework but it may not help evaluators to understand the acronyms.

Some refining and improvement based on results from the evaluation were done and the researcher has refined two of the main points raised. Due to time constraints, other suggestions were reserved for future work. Two categories were improved to accommodate responses from the evaluators; they are the graphical elements of the framework and additional information for the assessment level. The improved version of the framework can be referred to in Appendix D.

7.5.6 Limitations

The evaluation session also investigated the comments regarding the limitations of the Performance Measurement Migration Path. The limitations listed below are shared by the researcher throughout the process of evaluation with the evaluators. Those highlighted by evaluators during the discussion and by the researcher are as follows:

1. Training is required to implement the framework but this has resource implications. It involves financial and time aspects.
2. The evaluators thought that the framework is suitable to be implemented by large organisations since its implementation needs established resources to undertake all levels in the performance measurement process.
3. The framework does not show the mechanism of productivity at each level, meaning that it does not show the results gained by organisations after succeeding in one level before moving to another level.
4. Telephone interviews are a problem as it brought distraction to the receiver and the caller. As an example, sometimes the conversation could be affected by phone line problems or interruptions from other people around. There are no visual cues like facial expression and body language to help in the communication of information. A face-to-face interview for evaluation is better than telephone interview as it is a more effective method in passing on the message.

7.6 SUMMARY

This chapter has presented the evaluation process of the framework and the results obtained. To obtain feedback from evaluators on the framework, semi-structured interviews have been used together with a set of questions. Evaluations were made in the UK and Malaysia to test the practicality and usability as well as effectiveness of the framework for organisations in the construction industry. UK evaluations were made to

get responses on the capacity of the framework in helping organisations throughout the performance measurement process. The purpose of evaluations in Malaysia was to determine the applicability of the framework for organisations. The results of the evaluation were discussed; they were very positive and indicated that the aim and objectives of the evaluation have been achieved. The framework is considered as capable of helping organisations in implementing performance measurement. Barriers and suggestions to improve the framework have also been identified based on the discussion. The next chapter summarises the research, states its conclusions and makes recommendations for future research.

CHAPTER 8

CONCLUSIONS AND RECOMMENDATIONS

8.1 INTRODUCTION

This chapter concludes the research by discussing how the aim and objectives of the research were achieved. It also presents the contributions and achievements of the research, discusses its limitations and makes recommendations for future research. The final part of the chapter provides some closing remarks.

8.2 RESEARCH OVERVIEW

Performance measurement studies are always an interesting topic to discuss. It stimulates learning and experimentation as various scopes and aspects are handled. The need of it is undeniable by organisations in industries including the construction industry. It is useful and beneficial for organisations, which are keen to increase profits and be in a better position in business. The implementation of performance measurement can be conducted smoothly and effectively if organisations realise the importance of performance measurement and if they have the knowledge and skill to implement the process. Organisations that have implemented performance measurement also experienced challenges and barriers. However, these problems and obstacles can be reduced by improving the process of implementation. Based on that, a framework named Performance Measurement Migration Path was developed. The purpose of the framework is to assist and guide organisations to implement performance measurement in a structured and orderly manner; this can be done by adopting elements or criteria (five of it) considered suitable for the performance measurement process. To achieve the aim and objectives of the research, a number of methodological principles and approaches were used, from data collection to data analysis. The qualitative approach was applied from the initial stage of the research process until the final evaluation phase.

The aim and objectives of the research are presented as following:

Objective 1: To review the performance measurement concept

The review of existing literature on the performance measurement concept as well as its use in the construction industry has identified the various definitions and perceptions of performance measurement. It has also revealed the need and the importance for performance measurement to be implemented within organisations. Performance measurement could help to identify improvements needed for organisations and its use in developing business strategy. Commitment of all parties in an organisation (from top managerial to bottom levels) is required to make implementation of performance measurement a success. Factors such as leadership, knowledge, culture, people, resources and appropriate system in implementing performance measurement are crucial for the implementation to be successful. Barriers and difficulties to implement or in implementing performance measurement are contributed by these factors. Furthermore, literature review on performance measurement criteria revealed that two aspects are central to the assessment of organisational performance: financial and non-financial aspects. Both aspects are needed in assessing performance of organisations but financial aspects are the more important criteria compared to non-financial matters. Profitability, ROI and utilisation are examples of the financial aspects. Safety, functionality and satisfaction are examples of non-financial aspects. Specifically in the construction industry, performance measurement is approached in two ways: in relation to the product as a facility and in relation to the creation of the product as a process. As performance measurement has been introduced in industries more than twenty years ago, varieties of tools and models have been developed. The creation of the tools and models started in the late 1980s. At first, the tools and models were designed and developed to measure financial aspects in organisations. When industries and organisations became aware of the importance of non-financial matters, tools and models were created to measure those aspects. Some examples of the tools and models are the EFQM Excellence Model, the IPMS and BSC. The key findings of the performance measurement concept have been presented in Chapter 2. This part of the research was also presented at the ARCOM 2009 (Association of Researchers in Construction Management) Conference in Nottingham, UK (Latiffi et al., 2009) (See Appendix E – 1).

Objective 2: To determine the extent to which construction organisations use the established performance measurement tools and models.

This second objective has been achieved through the review on the performance measurement tools and models (as presented in Chapter 3), which discussed in depth the usability of the two most used and well-known models, the Balanced Scorecard and the European Foundation for Quality Management (EFQM) Excellence Model. The review showed the development of these two tools, the purposes of using them, as well as their advantages and disadvantages. To complete this objective, semi-structured interviews were conducted to obtain information on the extent of their use by organisations. It also investigated current studies of the performance measurement approach within organisations (as Objective 3) and part of the results revealed their use in organisations in both countries. Based on the literature review (as presented in Chapter 3), both tools and models are used to drive organisational improvement. Both are quite similar and the only major difference is that the EFQM Excellence Model is assigned based on the TQM principles, but the key objectives of BSC are based on the desired corporate strategy. Both require the users to select a set of appropriate metrics to implement them. The two models were discussed in this research as both were used for developing the performance measurement migration path. The BSC was applied as a key aspect in developing the path and the EFQM was used in shaping the improvement elements in the migration path. Results from the interviews show that both, the BSC and the EFQM Excellence Model were used by organisations for performance measurement. The BSC is used in both countries, the UK and Malaysia and is known to be common tools to measure performance. However, the EFQM Excellence Model is not used in Malaysia even though the model is a popular national quality award in Europe. Based on the advantages and importance of the EFQM Excellence Model in the UK and other countries (from data gathered from literature review and the interviews), it is appropriate to adopt it for the users in Malaysia. Part of the research work on the tools was presented at the Conference of The 6th International Conference on Innovation in Architecture, Engineering and Construction (AEC) 2010, in Pennsylvania, USA (Latiffi et al., 2010a) (See Appendix E – 2).

Objective 3: To investigate current practices of performance measurement within construction organisations.

This objective has been achieved through semi-structured interviews with the construction practitioners in the UK and Malaysia. The aim was to identify the performance measurement practices and related problems in these countries. The interviews were conducted with twelve managerial staff of large organisations involved with the construction industry in both countries. The purpose was to explore the similarities and differences of both countries in implementing and practising performance measurement in organisations. The studies revealed similarities of both countries in the following areas: understanding of performance measurement and the benefits that they can gain from it, the process of performance measurement, tools and models used to measure performance and challenges and approaches to addressing them in implementing performance measurement. The differences identified were in the following areas: duration of implementing performance measurement, tools and models used and challenges to implementing performance measurement. The UK has implemented performance measurement formally much earlier and is well ahead in the use of performance measurement tools and models in measuring performance process. The longer experience and the advances of the UK in implementing performance measurement are experiences and lessons that can be learnt by Malaysia. Based on that, a suggestion has been made to improve the process. Therefore, for improving and smoothening the performance measurement process, the step-by-step guiding approach is suggested. This approach was initiated in order to guide organisations to the process of implementing performance measurement. The application of the approach has been discussed in Chapter 6. Part of the research work has been presented in Chapter 5, as well as at the ARCOM 2009 Conference, in Nottingham, UK (Latiffi et al., 2009) and the 2010 Conference of the CIB World Congress, in Manchester, UK (Latiffi et al., 2010b) (See Appendix E – 3 for the CIB 2010).

Objective 4: To develop a tool that allows construction organisations to incrementally achieve performance measurement targets.

Achievement of this fourth objective of the research was through the development of a performance measurement migration path. The framework was developed based on information gained from the current studies of the two countries. The information, as mentioned in Objective 3, was obtained in one-to-one semi-structured interviews with key managerial level staff who are experienced in managing the performance measurement process in organisations. Based on the interviews (as presented in Chapter 5), challenges to implement performance measurement by staff in organisations were problems and difficulties in implementing it. Some examples of the problems and difficulties are as the following: negative perceptions on performance measurement, unfamiliarity with PMS and lack of knowledge about it. To improve the implementation process, the framework was introduced. The initial concept of the framework was based on the maturity principles of other frameworks such as the CMM, CLEVER and STEPS. The framework was developed with the intention to assist users in implementing performance measurement in a structured and systematic manner. The development of the framework included three steps. The first step is to develop maturity model of performance measurement; the second step is to identify critical migration paths and the final step is to develop appropriate performance measurement migration path. Discussion on the framework development process completed the objective. The development of the performance measurement migration path was presented in Chapter 6. Part of the process of framework development was presented at the 2010 Conference of AEC in Pennsylvania, USA (Latiffi et al., 2010a).

Objective 5: To evaluate the tool for its effectiveness in achieving performance measurement targets.

The final objective was achieved through one-to-one interaction with practitioners from the industry in the UK and Malaysia. All the practitioners, twelve from both countries, were involved in the evaluation process. They were experts in performance measurement and have experience in implementing performance measurement. All these evaluators were given the same set of questions to obtain their feedback on the framework. Their feedback and responses were analysed and discussed. In the evaluation, all evaluators gave positive reaction on the contents, effectiveness, capability and usability of the

framework. The framework could help them to understand what performance requirements and targets are. It showed the possible stages of their organisations in performance measurement so that they can make plans on what they need to do next in the process of performance measurement. Furthermore, the framework is suitable for organisations, which have implemented performance measurement but want further improvement. The framework will be helpful for the new comers of performance measurement who are looking for a way to strengthen the organisational performance. The framework was claimed by the evaluators as easy to use and understand. They were satisfied with the purpose of the framework and its contents. They mentioned the possibilities of using the framework in the performance measurement process of their organisations although there are some barriers such as the framework design and training required. The discussion of this part of research was presented in Chapter 7.

The conclusions of the research are presented in the following sections.

8.3 RESEARCH CONCLUSIONS

The following conclusions can be drawn from the research:

1. The main drivers of the implementation of performance measurement within the construction industry have been identified. Top-down approach is used in undertaking performance measurement activities in organisations. Commitment of top managerial level and functional level in an organisation is required either directly or indirectly in implementing performance measurement (Bar et al., 2005). It is the responsibility of top managerial staff in an organisation to make the implementation a success and achieve targets that has been planned (Marr et al., 2004).
2. Current practices of performance measurement within organisations in two different categories of countries, the UK (developed country) and Malaysia (developing country) have been documented. The studies revealed some similarities, differences and advances in performance measurement practices. The similarities are in the knowledge and understanding of performance measurement

as well as potential improvement in implementing performance measurement in organisations. The differences are in such areas as tools and models used in measuring performance of organisations and duration of implementing performance measurement in the construction industry.

3. Established performance measurement tools and models, the BSC concepts and elements of the EFQM Excellence Model, were used in developing a migration path for the implementation process of performance measurement for the construction industry.
4. For the framework development (Performance Measurement Migration Path), studies on current performance measurement in the UK as well as in Malaysia were conducted and data gained were used for the development. Literature review on migration path was also done as reference to the concept in developing the framework. The framework can be implemented by organisations as an approach for improving performance measurement implementation in organisations. The framework shows the process in a step-by-step manner how an organisation would achieve targets in the implementation of performance measurement. It consists of five elements that need to be considered in the process of implementing performance measurement.
5. Implementation of the migration path: Performance Measurement Migration Path assists organisations in the process of implementation of performance measurement in construction organisations.
6. The Performance Measurement Migration Path has been evaluated and tested with the industrial players in the UK and Malaysia for identifying its effectiveness and usability in organisations. It gives a structure to performance measurement implementation. The framework gives benefits and is suitable to be used by organisations in the construction industry even though some weaknesses have been identified in undertaking performance measurement.

8.4 CONTRIBUTION OF RESEARCH

This research investigated the role of performance measurement for improving business performance in the construction industry. The research has identified performance measurement activities within organisations in two different countries, the UK and Malaysia. Based on the studies, a framework to assist organisations in implementing performance measurement is developed and named as Performance Measurement Migration Path. The framework is based on the concept of migration path. Initially, the thesis presented novel contributions by investigating and analysing the subject areas and body of knowledge in two countries. The novel contribution of this research is presented in terms of providing the framework that can be used in assisting organisations in the construction industry with performance measurement processes.

The framework, a Performance Measurement Migration Path, consists of maturity levels of performance measurement and criteria or elements that are important and reflect organisations' performance. The framework developed provides a practical approach for organisations to identify their current position in the performance measurement process before they take further steps in completing the process. The framework also highlights the possible stages for organisations in the performance measurement process. It shows what the organisation needs to do and cascades down what has to be done for implementing performance measurement.

Furthermore, the developed framework facilitates organisations in identifying what needs to be done and when it can be done in improving the performance of organisations. It is usable in the process of evaluating strategy, as it can be a guide to the user in conducting evaluation strategy process. As mentioned in the previous paragraph, the framework shows five elements that are important to be considered in the performance measurement of organisations. The framework also regards the characteristics of each of the elements, which lead the organisation in implementing the balanced performance measurement that is considered as an internal aspect of organisation as well as external. The five elements are leaders, strategy, people, partnerships and resources and processes, product and services.

The developed framework gives a structure to performance measurement implementation. It is like a route map, and navigates the organisation in implementing performance measurement and makes it easy to use. Added to that, the Performance Measurement Migration Path improves the capability of human resources. Staff involved in the performance measurement process in the organisation can be more reactive towards tangible measurements and this means dynamic responses can be received from them. This can increase production of organisations in a systematic manner. The framework provides an easy but important approach for addressing improvement in performance measurement implementation.

8.5 RESEARCH LIMITATIONS

Fellows and Liu (2008) state that limitations recognised can be defined as explaining why the scope of the study, the results and data were constrained. The limitations for this research were based on the evaluators' views and their responses based on the framework of the Performance Measurement Migration Path during the evaluation process. The limitations are also based on the methodological limitations.

Added to that, a few of the limitations stated below were from the researcher's experiences in conducting the research.

1. The framework looks only at five elements in measuring performance of an organisation. There could be more elements to be considered in the process of measuring performance of organisations. The elements were considered from the fundamental aspects of the EFQM Excellence Model and focused on the enabler side of the model. The focus is on these five elements because that is the part, which covers what an organisation does and how it does it. It is directed more to 'action' than to the other part, which is 'results'. The remaining four criteria under this part cover what an organisation achieves. It is essential to consider other criteria such as customer or client in the process of performance measurement.

2. The framework can only be implemented and used by an organisation with an understanding and knowledge of performance measurement. It has been pointed out by the evaluators that it would be much easier for the organisation to take action and give responses, as well as improving its performance promptly if it does not achieve the target of one level based on its understanding and experience of performance measurement. Time for completing the implementation process could then be reduced.
3. Due to the constraints of time, location and cost, the evaluation of the framework was made using telephone interviews. Interviews by telephone brought some problems such as line interruptions and unclear voice when having conversations, especially for long distance calls such as to Malaysia, which made the interview process longer than it should have been. Because of such problems, evaluators had to repeat their answers or responses based on the questions given and the interviewer had to repeat the questions several times. The problem can be avoided if face-to-face interviews are used. The advantage of face-to-face interviews is that the interviewer can modify the questions when necessary, clarify doubt and ensure that the responses are properly understood, by repeating or rephrasing the questions. The researcher can also pick up nonverbal cues from the respondent. Any discomfort, stress and problems that the respondent experiences can be detected through frowns, nervous tapping and other body language, unconsciously exhibited by any person
4. Due to the constraints of time, data collection for the research in early interviews for current studies in both countries as well as for the evaluation phase, have been limited. It was difficult to get permission and agreement from the managerial level staff, especially those with senior positions as directors of the organisation, to participate in the research. Clearly, the research needed involvement of the managerial level staff to provide information and data on the current situation of performance measurement and their perceptions on the framework.

5. The activities of implementing performance measurement required cooperation and commitment of all staff in organisation. With the development of the framework, the managerial level staff will gain more benefit in using the framework compared to others. For other employees, it will be a challenge for them to really understand where the organisation stands and where to begin in the performance measurement process based on the framework.
6. It takes time to really understand the framework and see results of fully using it. The time needed to see organisations achieve the top level in the path and complete the process depends on the resources and action plan of an organisation. The results of the success of organisations in the implementation process cannot be seen in a short period.

8.6 RECOMMENDATIONS FOR FURTHER RESEARCH

Evaluation of what is concluded with high levels of confidence from the study should lead to any recommendations for implementation. The what, how and why of implementation must be noted (Fellows and Liu, 2008). In undertaking the research, there were some gaps not addressed. Therefore, this section makes recommendations for further research derived from this research study, based on self-evaluation and comments by evaluators as follows:

1. Consider further research on different elements in measuring performance such as customer perspectives and partnerships. There are other elements that can be considered in measuring performance of organisations and, by these, it could make the framework more comprehensive with details to be used by different types of business.
2. Test further the capability of the framework with other staff or members of the organisation to look at the efficiency and usability of the framework from the perspective of different people or staff. For example, non- managerial staff who are also involved in the process of performance measurement should participate in the

test. The performance measurement process would not be successful without the commitment and cooperation of both parties, staff of top managerial and functional levels. For this purpose, it needs additional time for doing the research and the time could be expanded.

3. Test further and re-modify if required, the capability of the framework for small and medium sized organisations in the construction industry. The use of the framework would be expanded by these types of organisations as the number of them expanding their business and becoming big is growing from day to day. Many organisations of their size are alerted to the importance of performance measurement for their businesses. The research project targets only the large organisations, as the implementation of it is much wider in this type of organisations in both countries. In terms of duration of implementing it, large size organisations are more established in implementing performance measurement than others.
4. The Performance Measurement Migration Path shows the direction for organisations in the process of implementing performance measurement, and what organisations need to do to move in the direction suggested. What the framework does not show is how organisations are going to move towards the direction given and what needs to be done by organisations to succeed in one level and move to another. For this purpose, it would be recommended that the framework can show not only elements of what organisations need to do to move in the performance measurement process but also show how to do it.

8.7 CONCLUDING REMARKS

The Performance Measurement Migration Path was developed as a method to lead organisations in a structured manner in implementing performance measurement. This is the ideal framework that has been generated and created for the purpose of facilitating organisations and it offers additional help to organisations in implementing performance measurement so they can carry out the process in an orderly, well planned way and

considering internal and external aspects of organisations. The research indicates that using the framework can give benefits to organisations facing obstacles and confusion in implementing performance measurement. The framework facilitates and is useful for developing strategy, apart from it being easy to understand and follow as well as easy to use by organisations.

Assessment to performance measurement implementation using this framework not only helps to position organisations in the appropriate level in implementation process but it also helps to identify areas where improvement is needed to achieve a higher maturity.

REFERENCES

- Ali, A.S. and Rahmat, I. (2010) *The Performance Measurement of Construction Projects Managed by ISO-Certified Contractors In Malaysia*. Journal of Retail and Leisure Property. Vol. 9 (1), pp. 25-35.
- Allan G. and Skinner C. (1993) *Handbook for Research Students in the Social Sciences*. The Falmer Press, UK.
- Anderson, K. and McAdam, R. (2004) *A Critique of Benchmarking and Performance Measurement (Lead or Lag?)*. Benchmarking: An International Journal. Vol. 11 (5), pp. 465-483.
- Ankrah, N.A. and Proverbs, D. (2005) "A Framework For Measuring Construction Project Performance: Overcoming Key Challenges of Performance Measurement". Proceedings. *The 21st Annual ARCOM Conference*, 7-9 September 2005, SOAS, University of London, UK.
- Anumba, C.J., Kamara, J.M. and Carrillo P.M. (2005) *Knowledge Management Strategy Development: A CLEVER Approach* in Anumba, C.J., Egbu, C. and Carrillo, P.M. Blackwell Publishing, Oxford, UK.
- Aras, G. and Crowther, D. (2010) *Sustaining Business Excellence*. Total Quality Management and Business Excellence. Vol. 21 (5), pp. 565-576.
- Araujo, J.I.C. and Martins, R.A. (2009) *Case Study on The Dimensions of Performance Measurement Systems Maturity*. Proceedings. The 2009 Industrial Engineering Research Conference, Miami, Florida, USA.
- Argote, L. and Ingram, P. (2000) *Knowledge Transfer: A Basis For Competitive Advantage In Firms*. Organizational Behavior and Human Decision Processes. Vol. 82 (1), pp. 150-169.
- Bailin, A. and Grafstein, A. (2010) *The Critical Assessment of Research: Traditional and New Methods of Evaluation*. Chandos Publishing, Oxford, UK.
- Balanced Scorecard (BSC) Institute (2007) *BSC Resources* [online]. Available at <http://www.balancedscorecard.org/BSCResources/AbouttheBalancedScorecard/tabid/55/Default.aspx> [accessed September 2008].

- Baldwin, A., McCaffer, R., Osman, I.I (2001) *Project Performance in a Contracting Organization: Analysis, Evaluation and Development*. Proceedings. The CIB World Congress, Wellington, New Zealand.
- Bamberger, J. (1997) *Essence of the Capability Maturity Model*. Computer Society, pp. 112-114.
- Bamberger, M., Rugh, J. and Mabry, L. (2006) *RealWord Evaluation – Working Under Budget, Time, Data and Political Constraints*. Sage Publications, California, USA.
- Barbour R. (2008) *Introducing Qualitative Research: A Student Guide to the Craft of Doing Qualitative Research*. Sage Publications, UK.
- Barr, R., Hussain, F. and Sommers, J. (2005) Real Time Modelling For Financial and Performance Management. Proceedings. Cement Industry Technical Conference, pp. 43-51.
- Bassioni, H.A., Price, A.D.F. and Hassan, T.M. (2004) Performance Measurement in Construction. *Journal of Management in Engineering*. Vol.20 (2), pp. 42-50.
- Bassioni, H.A., Price, A.D.F. and Hassan, T.M. (2005) Building a Conceptual Framework for Measuring Business Performance in Construction: An Empirical Evaluation. *Journal of Construction Management and Economics*. Vol. 23 (5), pp. 495.
- Beatham, S. (2003) *Development of an Integrated Business Improvement System for Construction*. Loughborough University, UK. pp. 13.
- Beatham, S., Anumba, C., Thorpe, T. and Hedges, I. (2004) KPIs: A Critical Appraisal of Their Use in Construction. *Benchmarking: An International Journal*. Vol.11 (1), pp. 93-117.
- Becker, J., Knackstedt, R. and Jens Poppelbuß, I. (2009) Developing Maturity Models For IT Management – A Procedure Model And Its Application. *Business & Information Systems Engineering*. Vol.3, pp. 213-222.
- Bititci, U.S., Mendibil, K., Nudurupati, S., Turner, T. and Garengo, P. (2004) The Interplay Between Performance Measurement, Organizational Culture and Management Styles. *Measuring Business Excellence*. Vol. 8 (3), pp. 28-41.
- Bititci, U.S., Mendibil, K. and Martinez, V. (2005) Measuring and Managing Performance in Extended Enterprises. *International Journal of Operations & Production Management*. Vol. 25 (4), pp. 333-353.

- Bititci, U.S., Suwignjo, P. and Carrie, A.S. (2001) Strategy Management Through Quantitative Modelling of Performance Measurement Systems. *International Journal of Production Economics*. Vol. 69 (2001), pp. 15-22.
- Bititci, U.S., Turner, T. and Begemann, C. (2000) Dynamics of Performance Measurement Systems. *International Journal of Operations and Production Management*. Vol. 20 (6), pp. 692-704.
- Bourne, M., Kennerley, M. and Franco-Santos, M. (2005) Managing Through Measures: A Study Of Impact On Performance. *Journal of Manufacturing Technology Management*. Vol.16 (4), pp. 373-395.
- Bourne, M., Mills, J., Wilcox, M., Neely, A. and Platts, K. (2000) Designing, Implementing and Updating Performance Measurement Systems. *International Journal of Operations and Production Management*. Vol.20 (7), pp. 754-771.
- Bourne, M., Neely, A., Platts, K. and Mills, J. (2002) The Success and Failure of Performance Measurement Initiatives: Perceptions of Participating Managers. *International Journal of Operations and Production Management*. Vol.22 (11), pp. 1288-1310.
- Bourne, M., Neely, A., Mills, J. and Platts K. (2003) Implementing Performance Measurement Systems: A Literature Review. *International Journal of Business Performance Management*. Vol.5 (1), pp. 1-24.
- British Quality Foundation or BQF (2000) *The Model in Practice – Using the EFQM Excellence Model to Deliver Continuous Improvement*. Deer Park Productions. Great Britain. pp. 28-38.
- Bryde, D.J. (2003) Modelling Project Management Performance. *International Journal of Quality and Reliability Management*. Vol.20 (2), pp. 229-254.
- Butcher, D.C.A. and Sheehan, M. J. (2010) Excellent Contractor Performance In The UK Construction Industry. *Journal of Engineering, Construction and Architectural Management*. Vol.17 (1), pp. 35-45.
- BQF (2001) *Excellence Model* [online]. Available at http://www.quality-foundation.co.uk/ex_description.htm [accessed September 2008].
- Cain, C.T (2004) *Performance Measurement for Construction Profitability*. Blackwell, UK.

- Cambridge Advanced Learner's Dictionary of English (2008) Method, Model, Tool, Approach and Framework [online]. Available at < <http://dictionary.cambridge.org/>> {Accessed June 2008}.
- Carrillo, P.M., Robinson, H.S., Anumba, C.J. and Al-Ghassani, A.M. (2003) *IMPACT: A Framework for Linking Knowledge Management to Business Performance*. *Electronic Journal of Knowledge Management*. Vol.1 (1), pp. 1-12.
- Carrillo, P.M., Robinson, H.S., Anumba, C.J. and Bouchaghem, N.M. (2006) A Knowledge Transfer Framework: The PFI Context. *Construction Management and Economics*, Vol.24 (10), pp. 1045-1056.
- Castilla, J.I.M. (2002) *Possible Ethical Implications In the Deployment of the EFQM Excellence Model*. *Journal Of Business Ethics*. Vol.39, pp. 125-134.
- Chan, A.P.C. and Chan, A.P.L. (2004) *Key Performance Indicators for Measuring Construction Success. Benchmarking: An International Journal*. Vol.11 (2), pp. 203-221.
- Chan, T.K. (2009) *Measuring Performance of The Malaysian Construction Industry*. *Construction Management and Economics*. Vol.27 (12), pp. 1231-1244.
- Chinowsky, P. and Carrillo, P.M. (2007) Knowledge Management To Learning Organization Connection. *Journal of Management In Engineering*. Vol. 23 (3), pp. 122-130.
- Cocca, P. and Alberti, M. (2010) A Framework To Assess Performance Measurement Systems in SMEs. *International Journal of Productivity and Performance Management*. Vol.59 (2), pp. 186-200.
- Creswell, J.W. (2007) *Qualitative Inquiry and Research Design – Choosing among Five Approaches*. 2nd Edition. Sage Publications, California, USA.
- D & D Excellence (2008) *About Excellence* [online]. Available at <http://www.ddexcellence.com/About%20Excellence/About%20Excellence%20Overview.htm> [accessed July 2009].
- Dainty, A. R. J. and Brooke, R. J. (2004) Towards Improved Construction Waste Minimisation: A Need for Improved Supply Chain Integration?. *Structural Survey*. Vol. 22 (1), pp. 20-29.

- Dalrymple, J.F. and Bryar, P. (2006) SME Construction Industry Subcontractors Performance Measurement and Improvement. Proceedings of The 20th ANZAM (Australian New Zealand Academy of Management) Conference on “Management: Pragmatism, Philosophy, Priorities”. Central Queensland University, Rochampton, Australia.
- Davies, M., B. (2007) *Doing a Successful Research Project: Using Qualitative or Quantitative Methods*. Palgrave MacMillan, UK.
- Debusk, G.K. and Crabtree, A.D. (2006) *Does the Balanced Scorecard Improve Performance? Much of the Evidence Available To Gauge The Success of the Balanced Scorecard Has Been Anecdotal. A Recent Survey of IMA Members Provides Numbers. Do They Reach A Final Verdict? You Be the Judge*. Management Accounting Quarterly. Fall Issue.
- Din, S., Abd-Hamid, Z. and Bryde, D. J. (2010) ISO 9000 Certification and Construction Project Performance: The Malaysian Experience. *International Journal of Project Management*. In Press, Corrected Proof.
- Drucker, P. F. (2007) *The Practice of Management*. Revised Edition. Butterworth - Heinemann, UK.
- EFQM (2009) *EFQM Excellence Model: Excellence Organisations Achieve And Sustain Superior Levels Of Performance That Meet Or Exceed The Expectations Of All Their Stakeholders*. EFQM. Brussels, Belgium.
- Elg, M. and Kollberg, B. (2009) Alternative Arguments And Directions For Studying Performance Measurement. *Total Quality Management and Business Excellence*. Vol.20 (4), pp. 409-421.
- El-Mashaleh, M.S., Minchin, Jr., R.E and O’Brien, W.J. (2007) Management of Construction Firm Performance Using Benchmarking. *Journal of Management In Engineering*. Vol. 23 (1), pp. 10-17.
- Fellows. R. and Liu, A. (2008) *Research Methods for Construction*. 3rd Edition. Blackwell, UK.
- Fink, A. (2008) *Practicing Research: Discovering Evidence That Matters*. Sage Publications, USA.
- Fraenkel, J., R. and Wallen, N., E. (2006) *How To Design and Evaluate Research In Education*. 6th Edition. McGraw-Hill, New York, USA.

- Franco, M. and Bourne, M. (2003) Factors That Play A Role In “Managing Through Measures”. *Management Decision*. Vol.41 (8), pp. 698-710.
- Gibson, W.J. and Brown, A. (2009) *Working with Qualitative Data*. Sage Publications, London, UK.
- Goncalves, H.S. (2009) *Proposal of A Strategy Model Planning Aligned To the Balanced Scorecard and the Quality Environments*. *The TQM Journal*. Vol.21 (5), pp. 462-472.
- Greene, J. C., Kreider, H. and Mayer, E. in Somekh, B. and Lewin, C. (2005) *Research Methods in the Social Sciences*. Sage Publications, London, UK.
- Gunasekaran, A., Patel, C. and McGaughey, R.E. (2004) A Framework For Supply Chain Performance Measurement. *International Journal of Production Economics*. Vol.87 (2004), pp. 333-347.
- Hall, J. and David, D. (2006) Six Sigma Measurement in a Service Organisation. Proceedings. The 20th ANZAM (Australian New Zealand Academy of Management) Conference on “Management: Pragmatism, Philosophy, Priorities”. Central Queensland University, Rochampton, Australia.
- Hampson, V.M and Best, J.P. (2005) *A Framework for Assessing the Effectiveness of Performance Measurement Practices*. Proceedings. The 3rd Conference on Performance Measurement and Management Control. The European Institute for Advanced Studies in Management. Nice, France.
- Harter, D.E., Krishnan, M.S. and Slaughter, S.A. (2000) Effect of Process Maturity on Quality, Cycle Time and Effort in Software Product Development. *Management Science*. Vol.46 (4), pp. 451-466.
- Hasan, H. (2005) Navigating The Malaysian Construction Industry To Be Among The Best In The World By Year 2015 in Building Capacity For Global Competitiveness. *CIDB News*. Issue (2), pp. 1.
- Helfat, C.E. and Peteraf, M.A. (2003) The Dynamic Resource-Based View: Capability Lifecycles. *Strategic Management Journal*, 24 (10), 997-1010.
- Hellsten, U. and Klefsjo, B. (2000) TQM As A Management System Consisting of Values, Techniques And Tools. *The TQM Magazine*, Vol.12 (4), pp. 238-244.
- Holliday, A. (2007) *Doing and Writing Qualitative Research*. Sage Publications, London, UK.

- Hoque, Z. (2004) A Contingency Model of The Association Between Strategy, Environmental Uncertainty And Performance Measurement: Impact On Organisational Performance. *International Business Review*. Vol.13, pp. 485-502.
- Hussain, Md., Mostaque and Hoque, Z. (2002) *Understanding Non-financial Performance Measurement Practices in Japanese Banks*. Accounting, Auditing & Accountability Journal. Vol. 15 (2), pp. 162-183.
- Hubbard, G. (2006) *Measuring Organizational Performance: Beyond the Triple Bottom Line*. Business Strategy and the Environment. John Wiley & Sons,
- Innovation Express (2004) *Helping Companies Get Clever* [online]. Available at <http://www.lati.org.uk/Documents/May2004> [accessed June 2011].
- Jusoh, R. and Parnell, J.A. (2008) Competitive Strategy And Performance Measurement In The Malaysian Context. *Management Decision*. Vol.46 (1), pp. 5-31.
- Kagioglou, M., Cooper, R. and Aouad, G. (2001) Performance Measurement in Construction: A Conceptual Framework. *Construction Management and Economic*. Vol.19, pp. 85-95.
- Kamara, J.M., Anumba, C.J. and Carrillo, P.M. (2002) A CLEVER Approach To Selecting A Knowledge Management Strategy. *International Journal of Project Management*. Vol.20, pp. 205-211.
- Kaplan, R.S. and Norton, D.P. (2000) *Having Trouble With Your Strategy? Then Map It*. *Harvard Business Review*. September - October.
- Kaplan, R.S. (2001) *Strategic Performance Measurement and Management In Nonprofit Organizations*. Nonprofit Management & Leadership. Vol.11 (3), pp. 353-370.
- Kaplan, R.S. and Norton, D.P. (2001) *The Strategy-focused Organization*. Harvard Business School Press, USA.
- Kaplan, R.S. and Norton, D.P. (2002) *Partnering and the Balanced Scorecard*. Harvard Business School Press, USA.
- Kennerley, M. and Neely, A. (2003) Measuring Performance In A Changing Business Environment. *International Journal of Operations and Production Management*. Vol.23 (2), pp. 213-229.
- Khalfan, M.M.A (2001) *Benchmarking and Readiness Assessment for Concurrent Engineering in Construction (BEACON)*. PhD Thesis, Loughborough University, Loughborough, UK.

- Kueng, P. (2000) Process Performance Measurement System: A Tool To Support Process-Based Organizations. *Total Quality Management*. Vol.11 (1), pp. 67-85.
- Kulatunga, U., Amaratunga, D. and Haigh, R. (2007) Performance Measurement in the Construction Research and Development. *International Journal of Productivity and Performance Management*. Vol.56 (8), pp. 673-688.
- Kumar, R., (2005) *Research Methodology: A Step-By-Step Guide for Beginners*. 2nd Edition. Sage Publications, London, UK.
- Latiffi, A.A, Carrillo, P., Ruikar, K. and Anumba, C.J. (2009) "The Need for Performance Measurement in Construction Strategy Development: A Current Scenario". Proceedings. *The 25th Annual ARCOM Conference*, 7-9 September 2009, Nottingham, UK.
- Latiffi, A.A, Carrillo, P., Ruikar, K. and Anumba, C.J. (2010a) "Improving Performance Measurement Practices In Construction Organisations". Proceedings. *The 6th International Conference on Innovation In Architecture, Engineering and Construction (AEC)*, 9-11 June 2010, Pennsylvania, USA.
- Latiffi, A.A, Carrillo, P., Ruikar, K. and Anumba, C.J. (2010b) "Current Performance Measurement Practices – Studies in The United Kingdom (UK) and Malaysia". Proceedings. *The CIB World Congress*, 10-13 May 2010, Manchester, UK.
- Leavitt, F. (2001) *Evaluating Scientific Research: Separating Fact from Fiction*. Prentice Hall, New Jersey, USA.
- Lee, A., Cooper, R. and Aouad, G. (2000) *A Methodology for Designing Performance Measures for the UK Construction Industry*. University of Salford, Salford, UK.
- Lee, J-N. (2001) The Impact of Knowledge Sharing, Organizational Capability and Partnership Quality on IS Outsourcing Success. *Information and Management*, Vol.38 (2001), pp. 323-335.
- Lee, P-M. and Quazi, H.A. (2001) A Methodology For Developing A Self-Assessment Tool To Measure Quality Performance In Organizations. *International Journal of Quality And Realibility Management*, Vol.18 (2), pp. 118-141.
- Lehtinen, J. and Ahola, T. (2010) Is Performance Measurement Suitable For an Extended Enterprise?. *International Journal of Operations and Production Management*. Vol.30 (2), pp. 181-204.
- Lin, G. and Shen, Q. (2007) Measuring The Performance of Value Management Studies In Construction. *Journal of Management in Engineering*. Vol. 23 (1), pp. 2-9.

- Lockamy III, A. and McCormack, K. (2004) *The Development of a Supply Chain Management Process Maturity Model Using the Concepts of Business Process Orientation*. *Supply Chain Management: An International Journal*. Vol.9 (4), pp. 272-278.
- Lukviarman, N. (2004) *Ownership Structure and Firm Performance: The Case of Indonesian*. PhD Thesis, Curtin University of Technology, Australia.
- Luu, T-V., Kim, S-Y., Cao, H-L. and Park, Y-M (2008) Performance Measurement of Construction Firms in Developing Countries. *The Journal of Construction Management and Economics*. Vol.26 (4), pp. 373-386.
- Marr, B., Gray, D. and Neely, A. (2003) Why Do Firms Measure Their Intellectual Capital?. *Journal of Intellectual Capital*. Vol.4 (4), pp. 441-464.
- Marr, B. and Schiuma, G. (2003) Business Performance Measurement – Past, Present and Future. *Management Decision*. Vol.41 (8), pp. 680-687.
- Marr, B., Schiuma, G. and Neely, A. (2004) The Dynamics of Value Creation: Mapping Your Intellectual Performance Drivers. *Journal of Intellectual Capital*. Vol.5 (2), pp. 312-325.
- Marr, W. A. (2007) *Why Monitor Performance?*. Proceedings of the FMGM 2007: Seventh International Symposium on Field Measurements in Geomechanics.
- Marrewijk, V.M., Wuisman, I., Cleyn, D.W., Timmers, J., Panapanaan, V. and Linnanen, L. (2004) *A Phase-wise Development Approach to Business Excellence: Towards an Innovative, Stakeholder-oriented Assessment Tool for Organizational Excellence and CSR*. *The Journal of Business Ethics*. Vol. 55 (2), pp. 83-98.
- Marshall, C. and Rossman, G.B. (2006). *Designing Qualitative Research*. 4th Edition. Sage Publications, USA.
- Mbugua, L.M., Harris, P., Holt, G.D and Olomolaiye, P.O (1999) A framework For Determining Critical Success Factors Influencing Construction Business Performance. In: Hughes, W. (ed) Proceedings. 15th Annual ARCOM Conference. September 5-7, Reading: ARCOM. 1, 255-264.
- McDougall, G., Kelly, J.R., Hinks, J. and Bititci, U.S. (2002) *A Review of The Leading Performance Measurement Tools For Assessing Buildings*. *Journal of Facilities Management*. Vol.1 (2), pp. 142-153.

- Menches, C.L. and Hanna, A.S. (2006) Quantitative Measurement of Successful Performance From The Project Manager's Perspective. *Journal of Construction Engineering And Management*. Vol.132 (12), pp. 1284-1293.
- Meng, X., Sun, M. and Jones, M. (2011) Maturity Model for Supply Chain Relationships In Construction. *Journal of Management In Engineering*. Vol.27 (2), pp. 97-105.
- Mentzer, J.T., DeWitt, W., Keebler, J.S, Min, S., Nix, N.W., Smith, C.D. and Zacharia, Z.G. (2001) *Defining Supply Chain Management*. *Journal of Business Logistics*. Vol. 22 (2), pp. 1-25.
- Mohamad, M. (1991) *Malaysia: The Way Forward*. Centre for Economic Research & Services, Malaysia Business Council, Malaysia.
- Mustine, D. (2007) *How the Balanced Scorecard Approach Compares To Policy Governance*. Proceedings. IPGA Annual Conference. June 23, Alexandria, VA.
- Naoum, S.G. (2006) *Dissertation Research and Writing for Construction Students*. Oxford Butterworth – Heinemann/Elsevier, UK.
- Neely, A., Mills, J., Platts, K., Gregory, M. and Richards, H. (1996) Performance Measurement System Design: Should Process Based Approaches Be Adopted?. *International Journal of Production Economics*. Vol.46-47, pp. 423-431.
- Neely, A. (1999) The Performance Measurement Revolution: Why Now and What Next?. *International Journal of Operations and Production Management*. Vol.19 (2), pp. 205-228.
- Neely, A., Mills, J., Platts, K., Richards, H., Gregory, M., Bourne, M. and Kennerley, M. (2000) Performance Measurement System Design: Developing and Testing A Process-Based Approach. *International Journal of Operations and Production Management*. Vol.20 (10), pp. 1119-1145.
- Neely, A., Adams, C. and Crowe, P. (2001) The Performance Prism In Practice. *Measuring Business Excellence*. Vol.5 (2), pp. 6-12.
- Neely, A., Adams, C. and Kennerley, M. (2002) *The Performance Prism: The Scorecard for Measuring and Managing Business Success*. London: Pearson Education.
- Neely, A., Marr, B., Roos, G., Pike, S. and Gupta, O. (2003) Towards the Third Generation of Performance Measurement. *Controlling*. Heft 3/4, pp. 129-135.

- Neely, A. (2005) The Evolution of Performance Measurement Research: Developments in the Last Decade and A Research Agenda for the Next. *International Journal of Operations and Production Management*. Vol.25 (12), pp. 1264-1277.
- Neely, A., Gregory, M. and Platts, K. (2005) Performance Measurement System Design: A Literature Review and Research Agenda. *International Journal of Operations and Production Management*. Vol. 25 (12), pp. 1228 – 1263.
- Niazi, M., Wilson, D. and Zowghi, D. (2005) *A Maturity Model For The Implementation of Software Process Improvement: An Empirical Study*. The Journal of Systems and Software. Vol.74 (2), pp. 155 – 172.
- Niven, P.R. (2002) *Balanced Scorecard Step-By-Step: Maximizing Performance and Maintaining Results*. John Wiley & Sons. USA.
- Nudurupati, S., Arshad, T. and Turner, T. (2007) Performance Measurement In The Construction Industry: An Action Case Investigating Manufacturing Methodologies. *Journal of Computers In Industry*. Vol.58 (2007), pp. 667-676.
- Otley, D. (1999) *Performance Management: A Framework for Management Control Systems Research*. Management Accounting Research. Vol.10, pp. 363-382.
- Oxford Dictionaries (2011) *Migration* [online]. Available at <http://oxforddictionaries.com/definition/migration> [accessed August 2011].
- Oxford Dictionaries (2011) *Path* [online]. Available at <http://oxforddictionaries.com/definition/path> [accessed August 2011].
- Parida, A. and Chattopadhyay, G. (2007) Development of A Multi-criteria Hierarchical Framework for Maintenance Performance Measurement (MPM). *Journal of Quality in Maintenance Engineering*. Vol.13 (3), pp. 241-258.
- Patton, M., Q. (2002) *Qualitative Research and Evaluation Methods*. 3rd Edition. Sage Publications, USA.
- Paulk, M.C., Weber, C.V., Garcia, S.M., Chrissis, M.B. and Bush, M. (1993) *Key Practices of the Capability Maturity Model, Version 1.1*, Technical Report CMU/SEI-93-TR-025 ESC-TR-93-178, Software Engineering Institute (SEI), Carnegie Mellon University, Pennsylvania, USA.
- Phang, M-F. (2006) *Outputs and Performance Measures – A Case Study of Two New Zealand Public Sector Organisations*. University of Canterbury. New Zealand.

- Pienaar, H. and Penzhorn, C. (2000) *Using the Balanced Scorecard To Facilitate Strategic Management at An Academic Information Service. Libri*. Vol.50, pp. 202-209.
- Powel, R.R. (2006) *Evaluation Research: An Overview* [online]. Available at <http://www.accessmylibrary.com/article-1G1-151440807/evaluation-research-overview> [accessed 16 September 2010].
- Price, A.D.F. (2003) The Strategy Process Within Large Construction Organisations. *Engineering, Construction and Architectural Management*. Vol.10 (4), pp. 283-296.
- Pyke, C.J., Gardner, D., Wilson, J., Hopkins, P. and Jones, S. (2001) *Achieving Best Value Through the EFQM Excellence Model: A Case Study of A Leisure And Community Services Department In A Metropolitan Authority*. *Journal of Finance And Management In Public Services*. Vol.1, pp. 29-40.
- Quality Scotland (2007) *Business Excellence* [online]. Available at <http://www.qualityscotland.co.uk/efqm.asp> [accessed September 2008].
- Richards, L. (2009) *Handling Qualitative Data: A Practical Guide. 2nd Edition*. Sage Publications, UK.
- Ritchie, L. and Dale, B.G. (2000) *Self-assessment Using The Business Excellence Model: A Study of Practice And Process*. *International Journal of Production Economics*. Vol. 66 (2000), pp. 241 – 254.
- Robinson, H.S, Carillo, P.M, Anumba, C.J and Al-Ghassani, A.M. (2005) *Review and Implementation of Performance Management Models in Construction Engineering Organizations*. *Construction Innovation*. Vol. 5 (4), pp. 203
- Robinson, H.S., Anumba, C.J, Carillo, P.M. and Al-Ghassani, A.M. (2006) *STEPS: A Knowledge Management Maturity Roadmap for Corporate Sustainability*. *Business Process Management Journal*. Vol.12 (6), pp. 793-808.
- Robson, A. (2002) *Real World Research. 2nd Edition*. Blackwell, UK.
- Sagor, R. (2005) *The Action Research Guidebook: A Four-Step Process for Educators and School Teams*. Corwin Press, California, USA.
- Salaheldin, S.I. (2009) Critical Success Factors For TQM Implementation And Their Impact On Performance of SMEs. *International Journal of Productivity and Performance Management*. Vol.58 (3), pp. 215-237.

- Sampson, S.E. and Froehle, C.M. (2006) Foundations and Implications of A Proposed Unified Services Theory. *Production and Operations Management*. Vol.15 (2), pp. 329-343.
- Santa, R., Ferrer, M. and W., Hyland, P. (2006) System Effectiveness and Operational Effectiveness: Can an optimal Balance Be Obtained?. Proceedings. The 20th ANZAM (Australian New Zealand Academy of Management) Conference on "Management: Pragmatism, Philosophy, Priorities". Central Queensland University, Rochampton, Australia.
- Sarshar, M., Haigh, R., Finnemore, M., Aouad, G., Barrett, P., Baldry, D. and Sexton, M. (2000) SPICE: A Business Process Diagnostics Tool for Construction Projects. *Engineering, Construction and Architectural Management*. Vol.7 (3), pp. 241-250.
- Saunders, M., R., Lewis, P. and Thornhill, A. (2007) *Research Method for Business Students*. 4th Edition. Prentice Hall, London, UK.
- Saunders, M., Mann, R.S. and Grigg, N.P. (2008) *Utilisation of Business Excellence Models: Australian And International Experience*. *The TQM Magazine*. Vol.20 (6), pp. 651-663.
- Schmuck, R. A. (2006) *Practical Action Research for Change*. 2nd Edition. Corwin Press, California, USA.
- Schneiderman, A.M. (1999) *Why Balanced Scorecards Fail?*. *Journal of Strategic Performance Measurement*. January, pp. 6-11.
- Schwandt, T. A. (2001) *Dictionary of Qualitative Inquiry*. 2nd Edition. Sage Publications, California, USA.
- Shulver, M. and Lawrie, G. (2007) *The Balanced Scorecard and the Business Excellence Model*. Proceedings. European Institute For Advanced Studied in Management, 8th Manufacturing Accounting Research Conference. June 18-20, University of Trento, Italy. pp. 1-10.
- Silverman, D. (2008a) *Interpreting Qualitative Data*. 3rd Edition. Sage Publications, London, UK.
- Silverman, D. (2008b) *Doing Qualitative Research – A Practical Handbook*. Sage Publications, London, UK.

- Sinclair, D. and Zairi, M. (1995) Effective Process Management Through Performance Measurement: Part I – Applications of Total Quality-Based Performance Measurement. *Business Process Re-engineering & Management Journal*. Vol.1 (1), pp. 75-88.
- Sousa, S. and Aspinwall, E. (2010) Development of A Performance Measurement Framework for SMEs. *Total Quality Management and Business Excellence*. Vol.21 (5), pp. 475-501.
- Stark, S. and Torrance, H. (2005) *Research Methods in the Social Sciences* in Somekh, B. and Lewin, C. Sage Publications, London, UK.
- Sulaiman, M. and Hashim, M.K. (2003) *Strategic Management: Origin Process, Approaches and Theories*. Analisis. Vol.10 (2), pp. 1-18.
- Sullivan, K., Kashiwagi, D. and Carey, B. (2008) Analysis of The Use Of Performance Information In The Construction Industry. Proceedings. First International Conference On Construction In Developing Countries (ICCIDC-I). August 4-5, Karachi, Pakistan, pp. 320-337.
- Sundaraj, G. (2007) *The Way Forward: Construction Industry Master Plan 2006 - 2015*, Malaysia, Master Builders.
- Suwignjo, P., Bititci, U.S. and Carrie, A.S. (2000) Quantitative Models For Performance Measurement System. *International Journal of Production Economics*. Vol.64 (2001), pp. 231-241.
- Takim, R. and Akintoye, A. (2002) Performance Indicators For Successful Construction Project Performance. In: Greenwood, D. (ed) Proceedings. 18th Annual ARCOM Conference. September 2-4, University of Northumbria. ARCOM, Vol. 2, 545-555.
- Takim, R., Akintoye, A. and Kelly, J. (2003) “Performance Measurement Systems In Construction”. Proceedings. *The 19th Annual ARCOM Conference*, 3-5 September 2003, SOAS, University of Brighton, UK.
- Tangen, S. (2004) Performance Measurement: From Philosophy To Practice. *International Journal of Productivity and Performance Management*. Vol.53 (8), pp. 726-737.
- Tangen, S. (2005) Insights From Practise Analysing the Requirements of Performance Measurement Systems. *Measuring Business Excellence*. Vol.9 (4), pp. 46-54.

- Tapanya, S. (2004) *Examining The Factors Which Influence Performance Measurement and Management in The Thai Banking Industry: An Application of The Balanced Scorecard Framework*. PhD Thesis, Murdoch University, Australia.
- Taticchi, P. and Balachandran, K.R. (2008) Forward Performance Measurement And Management Integrated Frameworks. *International Journal of Accounting And Information Management*. Vol.16 (2), pp. 140-154.
- Theeranuphattana, A. and Tang, J.C.S. (2008) A Conceptual Model of Performance Measurement for Supply Chains – Alternate Considerations. *Journal of Manufacturing Technology Management*. Vol. 19 (1), pp. 125 – 148.
- The Training Resources and Data Exchange or TRADE (2005) *How to Measure Performance – A Handbook of Techniques and Tools*. Oak Ridge Associated Universities.
- Toni, A. and Tonchia, S. (2001) Performance Measurement Systems – Models, Characteristics and Measures. *International Journal of Operations and Production Management*. Vol. 21(1/2), pp. 46 - 70.
- Trochim, W.M.K. (2006) *Research Methods Knowledge Base* [online]. Available at <http://www.socialresearchmethods.net/kb/intreval.htm> [accessed 15 September 2010].
- Verweire, K. and Van Den Berghe, L. (2003) Integrated Performance Management: Adding A New Dimension. *Management Decision*. Vol. 41, pp. 782 - 790.
- Verweire, K. and Van Den Berghe, L. (2004) *Integrated Performance Management: A Guide To Strategy Implementation – An Overview of Traditional Performance Management Frameworks*. Sage Publications. London.
- Vroom, V.H. and Jago, A.G. (2007) *The Role of the Situation In Leadership*. *American Psychologist*. Vol.23 (3), pp. 131-139.
- Wegelius-Lehtonen, T. (2001) Performance Measurement In Construction Logistics. *International Journal of Production Economics*. Vol.69, pp. 107-116.
- Wettstein, T. and Kueng, P. (2002) A Maturity Model for Performance Measurement Systems. *Management Information Systems*. pp. 113-122.
- Williams, R., Bertsch, B., Van Der Wiele, A., Van Iwaarden, J., and Dale, B. (2006) *Self-assessment Against Business Excellence Models: A Critique and Perspective*. *Total Quality Management and Business Excellence*. Vol.17 (10), pp. 1287 – 1300.

- Willis, J.W., Jost, M. and Nilakanta, R. (2007) *Foundations of Qualitative Research: Interpretive and Critical Approaches*. Sage Publications, USA.
- Wolcott, H.F. (2009) *Writing Up Qualitative Research. 3rd Edition*. Sage Publications, California, USA.
- Wongrassamee, S., Gardiner, P.D. and Simmons, J.E.L. (2003) Performance Measurement Tools: The Balanced Scorecard and The EFQM Excellence Model. *Measuring Business Excellence*. Vol.7 (1), pp. 14-29.
- Wu, L. and Song, Y. (2005) *Measuring Integrated Supply Chain Performance. IEEE Transactions on Engineering Management*. pp. 91-96.
- Wu, S-I. and Liu, S-Y. (2010) The Performance Measurement Perspectives and Causal Relationship for ISO-Certified Companies: A Case Of Opto-electronic Industry. *International Journal Of Quality & Reliability Management*. Vol.27 (1), pp. 27-47.
- Yang, J.B., Dale, B.G. and Siow, C.H.R. (2001) *Self-assessment of Excellence: An Application of The Evidential Reasoning Approach*. *International Journal of Production Research*. Vol.39 (16), pp. 3789 – 3812.
- Yin, R.K. (2003a) *Case Study Research: Design and Methods. 3rd Edition*. Sage Publications, UK.
- Yin, R.K. (2003b) *Applications of Case Study Research. 2nd Edition*. Sage Publications, UK.
- Yu, I., Kim, K., Jung, Y. and Chin, S. (2007) *Comparable Performance Measurement System for Construction Companies. Journal of Management in Engineering*. Vol.23 (3), pp. 131-139.

APPENDIX A

**INTERVIEW QUESTIONS FOR CURRENT STUDIES OF
PERFORMANCE MEASUREMENT WITHIN
ORGANISATIONS**

INTERVIEW QUESTIONS

RESEARCH TITLE:

Performance Measurement For Construction Businesses

AIM AND OBJECTIVES

The aim of interviews is to assess the experience and understanding of performance measurement by construction organisations. This interview is a major part of data collection for a PhD research and consists of four objectives to be fulfilled:

1. To identify a knowledge and understanding of performance measurement in construction organisations;
2. To assess current practices and effectiveness of performance measurement in construction organisations;
3. To identify the performance measurement models used in companies; and
4. To identify the connection between performance measurement and strategy development.

AGENDA

The assessment of interviews is in accordance to the following list of research issues:

1. Respondent Background;
2. Current Approach of Performance Measurement Within Organisation;
3. Performance Measurement Processes;
4. Performance Measurement Models;
5. Role of Strategy; and
6. Potential Improvements

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PERFORMANCE MEASUREMENT WITHIN CONSTRUCTION ORGANISATIONS

These interview questions will be used to review existing practices of performance measurement in the construction organisations. The questions will be used for the purpose of academic research. All responses will be treated in strict confidence. Any information indicating your identity will be removed and will not be linked to your responses. **Thank you.**

PART 1: RESPONDENT BACKGROUND

The aim of this part is to identify the respondent's background information.

- [1.1.] How many years have you been working in this organisation?
- [1.2.] Please describe your role in performance measurement?
- [1.3.] Please describe your involvement in performance measurement during your career?

PART 2: CURRENT APPROACH OF PERFORMANCE MEASUREMENT WITHIN ORGANISATION

The aim of this part is to identify a knowledge and understanding of performance measurement and assess current practices and effectiveness of performance measurement in organisation.

- [2.1.] Do you have a specific performance measurement system for your organisation? What is your approach to performance measurement using this system? Please explain your answer.
- [2.2.] How has performance measurement changed your organisation since your involvement with performance measurement of your organisation?
- [2.3.] What resources are allocated towards performance measurement in your organisation (for example staff, training, financial and technology)?

PART 3: PERFORMANCE MEASUREMENT PROCESSES

The aim of this part is to evaluate the performance measurement processes used in organisation.

- [3.1.] Can you map the processes for performance measurement in your organisation?
- [3.2.] What are the main performance criteria measured in your organisation?
- [3.3.] What are the indicators that you use to identify whether performance measurement has achieved the organisation's target?

PART 4: PERFORMANCE MEASUREMENT TOOLS AND MODELS

The aim of this part is to evaluate the performance measurement tools and models used in companies.

- [4.1.] What kind of performance measurement tools and models are currently used?
- [4.2.] What are the important aspects that you think influence your organisation in choosing an appropriate tool or model for performance measurement?

PART 5: ROLE OF STRATEGY

The aim of this part is to identify the connection between performance measurement and strategy development.

- [5.1.] What is the connection between strategy development and performance measurement?
- [5.2.] In your view, at which levels does performance measurement influence strategy development in your organisation?

PART 6: POTENTIAL IMPROVEMENTS

The aim of this part is to identify possible ways to improve performance measurement in organisation.

- [6.1.] Based on your experience, what are the barriers to implementing performance measurement?
- [6.2.] What improvements in performance measurement would you like to see in your organisation?
- [6.3.] Overall, has the performance measurement had a positive or negative impact on your organisation? Please explain your answer.

APPENDIX B

**ASSESSMENT QUESTIONS FOR THE PERFORMANCE
MEASUREMENT MIGRATION PATH**



LEVEL ASSESSMENT

**Questions for Assessing Level of Organisational Success
in Implementing Performance Measurement**

Purpose

To assess an organisation's success in fulfilling key aspects of each level of performance measurement. For completion by leaders in charge of performance measurement activities.

Guide

Please tick (✓) in appropriate box regarding organisation's achievement in managing and implementing performance measurement.

To complete each level of performance measurement, each aspect; leadership, strategy, people, partnerships and resources and processes, products and services should be weighted equally.

Level 1: Awareness of Performance Measurement**Description**

Our organisation has a clear understanding of performance measurement to improve business in terms of financial and non-financial aspects. Our organisation understands its directions in future business and ability to achieve success with performance measurement.

	YES	NO
1.0 Leadership		
1.1 Executive board is aware of the need for performance measurement.	<input type="checkbox"/>	<input type="checkbox"/>
1.2 Executive board has had training to increase awareness and understanding of performance measurement.	<input type="checkbox"/>	<input type="checkbox"/>
2.0 Strategy		
2.1 Our organisation is aware of the need to develop a performance measurement strategy.	<input type="checkbox"/>	<input type="checkbox"/>
2.2 Our organisation has developed a performance measurement strategy.	<input type="checkbox"/>	<input type="checkbox"/>
3.0 People		
3.1 Staff are aware of performance measurement needs of the organisation.	<input type="checkbox"/>	<input type="checkbox"/>
3.2 Training has been provided for staff involved directly with performance measurement activities to increase awareness and understanding.	<input type="checkbox"/>	<input type="checkbox"/>
4.0 Partnerships and Resources		
4.1 Our partners are aware of performance measurement needs of our organisation.	<input type="checkbox"/>	<input type="checkbox"/>
4.2 We have identified resources requirements for performance measurement.	<input type="checkbox"/>	<input type="checkbox"/>
5.0 Processes, Products and Services		
5.1 Our organisation is aware of the importance of processes for performance measurement.	<input type="checkbox"/>	<input type="checkbox"/>
5.2 Our organisation is aware that performance measurement can improve delivery of products and services.	<input type="checkbox"/>	<input type="checkbox"/>
TOTAL LEVEL 1	<input type="checkbox"/>	<input type="checkbox"/>

Level 2: Develop Strategy of Performance Measurement

Description

Our organisation has developed a strategy to implement performance measurement. Aspects such as resources, duties or tasks of staff and necessity activities are justified.

	YES	NO
1.0 Leadership		
1.1 Executive board has formed performance measurement teams to run performance measurement.	<input type="checkbox"/>	<input type="checkbox"/>
1.2 Executive board has ensured that plans for implementing performance measurement are ready.	<input type="checkbox"/>	<input type="checkbox"/>
2.0 Strategy		
2.1 Our organisation has identified activities than can achieve performance measurement strategy.	<input type="checkbox"/>	<input type="checkbox"/>
2.2 Our organisation has developed a policy for guiding the organisation in implementing performance measurement activities.	<input type="checkbox"/>	<input type="checkbox"/>
3.0 People		
3.1 Our performance measurement teams have knowledge of performance measurement.	<input type="checkbox"/>	<input type="checkbox"/>
3.2 Our performance measurement teams understand their tasks for performance measurement.	<input type="checkbox"/>	<input type="checkbox"/>
4.0 Partnerships and Resources		
4.1 Our organisation has developed measures to assess performance of our partners.	<input type="checkbox"/>	<input type="checkbox"/>
4.2 Our organisation has established resources for performance measurement implementation.	<input type="checkbox"/>	<input type="checkbox"/>
5.0 Processes, Products and Services		
5.1 Our organisation has developed a performance measurement processes map.	<input type="checkbox"/>	<input type="checkbox"/>
5.2 Our organisation has considered quality in handling good processes of products and services.	<input type="checkbox"/>	<input type="checkbox"/>
TOTAL LEVEL 2	<input type="checkbox"/>	<input type="checkbox"/>

Level 3: Implement Performance Measurement**Description**

All plans and strategies developed for performance measurement are implemented in our organisation. Aspects such as supervision and control of performance measurement processes have occurred in our organisation.

	YES	NO
1.0 Leadership		
1.1 Executive board has ensured implementation of performance measurement strategy.	<input type="checkbox"/>	<input type="checkbox"/>
1.2 Executive board has ensured resources have been used wisely in implementation process.	<input type="checkbox"/>	<input type="checkbox"/>
2.0 Strategy		
2.1 The strategy and activities designed for performance measurement have been implemented as planned.	<input type="checkbox"/>	<input type="checkbox"/>
2.2 The strategy and activities are executed in line with our organisation's needs.	<input type="checkbox"/>	<input type="checkbox"/>
3.0 People		
3.1 Our performance measurement teams have implemented performance measurement activities.	<input type="checkbox"/>	<input type="checkbox"/>
3.2 Our performance measurement teams have undertaken tasks to ensure that performance measurement implementation is successful.	<input type="checkbox"/>	<input type="checkbox"/>
4.0 Partnerships and Resources		
4.1 Performance measurement implementation in our organisation has the cooperation of our partners.	<input type="checkbox"/>	<input type="checkbox"/>
4.2 Our partners' performance and resources have been measured.	<input type="checkbox"/>	<input type="checkbox"/>
5.0 Processes, Products and Services		
5.1 Our organisation has fully implemented performance measurement processes.	<input type="checkbox"/>	<input type="checkbox"/>
5.2 Our organisation has delivered products and services based on the performance measurement processes.	<input type="checkbox"/>	<input type="checkbox"/>
TOTAL LEVEL 3	<input type="checkbox"/>	<input type="checkbox"/>

Level 4: Evaluate Performance Measurement**Description**

Our organisation has evaluated performance measurement processes and activities and taken necessary actions to improve or refine existing practices.

	YES	NO
1.0 Leadership		
1.1 Our executive board has evaluated our performance measurement activities.	<input type="checkbox"/>	<input type="checkbox"/>
1.2 Our executive board has refined our performance measurement activities.	<input type="checkbox"/>	<input type="checkbox"/>
2.0 Strategy		
2.1 Our organisation has strict process of evaluating performance measurement strategy.	<input type="checkbox"/>	<input type="checkbox"/>
2.2 Our performance measurement strategy is responsive to changes in performance measurement results.	<input type="checkbox"/>	<input type="checkbox"/>
3.0 People		
3.1 Our performance measurement teams are informed of results of the evaluation process.	<input type="checkbox"/>	<input type="checkbox"/>
3.2 Our performance measurement teams respond promptly to changes in performance measurement results.	<input type="checkbox"/>	<input type="checkbox"/>
4.0 Partnerships and Resources		
4.1 Our performance of partners and resources are assessed regularly and results communicated to them.	<input type="checkbox"/>	<input type="checkbox"/>
4.2 Performance measurement of our partners and resources are promptly changed in response to performance measurement results.	<input type="checkbox"/>	<input type="checkbox"/>
5.0 Processes, Products and Services		
5.1 Our performance measurement processes are refined after assessment.	<input type="checkbox"/>	<input type="checkbox"/>
5.2 Procedures are available in our organisation to check progress of performance measurement processes for delivering products and services.	<input type="checkbox"/>	<input type="checkbox"/>
TOTAL LEVEL 4	<input type="checkbox"/>	<input type="checkbox"/>

Level 5: Expand Performance Measurement**Description**

Our organisation is expanding and extending awareness of performance measurement to other business units and/or offices. The purpose is to extend performance measurement to other parts of the business as success has been achieved in at least one business unit or office.

	YES	NO
1.0 Leadership		
1.1 Executive board is continuously improving and expanding performance measurement to other units and/or businesses.	<input type="checkbox"/>	<input type="checkbox"/>
2.0 Strategy		
2.1 Our performance measurement strategy has been implemented within other units and/or other offices.	<input type="checkbox"/>	<input type="checkbox"/>
3.0 People		
3.1 Our performance measurement teams are continuing to improve their knowledge in performance and sharing lessons learnt with others.	<input type="checkbox"/>	<input type="checkbox"/>
4.0 Partnerships and Resources		
4.1 Performance measurement implementation is expanding to our partners.	<input type="checkbox"/>	<input type="checkbox"/>
5.0 Processes, Products and Services		
5.1 Performance measurement processes in delivering products and services are expanding to other business units and/or offices.	<input type="checkbox"/>	<input type="checkbox"/>
TOTAL LEVEL 5	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX C

**EVALUATION QUESTIONS FOR EVALUATING THE
FRAMEWORK**

EVALUATION OF A PERFORMANCE MEASUREMENT IMPLEMENTATION MODEL

The Performance Measurement Implementation Model is designed to identify critical migration paths for each specific performance measurement (PM) area. This is expected to raise the performance of organisations from their current position to a better one in the future. The purpose of the evaluation is to enable organisations to assess the effectiveness of the model for its content, capability and usability.

AIM AND OBJECTIVES

This exercise aims to evaluate the concept of the model and overcome any usability issues. The purpose of this evaluation is to:

1. Validate the concept of the model;
2. Strengthen the user requirements of the model; and
3. Test whether the model can provide efficient information and services to its users.

The results of the evaluation will be used to improve the model and deploy it in industry.

CONTENT

The evaluation is divided into three parts. Part 1 covers background information, Part 2 covers elements of the model and Part 3, general comments on the model. Please complete all items. Your responses will be used for academic purposes only and will be treated in strict confidence.

Your valuable cooperation would be much appreciated. Thank you.

RESEARCHER

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PART 1: BACKGROUND INFORMATION

The purpose of this part is just to help our analysis of your other responses.

Organisation Name and Address: _____

Type of Organisation (Consultant, Contractor, etc.): _____

Your Name (Optional): _____

Job Title: _____

Job Description: _____

Telephone: _____ Email: _____

PART 2: MODEL ELEMENTS

The aim of this part is to verify the need for the model and to assess its usefulness for organisations. The items cover content, effectiveness, capability and use of the model. The purpose of this is to ensure that the model is understandable and easy to use by industry practitioners.

Please tick (✓) in the box that best indicates your level of agreement with each of the statements below, where:

SD= Strongly Disagree **D**= Disagree **N**= Neutral **A**= Agree **SA**= Strongly Agree

		SD	D	N	A	SA
2.1	Model Content To what extent do you agree that the model content is suitable in so far as:					
1	Words and terms used are understandable.					
2	Words and terms used are important for PM implementation.					
3	Format is easy to navigate.					
2.2	Model Effectiveness To what extent do you agree that the model is effective for:					
1	Improving PM practices.					
2	Improving PM implementation processes in an organisation.					
3	Assisting the beginner in understanding PM processes.					
4	Addressing important elements of managing organisation performance.					

		SD	D	N	A	SA
5	Assisting an organisation to improve implementation of PM.					
2.3	Model Capability To what extent do you agree that the model is capable of:					
1	Providing a practical solution to improve PM practices by identifying maturity of PM activities.					
2	Providing a practical solution to improve PM practices by identifying migration of PM activities from the current to a better situation.					
3	Fostering learning and increasing the awareness of PM.					
4	Cultivating a cooperative spirit and helping to improve communication between employees.					
5	Achieving PM targets.					
2.4	Model Usability To what extent do you agree that:					
1	The model is simple and user-friendly.					
2	The organisation would use the model for guidance in PM processes.					
3	The organisation recognises the importance and benefits of using the model.					
4	Considerable training will be required for effective use of the model.					

PART 3: GENERAL COMMENTS

The aim of this part is to identify possible ways to improve the model in its content, effectiveness, capability and usability by an organisation.

[3.1] In your view, what are the benefits of using the Performance Measurement Implementation Model?

[3.2] What are the barriers to the use of the model in your organisation?

[3.3] How can the model be improved?

[3.4] How can the model improve performance measurement practices in your organisation?
Please give details.

[3.5] Would you use (or recommend using) the model in the future? Explain why/why not?

[3.6] Additional comments, please, would be welcome

APPENDIX D

REFINED FORMWORK

Additional Information To The Actual Framework

To start using the Performance Measurement Migration Path, read the instruction and procedure given.

A. Instruction and Procedure

Please follow the procedure as given below:

1. The Performance Measurement Migration Path is used as a tool to assist your organisation in implementing performance measurement process. It helps to improve the process of the implementation of performance measurement.
2. It can be referred by staff of managerial level, who is responsible in managing, controlling, monitoring and evaluating performance of organisation.
3. Other staff who are involved with the performance measurement process can use it as reference for the process of performance measurement implementation.
4. The Performance Measurement Migration Path includes three components. The first component is Table A: Criteria Considered In Improving Performance Measurement Implementation. The second component is Table B: Performance Measurement Migration Path. The third component is the Level Assessment form. The purpose of the form is to assess organisation success in fulfilling key aspects of each level.
5. Use the Level Assessment form mentioned above to identify the particular level of your organisation in the framework.
6. No level can be missed out or left out once you have identified your level.
7. You need to assess your performance at each level to make sure that you achieve the targets at that level before you can move to the next level.

TABLE A: Criteria Considered In Improving Performance Measurement Implementation

NO	CRITERIA	LEVEL 1 (L1): AWARENESS OF PM	LEVEL 2 (L2): DEVELOP STRATEGY OF PM	LEVEL 3 (L3): IMPLEMENT PM	LEVEL 4 (L4): EVALUATE PM	LEVEL 5 (L5): EXPAND PM
1	Leadership	Leaders are aware of PM needs.	Leaders create a task force to carry out PM.	Leaders ensure PM activities are implemented.	Leaders evaluate PM activities and identify improvements.	Leaders continuously improve and expand PM to other units and/or offices.
2	Strategy	Organisation is aware of need to develop PM strategy.	Organisation develops PM strategy.	Organisation implements PM strategy.	Organisation evaluates PM strategy.	PM strategy implemented within other units and/or other offices.
3	People	Staff are aware of PM needs.	Staff develop knowledge of PM.	Staff implement PM activities.	Staff performance in implementing tasks evaluated. Refine as necessary for improvement.	Staff continue to improve their knowledge in PM and share with others.
4	Partnerships and Resources	Partnerships are aware of need for PM.	Organisation develops measures to assess supply chain.	Organisation measures performance of supply chain.	Partnerships' performance and resources evaluated. Refine PM used in supply chain.	PM expands to other supply chain members.
5	Processes, Products and Services	Organisation is aware of need for processes within PM.	Organisation develops processes to undertake PM.	Processes implemented systematically.	Quality of products and services evaluated by organisation.	PM processes expanded to other units and/or offices.

TABLE B: Performance Measurement Migration Path

NO	CRITERIA	L1	MIGRATION PATH	L2	MIGRATION PATH	L3	MIGRATION PATH	L4	MIGRATION PATH	L5
1	Leadership		Leaders undertake training related with PM.		Leaders provide resources to ensure PM activities can be done.		Leaders identify evaluation format and results required.		Knowledge sharing through direct and indirect communication by leaders to others.	
2	Strategy		Organisation identifies current and future needs of PM.		Organisation identifies and allocates resources needed to implement PM strategy.		Organisation identifies success factors for PM.		Knowledge transfer by organisation to communicate results to other units and/or offices.	
3	People		Staff undertake training related with PM.		Staff undertake PM activities.		Staff competence in undertaking tasks assessed.		Ongoing training and development on PM for staff.	
4	Partnerships and Resources		Partnerships undertake training related with PM and ongoing dialogues on PM with organisation.		Partnerships cooperate with organisation in undertaking PM activities.		Organisation identifies supply chain success factors for PM.		Knowledge transfer to communicate results to existing and potential partnerships.	
5	Processes, Products and Services		Organisation develops PM processes map.		Organisation provides support systems to implement PM.		Organisation develops checklist of procedures.		Knowledge sharing through direct and indirect communication by organisation to others.	

APPENDIX E

PAPERS PRESENTED AT INTERNATIONAL CONFERENCES

APPENDIX E - 1

ARCOM 2009

THE NEED FOR PERFORMANCE MEASUREMENT IN CONSTRUCTION STRATEGY DEVELOPMENT - A CURRENT SCENARIO

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Performance measurement has become more important to the construction sector as an additional way of improving and sustaining business in the long-term. Most large construction organisations in the United Kingdom (UK) practice performance measurement because they believe it gives a positive impact to their businesses in the long-term. Performance measurement is seen as an important way of keeping an organisation on track in achieving the organisation's objectives and strategy. However, there are still construction sector organisations that believe performance measurement do not aid in creating and developing appropriate strategies for their organisations. This paper explores the current approaches to performance measurement with a particular focus on the connection between performance measurement and strategy development. It reports on semi-structured interviews with performance measurement directors and managers in large UK construction companies. Semi-structured interviews revealed that performance measurement is being practised in organisations either directly or indirectly to help improve businesses and profits. All organisations agreed that the financial aspects such as profit margins and growth, as well as non-financial aspects such as health and safety and customer satisfaction are the important criteria to be measured and will be accounted in creating an organisation's strategy. The interviews also revealed that performance measurement has a direct relationship with the strategy development. These findings suggest that the best way to create an organisation's strategy is by understanding the performance measurement process of organisations and identifying the appropriate criteria which need to be measured to improve business, identify strengths and opportunities which, in turn, can create a way to maximise profits for an organisation. This is expected to lead to the development of a migration path, which would help organisations target relevant performance measures and embed them in their organisation strategy in a structured step by the manner.

Keywords: organisation strategy, performance measurement, performance-measured criteria, strategy development.

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INTRODUCTION

Awareness of performance measurement is notably increasing as the business world undergoes the phenomenon of globalisation. Performance measurement is not an unusual for most large organisations in the UK. It is being practised by a variety of organisations in the construction industry and is not a new agenda for the industry (Khalfan et al., 2001). The UK Government initiated the Latham Report in 1994 and the Egan Report in 1998 which recommended an improvement of the construction industry's business performance. Since then, many companies and organisations in the construction industry are aware of performance measurement and its importance in an organisation. Performance measurement is now firmly on the construction industry management agenda, but it is not limited to construction. The changing nature of work such as increasing competition, specific improvement initiatives, national and international quality awards, changing organisational roles, changing external demands and the power of information technology have driven organisations from all sectors to search for ways of monitoring and improving performance (Beatham, 2003; Robinson et al., 2005).

The ability of organisations to manage projects and offer good services is more likely to depend on the capability of organisations in industry, which includes the previous performance of the organisation in the industry. The main factor why organisations need to measure performance is to identify the level of excellence in terms of financial and non-financial aspects such as leadership, customer satisfaction and policy compared to their competitors in industry. The results from this will be used to create and develop strategies for the organisation. The ability of an organisation to improve its performance is not based on what has been made and what has been done. It has to be looked at in the initial stage of business management in the first place. This includes the process of creating and developing strategies, a necessary part of strategic management (Sulaiman and Hashim, 2003). Although formulating strategies for long-term business to compete in markets is fundamental to strategic management process, only a few construction contractors have adopted formal processes in the formulation of long-term strategies (Price, 2003).

The most challenging part of measuring performance is not only about knowledge and experience or understanding the use of the right tools or methods to measure performance, but also obtaining the correct sources of information or data that will be used to measure an organisation's performance, especially when what has to be measured keeps changing (Hubbard, 2006). Therefore, an organisation has to be aware of all sources and data that might be used to measure overall performance of an organisation.

Chinowsky and Meredith (2000) mentioned that the entire life of a construction project represents opportunities for professional services. However, the knowledge to identify, find and pursue these opportunities must be developed as part of an expanded construction organisation strategy. Strategy can be defined as 'for doing something or to do something'. It is 'a plan intended to achieve a particular purpose' (Oxford Advanced Learner's Dictionary, 2008). Literally, it is the process of quantification and action leading to performance. Performance measurement is used as a business tool for formulating corporate strategy (Yu et al., 2007).

It is widely accepted that strategy intensively involves performance to attain goals (Luu et al., 2008). The creation of goals and objectives of an organisation not only relies on what the organisation wants to achieve in the long-term, but also needs to include elements of performance measurement as an additional means for making goals more realistic and achievable in the future. It has to be understood

that every strategy developed must be evaluated and assessed critically to ensure that it is suitable to be implemented by organisations.

PERFORMANCE MEASUREMENT

Performance measurement can be defined as the process of quantifying the efficiency and effectiveness of past actions (Neely et al., 2005). It can also be described as the process of quantifying action, which encompasses the selection of what activities to measure, why and what are the performance standards and benchmarks to be referred (Santa et al., 2006). Kagioglou et al. (2001) state that performance measurement is the process of determining how successful organisations or individuals have been in attaining their objectives and strategies. To achieve this, the outputs of an organisation's strategic and operational processes are measured in a quantifiable form to monitor the organisation in detail, internally and externally. Sinclair and Zairi (1995) and Mbugua et al. (1999) define performance measurement as a systematic way of evaluating the inputs and outputs in construction activities and it is known as a tool for continuous improvements. This has been agreed by Cain (2004) who stated that performance measurement is the initial stage in an improvement process that gives benefit to users as well as organisations. Considering the various definitions of performance measurement, it is seen that performance measurement is a process to identify efficiency and effectiveness by undergoing a critical evaluation of all aspects of management such as leadership, planning, human resources, financial and workers. By the end of the process, it will help the managerial staff to formulate effective strategies that help towards achieving the organisations' objectives and goals.

Importance of performance measurement

Over the past decade, many organisations have been alerted to the importance of measuring performance for their businesses. Performance measurement is critical to the success of almost any organisation. Understanding performance measurement can help organisations realise its importance towards business profitability and maintaining a long-term competitive advantage. Performance measurement is used as a business tool for evaluating management performance, managing human resources and formulating corporate strategy (Yu et al., 2007; Kulatunga et al., 2007 and Baldwin et al., 2001). Performance measurement is asserted, as it is a way to improve business and leads to successful organisation business. Performance measurement is seen as an important way of keeping an organisation on track in achieving the organisation's objectives and as a monitoring mechanism employed by the owner of an organisation (Tapanya, 2004). In the complex and ever-changing environment, organisations are looking to performance measurement as an additional way for increasing profits, enlarging market and strengthening existence in industry (Theeranuphattana and Tang, 2008). It also reflects "organisational culture and philosophy and describes how well work is done in terms of cost, time and quality" (Lukviarman, 2004).

Selection of performance measurement tools and models

There are various tools and models to measure performance. Robinson et al. (2005) state that there are several considerations in the implementation of performance measurement models such as strategic planning, operationalisation and review. Strategic planning is a crucial part of performance measurement as it is very important for the business objectives to be defined. Therefore, choosing the appropriate and right model to measure performance is critical but not easy. Performance measurement tools and models are increasingly being used to encourage organisations to focus on

measuring a wider range of business performance issues relating to processes, people and product (Carrillo et al., 2003). Other factors affecting the purpose of using the model are also based on how wide is the model has been used in the industry (British Quality Foundation, 2000). Changing financial into non-financial measures is affected by the changing of the environment and the importance of the non-financial term in the development of business has created many models of performance measurement. These methods are being used to assist organisations to become more competitive and sustainable (Dalrymple and Bryar, 2006). Key Performance Indicators (KPIs), The Balanced Scorecard and The European Foundation of Quality Management (EFQM) Excellence Model are some of the performance measurement tools and models widely used in the UK construction industry.

METHOD

In addition to the critical analysis of the literature review on the theoretical data of performance measurement, the current study used semi-structured interviews as an approach to gain information from the industry. Using this approach gives the interviewer an opportunity to explore answers more widely or other areas of discussion introduced by the interviewee (Barbour, 2008).

Interview and procedure

Five large construction organisations in the UK involved in building and civil work and services were invited to participate in interview sessions. All the organisations are listed in the top 75 construction organisations in the UK in year 2008. Table 1 shows brief information about the respondent's organisations. The interviews involve five managerial staff of different organisations; head of business excellence, process improvement manager, performance improvement director, business improvement director and business improvement manager in the UK. All of them have many years of experience with the industry and are responsible for the development of performance measurement of organisations and are involved with arranging, managing, implementing and evaluating organisation performance.

Table 1: Brief information about the respondents' organisations

	COMPANY 1	COMPANY 2	COMPANY 3	COMPANY 4	COMPANY 5
ITEM					
Number of employee	Approx. 600	Approx. 2,800	Approx. 3,000	1,986	Approx. 400
Turnover (£000)	300,000	4,714,300	1,400,000	307,000	207,000
Business type	Building and civil	Building and civil	Building	Infrastructure	Building

Semi-structured interviews were used to assess the experience and understanding of performance measurement by construction organisations. The interviews had four objectives:

1. To identify knowledge and understanding of performance measurement in construction organisations.
2. To assess current practices and effectiveness of performance measurement in construction organisations.

3. To identify the performance measurement tool and model used in construction organisations.
4. To identify the relationship between performance measurement and strategy development in construction organisations.

Pilot interviews took place before the main interviews. Their purpose was to examine whether or not the interview questions were well developed and suitable to gain data for the study.

The face-to-face interviews used a set of questions developed from the extant literature. Topics covered included reasons for implementing performance measurement, performance measurement processes, performance measurement tools and models used and relationship between strategy development and performance measurement. Most of the interviews lasted at least an hour and a half. The information obtained was then analysed and evaluated.

RESULTS AND DISCUSSION

Knowledge and understanding of performance measurement in organisations

Generally, all respondents shared a similar understanding that performance measurement was to 'improve business' and 'maximise profits'. Improve business was in the sense of making improvement in the process of projects and overall organisation business. Two respondents mentioned that performance measurement is an ongoing process in their organisations. It is involved in the process of planning, operations and review. Furthermore, some respondents believe that performance measurement is an approach to maximise opportunity for organisations and mitigate risk. All respondents showed performance measurement gives benefit rather than negative impact to an organisation. The benefits gained from performance measurement as mentioned by all respondents are:

1. Identify the potential area to be improved by organisations.
2. High productivity in work.
3. Projects put in place, know what can help to deliver projects (what gets measured, gets done).
4. Manage resources.
5. Employers are more efficient in delivering their tasks.
6. High passion of staff in commitment to their organisations.

Apart from that, all respondents agreed that performance measurement helps them in the process of creating and developing strategies for organisations.

It was stated that;

'It provident you measure your performance. It does not really matter how you measure it. It is about knowing where you are and where you want to be and put them in the action plan'.

This quote illustrates that performance measurement can assist in identifying organisation needs for strategy development.

Even though there are differences in length of direct involvement with the performance measurement process, it does not make any differences in the interpretation of performance measurement by respondents. Three had more than 10 years' direct experience in performance measurement. Another two had less than 10 years.

Performance measurement system

A performance measurement system is a way to help generate performance measurement activities in an organisation. The interviews revealed that the systems can be divided into two: separated and non-separated performance measurement systems. A separated or 'individual' performance measurement system means every unit or department in an organisation uses a different system from each other for running performance. A non-separated or 'corporate' system means every unit or department in an organisation uses a similar system to generate performance measurement. A majority of respondents reported that a non-separated system was used to run the performance measurement process of their organisations. Only one respondent used a separated performance measurement system.

Adaptation of other systems to generate performance measurement is helping organisations to smooth the performance measurement process. Adaptation of system means taking other organisations' or individuals' approaches or taking an established and well known system for running performance measurement in the organisation. Three respondents used adapted systems in generating the performance measurement process. The following is the adapted system based on one respondent:

1. Site Man: used by quantity surveyor for gaining orders from customers, placing orders with supplier and evaluating works.
2. Summer Account: used in finance to produce reports to answer various queries.
3. Human Resource System: used in Human Resource (HR) department.
4. Umbrella System: describes how the business is run by the organisation.

Although all of the systems above had never been used by other respondents, the functions of the systems are similar to theirs which use other adapted system for the same purpose. One respondent used a system called 'dashboard', a system of one page reports including all the information about project including financial, management and customers, 'Oracle Management Accounting System' and 'planning packages'.

Two respondents had created their own system for generating performance measurement. All the systems (adapted systems and created) involve the use of computers. However, 'pen and paper' method is used entirely by all respondents with support from the computerised system.

Performance measurement process

The interviews revealed that all parties from managerial to bottom level in organisations were involved either directly or indirectly in the performance measurement process. Employees play a vital role by supporting managerial staff in doing their tasks and roles to create efficient and effective ways of management. Managerial staff are responsible for assisting business units and functional units staff in doing their tasks and aligning these with the organisation's target.

The managerial staff decided organisation targets needing to be achieved in every year. Every individual has his or her own objectives and targets to achieve the organisation's objectives and

targets. The main objectives came from the main board or Chief Executive Team (CET) (the term used by one respondent) and are cascaded to everybody in-group. The individual objectives and targets need to be aligned with organisation needs. Senior managers will monitor individual objectives and targets to make sure they are suitable to be used and practised to achieve the organisation's. Any individual objective and target not meeting the organisation's targets or maybe clashing with them will be reset.

Performance criteria measured

In discussion of performance criteria measured, there is not much difference in choosing the appropriate ones. All respondents measured financial and non-financial aspects of their organisations. There are many criteria used by respondents to measure the results of business performance. Those cited by all five respondents were: People aspect; Safety aspect; Customer satisfaction; Business risk; Growth; and Margin improvement and balance sheet.

One respondent also considered sustainability as one of the main criteria measured for her organisation. Another respondent mentioned that the serious intention to measure non-financial aspects started in the past ten years. Financial aspect is the only necessary criterion measured by any organisation in the last ten years.

It was stated that;

'If we went back more than ten years, there was very little measurement of anything other than financial performance'.

This quote illustrates that the financial aspect is the most important to be measured by industry. Nowadays, it has been changed to align with the changes in the economy, trends and needs in the industry. People were interested not only in the financial aspects but also non-financial.

Performance measurement tools and models

All respondents agreed that performance measurement tools and models are needed to measure performance. Table 2 shows the performance measurement tools and models used by each respondent.

Table 2: Performance measurement tools and models used by respondents

	COMPANY 1	COMPANY 2	COMPANY 3	COMPANY 4	COMPANY 5
TYPES					
KPIs			√		√
Balanced Scorecard	√			√	
Business Excellence		√		√	
ISO 9001 (Standard for Quality Management System)		√			
ISO 14001 (Standard for Environmental Management System)		√			
OHSAS 18001 (Occupational Health and Safety System)		√			
Others (Bespoke)	√	√	√		√

What type of tools and models is not important as long as they can measure things that need to be measured correctly. It also depends on what organisations need to see in the results of performance measurement. One respondent stressed that the most critical things are what action can be taken after measurement and delivering the right choice for the organisation to improve business.

Three respondents justified the best and appropriate tools and models to measure performance must be best suited to the organisation's business, the simplicity of the tools and models and the action to put in place for the measurement element.

'In term of what tools and models we want to use, I guess it will be looking at what is out there, what benefit different things give us and then how they fit with what works for us and how easy they are'.

It is not only about measurement, it is about what you do with the information and how to improve it.

Relationship between performance measurement and strategy development

The interviews revealed that there are direct relationships between performance measurement and strategy development. Four respondents believe that there is a direct relationship between performance measurement and strategy development. They all shared similar thoughts that performance measurement influences strategy development at all levels of the process. It involves everything from the planning stage or where their project should go and what the organisation needs to do, the implementation stage and the evaluation stage.

Organisations need to measure their performance based on the specific criteria or areas for getting the results for improvement (if needed) and identify what will be the next target to be achieved for the next year and beyond. The involvement of performance measurement is at the implementation stage and monthly evaluation of projects. All respondents were aware that organisation's strategy needs to be revised annually, even though some of the respondents have made a long-term strategic plan for

more than three years. One respondent expressed the belief that performance measurement does not have any relationship with strategy development. The respondent understood that performance measurement is needed for getting information on what needs to be improved by the organisation. Added to that, the respondent does not see that performance measurement has been involved directly in the process of developing strategy. Even though all respondents have different points of views on the relationship between these two, all agreed that performance measurement is one of the key successes for organisations to achieve objectives or targets and strategy.

CONCLUSIONS

Current literature has argued that performance measurement is an important way of improving and sustaining business in the long-term as well as creating and developing organisations' strategies. The selection of the most appropriate criteria to be measured is very important since these could have a massive impact on whether an organisation achieves its aims, objectives and strategy for continuing success. These criteria selected should include both; Financial and non-financial aspects because these provide a more holistic assessment of the organisation. Also, the appropriate use of tools and models to measure performance simplifies the performance measurement process.

Interviews have been conducted with the intention of giving a clear understanding about current approaches of performance measurement in industry. The data gained from the interviews show that the organisations have an understanding of the purpose of performance measurement in organisations. They are also aware of its importance to an organisation, particularly as a mechanism to identifying potential areas for improvement and to support the process of developing the organisation's strategy. Performance measurement influences strategy development at all levels of the process. There are various tools and models used by organisations for measuring performance. KPIs, Balanced Scorecard, Business Excellence Model and Management of Quality System (ISO) are currently used. These tools and models are known as established and good examples of performance measures. Apart from the established tools and models, some organisations have created their own tools. Criteria to be considered when choosing the most appropriate tools and models to measure performance are based on capability to measure things correctly, what organisations need to see from the results of performance measurement and ability to propose the right options for the organisations to improve business.

However, whilst organisations are undertaking performance measurement, further work required to investigate the relationship between performance measurement and strategy development. Also, the selection of criteria to be measured and the tools and models used need to be explored to investigate the impact on organisation performance. A detailed study will look at the established tools and models such as Balanced Scorecard and the Excellence Model. This will lead to ways of helping organisations target relevant performance measures, based on their maturity level and propose mechanisms for embedding these within their organisation strategy.

REFERENCES

- Baldwin, A., McCaffer, R., Osman, I.I (2001) Project Performance in a Contracting Organization: Analysis, Evaluation and Development. Paper presented at the CIB World Congress, Wellington, New Zealand.
- Barbour, R.S (2008) *Introducing Qualitative Research: A Student's Guide to the Craft of Doing Qualitative Research*. Sage Publications. UK.
- Beatham, S (2003) Development of an Integrated Business Improvement System for Construction. EngD Thesis, Loughborough University, United Kingdom.
- British Quality Foundation (2000) *The Model in Practice: Using the EFQM Excellence Model to Deliver Continuous Improvement*. Deer Park Productions. Great Britain.
- Cain, C.T (2004) *Performance Measurement for Construction Profitability*. Blackwell Publishing. UK.
- Carrillo, P.M, Robinson, H.S, Anumba, C.J and Al-Ghassani, A.M (2003) IMPaKT: A Framework for Linking Knowledge Management to Business Performance. *Electronic Journal of Knowledge Management*, 1 (1), 1-12.
- Chinowsky, P.S and Meredith, J.E (2000) Strategic Management in Construction. *The Journal of Construction Engineering and Management*, 126 (1), 1-9.
- Dalrymple, J.F and Bryar, P (2006) SME Construction Industry Subcontractors Performance Measurement and Improvement. Paper presented at The 20th ANZAM (Australian New Zealand Academy of Management) Conference on "Management: Pragmatism, Philosophy, Priorities". Central Queensland University, Rochampton, Australia.
- Egan (2002) *Rethinking Construction*, prepared for the Deputy Prime Minister [online]. Available at <http://www.ciob.org.cn/resources/download/Rethinking%20construction%20the%20egan%20report.pdf> [accessed April 2008].
- Hubbard, G (2006) *Measuring Organizational Performance: Beyond the Triple Bottom Line*. Business Strategy and the Environment. John Wiley & Sons. UK.
- Kagioglou, M, Cooper, R. and Aouad, G (2001) Performance Measurement in Construction: A Conceptual Framework. *The Journal of Construction Management and Economics*, 19, 85-95.
- Khalfan, M.M.A (2001) Benchmarking and Readiness Assessment for Concurrent Engineering in Construction (BEACON). Loughborough University, Loughborough, UK.
- Kulatunga, U., Amaratunga, D. and Haigh, R. (2007) Performance Measurement in the Construction Research and Development. *International Journal of Productivity and Performance Management*, 56 (8), 673-688.
- Luu, T-V., Kim, S-Y., Cao, H-L. and Park, Y-M (2008) Performance Measurement of Construction Firms in Developing Countries. *The Journal of Construction Management and Economics*, 26 (4), 373-386.
- Lukviarman, N (2004) *Ownership Structure and Firm Performance: The Case of Indonesia*. Curtin University of Technology, Australia.
- Mbugua, L.M., Harris, P., Holt, G.D and Olomolaiye, P.O (1999) A framework for determining critical success factors influencing construction business performance. In: Hughes, W. (ed) *Proceedings. 15th Annual ARCOM Conference. September 5-7, Reading: ARCOM*. 1, 255-264.
- Neely, A., Gregory, M. and Platts, K (2005) Performance Measurement System Design: A Literature Review and Research Agenda. *International Journal of Operations and Production Management*, 25 (12), 1228-1263.

- Oxford Advanced Learner's Dictionary (2008) [online] Definition of Strategy. Available at <http://www.oup.com/elt/catalogue/teachersites/oald7/lookup?cc=global> [accessed July 2008].
- Price, A.D.F (2003) The strategy process within large construction organisations. *The Journal of Engineering, Construction and Architectural Management*, 10 (4), 283-296.
- Robinson, H.S, Carrillo, P.M, Anumba, C.J and Al-Ghassani, A.M (2005) Review and Implementation of Performance Management Models in Construction Engineering Organizations. *The Journal of Construction Innovation*, 5 (4), 203.
- Santa, R., Ferrer, M. and Hyland, W.P (2006) System Effectiveness and Operational Effectiveness: Can an Optimal Balance be Obtained?. Paper presented at the at The 20th ANZAM (Australian New Zealand Academy of Management) Conference on "Management: Pragmatism, Philosophy, Priorities". Central Queensland University, Rochampton, Australia.
- Sinclair, D. and Zairi, M (1995) Effective Process Management through Performance Measurement: Part I - Applications of Total Quality-Based Performance Measurement. *Business Process Re-engineering & Management Journal*, 1 (1), 75-88.
- Sulaiman, M. and Hashim, M.K (2003) Strategic Management: Origin Process, Approaches and Theories. *Analisis*, 10 (2), 1-18.
- Tapanya, S (2004) Examining the Factors which Influence Performance Measurement and Management in the Thai Banking Industry: An Application of the Balanced Scorecard Framework. Murdoch University. Australia.
- Theeranuphattana, A. and Tang John, C.S (2008) A Conceptual Model of Performance Measurement for Supply Chains - Alternate Considerations. *The Journal of Manufacturing Technology Management*, 19 (1), 125-148.
- Yu, I., Kim, K., Jung, Y. and Chin, S (2007) Comparable Performance Measurement System for Construction Companies. *The Journal of Management in Engineering*, 23 (3), 131-139.

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APPENDIX E - 2

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IMPROVING PERFORMANCE MEASUREMENT PRACTICES IN CONSTRUCTION ORGANISATIONS

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ABSTRACT

Performance measurement (PM) is being practised by a variety of construction organisations and many are aware of its importance to them. It is necessary for organisations intending to extend businesses locally or globally and as an important ingredient for the strategy development process. The paper contributes to a growing body of knowledge on PM and describes a maturity model to help organisations to structure and organise the PM practices. In particular, it explores the importance of PM and potential tools such as the Balanced Scorecard (BSC) and the European Foundation for Quality Management (EFQM) Excellence Model. These two tools are widely known and the most used in all sectors including construction to measure organisations' performance. This paper focuses on current PM practices in two countries, UK and Malaysia. Information on knowledge and understanding of PM, PM processes, criteria, tools and models used and challenges in implementing PM was gathered using semi-structured interviews with twelve large construction organisations. The purpose of interviews was to seek the organisations' views on how they approach and conduct PM and derive benefits from it. Results indicate that organisations understand what they can gain from implementing PM. It is being practised in organisations to help improve business and gain more profits. Involvement of all staff, managerial level to bottom level, is important either directly or indirectly in the PM process. Furthermore, all organisations agreed that the appropriate use of tools and models to measure performance simplifies the process and indicates how organisations can move in future. Financial and non-financial aspects are evaluated and measured for assessing organisations' performance. However, PM for organisations remains a challenge. It is seen that organisations face difficulties not only in understanding the PM process but also where appropriate data for measuring performance can be sourced. A critical analysis of the literature reviewed and the interview results lead to ways of helping organisations to target relevant performance measures, based on their maturity level.

Keywords: Balanced Scorecard (BSC), Construction Organisations, EFQM Excellence Model, Improving, Performance Measurement (PM)

INTRODUCTION

Many large organisations have realised the importance of measuring organisations' performances. It is an integral part of management and thus may have been exercised ever since management has existed (Bassioni et al., 2004). These days, organisations are looking to PM as an additional way to increase their profit, enlarge their market and strengthen their existence in industry. PM creates understanding as well as helps to facilitate competitiveness (Theeranuphattana and Tang, 2008). Organisations with the vision to expand their businesses

and markets will look at PM as an approach to help them identify what they need to do to move forward from their current stage to a future stage with the highest possible movement they can.

As PM is required for organisations in extending their business not only in local but also in international level, PM is being practised in many countries such as in the UK as well as in Malaysia. PM is not a new agenda to the UK as it has been implemented formally after government initiated the Latham Report in 1994 and the Egan Report in 1998. Since then, many organisations aware of PM and its importance for improving business of their organisation. The declaration of developed country for Malaysia in year 2020 has brought the country to look seriously on PM. Many organisations in the country believe that PM can bring them to an international level as what has been listed as one of aim for vision of 2020. There is a need for Malaysia to learn from other developed countries such as UK as PM has growth early in their industry and they really understand PM and more of it as an approach that can help organisations identify way to improve their businesses. Therefore, this paper focuses on the importance of PM to organisations and current practices of PM in the construction industry of two countries. An introduction to a maturity model to facilitate the implementation of PM processes will be described. The model is produced as an alternative way to improve PM practices in construction organisations based on studies in the two countries.

IMPORTANCE OF PERFORMANCE MEASUREMENT

Over the past decade, many organisations have been alerted to the importance of measuring performance of their businesses. They understand that measurement can help them to realise their business potential for sustaining long-term competitiveness. The changing nature of work such as increasing competition, specific improvement initiatives, national and international quality awards, changing organisational roles, changing external demands and the power of information technology have driven organisations from all sectors to search for ways of monitoring and improving performance (Neely, 1999; Beatham, 2003; Robinson et al., 2005).

PM has been used to assess the success of organisations (Kennerley and Neely, 2003). It has also been used by a number of organisations with the intention to improve their performance in business management. PM is an additional way for identifying the strengths and weaknesses as well as opportunities and threats of organisations either in financial or non-financial aspects (Hoque, 2004). The main reason why organisations measure their performance is to identify their level of excellence in financial terms such as return on investment (ROI) or net earnings and non-financial such as leadership, customer satisfaction and policy compared to their competitors. The results gained from measuring performance in these two aspects will be used to create and develop strategies for the organisation in achieving its aims and objectives in business. It is used as well to attract future investment, increase share value and recruit high calibre employees (Kagioglou et al., 2001). PM is used as a business tool for formulating corporate strategy (Yu et al., 2007). Acceptance of PM in the strategy development process is a way to make sure that organisations take good consideration of all aspects when developing their objectives and goals (Luu et al., 2008). An organisation not only has to consider what it intends to achieve in the future but also to accept PM as a consideration for making its goals and objectives more realistic, achievable and accepted by everyone for a brighter business future.

BALANCED SCORECARD AND THE EXCELLENCE MODEL

These two instruments are amongst the established instruments using measures of an organisation's performance to drive organisational improvement. This is done by highlighting to management teams current shortfalls in performance. Both have been widely adopted in recent years (Shulver and Lawrie, 2007) as useful to business of any type, sector and public as well as private. They are broad ranging (EFQM, 2008), combining traditional financial measures such as profit margin, growth and cash flow with non-financial such as workers' performance, customer satisfaction and human resources (Latiffi et al., 2009). Both performance measures have their characteristics and advantages in making them widely used in industries.

The Balanced Scorecard (BSC), developed in 1992 by Professor Robert Kaplan from Harvard Business School and David Norton, President of Renaissance Solutions, is a tool that provides managers with richer and more relevant information about activities they are managing thus increasing the possibility of organisational objectives being achieved (BSC Institute, 2007). It uses specific Key Performance Indicators (KPIs) to assess organisations' performance. They must measure key strategic mechanisms for implementing and judging strategy for business (Beatham, 2003). BSC consists of four perspectives to be measured (Bassioni et al., 2004; Dalrymple and Bryar, 2006): financial, customer, internal and learning and growth.

The Excellence Model is based on practical experience of organisations across Europe (Pyke et al., 2001). It is a practical instrument to help organisations by measuring where they are on the path to excellence, helping them understand the gaps and then stimulating solutions (Beatham, 2003; BQF, 2001). This instrument is known as a primary model for assessing and improving organisations in order that they may achieve sustainable advantage and use it as well as a management system and associated growth in the key management discipline of organisational self-assessment (Marrewijk et al., 2004). It is structured following nine basic criteria, five at enablers level and four at results level and 32 sub-criteria detailing scope and application of the model (Pyke et al., 2001; Shulver and Lawrie, 2007). Enablers comprise leadership, policy and strategy, people, partnership and resources and processes. Results contain customer results, people results, society results and key performance results (Shulver and Lawrie, 2007; EFQM, 2008). The criteria have a prescribed weighting. Enablers concentrate on how the organisation is run and operated. Results concentrate on what is seen to be achieved, by all those who have an interest in the organisation and how achievement is measured and targeted (Pyke et al., 2001; Marrewijk et al., 2004). Table 1 shows information on strengths and weaknesses of the instruments.

Table 1: Strengths and Weaknesses of BSC and EFQM Excellence Model

ITEM	BSC	EFQM EXCELLENCE MODEL
Strengths	<ul style="list-style-type: none"> Provides manager with instrumentation needed to navigate to future competitive success (Kaplan and Norton, 1996) 	<ul style="list-style-type: none"> Helps define and assess continuous improvement of an organisation (Beatham, 2003; Shulver and Lawrie, 2007). Delivers total business improvement using a holistic approach (Beatham, 2003). Relationships between enablers and results criteria give strength to model.
Weaknesses	<ul style="list-style-type: none"> Useful only if applied correctly. Potential benefits depend on how it is to be used (BSC Institute, 2007). Number of potential mistakes when implementing BSC (Kagioglou et al., 2001): <ul style="list-style-type: none"> - Measuring wrong things even if measured in right way. - Assuming some un-measurable or people undertaking activities are too professional to measure (rather than measuring all necessary activities). - Yielding to conflict between managers along functional lines. 	<ul style="list-style-type: none"> Self-assessment process needs to be applied rigorously in order to be effective (Shulver and Lawrie, 2007). Self assessment does not improve organisation by itself – Subsequent improvement activity is needed. So there must be follow-up to get benefit (D&D, 2008).

DATA COLLECTION METHOD

To establish current PM practices, semi-structured interviews were conducted with twelve large construction organisations in the UK and Malaysia, six from each, involved in building and civil works as well as services such as infrastructure.

Interviews and Procedure

The interviews were a major part of data collection on current practices in PM in the UK and Malaysia. The purpose was to identify the differences in implementing PM for running businesses so as to understand the loop from PM and identify the needs of both countries. Considering this, the interviews had four objectives:

- To identify knowledge and understanding of PM in construction organisations.
- To assess current practices and effectiveness of PM in construction organisations.
- To identify PM tools and models used in the organisations.
- To identify the relationship between PM and strategy development.

The face-to-face interviews involved twelve managerial staff of different organisations. All selected interviewees have many years of experience with the construction industry. Ten had more than 10 years' direct experience in PM and another two had less than 10 years. They all are responsible for the development of PM in their organisations. They all are involved directly with arranging, managing, implementing and evaluating organisation performance.

The interviews consisted of questions developed for the purpose of gaining information mentioned above on the reasons for implementing PM, PM processes, tools and models used, relationship between strategy development and PM, and challenges to implementing PM and approaches to addressing them. Information obtained was then analysed, evaluated and presented using a content analysis approach.

INTERVIEW FINDINGS

The interviews provided an in-depth analysis of issues critical to the implementation of PM and the following is a summary of the key findings:

Knowledge and Understanding of PM

PM is being practised to improve business in the sense of making improvements in the process of projects and overall business organisation. All interviewees agreed that PM is an approach that can help to maximise profits and provide opportunity for organisations. PM leads to a positive approach in businesses by identifying potential areas to be improved by organisations and helps them in creating and developing strategies for organisations. It can assist in identifying their needs for strategy development and mitigating risks. More benefits they can obtain through implementing PM are creation of high productivity in work, more efficiency from employees in delivering their tasks and managing resources, as well as enhancing organisation reputation and market position.

PM Processes

Staff of a wide spectrum of responsibility are involved either directly or indirectly in the PM process. Employees play their role by supporting managerial staff in doing their tasks and delivering good work to the organisation. Managerial staff are responsible for assisting business and functional units' staff in their tasks and aligning these with the organisation's target. They decide on organisation targets needing to be achieved every year. Cooperation among them is necessary to ensure that the PM process can be implemented smoothly and run successfully.

Performance Criteria Measured

Financial and non-financial aspects have been measured in organisations. Four criteria: business performance, staff or workers, customers or clients and society have been used to measure the results of business performance. Some of the criteria were measured monthly and some yearly. All organisations mentioned that identification of criteria is based on organisation needs.

PM Tools and Models

All respondents agreed that PM tools and models are needed to measure performance. The tools and models used by all respondents are BSC, Excellence Model, Key Performance Indicators (KPIs) and ISO 9000/1, 14001 and 18001. Apart from that, some create their own instruments. The important criteria needing to be considered in choosing appropriate tools or models for PM are results anticipated and those must be best suited to the organisation's business. In addition to that are simplicity to use and the action to put in place the measurement element. The type is not important as long as they can measure things that need to be measured correctly. One UK respondent stressed that the most critical things are what action can be taken after measurement and delivering the right choice for the organisation to improve business. Another from the UK added that the use of PM tools and models is also influenced by clients. It is not about measurement but about what you do with the information and how to improve it. Other factors influencing selection of tools and models are clients' requirements and government requirements. This is happening in Malaysia as every construction organisation needs to implement ISO if it wants to get government projects. All respondents mentioned that nothing more needs to be changed in the tools and models they use at the moment. They stressed that they first need to determine what they have to establish

(stabilising what already has already been used and practised) rather than thinking about using different types of tools and models.

Relationship between PM and Strategy Development

The interviews revealed that there are direct relationships between PM and strategy development. The former influences the latter at all levels of the process. It involves everything from the planning stage or where their project should go to what the organisation needs to do in the implementation and evaluation stages. All agreed that PM is one of the key success indicators for organisations to achieve objectives or targets and strategy.

Challenges in Implementing PM

Based on the interviews, there are challenges in implementing PM. The challenges are as follows:

- Changing people's mindset about PM is the most challenging part in implementing PM. Some staff or workers are afraid of existence of feasibility in evaluation and assessment of their performance by their leader. The leader has a tendency to evaluate their performance and level their performance based on feelings and emotional or personal reasons.
- Some staff or workers think that by implementing PM in organisations, they have to work much harder than they should. Furthermore, staff try to justify the measurement (justify what we are) rather than understand how to achieve the target.
- For organisations new to PM, one of the challenges is to really understand in depth the PM process of the organisation and the way to make it easy to be implemented and followed by all staff or workers and aligned with the existing management practices in the organisation.
- Using numerous PM systems in an organisation can create difficulty for staff. It brought difficulty to one in the way of delivering information to the right person in the fastest way.
- Many staff or workers are unaware of what they have to measure and what they can get from what they measured. It is easy for managerial staff to come out with a list of criteria needing to be measured by the organisation. The managerial staff might not have any problem or difficulty to understand what needs to be measured but it can be a problem and difficult for staff at functional level, especially the new ones unfamiliar with PM.

Mistakes in measuring performance and fully understanding the criteria needing to be measured will bring unacceptable results for organisation performance.

STRATEGY APPROACH

Based on current studies in the two countries, levels of understanding in organisations are similar. They look at PM as an approach to improve businesses and understand what PM can do more for organisations, such as increase profits and identify risks for them. They can do this by measuring the organisation's performance in a certain period (depending on the organisation, some measure their performance every year, some every six months, etc.). Results of measurement can be used as references for organisations to develop strategies that can improve their businesses by earning more profits and sustaining them in the market. An action plan can be made for any risks and problems that can cause difficulty to organisations in achieving their businesses target.

Even though they tend to understand the use of PM, there are still organisations which need to be guided properly in the way that they think of PM. There is more that PM can do for an

organisation. It can be used to identify organisation capability level in terms of financial and non-financial aspects compared to their competitors. Apart from that, lack of understanding of roles and tasks of each member of staff, especially in the functional level in PM, have brought difficulties and have made the PM process become complicated.

The difficulties and challenges in implementation of PM lead to improving PM practices by developing a maturity model. There is a need to look at the maturity of PM practices on the way to improve them in organisations. It is clearly understand that there is a need for a structured approach to facilitate and benchmark implementation attempts.

PERFORMANCE MEASUREMENT MATURITY MODEL

A maturity model is proposed to help organisations to structure and organise the PM practices in their organisations and as an indicator of their maturity with respect to PM. It is a tool for organisations to benchmark their PM activities and to develop a PM strategy that would improve their activities. The model has been produced by taking the Capability Maturity Model (CMM) and STEPS as references. STEPS is an example of a model created and developed for the construction industry. Even though it was created for knowledge management (KM), its purpose is similar to that of the model created for this research. STEPS is there to provide a mechanism for organisations to benchmark their KM activities and to develop a KM strategy to improve them (Robinson et al., 2006). CMM is a good example of a maturity model (Harter et al., 2000). It was developed as a tool to improve software development processes. It can be used over and over by organisations and is known as a maturity model of an organisation's software process in industry. Most existing maturity models are based on CMM, one of the earliest complete maturity models (released in August 1991), well known in industries (Paulk et al., 1993).

The purpose of the model is to classify the maturity of an organisation's PM development in business process. It can be used to guide the effective PM process for creating and developing organisations' strategies and aid in improving organisational business in diverse areas by guiding the organisation into the appropriate way and towards being more methodical in implementing PM to get results for organisation improvement.

Concept

The concept of the maturity model is shown in Figure 1. The model is composed of five levels and moves upwards from Level 1 (lowest) to Level 5 (highest). Each level comprises several key aspects that need to be addressed. In Level 1, the lowest level of the model shows PM knowledge level and readiness of organisations for using PM in the organisation's management. The highest level in the model, Level 5, is where an organisation has awareness to extend PM to other business units and offices. Each level needs to be accessed to make sure that the model's purposes can be achieved. It is important to note that no level can be left out as the purposes of the model cannot then succeed. Each level contains different characteristics to achieve sustainability. Different organisations need different time scales to accomplish each level as every organisation has a different time of implementation of PM and different plans, strategies, aim and objectives they need to achieve.



Figure 1: Concept of Maturity Model

The model contains several key aspects under each level as follows:

- *Level 1: Awareness of PM.* This level focuses on identifying organisation awareness of PM. The organisation understands its direction in future business and tendency to achieve success with PM. At this level, the organisation identifies level of PM knowledge and preparation for using PM in the organisation's management.
- *Level 2: Develop PM strategy.* This level involves developing and creating convenient PM activities. Strengths, weaknesses, opportunities and threats of organisations in their business are justified for smooth PM processes.
- *Level 3: Implement PM.* This level requires managing PM in the organisation. At this level, all plans and strategies made for PM will be implemented. This level will involve systematic structure for monitoring and controlling PM process.
- *Level 4: Evaluate PM.* This level is characterised by assessing PM process, improving action of PM and the organisation's action on PM implementation.
- *Level 5: Expand PM.* At this level, awareness of PM is expand or extend to other business units and offices. This will be a way to increase the scale of PM processes.

As PM becomes institutionalised, sustainability of PM appears in each level and its cycle in the model. Sustainability level appears in each level after all five levels have been gone through by organisation.

CONCLUSIONS AND FURTHER WORK

This paper has demonstrated that PM is used as an important way of improving performance of organisations and to sustain business in the long-term as well as creating and developing strategies. It is not an individual's agenda but it is the responsibility of all staff and also organisation for the benefits of both parties. Current practices in PM revealed the same on this in two different geographic countries, The UK and Malaysia. Based on current practices in the two countries, there are differences that have been identified in implementing PM. These are duration in implementing PM and the tools and models used in measuring process. Organisations in the UK formally implemented PM much longer or earlier than organisations in Malaysia. They used different PM tools and models to measure performance in PM process. Apart from that, organisations created their own tools to fit with their need and suitability of their business. The advancement of PM in UK organisations can be adopted and learnt by other countries. As PM is becoming important to organisations in Malaysia in gaining opportunity to further business locally and globally, improvement should be made in

the level of awareness of PM as well. Lessons learnt from UK will help them in improving their PM processes and make it easy to understand and follow by staff in organisations. There is a need to identify the maturity of PM in Malaysian organisations as it shows and guide organisation to appropriate way in PM process. The maturity model shows organisation benchmarks in the PM implementing process that would improve organisations' PM activities. The development of the model could help organisations in running PM in a more well-organised and systematic way. After model development, a migration path will be developed. The purpose of developing a migration path for this research is to explore how organisations move from a current level to another level in improving businesses with PM.

REFERENCES

- Balanced Scorecard (BSC) Institute (2007) *BSC Resources*, (available online <http://www.balancedscorecard.org/BSCResources/AbouttheBalancedScorecard/tabid/55/Default.aspx> [accessed 17/09/2008]).
- Bassioni, H.A., Price, A.D.F and Hassan T.M. (2004) "Performance Measurement in Construction." *The Journal of Management in Engineering*, 20: 42-50.
- Beatham, S. (2003) *Development of an Integrated Business Improvement System for Construction*, EngD Thesis, Loughborough University, Loughborough, UK.
- British Quality Foundation (BQF) (2001) *Excellence Model*, (available online http://www.quality-foundation.co.uk/ex_description.htm [accessed 18/12/2007]).
- Dalrymple, J.F. and Bryar, P. (2006) "SME Construction Industry Subcontractors Performance Measurement and Improvement", *Proceedings of the 20th ANZAM (Australian New Zealand Academy of Management) Conference on Management: Pragmatism, Philosophy, Priorities*, Central Queensland University, Rochampton, Australia.
- D&D Excellence (2008) *About Excellence*, (available online <http://www.ddexcellence.com/About%20Excellence/About%20Excellence%20Overview.htm> [accessed 17/07/2009]).
- EFQM (2008) *The EFQM Excellence Model*, (available online <http://ww1.efqm.org/en/Home/aboutEFQM/Ourmodels/TheEFQMExcellenceModel/tabid/170/Default.aspx> [accessed 14/07/2009]).
- Harter, D.E., Krishnan, M.S. and Slaughter, S.A. (2000) "Effects of Process Maturity on Quality, Cycle Time and Effort in Software Product Development." *Management Science*, 46(4): 451-466.
- Hoque, Z. (2004) "A Contingency Model of the Association Between Strategy, Environmental Uncertainty and Performance Measurement: Impact on Organizational Performance." *International Business Review*, 13: 485-502.
- Kagioglou, M., Cooper, R. and Aouad, G. (2001) "Performance Measurement in Construction: A Conceptual Framework." *The Journal of Construction Management and Economics*, 19: 85-95.
- Kaplan, R.S. and Norton, D.P. (1996) "Using the Balanced Scorecard as Strategic Management System." *Harvard Business Review*: January-February, 1-12.
- Kennerly, M. and Neely, A. (2003) "Measuring Performance in a Changing Business Environment." *International Journal of Operations & Production Management*, 23(2): 213-229.
- Latiffi, A.A., Carrillo, P.M., Ruikar, K. and Anumba, C.J. (2009) "The Need for Performance Measurement in Construction Strategy Development: A Current Scenario", *Proceedings of the 25th Annual ARCOM Conference*, 7-9 September 2009, Nottingham, UK.
- Luu, T.V., Kim, S-Y., Cao, H-L. and Park, Y-M. (2008) "Performance Measurement of Construction Firms in Developing Countries." *The Journal of Construction Management and Economics*, 26(4): 373-386.

- Marrewijk, V.M., Wuisman, I., Cleyn, W.D., Timmers, J., Panapanaan, V. And Linnanen, L. (2004) "A Phase-wise Development Approach to Business Excellence: Towards an Innovative, Stakeholder-oriented Assessment Tool for Organizational Excellence and CSR." *The Journal of Business Ethics*, 55: 83-98.
- Neely, A. (1999) "The Performance Measurement Revolution: Why Now and What Next?." *International Journal of Operations & Production Management*, 19(2): 205-228.
- Paulk, M.C., Weber, C.V., Garcia, S.M., Chrissis, M.B. and Bush, M. (1993) *Key Practices of the Capability Maturity Model, Version 1.1*, Software Engineering Institute (SEI), Carnegie Mellon University, Pennsylvania.
- Pyke, C.J., Gardner, D., Wilson, J., Hopkins, P. and Jones, S. (2001) "Achieving Best Value Through the EFQM Excellence model." *The Journal of Finance and Management in Public Services*, 1: Summer 2001.
- Robinson, H.S., Carrillo, P.M., Anumba, C.J. and Al-Ghassani, A.M. (2005) "Review and Implementation of Performance Management Models in Construction Engineering Organizations." *The Journal of Construction Innovation*, 5(4): 203.
- Robinson, H.S., Anumba, C.J., Carrillo, P.M. and Al-Ghassani, A.M. (2006) "STEPS: A Knowledge Management Maturity Roadmap for Corporate Sustainability." *Business Process Management Journal*, 12(6): 793-808.
- Shulver, M. and Lawrie, G. (2007) "The Balanced Scorecard and The Business Excellence Model", *Proceedings of the European Institute for Advanced Studies in Management, 8th Manufacturing Accounting Research Conference*, 18-20 June 2007, University of Trento, Italy.
- Theeranuphattana, A. and Tang, J. (2008) "A Conceptual Model of Performance Measurement for Supply Chains – Alternate Considerations." *The Journal of Manufacturing Technology Management*, 19(1): 125-148.
- Yu, I., Kim, K., Jung, Y. and Chin, S. (2007) "Comparable Performance Measurement System for Construction Companies." *The Journal of Management in Engineering*, 23(3): 131-139.

APPENDIX E - 3

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Current Performance Measurement Practices – Studies in the United Kingdom (UK) and Malaysia

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Abstract

All types of construction businesses are aware of the importance of performance measurement (PM). It is becoming increasingly difficult to ignore it, as it is an important way of improving and sustaining businesses in the long-term as well as creating and developing strategies for organisations. This paper focuses on the implementation of PM by construction sector organisations. It explores current practices of PM in construction organisations of two different countries, the UK and Malaysia. Aspects such as PM processes, tools and models used and the relationship between PM and strategy development are explored. Also, the challenges and improvements in PM are investigated. The main investigation consists of a literature review and interviews with selected organisations in these countries. Interviews involved twelve large construction organisations in order to seek their views on how organisations approach and conduct PM within their establishments. They revealed that PM is being practised in organisations either directly or indirectly to help improve business and profits. The appropriate use of tools and models to measure performance simplifies the PM process. Furthermore, aspects such as financial and non-financial, for example staff or workers' performance, client satisfaction and social, are evaluated and measured. The interviews also revealed that PM has a direct relationship with strategy development. However, the PM practices in organisations remain a challenge. Staff or workers, especially the new ones, faced difficulty to understand the PM process, and where the appropriate data for measuring performance can be sourced. Improvement should be made in the level of awareness of this PM and in the PM process itself and there are several approaches to addressing barriers and challenges in implementing PM. The results from these interviews and the critical analysis of the literature review will enable solutions to be devised for the effective use of PM from a strategic perspective.

Keywords: Construction Organisations, Current Practices, Performance Measurement, Strategy Development.

Background

The aim of this paper is to investigate the current practices in performance measurement (PM) by construction organisations in two countries with a view to understanding the implementation of PM within organisations and its purpose in helping to improve organisations' business in those countries. Many organisations have been alerted to the importance of measuring performance of their business because of their understanding that measurement can help to realise business potential for sustaining long-term competitiveness. The changing nature of work such as increasing competition, specific improvement initiatives, national and international quality awards, changing organisational roles, changing external demands and the power of information technology have driven organisations from all sectors to search for ways of monitoring and improving performance (Beatham, 2003; Robinson et al., 2005). PM is an approach to identifying the current situation of organisations and gives directions to them in making plans for future organisation movement in markets. PM is therefore on the management agenda (Neely et al., 2002). It is used in aligning with business management and is needed in developing organisations' strategies. Yet although formulating strategies for long-term business to compete in markets is fundamental to the strategic management process, only a few construction organisations have adopted formal processes for such formulation (Price, 2003).

Success in implementing PM that can be used as an approach to improve business performance is dependent on cooperation among all staff or workers in an organisation and a management style related to a firm-specific strategy and information systems (Hoque, 2004). How to measure and what needs to be measured depends on what is the organisation aim and what it needs to achieve. It is important for organisations to measure the right elements of their organisation as this will guide it to its success in business. *'To achieve sustainable business success in the demanding world market place, a company must use relevant performance measures'* (Neely et al., 2002). Therefore, an organisation has to be aware of all sources and data that might be used to measure its overall performance.

Economics keep changing, therefore organisations keep changing their aim and strategies for sustainability in business and seize new opportunities in order to sustain themselves and stay in the markets. Competition will never end and each organisation must take whatever opportunities to achieve success in their business.

Performance measurement and its use to organisations

Performance measurement (PM) is a process that identifies efficiency and effectiveness by undergoing a critical evaluation of all aspects of management such as leadership, planning, human resources, finance and workers. By the end of the process, it will help managerial staff to formulate effective strategies that help towards achieving organisations' objectives and goals (Ahmad-Latiffi et al., 2009). Organisations measure their performance because they want to identify their level of excellence in financial and non-financial aspects such as leadership, customer satisfaction and policy compared to their competitors. The results obtained will be used to create and develop further strategies for the organisation.

PM is used for many reasons. It is used as a business tool for formulating corporate strategy (Yu et al., 2007). Acceptance of PM in the strategy development process is a way to make sure that organisations take good consideration of all aspects when developing their objectives and goals (Luu

et al., 2008). An organisation has not only to consider what it intends to achieve in the future but also to accept PM as a consideration for making its goals and objectives more realistic, achievable and accepted by everyone for a brighter business future. An organisation has to accept that the strategy needing to be developed must also involve assessment and evaluation. This is to ensure that the strategy created is suitable and achievable by the organisation within a certain period. A strategy that will be created and developed must be reflected by the organisation in its current performance and align with the current economic situation.

Apart from that, the implementation of PM by organisations can attract future investment to retain and attract more customers and to remain competitive and innovative in order to increase profit and share prices (Kagioglou et al., 2001; Robinson et al., 2005). With PM, organisations can improve their business in all aspects, financial and non-financial, such as leadership, profit margins and policy goals. It is clear that PM is primarily to manage the outcome and to reduce or eliminate an overall variation in the work product or process. The goal is to arrive at actions affecting product or process.

Performance measurement implementation in UK and Malaysia

Performance measurement (PM) is being practised by most large organisations in the construction industry. The UK Government initiated the Latham Report in 1994 and the Egan Report in 1998, which recommended improving business performance of the construction industry. Since then, many organisations in the UK have been aware on PM needs for their businesses (Khalfan et al., 2001; Ahmad-Latiffi et al., 2009).

In Malaysia, PM is not a new thing for all industries, including construction. The concept has grown since the former prime minister, the fourth, Tun Dr Mahathir Mohammed announced the aim to declare Malaysia a developed country in the year 2020. Many organisations from various sectors of industry have since been aware of PM as they believe it can bring organisations to an international level (involved with international projects, enlarged businesses and growth in markets) just to align with the vision of 2020. Even though industries are aware of it, there is no proper standard or guidance for industry for its implementation as one of the approaches in organisation management. For that reason, many organisations do not consider measuring performance to improve businesses and mitigate risks. As globalisation is a dream of success for all types of organisations including construction, PM is implemented by those which know the benefits to be gained. From time to time, many construction organisations have implemented and are implementing PM as an additional way of improving and sustaining business in the long-term. With the introduction of the Construction Industry Master Plan (CIMP) 2006 - 2015 by the Construction Industry Development Board (CIDB) as an initiative to improve performance of the construction industry, PM will be an approach to achieve the ten year target of the industry. CIMP has been developed with the intention to rectify the weaknesses and to improve the industry's performance as well as its image (Sundaraj, 2007).

Research methods

A literature review of the PM concept has included definitions of PM, criteria, tools and models as well as the importance of PM and its connection with strategy development. Besides an in-depth review of theoretical literature on PM, semi-structured interviews have provided information on current practices of PM. The interviews were with twelve large construction organisations in the UK and Malaysia, six from each, involved in building and civil works and services. The semi-structured

interviews, which consisted mainly of open-ended questions based on topics needing to be covered, as suggested by Fellows and Liu (2008), gave an opportunity to explore answers more widely and expand on specific areas (Barbour, 2008).

Interviews and Procedure

Interviews were a major part of data collection to gain data on current practices in the two countries. The purpose was to identify the differences in implementing PM for running businesses so as to identify the needs of both countries in using PM as an approach to management of organisations' businesses. The interviews had four objectives:

- To identify knowledge and understanding of PM in construction organisations.
- To assess current practices and effectiveness of PM in construction organisations.
- To identify PM tools and models used in organisations.
- To identify the relationship between PM and strategy development.

Pilot interviews took place before the main interviews to examine whether or not the interview questions were well developed and suitable to obtain data for the study.

The face-to-face interviews used a set of questions developed from extant literature. Topics covered included reasons for implementing PM, measurement processes, tools and models used and relationship between strategy development and PM, challenges to implementing PM and approaches to addressing the challenges. Information obtained was then analysed, evaluated and presented using content analysis.

The semi-structured interviews involved twelve managerial staff of different organisations, all of whom have many years of experience with the industry and are responsible for the development of PM in their organisations. They all are directly concerned with arranging, managing, implementing and evaluating organisation performance. A brief summary of respondents' backgrounds is given in Table 1.

Table 1: Respondents' backgrounds

No.	Organisation	Business Type	Role	Experience in PM
UK				
1	U1	Building and Civil	Process Improvement Manager	10 years
2	U2	Building and Civil	Head of Business Excellence	26 years
3	U3	Building	Performance Improvement Director	22 years
4	U4	Infrastructure Services	Business Improvement Director	2 years
5	U5	Building	Business Improvement Manager	7 years
6	U6	Building	Director of Strategy Development	25 years
Malaysia				
7	M1	Building, Civil and Infrastructure	Technical Director	More than 10 years
8	M2	Building and Civil	Executive Director	11 years
9	M3	Building, Civil and Services	Senior Manager	14 years
10	M4	Trading services	Chief Executive Officer (CEO)	12 years
11	M5	Building and Civil	Chief Executive Officer (CEO)	20 years
12	M6	Mechanical and Electrical Services	Managing Director	28 years

Results and Discussion

The analysis of all the interview data is presented in this section which discusses the results in detail under the following seven headings.

Knowledge and understanding of performance measurement in organisations

Generally, all respondents shared a similar understanding that PM was to 'improve business' and 'maximise profits'. Improve business was in the sense of making improvement in the process of projects and overall business organisation. Furthermore, some respondents believe that performance measurement is an approach to maximise opportunity for organisations and mitigate risk. All respondents agreed that PM has benefits rather than negative impacts for an organisation. The benefits gained from PM as identified by the respondents are as follows:

- Identifying potential areas to be improved by organisations.
- Improving productivity in work.
- Assisting in managing projects, knowing what can help to deliver projects (what gets measured, gets done).
- Managing resources.

- Enhancing organisation reputation and market position.
- Improving employers' efficiency in delivering their tasks.
- High passion of staff in commitment to their organisations.

It was stated that,

'It allows us to manage our resources...it allows you to make quality decision-based'.

Apart from that, PM helps them in the process of creating and developing strategies for their organisations.

It was stated that,

'It does not really matter how you measure it. It is about knowing where you are and where you want to be and put them in the action plan'.

This quotation illustrates that PM can assist in identifying organisation needs for strategy development.

From the interviews, Malaysia is lagging behind in comparison to the UK in implementing PM, even though awareness of the importance of implementing PM for businesses emerged eight years ago. This is happening because there is no enforcement of implementation from government. Besides, most organisations at one time were used to playing safe by not focusing on global business and rather sticking to extending business in local markets. At the moment, PM has not appeared critically in organisation management but, from time to time, economics keep changing and lots of organisations focus on embracing success and expanding business in the global market, PM is becoming important and needs to be implemented to identify what should be improved by the organisation and what its position is in business. Even though there are differences in length of respondents' direct involvement with the PM process and also in position (see Table 1), these are not shown in their interpretation of PM. Ten had more than 10 years' direct PM experience and the other two had less.

Performance measurement processes

The interviews revealed that staff with a wide spectrum of responsibility are involved either directly or indirectly in the PM process. Generally, employees play a vital role by supporting managerial staff in doing their tasks and playing their roles to create efficient and effective ways of management. Managerial staff are responsible for assisting business and functional units' staff in doing their tasks and aligning these with the organisation's target.

The managerial staff decide organisation targets needing to be achieved every year and every individual has his or her own objectives and targets to achieve those of the organisation. The main objectives come from the main board and are cascaded to everybody in-group. The individual objectives and targets need to be aligned with organisation needs and senior managers will monitor them to ensure they are suitable to be used and practised to achieve those of the organisation. Any individual objectives and targets not meeting the organisation's targets or maybe clashing with them will be reset.

Performance criteria measured

In discussion of performance criteria measured, there is not much difference in choosing the appropriate ones. All aspects, both financial and non-financial have been measured by organisations in improving areas needing to be improved in their organisations. One respondent mentioned that the serious intention to measure non-financial aspects started ten years ago. Until then, the financial aspect was the only necessary criterion measured by any organisation.

It was stated that,

'If we went back more than ten years, there was very little measurement of anything other than financial performance'.

This illustrates that the financial aspect is the long standing one to be measured by industry. Nowadays, it has been changed to align with the changes in the economy, trends and needs in the industry. People are interested not only in the financial aspects but also non-financial aspects.

There are many criteria used by respondents to measure the results of business performance. All used four main criteria: business performance, staff or workers, customer or client and society feedback. Business performance means profit margins, turnover and organisation budget. Staff or workers are measured by looking at their performance in doing their tasks and playing their roles for achieving the organisation's target and aim in business. Customer or client satisfaction is measured to gain information on their level of satisfaction with services delivered as well as product. Society feedback means information gained from the public by understanding the needs of organisation related to local people, environment, economy and social impact on others. All these criteria have been measured with PM tools and models suitable for the organisation's need.

Even though there were quite a number of similarities in the performance criteria, there were still differences in measuring organisation performance. Some of the criteria were measured monthly and some yearly. All organisations mentioned that identification of criteria is based on organisation needs. No matter what criteria have been and are being used, the overall target of all respondents is to make a profit in their businesses.

Performance measurement tools and models

All respondents agreed that PM tools and models are needed to measure performance. The type is not important as long as they can measure things that need to be measured correctly. It also depends on what organisations need to see in the results of PM. One UK respondent stressed that the most critical things are what action can be taken after measurement and delivering the right choice for the organisation to improve business. Another from the UK added that the use of PM tools and models is also influenced by clients.

All respondents also justified that the appropriate tools and models to measure performance must be best suited to the organisation's business, the simplicity of the tools and models and the action to put in place for the measurement element. It is not about measurement but about what you do with the information and how to improve it. Table 2 shows the PM tools and models used by each respondent.

'In terms of what tools and models we want to use, I guess it will be looking at what is out there, what benefit different things give us and then how they fit with what works for us and how easy they are'.

Table 2: PM tools and models used by respondents

Types O	KPIs	BSC	BUSINESS EXCELLENCE	MANAGEMENT OF QUALITY SYSTEM			OTHERS (OWN CREATION)
				ISO 9000/1	ISO 14001	ISO 18001	
U1		√					√
U2			√	√	√	√	√
U3	√						√
U4		√	√				
U5	√						√
U6	√						
M1				√			
M2	√			√	√	√	
M3	√	√		√			
M4	√						√
M5	√			√			
M6	√			√			

* O = Organisations

* KPIs = Key Performance Indicators

UK respondents use a wider variety of tools compared to Malaysia. None of the Malaysia respondents uses the Excellence Model. However, one respondent had heard about the Excellence Model. All respondents mentioned that the board of directors made the decision on what type of tools and models will be used to measure performance of their organisations. Other factors influencing the selection of tools and models are clients' requirements and government requirements. In Malaysia, the Standards of the International Organisation for Standardisation, widely known as ISO, need to be implemented by construction organisations if they want to tender for projects, especially government ones. The ISO 9000/1 is a necessity to be implemented by those who want to get projects, especially government ones.

It was stated that,

'We have no choice, government requirement. If you do not have the ISO, you cannot tender for government project'.

One respondent stressed that, recently, ISO is a prerequisite announced by CIDB that every construction organisation must get ISO 9000/1 certification to qualify for construction projects. For the respondent, ISO is not new as his organisation has used it for seven years. Two more respondents have used it for nearly ten years. The ISO is used to ensure things are done in sequence. All respondents, in any case, mentioned that they were considering use of any PM tool or model to measure performance even though it has not been made compulsory by the government or any other

bodies in the country. They believe that if they want to grow, they have to measure performance of organisations and the right and appropriate tools and models can help them.

When all respondents were asked whether they have a plan to change the tools and models they use, all answered that nothing more needs to be changed. They stressed that they need to determine what they have to establish first rather than thinking about using different types of tools and models.

Relationship between performance measurement and strategy development

All respondents held shared views about the relationship between PM and strategy development. Eleven believe that there is a direct relationship between PM and strategy development. They all had similar thoughts that PM influences strategy development at all levels of the process. It involves everything from the planning stage or where their project should go and what the organisation needs to do in the implementation and evaluation stages.

Organisations need to measure their performance based on the specific criteria or areas for getting the results for improvement (if needed) and identify what will be the next target to be achieved for the following year and beyond. PM is involved at the implementation stage and evaluation of projects every month. All respondents were aware that an organisation's strategy needs to be revised annually, even though some have made long-term strategic plans for more than three years. One respondent expressed the belief that PM does not have any relationship with strategy development but understood that it is needed for getting information on what needs to be improved by the organisation. Even though all respondents have different points of views on the relationship between these two, all agreed that PM is one of the key success indicators for organisations to achieve objectives or targets and strategy.

Challenges to implementing performance measurement

The interviews revealed that there are barriers and challenges to implementing PM. All respondents agreed that implementing PM is not as easy as other people think. The most challenging part is changing people's mindset about it. Many employees think that by implementing PM in organisations, they have to work much harder than they should. Workers try to justify the measurement rather than understand how to achieve the target. It was stated that,

'The perception about this is because of lack of understanding and thinking it is more complicated than it should be'.

Employees are seeing PM as a criticism of them, as everything will be revealed and measured, including individual performance in conducting their tasks and responsibilities. If they are interested in doing the work, they are willing to do it without any pressure. If not, they will not perform in their work. One respondent explained that employees' lack of awareness of PM is a real problem in measuring performance. Employees tend not to look at PM as a part of their responsibility to which they must give full commitment. For organisations new to PM, one of the challenges is to really understand in depth the PM process of the organisation and the way to make it easy to be implemented and followed by all staff or workers and align with the existing management practices in the organisation.

Another challenge is using numerous PM systems in an organisation. It can create difficulty for staff. One respondent from the UK mentioned that her difficulty was in the way of delivering information to the right person in the fastest way. Not all the systems can be accessed and used by all staff. An accounting system can be accessed and read only by staff working in that area and involved with accounting activity. Not all departments can easily or maybe cannot get access to the system. Even though it gives benefit to the person needing the system, it does not for several staff who have to get all data and information every time from other staff.

Based on the experience of three respondents from Malaysia, unclear performance measure is one of the main challenges to its implementation. Many employees are unaware about what they have to measure and what they can get from what they measure. It is easy for managerial staff to come up with the list of criteria needing to be measured by the organisation. The managerial staff might not have any problem or difficulty to understand what needs to be measured but it can be a problem and difficult for functional level staff, especially new ones not familiar with PM. Making mistakes in measuring performance and fully understanding the criteria needing to be measured will reflect different points of view on the relationship between these two, but all agreed that PM is one of the key success indicators for organisations to achieve objectives or targets and strategy.

Approaches to addressing challenges

There were several approaches to addressing barriers and challenges in implementing PM. The approaches are as follows:

- Firstly, giving early understanding to all staff or workers in organisations of what PM is. Everybody works to achieve targets for organisations. It is not an individual's agenda but it is the responsibility of all staff and also the organisation for the benefits of both parties.
- Improvement should be made in the level of awareness of this PM. Two respondents mentioned that mostly lower level staff are not aware of it. The best way to make them understand performances and quality is by giving them training that will benefit them in their career and also benefit the organisation.
- A suggestion has been made by one respondent to improve the storage and delivery of information in an organisation. All information gathered from all departments or units can be put in one system. Creating a 'central system' or 'warehousing facility' can be a good idea for storage of information gathered. Doing so will make it easy to be accessed by all staff or workers in the organisation. Details of the data can also be referred to by the staff or workers (if needed for their roles and tasks). Telephone use can be avoided if such a system exists.

All respondents in Malaysia said that they need to be given more time to use PM and become familiar with it for the benefit of the organisation. They are still in the PM learning process even though all of them had more than ten years' experience of it.

Conclusions and further work

Performance measurement (PM) is being practised by organisations because it is an important way of improving and sustaining business in the long-term. Selection of the appropriate and necessary criteria

to be measured brings massive impact to an organisation in achieving its aims, objectives and strategy for gaining success in the future. Studies of PM in two countries revealed both similarities and differences in implementing PM. The similarities are that PM has been practised and implemented by large organisations to improve business and increase profit margins for the organisation. More benefits are gained from implementing PM. Aspects such as financial and non-financial are evaluated and measured for creating strategy. The appropriate use of tools and models to measure performance are needed to complete the PM process. Besides the similarities, differences between these two countries in implementing PM are the duration of implementing PM and tools and models used to measure performance. Malaysia organisations do not use the Excellence Model and ISO 9000/1 is a prerequisite to qualify them for construction projects especially government projects. Apart from that, difficulty to understand PM process by functional level staff or workers as well as staff new to PM is another difference between both countries.

PM has been more advanced in implementation in organisations in the UK. It can be concluded that UK is more mature in PM than Malaysia as the duration of implementation is more advanced compared Malaysia. The PM practices in the UK can be adopted by another country and lessons learnt from the UK will help in improving the PM process in organisations in Malaysia. There is a need to understand the maturity level of the PM process in Malaysia and for a maturity model to help organisations to structure and organise the PM practices. The maturity model will be the next work for this research.

References

Ahmad-Latiffi A, Carrillo P, Ruikar K and Anumba C.J (2009) "The Need for Performance Measurement in Construction Strategy Development: A Current Scenario", *Proceedings of the 25th Annual ARCOM Conference*, 7-9 September 2009, Nottingham, UK.

Barbour R.S (2008) *Introduction Qualitative Research: A Student's Guide to the Craft of Doing Qualitative Research*, Sage Publications, UK.

Beatham S (2003) *Development of an Integrated Business Improvement System for Construction*, EngD Thesis, Loughborough University, Loughborough, UK.

Fellows R and Liu A (2008) *Research Methods for Construction*, Blackwell Publishing Ltd., UK.

Hoque Z (2004) "A Contingency Model of the Association Between Strategy, Environmental Uncertainty and Performance Measurement: Impact on Organizational Performance." *International Business Review*, **13**: 485-502.

Kagioglou M, Cooper R and Aouad G (2001) "Performance Measurement in Construction: A Conceptual Framework." *The Journal of Construction Management and Economics*, **19**: 85-95.

Khalfan M.M.A (2001) *Benchmarking and Readiness Assessment for Concurrent Engineering in Construction (BEACON)*, Loughborough University, Loughborough, UK.

Luu T.V, Kim S-Y, Cao H-L and Park Y-M (2008) "Performance Measurement of Construction Firms in Developing Countries." *The Journal of Construction Management and Economics*, **26(4)**: 373-386.

Neely A, Bourne M, Mills J, Platts K and Richards H (2002) *Strategy and Performance – Getting the Measure of Your Business*, Cambridge University Press, UK.

Price A.D.F (2003) "The Strategy Process Within Large Construction Organisations." *The Journal of Engineering, Construction and Architectural Management*, **10(4)**: 283-296.

Robinson H.S, Carrillo P.M, Anumba C.J and Al-Ghassani A.M (2005) "Review and Implementation of Performance Management Models in Construction Engineering Organizations." *The Journal of Construction Innovation*, **5(4)**: 203.

Sundaraj G (2007) *The Way Forward: Construction Industry Master Plan 2006 - 2015*, Malaysia, Master Builders.

Yu I, Kim K, Jung Y and Chin S (2007) "Comparable Performance Measurement System for Construction Companies." *The Journal of Management in Engineering*, **23(3)**: 131-139.