

**ADEQUACY OF PROJECT BASED FINANCIAL MANAGEMENT
SYSTEMS OF SMALL AND MEDIUM CONSTRUCTION
ENTERPRISES IN BOTSWANA**

By

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STATEMENT OF ORIGINALITY AND ACKNOWLEDGEMENT OF SOURCES

I declare that this thesis titled '**Adequacy of Project Based Financial Management Systems of Small and Medium Construction Enterprises in Botswana**' is my own work and that all sources of information that I have used or quoted have been indicated and acknowledged by means of a complete reference list.

J K Ssegawa

3rd October, 2008

GLOSSARY OF ABBREVIATIONS

APM	Association of project managers
BHC	Botswana Housing Corporation
BOCCIM	Botswana Confederation of Commerce Industry and Manpower
BoK	Body of knowledge
CSO	Central Statistics Organisation
D&B	Design & Build
DBES	Department of Building and Engineering Services
DR	Department of Roads
EVM	Earned value management
FMS	Financial management system
GAAP	Generally agreed accounting principles
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
ICT	Information and communication Technologies
ILO	International Labour Organisation
MCR	Motorist-car-road
NDP	National Development Plan
PBFMS	Project based financial management system
PEE	Proprietor-Enterprise-environment
PEST	Political, economic, social and technological (factors)
PMI	Project management institute
PPADB	Public procurement and asset Disposal board
QS	Quantity surveyor
ROI	Return on investment
SADC	Southern African Development Council
SMCE	Small and Medium Construction Enterprise
SMEs	Small and Medium Enterprises
SMMEs	Small, Medium and Micro Enterprises
SWOT	Strength, weaknesses, opportunities and threats
TPS	Traditional procurement system
UNDP	United Nations Development Programme
WBS	Work breakdown structure

THESIS SUMMARY

The thesis documents findings of a study conducted to develop a project based financial management system (PBFMS) whose *role* was viewed as a contributor to the successful delivery of projects leading to improved financial performance of small and medium construction enterprise (SMCEs). In particular, the PBFMS was viewed as a facilitator (*function*) for the efficient and effective conduction of the strategic management, project planning and control processes. Thus an adequate PBFMS was seen as one which, facilitates the efficient and effective delivery of projects with a view to provide enhanced enterprise performance. In pursuit of this aim, theory and practices relating to the development, operation and use of a PBFMS were investigated and analysed from both literature and field work leading to findings being reported in the thesis. In addition, the actual financial management systems of SMCEs were investigated to determine the extent to which their attributes match those of the proposed PBFMS model.

The motivation for embarking on the study was brought about by three aspects observed in Botswana. Firstly, was the frequently documented poor delivery of projects, that is, for a sustained period of time, projects were being delivered beyond stipulated times, above agreed cost, and below specified quality. In some worst scenarios, projects were being abandoned at various stages execution but before completion. Secondly, the investigation was also prompted by the frequent financial failures of enterprises that were being recorded in the construction industry. Thirdly, the conduct of the proprietors of the construction enterprises was also frequently circumspect, particularly in matters relating to financial management.

Thus in pursuing the study, a number of premises were made. Firstly, the financial management systems of the SMCEs were considered inadequate to fulfil their functions, that is, they were incapable of facilitating the strategic management, project planning and control process. It was also speculated that management of SMCEs were not committed to the PBFMS i.e. they did not participate, get involved and did not comply with the policies regarding the planning, developing, and operation of financial management systems. As a result, PBFMS were unable to play their role of facilitating to the successful delivery of projects for improved contribution to the financial performance of SMCEs. The second

premise was that financial models available are either too generic to guide SMCEs in financial management matters or the strategic component is not linked to the operational plans to execute the strategy. For those which are meant for construction enterprises, they normally prescribe practices for project planning and control without including the strategic element and vice versa. In essence there is a gap in each of the models available for use by the SMCEs. It is the closing of this perceived gap in knowledge that the results of the thesis contribute in finding a solution to the mentioned problem. Thus the study aimed at answering two research questions: (i) *Do SMCEs have adequate PBFMS that facilitate the effective delivery of projects for enhanced financial performance?* and (ii) *Is there a relationship between the adequacy PBFMS and poor performance of SMCEs?* To facilitate the answering of these two question two hypothesis were formulated namely: **H₀₁**: *The PBFMS of SMCEs are adequate to facilitate the delivery of projects;* and **H₀₂**: *The adequacy of the PBFMS is positively correlated with the performance of SMCEs.* To test the two questions a research process was planned and executed in several steps.

Firstly, a survey strategy using the questionnaire was selected as the most appropriate method to provide a snap shot of the existence of attributes of PBFMS and to investigate associated practices relating to their development and operation. The method was considered more appropriate and effective in gathering large data in a short space of time in line with the doctoral time framework. Construction enterprises registered with Public Procurement and Asset Disposal Board (PPADB) for building and civil work in classes A, B, C and D were surveyed. The internal quantity surveyor, estimator or accountant were requested to respond on matters relating PBFMS on behalf of the SMCEs. The sampling frame from which the SMCEs considered for study were obtained from the two government departments which work closely with PPADB, the Department of Building and Engineering Services (DBES) and Department of Roads (DR). The sample sizes for each group category (small and medium) were determined using Krajcic and Morgan (1970) table. Stratified and systematic random sampling was used to select the identity of the members to form a sample fro study from the sampling frame. The second step was to design the questionnaire to probe the three aspects identified as constituting the PBFMS namely the strategic management; project planning and control; and management commitment. Essentially the questionnaire sought to investigate the

knowledge, tools, techniques, practices, opinions and attitudes of those who design, develop, operate and use the PBFMS in the SMCEs. To ensure a high quality design, the questionnaire was given to experts in the subject area to provide some comments on its suitability and was also piloted on four enterprises. Data collected was analysed using mainly the SPSS software and involved application of various statistical techniques including cross-tabs, ratio analysis, t-tests and correlational tests.

A total of 101 completed questionnaires were received, made up of 55% and 46% small and medium enterprises, respectively. The demographic profile of SMCEs confirmed some of the expected results, for example, majority (59%) of the respondents were owner/managers confirming the dominance of the owner in SMCEs. Majority of SMCEs (59%) were more than 9 years old, with medium enterprises being more mature (60% older than 9 years) than the small sized enterprises (49% older than 9 years). Majority (56%) of SMCEs had 10 or more employees, with medium sized enterprises having more employees (75% with 10 or more) than the small sized enterprises (42% with 10 or more). SMCEs performed more of building work alone (48%) than both building and civil work (48%) or maintenance (11%) and no enterprise performed civil work (0%) alone. Majority of SMCEs (65%) acted as main contractors as opposed to sub-contractors, though as expected sub-contracting was seen more in small (20%) than medium (10%) enterprises. Lastly, the public sector (central and local authorities) provided majority (65%) of the SMCEs jobs. However, if parastatals which are wholly owned by government were added, the public sector job market adds up to 73% (65%+8%).

The testing of the major two major hypothesis resulted in the following conclusion. **The results indicated that the first hypothesis was supported, that is, in a majority of SMCEs operating in Botswana the PBFMS were found to be adequate in facilitating the delivery of projects.** The results were therefore not in agreement with the basic premise made at the commencement of the study. In view of the finding, it suggests that SMCEs in Botswana have adequate systems that support the efficient and effective project planning and control. Secondly, management is committed to the ‘welfare’ of the PBFMS in terms of complying and supporting their development and operation. However, like any human endeavour, there

are weaknesses in the PBFMS, for example, they were found inadequate in facilitating the strategic management process, including lack of linking the process to the operational process in order to execute the strategy. They were also found weak in one of the most crucial process of project management; that of project control.

The second major investigation showed a weak link between the adequacy of a PBFMS and performance. Secondly, the results also indicated that the SMCEs which had adequate PBFMS performed better than their counterparts. The first results were not surprising since the cause of poor performance were shown as three pillars (business environment, client/representatives and enterprise factors). However, the second results emphasise that SMCEs with adequate PBFMS posted better performance than their counterparts with inadequate systems. In this way the role of PBFMS in contributing to better performance was illustrated by the results.

Some recommendations are proposed resulting from the findings and how to achieve a deeper understanding of the subject. Firstly, SMCEs should pay more attention to matters pertaining to strategic management to ensure a long-term view of their enterprises. Secondly, when a strategic plan is developed, it must be implemented through operational plans as a means of executing the strategy. Thirdly, concerted effort should made in ensuring that the projects are controlled as it is the only way to achieve sustained profitability and satisfied customers. Fourthly, as a way of providing a deeper understanding of the subject, it is suggested a longitudinal study could be undertaken to yield a more encompassing investigation than a cross sectional study which captured only one business cycle of the industry (down turn). Lastly, the study could be replicated in another industry with a similar profile like the construction industry in Botswana, for example, Namibia or/and the study could include large enterprises to provide means of comparing the different profiles of enterprises.

CHAPTER 1: GENERAL INTRODUCTION

1.1 Preamble

This thesis documents findings of a study that set out to investigate the adequacy of project based financial management systems (PBFMS) of small and medium construction enterprises (SMCEs) operating in the construction industry in Botswana (Botswana is a landlocked country in southern Africa with a population of 1.8 million inhabitants and a landmass of 582,456 Km² - see map in Appendix 1). The premise of the study was that the PBFMS of SMCEs are inadequate and therefore cannot facilitate efficient and effective delivery of projects within required time, quality and cost agreed with clients. As a consequence this has created dissatisfied customers who are not so willing to re-engage the services of SMCEs. Secondly, as a result of poor delivery of projects, SMCEs themselves have encountered financial difficulties exacerbating the project delivery problem.

The second premise of the study was that the unique nature of construction work implies that the generic financial management systems (FMS) used in other sectors of the economy (e.g. manufacturing and other service related enterprises) are not appropriate and need modification to make them suitable for the construction industry (Peterson, 2005). This is why the systems are specifically referred to in this document as PBFMS to distinguish them from those of other sectors.

The study focuses on small and medium enterprises with the premise that they are more prone to business failure than large enterprises. This is based on findings reached from earlier studies that concluded that small and medium enterprises (SMEs), perform at a lower level than large corporations (e.g. Kale and Arditi, 1998; Sentongo, 2005).

In pursuit of those premises, this Chapter begins by providing a background to the research problem to elucidate the claims that have been made about SMEs and in particular SMCEs. Since the study deals with SMCEs, it is felt that a brief discussion of the role of small and medium enterprises (SMEs) in the economy would be of crucial importance to underpin the

significance of the research. Following on to the background the subsequent section defines the research problem and its goal. This is followed by a brief overview of the research process used in the investigation. A statement relating to the contribution by the study to knowledge is also given as a follow up. The Chapter ends by providing a summary of the major themes covered by the different Chapters of the report.

1.2 Background

All enterprises strive to be successful in achieving their business mission, including construction enterprises. For construction enterprises, the mission is only achieved when project tenders are won and projects are delivered within terms agreed with clients. It is only in this way that the planned turnover and profitability may be achieved. The accomplishment of profitability in a sustained manner, in all business cycles will most likely facilitate an enterprise in achieving its planned business targets.

A number of mechanisms related to business operations need to be in place for an enterprise to achieve its mission and one of them is a well planned and managed PBFMS. A PBFMS is the spinal chord of any successful construction business enterprise. A PBFMS is made up of equipment, procedures, policies, information tools and techniques that facilitate the efficient and effective planning and control processes (e.g. Sun and Howard, 2004; Marchewka, 2003) of an enterprise. Since the PBFMS is designed, developed and operated by people, their disposition towards its activities is of paramount importance too. An adequate PBFMS ensures that an enterprise can plan and control, not only its activities, but can also influence the dynamics of the underlying business environment in which it operates (Fortune and White, 2006; Charoenngam and Sriprasert, 2001).

The planning process, both at strategic and operational level, ensures that the objectives of the enterprise are formulated and thus achieved in a systematic, coordinated and organised manner. Strategies and activities aimed at fulfilling the enterprise objectives are carved out by considering the strength and weaknesses of capabilities of an enterprise (Newkirk and Lederer, 2006). In addition, the ability to forecast the business horizon ensures that business threats are

identified early enough to set in motion mitigating actions aimed at reducing their impact (Keller and Field 2004). In addition, forecasting facilitates the seizing of opportunities before the competition takes note of it.

The control function naturally follows on to the planning function. It is again the PBFMS of an enterprise which fulfils this important role of controlling activities and resources (Keller and Field 2004; Whitehead and Upson, 1992). Through, for example, project estimates, budgets, and cashflow statements, the PBFMS is able to provide the enterprise with the ability to monitor and control business resources in form of equipment, cash, assets and labour usage. Both, the monitoring and control processes ensure economic and efficient use of resources and effective delivery of projects. Finally, a combination of planning and control processes provides an opportunity for measuring business performance and thus as a way of knowing whether planned targets have been achieved.

It must be borne in mind that the functions of planning and control and associated processes involve making appropriate business decisions and taking necessary actions to ensure that what was planned is achieved. Therefore, in fulfilling these functions, the PBFMS of a construction enterprise must have the necessary infrastructure with efficient processes to provide quality information that empowers decision makers in an enterprise, to efficiently and effectively carry out their duties. **It is on this basis that the adequacy of the PBFMS was judged.**

An important note though, is that no matter how efficient and effective the PBFMS may be, the human element plays a vital role in its viability. It is the human element that influences the quality of information, that goes in and out of PBFMS, through the design as to what data to capture; what information to generate and when; at what costs; and in what format. In addition, the human element is crucial in using the information to make decisions and to take actions that affect the enterprise. The skills, integrity and behaviour of the human element, both at management and operational level are of paramount importance for the PBFMS is to be effective in enhancing enterprise performance. Thus in judging the adequacy of the PBFMS, the human element must be included. This is because no matter how good the other

components may be, a poorly skilled, inadequate and inexperienced human element will not facilitate the working of the PBFMS. This in turn will not facilitate the performance of the enterprise.

Financial management systems are instrumental to all enterprises of all sectors of any national economy. However, in the construction industry where majority of work is organised by projects, the normal financial management systems designed around 'functional' work organisation are not appropriate (Peterson, 2005; Adrian 1986). This is due to the fact each project job a construction enterprise procures is unique due to the different specification, location, client and the need it is satisfying. Secondly, each project must be treated as a cost centre as opposed to the normal permanent cost centres found in functional based work organisation (Peterson, 2005).

There is a compelling reason to ensure that the PBFMS of a construction enterprise is designed and developed around a project management philosophy, embracing the project principles of planning and control, but focusing on the peculiarities of a construction project. The uniqueness of each project provides a challenge to adopt and adjust a generic financial management system. Symptoms and actual problems of failing to rise to the challenges are well documented in literatures sources (e.g. Canter, 1993 and Miles, 1979).

Over the years the construction industry, and in particular construction enterprises, have had a bad reputation in two interrelated areas, project delivery and financial management. Clients have accused the construction industry of delivering projects late, beyond budget and in most cases below the specified quality. In some cases contractors have abandoned projects before they are completed to the demise of clients. A study by BOCCIM (2005) indicated that only 8% of the projects were delivered both in time and on cost. Moreover, of the 323 projects sampled, 35% were abandoned at the various stages of completion. In disappointing the clients the construction enterprises have not done a favour to themselves either, they often incurred frequent losses and ultimate financial failures. Business failure in the sector is an ubiquitous problem, for example, Adrian (1986), conducted a study on construction enterprises in the USA and estimated that 13% fail annually. This high failure rate has led the construction

industry to be perceived by financial institutions as a high risk sector in any economy, perhaps second to mineral exploitation.

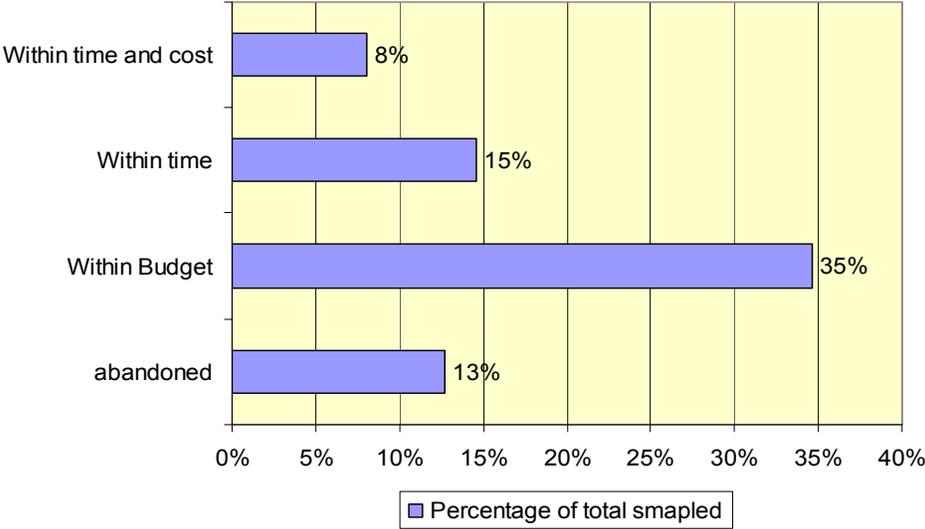


Figure 1.1: Performance of completed projects by construction enterprises in Botswana

Source: BOCCIM (2005)

There are several reasons that have been propounded to explain the persistent situation, many which point to issues of financial management. After an exhaustive investigation into the cause of bankruptcies of many firms in the USA, a Butterworth (1999), for example, made the following comments that at least 75% of the nation's bankruptcies could be avoided and more than 15% of the failures of all businesses in the US resulted from carelessness in giving credit. Butterworth further noted that the cause of bankruptcy is the failure to keep proper books because in 90% of the failures in USA, enterprises did not keep proper books. Though the comments were directed at enterprises of all businesses sectors, they are certainly relevant to construction enterprises. The first point indicates that there is room for improvement, while the second indicates that clients especially in the construction industry who pay contractors late are another source of financial problems. Late payment of clients in the construction industry is one of the most nagging problems in the industry (Larcher, 1988). Failure by clients to pay on time is an endemic problem in the construction industry which frequently causes a cashflow crisis for enterprises. The third point is further reinforced by Upson (1987) who observed that British construction enterprises, especially the smaller firms, are just too busy with construction work at site to pay attention to financial matters such as the prompt and

accurate recording of transactions, budgeting, cashflow forecasting, and cost-value reconciliations.

Another study (Dun and Bradstreet, 1976 and 1987), which focused on the construction industry identified the causes of construction business failures as the as lack of experience in construction business; inadequate project estimating and cost control; insufficient working capital; difficulty in managing receivables; intense competition; lack of advertising; lack of technical expertise; wrong location of service in relation to the market; poor inventory control; and fraud.

Most of the factors mentioned by the study are typical areas of PBFMS and depict a presence of inadequate systems or a complete lack of them in a number of construction enterprises. The other causes allude to lack of business management skills, particularly in the area of marketing and construction by the management of construction enterprises.

The problems mentioned above are not only confined to USA and UK but are also common in the developing countries. However, in the developing countries, like Botswana, their impact is exacerbated by two issues. Firstly, a number of economies in the developing world have been economically depressed especially during the 1980's and 1990's. This has resulted in diminished demand for construction services and hence reduced project procurement. Secondly, the dependence of the construction industry on both the central and local governments as a major client in developing world is enormous, for example, the government of Botswana provided 80%, by value, of construction jobs in 2000 (Ssegawa, 2000). Two examples further illustrate the two issues.

A typical scenario of the effect of the business environment on the construction industry was documented by an ILO study (Trulsson (2003) conducted in the countries of Tanzania, Uganda and Zimbabwe. The study revealed that the business environment normally hampered the survival and growth of small enterprises including, SMCEs. A particular reference was made to Zimbabwe where Trulsson (2003) observed that in the period between 1991 to 2001, Zimbabwe under went a number of structural economic adjustments which created a variety of

problems for businesses, the major one being lack of foreign exchange. Lack of foreign exchange was also followed by a depreciation of the Zimbabwe currency (Z\$). As if that was not enough the land disputes between the Government and the white farmers exacerbated the problem of foreign exchange and created more economic problems to the extent of paralysing the economy. In all, these problems culminated in the government of Zimbabwe not being able to procure construction projects leading to a severe down-turn for the construction industry. The down-turn left the industry paralysed and with a diminished input and output capacity (the situation has actually become worse over the years).

In Botswana different circumstances led to a down-turn in the industry. In 1992 the construction industry in Botswana experienced some turbulent times when allegation of corruption and fraudulent dealings were levelled against Botswana Housing Corporation (BHC) after the death of its CEO. Following these allegations, many housing projects which formed a very large percentage (40%) of the total output of the construction industry were disrupted or cancelled (Yahya Saad *et al.*, 1997 and BOCCIM, 1992). As if that was not enough, a world recession in the early 1990's saw the demand for diamonds, the major export and foreign exchange earner for Botswana, plunge by a significant level. The reduced demand resulted in shrinkage of the construction output to about 15% (Ssegawa, 1999; CSO, 1998) in just three years (1991-93) as the government suspended implementing new projects (Molefe, 1992).

The two examples illustrate how over dependence on the public sector is detrimental to the construction industry especially in the developing world. However, it must be noted that even without a harsh business environment, construction enterprises are prone to failure. The construction industry in Botswana recovered after the 1992 crisis and went on to record a steady performance right through the late 1990's. However, several citizen-owned construction enterprises went into serious financial trouble to the extent that the Government had to intervene to save them from total collapse. A special fund of Pula 50 (R75) million, was set up to bail out collapsing citizen-owned construction enterprises (Malema, 2000). The aim was that proprietors of the ailing or failing construction enterprises could borrow funds at an interest rate below the market rate, that is, 7% instead of 16% in order to alleviate the

cashflow problems (Gaolathe, 2000). A study conducted by the University of Botswana (Kgabo *et al*, 1999) gave an insight to the performance of construction enterprises. Among the business failures (‘mortality rate’), in the entire economy, construction industry ranked highest at 45 %. The study further concluded that, of all businesses that did not cross the two-year birthday after registration (‘infant mortality’), enterprises in the construction industry ranked highest at 30% (Kagbo *et al*, 1999). The rate of project delays, cost escalation and project abandonment also escalated during the period. Plausible reasons for the financial failures were given both in media (Malema, 2000) and industry reports (BOCCIM, 1992) as lack of managerial skills and fiscal discipline; poor project planning and poor cost estimation; and inefficient and ineffective cost control systems.

A further indication of the problem was provided by two studies conducted by BOCCIM (BOCCIM, 1992) and ILO (Sibanda, 2000) which suggested that there are indications that SMCES are riddled with problems in particular, they :

- i) lack efficient and effective financial information systems to steer firms to a profitable and successful business course,
- ii) proprietors display inappropriate behavioural practices and attitudes towards financially related matters, and thus often lack fiscal discipline.
- iii) proprietors lack managerial, operational, financial and sometimes technical skills relating to the construction business, and
- iv) operate in environments that do not nurture growth, in a number of instances.

Further analysis of literature (e.g. World Bank, 1984; Aniekwu and Okpala, 1987; Kirmani, 1988; Materu, 2000) showed that factors that hamper project delivery and construction enterprise may be grouped into three categories namely those relating to (i) constraints from the business environment; (ii) constraints by clients and their representatives and (iii) deficiencies within the enterprise as illustrated in Figure 1.2. According to various scholars the factors (and their sub-factors) are purported to be the cause of the problem of poor delivery of projects which in turn leads to business or financial failure. The factors will be examined in detail in Chapters 2 and 3 but for now it is suffice to say that the thesis focuses on the factor of

deficiencies within the enterprise and in particular aspects related to the inadequacy of the PBFMS of SMCEs.

Based on the above, it is inconceivable to think that entrepreneurs in the industry can make sound and informed decisions given the lack of adequate PBFMS. Despite their ills, failures and inadequacies, SMCEs must be assisted to overcome their challenges and problems because they play an important role in national development of any country as highlighted in the next section

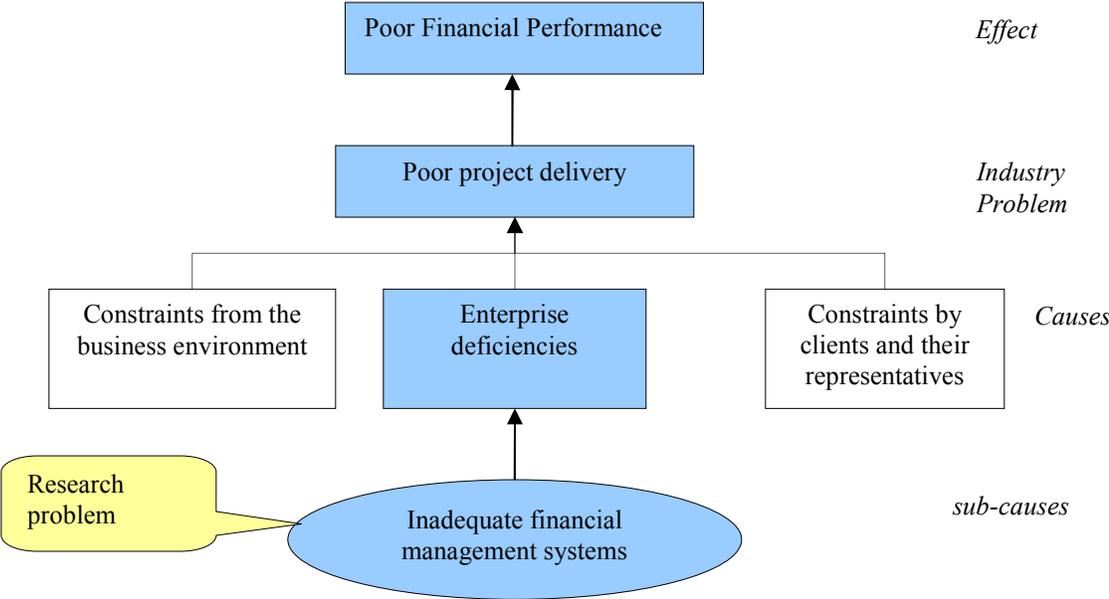


Figure 1.2: Inadequate financial management systems and SMCEs performance

1.3 Role of SMCEs

SMCEs being part of the small and medium enterprises (SMEs) family, the contribution they make to national development is similar. That being the case, the role of SMCEs is discussed in a more general sense by looking at SMEs contribution to the economy.

There has been a great realisation that SMEs play an important role in fostering economic and industrial development through entrepreneurial activity, innovation and employment creation (Acs, 1992; Poutziouris, 2003). Thurik and Wenneker (2004) observed that in most economies, there is ample evidence that economic activity has shifted away from large to

small enterprises. They further observed that in the developed world this movement has been catalysed by some fundamental structural changes in the world economy which have taken place. The most notable changes have been in the political, economic, technological and marketing arenas. The end of the Cold War ushered in a new era of increased cooperation among the nations of the world. Economically, nations are moving towards greater integration and deregulation and thus breaking the trade barriers (Thurik and Wenneker, 2004). Technological breakthroughs have been enormous and have supported both political and economic changes especially in the areas of communication where it has become cheaper, reliable, faster and more accessible to communicate. In the market place, consumer tastes are ever changing, demanding more in terms of value-for-money by requiring more variety, access and quality at a competitive price.

The above changes have brought fierce competition in the market place particularly among suppliers and producers to cash in on the consumer demand. Fragmentation of the market has been observed, with niche markets being created which favour SMEs because of their low capitalisation. In essence, the changes mean that national or international business opportunities are no longer the domain of large enterprises. SMEs are able to play a vital role both in local and international markets because gone are the days when a critical mass of resources was needed to break international barriers. Specifically and as discussed below, SMEs contribute to social, economic and industrial development by providing entrepreneurial outlets, fostering innovation, creation of competition, creation of employment, fostering economic growth and synergy with large enterprises.

i) Firstly, SMEs provide a seedbed as a productive outlet for entrepreneurs to channel their talents and energies in enterprise, innovation and vision. The bureaucratic nature of large enterprises tends to inhibit entrepreneurs' innovation and independence in thinking and decision making. SMEs thus provide motivating careers that would not have been achieved in large enterprises. Large enterprises rarely nurture the process of innovation, if anything they hamper the process through their hierarchical decision-making process. However, small enterprises provide the autonomy to identify opportunities and the discretion to initiate and plan projects. This in turn allows entrepreneurs to take risks, the

authority to commit resources and ability to execute projects (Vosloo, 1994). Marsden (1981) also noted that SMEs create wealth through return on capital invested like their counterparts, the large enterprises. However, what is significant is that they provide an avenue for mobilising savings from owners and their families. According to Marsden (1981) owners have a surprisingly high propensity to save and reinvest despite the low incomes levels.

- ii) In case of the construction industry, it acts as an entrepreneurial arena for individuals wishing to invest and operate construction firms. As a result of owning firms, proprietors may earn entrepreneurial income if they are successful in their business. Simultaneously as the enterprise provides income to the entrepreneur, it also provides a service to the economy in form of delivering project. However, before each construction enterprise plays both roles, it has to be a viable entity. Profitability requires minimising project costs with a view to creating an appropriate margin in relation to the tender price quoted. The need to have profitable CEs may be best examined from stakeholders theory point of view. Though all stakeholders of a CE have the same interest of profitability, survival and growth, each group may have unique interests in the firm, for example, shareholders want a return on investment (ROI); employees want employment and career development; trade creditors want sustained purchases, government wants employment, delivery of infrastructure development and payment of taxes; and clients want provision of services within agreed conditions.
- iii) Secondly, SMEs are more creative and have been found to create more innovations per employee than large firms. Kirchoff (1991) asserts that inventions and their subsequent commercialisation like personal computers, computer software, and jet engines were innovations of small firms despite currently being the domain of large enterprises. Small businesses are better at producing new products, creating new industries and providing new technological directions.
- iv) Thirdly, SMEs infuse and foster a spirit of competition necessary for a market economy. This results in consumers getting improved products or services in terms of quality, safety and value-for-money (Kotler, 1991; Levy, 1996; and Republic of Botswana, 1998). Related to competition is the fact that SMEs are bound to increase choice through

a variety of products and services offered and in the process pave way for innovation (Carree and Thurik, 2001).

- v) Fourthly, SMEs facilitate the creation of employment, as their operations are normally more labour intensive than large enterprises. Keats and Bracker (1988), for example, noted that in the 1980's SMEs employed 58% of the work force and were responsible for generating 87% of the new jobs in USA. This feature is of significant importance especially in developing nations where the labour supply is in abundance but there is a shortage of both capital and foreign exchange to absorb it in large firms. SMEs become handy in assimilating this excess labour, especially if they use less capital per worker than large enterprises. They tend to show significantly higher ratios of value added to fixed assets than large enterprises.

- vi) Fifthly, Kirchoff (1991) takes the debate further by asserting that economic growth is dominated by SMEs and identifies two specific characteristics associated with SMEs, namely innovation and high growth rate. Firstly, if it is true that innovation drives economic growth then it logically follows that economic growth should be dominated by small firms. Secondly, SMEs appear to be more active in stimulating economic growth since they have a higher growth rate. Thirdly, SMEs provide a vehicle for promoting 'grassroots' development in less developed communities because they use local resources that may not have been drawn into the mainstream development process. SMEs provide an avenue for broader participation in the economy, fostering greater political stability. A high proportion of their labour is normally from the local community with initially less skills but with a chance to learn skills on the job. Due to innovation and creativity, they also permit the use of raw materials that would otherwise have gone to waste or stayed idle (Marsden, 1981).

- vii) Lastly, SMEs satisfy demand in niches that are not attractive to large enterprises due to remoteness, low demand or due to the customised nature of a product. Moreover, Baumbach (1988) observes that large enterprises are more effective in well-established industries where large markets provide an opportunity for low-cost units, where technology and automation has been developed to a high degree of efficiency, where a

huge capital investment is needed, and where standardisation and simplification that reduces variety are desirable strategies. Thus SMEs bridge the gap that exists in the markets not served by large enterprises. In addition, Vosloo (1994) and Baumbach (1988) noted that SMEs are important partners to large enterprises in production, distribution, maintenance and repair work. They are often extremely effective in providing outsourcing through subcontracting arrangements with large enterprises.

With above mentioned advantages, developing countries are also realising that to bolster economic development, emphasis must be put on creating an enabling environment aimed at nurturing SMEs. The above and other aspects have forced governments in the developing world to make a paradigm shift which emphasises not only private participation but also the need to empower SMEs, for example:

- i) state owned organisations, which dominated the business landscape for several decades after independence, have been ineffective in delivering services but have been very 'efficient' in draining tax payers' money. In addition, structural adjustment programmes which have been instituted by some governments (e.g. Zambia, Tanzania and Uganda) have moved in the direction of lesser government involvement in business and greater private sector participation (though in some cases without success).
- ii) most developing countries are single export commodity economies, for example, diamonds in Botswana, tobacco in Zimbabwe and copper in Zambia. There is a realisation that diversification of the economy is the key to sustained development.
- iii) the drive to private state-owned enterprises has meant retrenchment and hence an increase in unemployment. Therefore the growth of SMEs may be the key to the absorption of retrenched labour.
- iv) most of the roles of SMEs discussed, many of which have been observed in the developed nations have been found applicable in developing nations in terms of generating entrepreneurial activity, innovation and employment creation to foster economic growth.

Thus, in the last decade, the role of SMEs has been embraced in developing nations and there are policies on SMEs to illustrate this direction, for example, the Policy on Small, medium,

and Micro-Enterprises in Botswana (Republic of Botswana, 1998). However, there is little empirical evidence on their impact on development. A study by Newell (1996) indicated that in the mid-1980 and early 1990's, SMEs contributed about 30% towards Botswana's GDP and 45% to employment as shown in Table 1.1. These figures are quite high when compared with Botswana's neighbours, for example, Namibia's SMEs contribute 33% of the labour force (NEPRU, 2003 and Botes, 2003). In Zimbabwe SMEs contributed an estimated 15% of GDP and 30% to employment (Machipisa, 2003).

Table 1.1: Role of SMEs in Botswana, Namibia and Zimbabwe.

Country	Contribution to GDP	Ratio of Employment	No. of firms
Botswana ¹	30%	45%	6,300
Namibia ²	5-7%	33%	32,911
Zimbabwe ³	15%	30%	22,300

Sources: ¹ Republic of Botswana (1998); ²NEPRU (2003); ³Machipisa (2003), ²Botes (2003)

With a paradigm shift by most governments to embrace SMEs, there is a greater need to understand the theory and practices surrounding developing efficient and effective SMES in order to make informed decisions as to how they could be nurtured and enhanced. This enhanced role of SME is another motivating factor that led the study though more focused on SMCEs.

Having provided a background to the research problem, the next section defines the problem in a more operational perspective starting with definition of key operational terms used in the study.

1.4 Definition of Operational Terms

There are a number of key terms, particularly those appearing in the research title, which require defining to create a common understanding of how they are used in the study. The key terms include the construction industry, construction projects, small and medium construction enterprises (SMCEs), and an adequate PBFMS. Each term is defined next.

1.4.1 Construction industry

The construction industry is a sector which offers services that produce a construction product. According to Barrie and Boyd (1978) a construction project may be in form of residential buildings (family homes, apartments, condominium, etc); commercial or social buildings (e.g. offices, churches, health, recreational and educational facilities, etc); roads (paved and non-paved); civil works (e.g. sewer plants, water reticulation plants, dams, tunnels, bridges and communication infrastructure, etc); and industrial complexes (e.g. oil ridges, refineries and mine developments, etc). For a landlocked and dry nation, like Botswana, the list of possible activities is not as elaborate as countries with rivers or those surrounded by the sea where the construction of facilities such as oil rigs, dykes and tunnels are a common sight.

The construction industry may also be viewed from a perspective which takes cognisance of the life-cycle of construction projects, with phases namely inception, design, construction, occupation or operation and demolition (PMI, 2004). Another view is to consider the construction industry as an industry where projects are planned, designed, constructed, commissioned for use and later maintained (Abaasi and El-Mharmah, 2000).

Another view is to define the industry by comparing it with another sector (e.g. the manufacturing sector) particularly the manner in which the products are delivered to the client. Construction projects are delivered to clients in what is known as a project delivery system or procurement system. A delivery system charts out how a project is conceptualised, planned, designed, constructed, and commissioned for delivering to the client. There are a number of project procurement systems including, for example, the traditional procurement system (TPS), design and build (D&B), and project management (Franks, 1990; Hore *et al*, 1997). Of the four, the most commonly used in many developing nations especially those in the British Commonwealth, is the TPS (Rwelamila and Ngowi, 1996).

The TPS involves a client appointing a consultant in form of an architect (for building projects) or an engineer (for civil engineering projects) to take down the needs in form of a brief. The brief is then transformed into a design (construction information) for the project. A

quantity surveyor is appointed to prepare a project budget and in addition a bill of quantities and other tendering documents. The consultants then facilitate the client in the selection of a suitable contractor and nominated sub-contractors (electrical and mechanical engineering) to implement the project design, through some form of tendering system. The consultant supervises the contractor during the construction phase while a quantity surveyor values the work done on behalf of the client. Both the consultant and quantity surveyor ensure that cost, time and quality (specifications and standards) are met in order to deliver the project as per the contract (Franks, 1990; Hore *et al*, 1997).

The TPS inherently breaks the delivery of a project into two separate phases, namely the design and construction phase. The industry therefore, provides both services of design and construction. The arrangement contrasts with manufacturing sector where a client procures a product already designed and manufactured by one entity, for example, as in the case of aircraft manufacturing. The aeroplane is designed and built by one firm. There could be several sub-contractors but it is one firm responsible for the entire delivery chain.

Another definition by Smith (1998) focused on the construction phase by noting that it is an industry where new structures are built and where existing structures are altered, extended, refurbished, maintained, repaired, and demolished. Thus Smith's definition concentrates more on the construction activity as opposed to the design, a view which was found more appropriate for the study.

While wider definitions of the construction industry provides a holistic view of the industry, *this study focuses on construction sector as one which deals with the construction of new structures and the altering, extending, refurbishing, maintaining, repairing, and demolishing of existing structures.*

Structures refer to what Barrie and Boyd (1978) describes as residential buildings, commercial or social buildings, roads, civil works, and industrial complexes.

1.4.2 Small and medium construction enterprises

To arrive at the definition of small and medium construction enterprises, three definitions are necessary namely enterprise, small and medium enterprises then finally, small and medium construction enterprises (SMCEs).

▪ *Enterprise*

The Longman's Dictionary of Contemporary English defines *enterprises* as 'organisations especially business firms' (Longman, 2000). It continues to define firms as 'business companies' and in turn defines companies as 'a group of people combined for business or trade'. The definition provides an array of substitutable words for 'enterprise', such as, the firm, company, corporation, business entity or organisation. In this report these words shall have the same meaning though the preferred word is '*enterprise*'.

In standard microeconomic theory, Poutziouris (2003) argued that the objective of enterprises is to trade with aim of obtaining (maximising) a profit for services rendered to clients, for example, construction enterprises erect or repair structures and in turn expect to make a profit on the services. The objective of obtaining a profit differentiates business enterprises from other organisations, for example, societies and social clubs. Like economic theory, the law provides for objectives that an enterprise should pursue and why it should pursue them - for profit. Secondly, it separates ownership and the enterprise which is a fundamental issue in the management of SMEs especially as to how it relates to practices of financial management. Often the lack of understanding of the implication of separation of the ownership from the enterprise has led to serious abuses of financial resources and assets.

The legal position of enterprises in Botswana, is based on the Company Act (Republic of Botswana, 2003). The Act defines the enterprise by identifying a number of legal features. Enterprises should be incorporated through registration with the Office of the Registrar of Companies in accordance with the requirements of the Company Act. Merits and demerits of incorporation are well discussed in many literature sources elsewhere (e.g. Owusu-Ansah,

2000; Jennings, 1995). However, two aspects of relevance will be noted here, the types of incorporated enterprises and issues of corporate governance.

Incorporated enterprises may be private or public. The latter implies that its shares are traded on the stock exchange and may be purchased by any member of the public in the secondary market. Apparently there are no public construction enterprises in Botswana which implies that the study focuses on privately owned enterprises. In addition, the Act requires that the financial statements of public enterprises be audited and made public. This requirement places a higher level of corporate governance and the need to have viable financial systems. As a consequence, the financial systems for such enterprises are presumed to be more formal, organised and systematic than private enterprises. The removal of the requirement for auditing and making financial statement public for private enterprises has its own merits and demerits. While it saves money due to auditing fees, the downside of it is that it makes owners of SMEs complacent about the proper recording and keeping of books relating to business transactions. In support of this view, both Peterson (2005) and Upson (1987) noted that construction enterprises are complacent in record keeping and are laid back in matters relating to financial management because they are not obliged to audit and publish them publicly. This is where financial management woes begin and later enterprise obituaries are written.

- ***Small and medium enterprises***

There is no authoritative definition of SMEs. However, there is agreement by practitioners, policy makers and academics that enterprises are of varying sizes and may be grouped in four broad categories namely micro, small, medium and large enterprises. What always lacks is an agreement on the measure and the thresholds of each size. Storey (1994) noted that SMEs have distinct features that differentiate them from a majority of their larger counterparts. The same observation was made by the Policy on Small, Medium, and Micro-Enterprises in Botswana which noted that there is noticeable difference in the scale and sophistication of operation of SMEs and their counterparts, the large enterprises (Republic of Botswana, 1998).

One way of creating an understanding of what constitutes an SMEs is to define the micro and large enterprises, for example, Frese, Brantjes and Hoorn (2002) further noted that micro

enterprises are informal in nature with no fixed addresses, recognisable information systems or organised trading records. Kitindi, Iwisi, and Mgaya (2000) observed that micro enterprises are normally referred to as the informal sector with limited scope of operations. The informal sector consists of businesses majority of which are not incorporated and hence not governed by the Act. These are normally what are known as sole proprietors. Sunny and Babikanyisa (1993) noted that micro-enterprises do not (i) normally register with registrar of companies, (ii) pay direct company taxes on a regular and verifiable basis if they are at all incorporated, and (iii) render themselves to official regulation and control. Morewagae, Seemule and Rempel (1995), also noted that micro enterprises seldom make returns to the tax department or to registrar of companies.

While commenting on the construction sector Wells (1998) noted that the informal sector for which most micro enterprises belong, consists of unregistered and unprotected individuals and enterprises. From a Tanzanian construction perspective, Mlinga (2000) noted that micro-enterprises or the informal sector are enterprises or individuals carrying out, and supplying labour for construction work without business licences or are not registered with the Contractor Registration Board of Tanzania. A combination of all these features makes micro enterprises elusive to study and is one of the key reasons why they were not included in the study.

On the other hand large enterprise are characterised by resource endowments, age and formalised systems. In distinguishing SMEs and large enterprises, scholars, government and funding agencies have attempted to define size through some qualitative and quantitative means (Vosloo, 1994). A qualitative definition would normally attempt to relate structural and managerial characteristics of an enterprise (Stanworth and Curan, 1976; Carland, Boulton and Carland, 1984), for example a close linkage between management and ownership of the enterprise (owner/manager relationship); and personalisation of management and independence of the decision-making process by owner/manager.

Baumback (1988) and Robinson and Pearce (1983) further observed that SMEs are normally localised, dominant in their area of operations (niche) and are dependent on internal sources to finance growth. However, as the enterprise grows the features become less distinct.

Though a qualitative definition does not provide specific demarcation of the sizes, as there numerous exceptions to the observations made above, it nevertheless provide a starting point for distinguishing SMEs from micro and large enterprises. In addition, the qualitative definitions shed light on the modus operandi of the enterprises especially in relation to the maturity of their management and systems. The presence or lack of, the features mentioned is an important aspect in understanding SMEs (Stanworth and Curan, 1976).

Specific attempts have been made by various groups to use quantitative measures to define the sizes of enterprises. Blum (2000) and Smith (1995) noted, for example, that SMEs and large enterprises could be distinguished from each other by using the following aspects, individually or as a combination, namely financially related indicators like annual turnover, market share, budget and value of assets; operational related indicators like value of production or capacity of production facilities, market share; and average number of permanent employees.

Certainly using one of the above or as a combination of them depends on the country and the sector in question due to the different levels of development and peculiarities of the industry, respectively. The currency conversions also do not provide a true picture of the sizes in each country if turnover is used as a measure of size. Sizes also vary in the various sectors of the economy, especially given the fact that some sectors are more capital intensive while others are more labour intensive. Hence if the number of employees were to be used as a measure size, the labour intensive enterprises would seem larger.

Despite the flaws in the definitions, the most common measurement of enterprise size is the number of employees and enterprise turnover. Belaud (1990) noted, for example, that in the economies of Japan, USA and some European countries, a SME is an enterprise with less than 500 employees. However, the figures are not sacrosanct as Malinen (2001) observed that in Finland, SMEs are enterprise with less than 250 employees.

Just like in developed nations there are variations in the definitions of sizes in the developing world. In some of the southern African countries, for example, Botswana, Namibia and Zimbabwe, SMEs are defined using different employee and turnover thresholds as shown in Table 1.2

Table 1.2 Employee and turnover as a means of defining SMEs

Country	Average Number of Employees	Annual Turnover (US\$'million)
Botswana ¹	6-100	13-1.1
Namibia ²	5-250	6-0.7
Zimbabwe ³	5-100	7.5-1.0

Sources: ¹ Republic of Botswana (1998); ² Hansohm (2003); ³ Machipisa (2003), ² Botes (2003)

▪ ***Specific definitions***

To avoid pitfalls discussed above when using qualitative or quantitative measures, enterprises may be defined by focusing on particular aspects. For most public procurement processes of most countries, for example, construction enterprises are classified using the maximum value of a project that an enterprise can execute. The classification is made by assessing their financial resources, that is, in terms of bank balance, or their ability to access to credit and short term investments; assets or guarantees to accessing assets like plant and equipment; human resources particularly in terms of expertise and skills; and experience relating to past projects executed and associated performance arising thereof.

A typical example of such classification is that used by Public Procurement and Asset Disposal Board of Botswana (PPADB). As the name suggests, the Board deals with matters pertaining to the procurement and disposal of public assets including construction projects. It classifies enterprises or contractors in classes OC, A, B, C, D and E for the purposes of procurements as shown in Table 1.3. OC is lowest class while E is highest class of any of the four categories of contractors namely, building, civil, electrical and mechanical contractors.

Table 1.3 Classification of contractors

Class	Civil contractors		Building contractors		Electrical/mechanical	
	Maximum Contract Value (P)	Enterprise size	Maximum Contract Value (P)	Enterprise size	Maximum Contract Value (P)	Enterprise Sizes
	OC	600,000	micro	300,000	micro	40,000
A	2,000,000	small	800,000	small	100,000	small
B	10,000,000	small	2,000,000	small	250,000	small
C	20,000,000	medium	4,000,000	medium	500,000	medium
D	40,000,000	medium	8,000,000	medium	1,000,000	medium
E	Unlimited	large	Unlimited	large	Unlimited	large

Source: DBES (2005); DR (2005)

Table 1.3 shows that the class thresholds are different in each category, for example, maximum value for Class D is P40, P8 and P1 million for civil, building, and electrical/mechanical contractors, respectively. This reinforces the earlier observation that sizes not only differ in accordance to the nature of industry but also the nature of work. Civil engineering projects are usually large, expansive and expensive and hence the high thresholds in the group. On the other hand, most of the electrical and mechanical work is sub-contracted on a project and hence the value of their work is only a fraction of the tender sum.

▪ **SMCEs**

It is important to relate the classes to the generic sizes (micro, small, medium and large) already mentioned and some (small and medium) of which are used in the study. PPADB does not use the sizes already referred to namely, micro, small, medium or large but some inference was made for the research study as to which class belongs to which size. The right hand side of Table 1.3 shows the size determination made in the study to group classes A, B, C and D as SMCEs and OC as micro and E as large enterprises category of work (building and civil).

The determination of the size was reached after a discussion with officers of PPADB, the Departments of Roads (DR) and Department of Building and Engineering Services (DBES). The last two departments plan and manage all public projects in the areas of roads and

buildings, respectively. Currently the two departments also determine the classification on behalf of PPADB. The officers of the two departments indicated that enterprises in category OC are difficult to trace and contact unless there is an advertised tender. They indicated that quite a large number of enterprises in the class are registered but have never carried out any work for the departments and those who perform some work do it on an irregular basis. Moreover, many of them are not contactable at the addresses (postal or physical) or telephones they provide during registration. This description somehow fitted that of micro enterprises as observed by others (e.g. Kitindi *et al*, 2002; Belaud, 1990; and Sunny and Babikanyisa, 1993) relating to the *modus operandi*.

Further discussion with officers of PPADB and the two Departments revealed that firms in class E were quite big by the standards of the construction industry in Botswana. About 70% (Sentongo, 2005) are foreign owned or are branches of foreign enterprises. Their profile varies considerably from other classes, for example, they are well resourced in terms of finance, equipment, plant and personnel. They have significant experience in terms of executing construction jobs and it is of no surprise that all are registered for both building and civil engineering category of work. Therefore, the reason for excluding class OC and E is the high disparity in the profile of their resources, operations and systems. In fact for class OC it was a challenge to trace their contacts, physical or otherwise that a decision to exclude them was made.

That observation leads to another issue. It is quite in order to give an indication as to which of the four groups (building, civil, electrical and mechanical contractors) are relevant to the study. Only contractors registered for building and civil works were included in the study leaving the electrical and mechanical contractors out. The reason is that owners of building and civil contractors are of varying backgrounds; some are educated while others are not; some had technical knowledge in some aspects of the built environment prior to their entry in the industry, while others did not (Sentongo, 2005). From the discussions held with officials of PPADB, DBES and DR, it became clear that a vast majority of electrical and mechanical contractors are proprietors with a good technical background in their trade, perhaps varying in

depth in terms of qualifications and managerial experience. Most are usually diploma or degree holders in aspects related to electrical, electronic or mechanical work.

The other persuasive factor for excluding mechanical and electrical contractors from the study is the level of their involvement in a project. Compared to building and civil contractors, their participation is normally limited to sub-contracting (nominated or domestic). If they were included in the study, the mix would not be a homogeneous group of subjects which Blumberg, *et al.* (2003) observed must be treated with care in order to obtain valid results.

In view of the above discussion and description, *small and medium construction enterprises (SMCEs) shall mean contractors in class A, B, C and D in civil and building category as prescribed by the PPADB. Small sized enterprises shall be of class A and B while medium sized enterprises shall be of class C and D.*

1.4.3 Project based financial management system

The definition of a project based financial management system (PBFMS) is approached from an understanding of a project. This in a way facilitates distinguishing between a generic financial management system used in a functional environment with the proposed project based financial management system (PBFMS).

There are several definitions relating to what constitutes a project and these are given in many literature sources (e.g. Field and Keller, 2004; Kerzner, 2003; Meridith and Mantel, 2003) because projects vary so much, for example, Field and Keller (2004:3) defined a project as:

...a project is organised work towards a pre-defined goal or objective that requires resources and effort, unique (and therefore risk) venture having a budget and schedule. A project's success can be measured in terms of how closely it comes to meeting the goal or objective (and this is an issue of quality) within the parameters of its budget and schedule...

The Association of Project Management (APM) defined a project as (APM, 2005:11)

...The simplest form of a project is a discrete undertaking with defined objectives often including time, cost and quality (performance) goals. All projects evolve

through life-cycle sequence during which there should be recognised start and finish points. In addition, the project objectives may be defined in a number of ways, e.g. financial, social and economic, the important point being that the goals are defined and the project is finite...

The Project Management Institute (PMI) defines a project as PMI, 2004:5)

...a temporary endeavour undertaken to create a unique product or service. Temporary means that every project has a definite beginning and a definite end. Unique means that the product or service is different in some distinguishing way from all similar products or services...

From the definitions a number of project attributes may be noted, for example, a project:

- i) has a specific goal or benefit for which the procuring entity is intending to realise when it is delivered.
- ii) has specific objectives (i.e. function, time, budget and performance) that if achieved will lead to its successful execution.
- iii) has an interdependent and interactive environment which provides opportunities for success but where there are threats (risks) that may hamper its success.
- iv) is a unique undertaking that has differences from the previous or the next one.
- v) requires resources and effort of people.
- vi) temporary but with a life-cycle made up of recognisable phases with start and end times.

The attributes mentioned above are those of a generic project but a typical construction project has an additional set of unique features worth mentioning, for example, it is:

- i) often carried out at a distant location from the head office of the executing enterprise thus requiring the mobilisation of resources, and re-organisation of work, including information processing and communication.
- ii) subject to inclement weather, thus requiring work stoppages and which if not forecast and incorporated in the schedule and budget may pose a threat to successful execution.
- iii) where the payment method is always in arrears requiring to consider the effect on cashflow and procurement of resources.

iv) where there is high level of subcontracting requiring further management.

A combination of these attributes makes construction projects very unique from all other projects, for example, IT projects. These are normally implemented in a controlled environment with fewer challenges as compared to construction projects executed at distant location with uncertain weather conditions. Since the activities of the construction industry are already defined in Section 1.4.1 then the definition of a construction project may be stated as a *unique and temporary construction endeavour with both specific goals and objectives and which is often executed away from the contractor's head office thus subjected to vagaries of the environment.*

This leads us to the definition of a PBFMS.

▪ **PBFMS**

The definition of a PBFMS may be formulated by looking at its role - 'contribution to the enterprise'; its function - 'processes and outputs'; and its nature – 'what it is'. Though there may overlaps in these concepts, the position here is that the last two are details which are discussed in Chapter 2. Therefore, the definition will concentrate on the role of a PBFMS which may be appreciated if an analogy of a ship and its captain are considered. The captain must have a defined journey to make, most significantly with a purpose. He then charts the course to a destination based on the purpose of a journey. The captain manages the ship's course from time to time, using whatever navigation instrument (compass, radar or GPS), is available until the ship arrives at the destination. The captain will be lucky if there are no storms or other types of adverse weather conditions.

For a construction enterprise, there must be a destiny as provided for by the vision, mission and the goals (purpose of the ship's journey). The PBFMS thus becomes the navigating instrument which facilitates the charting of direction and management of operations (course) of the enterprise by collecting and producing information (navigation data). Put in another way, PBFMS facilitates the formulation of the strategic direction of an enterprise and provides the means of implementing the strategic plan through the day-today operations.

Arising from the analogy of a ship, the PBFMS may be viewed from its role as the need to facilitate two aspects in a construction enterprise. Firstly, that projects are delivered on time, within agreed price and quality. This will ensure the customer is satisfied and in the long run this will ensure that the enterprise has sustained customers. The second aspect of the role of the PBFMS is to ensure that the goals (or targets) of the enterprise are achieved and this is only possible if the first aspect is achieved.

To ensure that projects are delivered successfully, various decisions and actions relating to projects' processes, activities and resources are taken. The decisions and actions must be based on quality information which the PBFMS must produce. In addition, it is clear from that description that in order to achieve this role PBFMS must be designed, developed and sustained in such way that the information produced is of a high quality to effect decision making (the details of the nature of information produced and managed is the subject of a later discussion in Chapter 2)

It is noteworthy to state that a PBFMS, may be manual or computerised or a combination of both. However, with the efficiency and other advantages that accrue from the use of computer systems, a computerised PBFMS is highly recommended. Secondly, the PBFMS is designed, planned and operated by skilled personnel and where possible with help of some equipment (software and hardware). This highlights the need to incorporate the human element as part and parcel of the PBFMS.

Therefore, for the purposes of the study a PBFMS was defined as *a systematically arranged collection of knowledge, tools, techniques, procedures and policies that facilitate the carrying out of the roles and functions of an enterprise. These include the provision of information for decision making at all levels of management in order to fulfil the primary objective of delivering projects efficiently and effectively which in turn leads to fulfilling enterprise's mission.*

- ***An adequate PBFMS***

Now that the PBFMS has been defined the next question is: *how can it be adequate?* An adequate PBFMS is one which facilitates the carrying out of the strategic and operational roles and functions of an enterprise in *an efficient and effective manner*.

Efficiency refers to the manner to which the PBFMS facilitates in accomplishing the functions of an enterprise. An efficient PBFMS must provide information in a timely, and accessible manner at the time needed, for example, the need to get suppliers quotations during project tendering. Secondly, the information must be accurate and complete e.g. inaccurate project estimate lead to an uncompetitive tender. Thirdly, the information must be in the right format for use by individuals taking decisions or actions, for example, a builder cannot proceed with work if the drawings are not clear and in the standard format.

The effectiveness of the PBFMS refers to the manner in which the functions of the enterprises are achieved to fulfil its mission. These include strategic planning and operational planning (producing project estimates), bidding, valuation, monitoring and control.

Having defined the basic terms used in the study, the next section defines the research problem.

1.5 Research Study Definition

To define the problem of research in more operational details, a statement of the problem was formulated followed by research questions as a means of focusing the study. Arising from the research questions several objectives were formulated to break down the problem into manageable sub-problems. Blumberg *et al.*, (2005) noted that research questions (or aims or goals) provide a strategic view of the research while the objectives provide the operational side of the investigation. The fulfilment of the objectives marks the achievement of a solution to the problem. To further sharpen the investigative effort, a number of propositions were posited and whose findings will provide the sum total of the overall solution to the problem. Lastly, the research scope was defined, stating the boundaries of the study. The next section follows through the research definition.

1.5.1 Research problem statement

In recent times governments of both developed and developing nations have embraced SMEs as serious development partners. SMEs have been identified as vehicles for social, economic and industrial development, providing nations with the needed innovation, competition, employment and entrepreneurial outlets. In addition, to the above, and in particular SMCEs have been identified as vehicles for providing a significant contribution to the nations' infrastructure by implementing projects which lead to the construction and maintenance of buildings and civil works.

However, research studies from various part of the world (e.g. Adrian, 1986 and Dun and Bradstreet, 1987) including Botswana (e.g. Sibanda, 2000; BOCCIM, 2005; Sentongo, 2005) have indicated that SMCEs have two major problems. The first one relates to being unable to deliver projects within the agreed contractual framework. In this vain, they deliver projects late, over the agreed cost and in most cases below the specified quality. In some cases they even abandon the projects before they are completed. This leaves customers disillusioned and unwilling to re-engage them or to provide them with good references for the next job.

The second aspect is much related to the first one. There are indications, particularly in Botswana, that SMCEs have the highest rate of business failures. Business failures may arise in two situations, where the enterprises cannot pay their suppliers, be it employees or resource suppliers. The second is failing to continue with the construction job or delay in continuing with job because of cashflow problems. The worst scenario is when the enterprise is liquidated because it cannot continue as a viable entity.

There could be a number of causes attributed to the poor performance, for example, client, consultant or environment related problems. However, the enterprises themselves have a fair share of the blame and in particular the proprietors. In particular, lack of best practices relating to issues of financial management has been cited (e.g. Sibanda, 2000; Butterworth, 1999) as one of the major contributors of the problem. The problem is exacerbated by lack of adequate

PBFMS, both in terms of design, development, management and commitment to the use of best practices.

If the situation remains unresolved, that is, poor project delivery and construction business failures, it will have a wider implication to various stakeholders including creditors, employees, suppliers, client and the community. For the latter two it is a serious problem because of the government happens to be the largest client and projects are meant for development of communities.

Conducting a study to investigate the nature of one of the possible causes of the problem, especially in SMCEs where it is more acute (e.g. Kale and Arditi, 1998), was an opportune moment.

1.5.2 Research questions

The study was based on answering the following research questions, namely:

- RQ1** *Do SMCEs have adequate PBFMS that facilitate the effective delivery of projects for enhanced financial performance?*
- RQ2** *Is there a relationship between the adequacy PBFMS and poor performance of SMCEs?*

To answer the two questions several objectives were set as described next.

Research objectives

The following objectives were formulated to guide the research based on the various themes related to the PBFMS

- i) To search, identify, review and analyse *theory* and *practices* relating to roles, functions and nature of PBFMS including best practices, competences and attitudes required to operate an efficient and effective PBFMS within SMCEs.
- ii) To identify and analyse intervening factors, especially from the environment, that may act as barriers to the development, management and sustenance of a viable PBFMS in SMCEs.
- iii) To investigate the adequacy of PBFMS used in SMCEs in Botswana.

- iv) To determine if the adequacy of the PBFMS is a contributing factor in the poor performance of SMCEs in Botswana.
- v) To make recommendations arising from the identified gap between the expected and actual functions and fiscal regimes relating to the development, management and sustenance of PBFMS in SMCEs

1.5.4 Research Hypothesis

In order to fine tune the research investigation the following major hypothesis were formulated:

H₀₁: The PBFMS of SMCEs are adequate to facilitate the delivery of project.

H₀₂: The adequacy of the PBFMS is positively correlated with the performance of SMCEs.

1.5.5 Research scope

The scope of research involved investigating small and medium enterprises operating in the construction industry in Botswana. In particular, the enterprises studied were those in class A, B, C and D registered with PPADB and as defined in sections 1.4.2. Secondly, only enterprises which carry out civil and building construction activities were studied, thus excluding electrical and mechanical contractors.

1.6 Overview of the Research Approach

Though a detailed description and discussion of the research process is given in Chapter 4, it is noteworthy briefly indicating how the research problem was investigated.

The main research approach employed was the *survey strategy* using a *self-administered* questionnaire. The approach was chosen due to its appropriateness in solving the problem. Firstly, the problem required describing the nature of PBFMS in SMCEs and in particular investigating whether their attributes measure up to those of the proposed model. Gay and Airasian (2003) noted that a survey study is more concerned with assessing the attitudes, opinions, preferences, demographics, practices and procedures. The descriptors of the

approach are in line with the areas of investigation that the study undertook in solving the problem, for example, issues of practices, procedures, attitudes, demographics were used to understand the PBFMS, the SMCEs themselves, management and employees.

The survey method also allowed an economic and quick understanding of the problem. The economic aspect relates to two aspects, firstly the fact that postal mail was used as a means of communicating the research instrument. This would contrast with an approach which would require, for example, travelling to each of the SMCEs and observe the PBFMS in action for some period of time. Secondly, the approach allowed the studying of a large population of enterprises yet using a small sample and yet the results still remain valid. The approach also allowed the piloting of the measuring instrument as a means of improving its quality and validity.

Using appropriate statistical procedures (from the SPSS software), it was possible to test the major and sub-hypothesis formulated in order to investigate the major premises made at the start of the study.

Ethical issues were also incorporated in the research process. Firstly, this was done by following the regulations relating to research studies in Botswana. The regulations require that any researcher conducting a research study in Botswana, irrespective of the purpose (except for undergraduate project), must obtain a research permit (Republic of Botswana, 2004). The research permit was sought and obtained prior to collecting data. Secondly, and following the ethical and professional conduct espoused by literature from the research community, all due processes were followed in the design of the investigation; in the collection of data and in its processing, analysis and interpretation. All these procedures were geared towards respecting the rights of participants and guard against any harm being done to any person whether physically or psychologically due to the process.

1.7 Perceived Contribution to Knowledge

This section addresses research *study's contribution to knowledge*. It begins by providing a general overview of the attributes of a good doctoral thesis. This is followed by a discussion of the gap in knowledge as synthesised from current literature and indication *of how the study intends to close*.

1.7.1 Attributes of a good doctoral thesis

Some scholars (e.g. Phillips and Pugh, 1994) noted that while a study must show contribution to knowledge, it must also be original. Originality is viewed from the point of view of demonstrating a combination of the following attributes namely, that the empirical work has not been done before; it is a new synthesis that has not been tried before; a new interpretation of existing material; trying out something in a geographical area such as a country that has previously not been carried out before; applying a particular technique in a novel way; introducing substantial new evidence to an old issue; and being cross-disciplinary or using different methodologies (Phillips and Pugh, 1994).

Several authors (e.g. Moses, 1985; Howard and Sharp, 1983; and Phillips and Pugh, 1994) have provided guidelines on which a quality doctoral thesis may be judged as a contribution to knowledge and these include a mastery of a body of knowledge, including an ability to make critical use of published work by demonstrating an appreciation of the relationship of the study theme to the wider field of knowledge; a competence in research processes, including an understanding of, and competence in, appropriate research techniques and an ability to report research; a distinct contribution to a body of knowledge through an original investigation or testing of ideas; and worthy in part of publication.

In the next sections the guidelines are placed in context of the research study, firstly by highlighting the attributes of existing models of financial management systems and the consequently identifying the gap that the proposed model (PBFMS) intends to close.

1.7.2 Existing models

However, a full discussion of each model is given in Chapter 3, the following sections provide an overview of three categories of financial management models namely the generic, project management and construction management illustrated in Figure 1.3. The models depict a move from more generic to more specific financial and construction systems (left to right). The discussion also highlights what *each contributes to the proposed PBFMS model but also highlight what it lacks*.

- ♦ ***Generic financial models***

A number of models have been proposed by various scholars (e.g. Fortune and White, 2006; Fitzgerald *et al*, 1991; Kaplan and Norton, 1992;1996; Hernri, 2004; Rockert, 1979) aimed at developing an effective financial management system for enterprises with the overall aim of providing an efficient and effective financial information infrastructure for use in planning, performance measurement and control. The models target the most important processes of any enterprise namely strategic and tactical (operational) planning and control with the overall aim of providing enterprises with strategic direction and operational performance to achieve a sustained competitive advantage in their selected markets as illustrated in Figure 1.2 (a). However, most of the models have focused on the manufacturing and other service related sectors and rarely, if at all, on the construction sector.

The realisation that such models do not address the peculiar nature of project based work led to project management associations to develop specialised project management models briefly discussed next.

- ♦ ***Project management models***

Project management associations, for example, the Project Management Institute (PMI) of USA and Association of Project Management (APM) of UK have provided guidelines on a number of aspects related to the planning, implementation and control of projects in the body of knowledge (BoK). As a consequence they provide projects based organisations guidelines on how to develop their financial management systems.

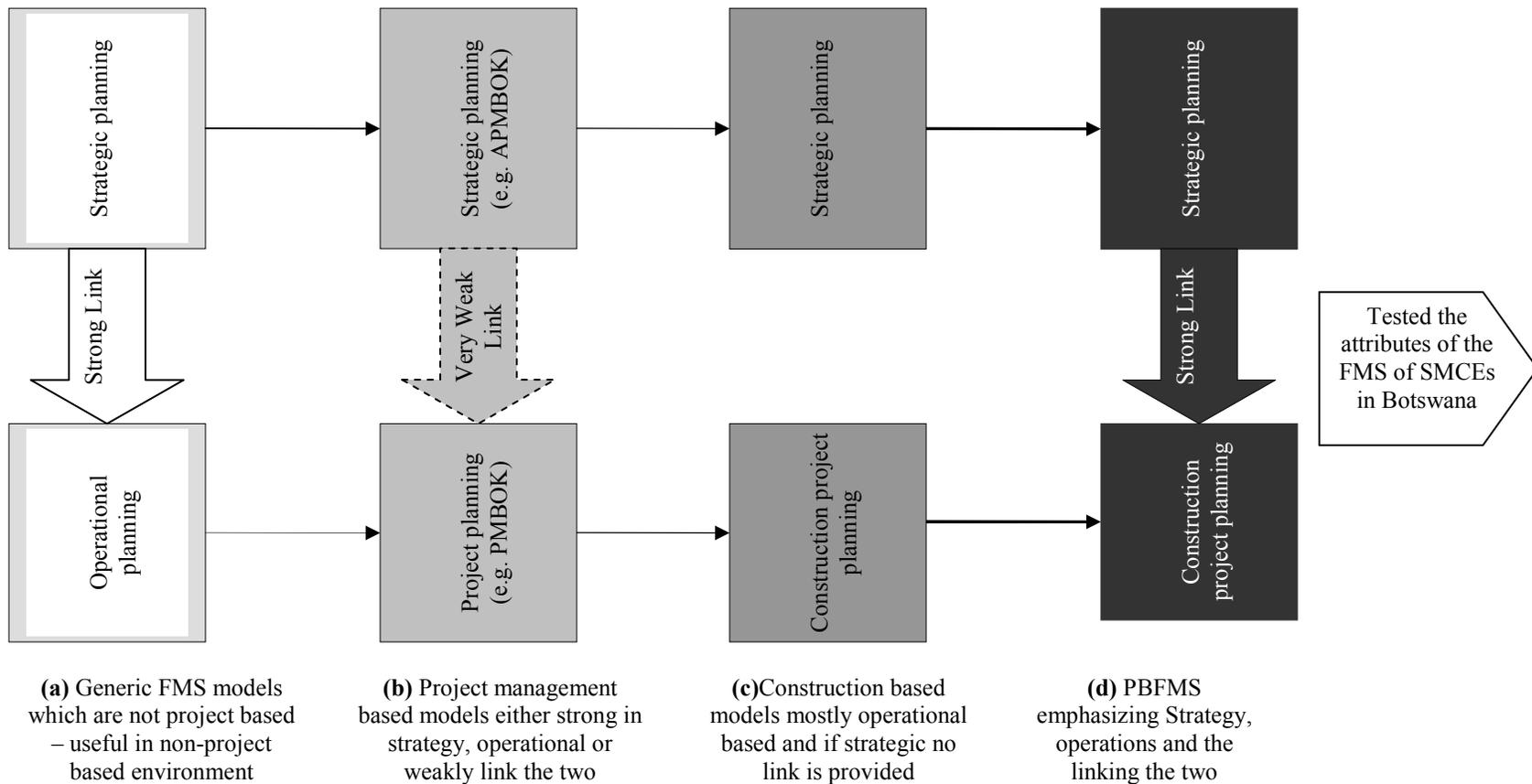


Figure 1.3 Development of a PBFMS using various models

However, the models proposed by the two associations are very generic in nature, in the sense that they address the life-cycle processes of any project in any sector be IT, manufacturing or service industry (see Figure 1.3b). In addition, as Burke (2003) and Morris *et al.* (2006) noted, they emphasise on two different aspects. Burke (2003) observed that the PMBoK (especially the first to the third edition), were inwardly focused dwelling on the need for an efficient and effective project execution through meticulous planning, implementation and control. They lacked the linkage between Strategy and the projects. This was later addressed, though briefly, in the fourth edition (PMI, 2004)

On the other hand, 5th edition of the APMBok provides guidelines on project management from a strategic point of view by addressing the way a project... *is defined and developed and how it may be related to programmes, portfolios and the strategic intent...* (Morris *et al.*, 2006:462). Burke (2003) called this approach the front-end process view.

However, both BoKs do not provide a practical step-by-step approach to the core business of construction enterprises namely project tendering, planning, execution and control. Despite some shortcomings, substantial material from the two BoKs (APMBok and PMBoK) has been used in developing the PBFMS. It is important to note that other literature sources (Kerzener, 2003; Meridith and Mantel Klastorin, 2004), with similar project management prescriptions were also considered. This has been done in conjunction with more specific construction based models of which a brief analysis of their suitability is discussed next.

♦ **Construction models**

Construction financial management models provide a more focused approach for dealing with construction projects. However, like the PMBoK, most of them lack the strategic link to operational (project) planning, for example, scholars like MacCaffer and Baldwin (1995), Ndekugri and MacCaffer (1988), Smith (1995) have provided models that provide eloquent prescription of the pre- and post tender process and activities stage without linking them to strategy (see Figure 1.3c). Thus, while the models address the basic tenets of the work in construction enterprises and the need to treat each project on its own merit during planning and execution, they fail to link it to the strategic intent of the enterprise. However, they

provide the necessary ingredients for the functions performed in a construction enterprise including project planning (scheduling, tendering and cashflow forecast), risk evaluation, tendering, valuing and control.

Some scholars have addressed the issue of strategy in the construction industry on its own, for example, (Ofori and Betts, 1992; Ngowi and Rwelamila, 1999; Warszawski , 1996; Junnonen, 1998; Kale and Arditi, 2003) but again without linking it to operations. Some are of the view that while strategy is an important issue in the large corporate world it is difficult to implement it in the construction industry especially at the lower end of the enterprise size continuum (e.g. Ofori and Betts, 1988; Kale and Arditi, 2003). The view taken here is without strategy no enterprise survives the competitive environment and hence the strategic intent must not only exist but it must be linked to the business of acquisition and operation.

With that background the next section briefly highlights a case for the development of PBFMS and hence the gap in knowledge that the study fills.

1.7.3 The PBFMS model.

It has been stated that the generic FMS used in manufacturing, retail, manufacturing or service industries do not adequately address the needs of the construction industry. The models provided in the PMBoK try to address the project nature of the construction business but not in specific terms. Moreover, each BoK emphasises a particular aspect, that is, APMBok addresses the project's strategic link while the PMBoK addresses the efficiency and effectiveness of project planning and execution (Morris *et al.*, 2006). In the same vain the construction specific models address either the strategic aspect or the operational aspect.

Therefore, the study develops a model that provides a strategic link to operational aspects of a construction enterprise. The model is based on the premises *that effective* management of the construction business must be based on the strategic intent of the construction enterprise. Strategy must guide the manner in which a construction enterprise selects its markets and hence the projects to tender for. Secondly, there should be a step-by-step guidelines relating to processes of acquiring (tendering) and executing (operations) jobs how awarded tenders

are executed emphasising the need for efficiency and effective in order for the enterprises to remain competitive.

Furthermore, a search of literature revealed that while there are studies on the construction industry in Botswana none has been conducted empirically relating to financial management in a project based environment and in particular the construction industry.

Therefore, the proposed model, termed as the PBFMS is the study's contribution to knowledge. It closes the gaps identified in the models reviewed in section 1.6.2 and discusses in detail in Chapter 3. In addition, the model is tested on SMCEs in Botswana to see the extent to which they conform to the attributes of model as a measure of their adequacy.

1.8 Chapter Summary

This Chapter has introduced and provided a background on issues relating to the research problem by firstly introducing the problem from a wider context until it was narrowed down to domicile of the research setting in Botswana. The second part of the Chapter defined the research problem by defining the key terms. This was followed the provision of the problem statement, the research question, objectives, hypothesis and scope. The third part provided an overview of the methodology adopted in the study while the fourth part of the Chapter provided a discussion of the research's contribution to knowledge.

Chapter 2 discusses the *SMCES environments as way of contextualising the nature of the environment in which PBFMS operate*. The Chapter is therefore divided into two major parts enterprise development and the construction industry. Enterprise development underpins issues that affect the performance, growth and development of enterprises using three major factors - proprietor, enterprise and environment. The second part of the chapter highlights a number of issues including a description of the industry, particularly by highlighting the unique features of the industry. Following on this generic discussion the third section focuses on construction in Botswana by highlighting its role in the economy, capacity and past performance. In pursuit of this, and where possible, a comparison of construction industries of a similar nature in the region is also performed. The Chapter ends with an overview of the

problems and challenges that are faced by construction enterprises in general and in Botswana.

Chapter 3 develops the theme which was touched on in Section 1.3.5 regarding the role and *functions of the PBFMS* with the aim of focusing on the latter. Several frameworks are used to describe the functions of PBFMS in a construction enterprise, including planning-control, accounting and finance, project management and others. In addition the attributes that make an adequate PBFMS in SMCEs are highlighted including behavioural issues. Essentially this leads to developing best practice PBFMS model for the SMCEs. Once the model is developed, the second part of Chapter 3 is devoted to discussing the various parts of the model namely strategic planning, operational planning and control in the context of the work performed by SMCEs, that is, construction projects. This section further underpins the best practise of PBFMS and what to expect in SMCEs.

Chapter 4 discusses the *research methodology* adopted for the study in three parts. The first part examines the philosophical context of research with a view to placing the research study in the context of research methodology framework. This culminates in identifying and justifying the most suitable research approach used in the study - the questionnaire survey method. The second part of the Chapter describes the questionnaire survey method in detail as guide to its implementing in the study. Needless to say the discussion includes issues of sampling design and actual sample determination. The last part of the Chapter discusses the design of the data collecting instrument – the questionnaire - and the means of validating and administering it.

Chapter 5 presents *the research results*. It begins firstly, with a description of the nature of response obtained during data collection resulting from a self-administered questionnaire sent to SMCEs. The third section of the Chapter describes the ‘demographic’ profile of respondents. The fourth section looks generally at the manner in which data was analysed. The fifth section provides an analysis of the findings relating to the major themes of investigation addressing the conjectures posited in Sections 1.5.2-1.5.4 relating to the components of an efficient and effective PBFMS.

Chapter 6 presents a *discussion of the findings of the study* based on the results obtained and presented in Chapter 5. The Chapter presents the findings in two themes related to the major hypotheses of the study namely that the PBFMS of SMCEs were considered inadequate to facilitate the strategic and project planning and control processes; and that the lack of adequate PBFMS exacerbated poor performance of SMCEs in Botswana

Chapter 7 provides the overall *conclusions* of findings of the study. The Chapter also provides some *recommendations* based on the identified gaps.

CHAPTER 2: THE ENVIRONMENT OF PROJECT BASED INFORMATION SYSTEMS

2.1 Introduction

Chapter 1 introduced and defined the problem of study as being an investigation into the *adequacy of project based financial based management systems (PBFMS) in small and medium construction enterprises (SMCEs) in Botswana*. The Chapter also alluded to the fact that the inadequacy of the PBFMS could have significantly *contributed* to the poor project delivery and business failures experienced in the construction industry, particularly in the small and medium sized enterprises. This Chapter contextualises the SMCEs and indeed PBFMS in the environment in which they operate to provide a holistic picture of the nature of the problem. The Chapter is based on the view proposed by Leedy and Ormrod (2005) that an associational and historical perspective relating to the problem of study in question is needed to identify (i) what other scholars have found in similar studies, and (ii) how they approached some of the teething issues relating to the concepts, theories and methodologies relevant to the topic under investigation.

This Chapter is therefore, divided into two major parts, the first discusses issues related to the internal environment of the enterprise, particularly enterprise growth and development. The discussion is generic in nature with no sector in mind though there is always a temptation to refer to the construction industry. Theories and concepts which have been developed to aid understanding the challenges and problems facing enterprises are discussed, particularly a growth from micro through small, medium to large enterprises. The presumption is that some challenges of growth are common to all enterprises in the various sectors of the economy.

The second part of the Chapter focuses on a specific environment namely the construction industry. The section starts by firstly looking at the external environment from a macro point of view. It then focuses on the construction industry by highlighting its nature and its role in national development to emphasise the importance of the study. The section ends with a closer look at the Botswana construction industry, in terms of its size, past performance, key

players, particularly the government. Where appropriate, a comparative performance of the industry with a few of the neighbouring countries namely, Namibia and Zimbabwe is given. The section ends with a discussion of the problems and challenges of the construction industry.

2.2 Framework for Further Discussion

The last section alluded to the fact that enhanced performance leads to growth of enterprises. Growth models have therefore been proposed to attempt and identify factors that enhance performance and growth. There is a dearth of propositions attempting to explain factors that could lead to the success of organisations. Thus identifying SME problems and formulating associated solutions could enhance their performance. In this spirit various scholars have formulated a number of frameworks which try to explain factors which influence the development and performance of SMEs, for example, the multiple realities (Hill and McGowan, 1999), programmed or un-programmed (March and Simon, 1958), and strategic and operational framework (Drucker, 1954). Adams and Hall (1993) expanded the factors to include internal (e.g. organisation structure, resources base, innovative capacity, marketing mix strategy) and external to the business (e.g. socio-economic, legal and political regime all of which are beyond the control of the decision maker). Cowan's (1990) added the human aspects (personnel and management) but agreed that the internal environment (strategy, production, operations, management information system and data processing, accounting, marketing and communications) and external environment (including customers) as factors that could inhibit or enhance enterprise performance. In general, each framework offers something of value to improve the understanding of performance problems of SMEs (Cowan, 1990). This study however, uses a simple framework modelled on an analogy of a motorist embarking on a journey though it incorporates the contribution of other scholars.

2.2.1 The motorist-car-road system analogy

The problems of SMEs may be described using an analogy of a motorist embarking on a journey from point A to point B. The objective of the motorist is to arrive at point B at a scheduled time and in the most comfortable, safe and cost effective manner. Some of the

factors leading to a safe and successful journey are within the control of the motorist, for example, the motorist must be competent in driving, must ensure that time is managed, the car is mechanically sound, filled with fuel and must know the route to point B. However, some aspects are not in the driver's control, for example, the motorist has no control over the road system. The condition of the road may seriously affect both his driving performance and that of the car. The road system may be jammed with traffic; the road may be bad, perhaps narrow or filled with pot holes. Bad weather may be encountered, particularly rain, fog or snow. Each variable or combination of, may lead to poor performance in terms of the objectives of the journey. The motorist may try to be alert and listen to weather forecasts or warning signs but cannot confidently be in control of the road system environment. It is fair then to say that the performance of the motorist during the journey is contingent to how the three factors motorist, car and road system (MCR), ecologically fit together. This analogy could as well be extended to enterprise performance as discussed next.

2.2.2 The proprietor-enterprise-environment analogy

The MCR analogy may be extended to an enterprise which has its mission and goals to achieve. The motorist is analogous to a *proprietor*, the car to an *enterprise* and the road system to the *business environment* as illustrated in Figure 2.1.

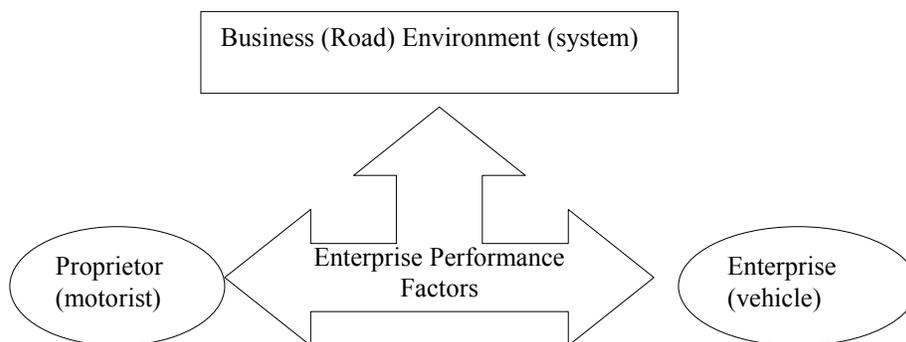


Figure 2.1 The MCR and PEE analogy - three performance factors

Like the motorist who plans a journey, the proprietor identifies business projects, plans how to execute them and supervises their implementation. Implementation requires mobilisation and organisation of the necessary resources for production followed by marketing the products in the selected markets to get revenue. The activities of the enterprise are carried out

in a business environment, laden with resource constraints, statutory laws and competition just as a road system has numerous constraints. Success is only achieved if there is a fit between the capabilities of the proprietor, enterprise and the environment (PEE). This 'fit' is dynamic and therefore success is dependent on how, the proprietor constantly mobilises and organises the resources of the enterprise in the prevailing environment. Thus the model in Figure 2.1 may be modified as illustrated in Figure 2.2.

The discussion in the rest of the Chapter is based on the model illustrated in Figure 2.2. The premise made here is that each of the three variables are identified as the most significant in enhancing or inhibiting performance and hence the growth of SMEs. In addition, it would be presumptuous to perceive the three variables as if they are completely independent. If anything they are closely interrelated, for example, a good entrepreneur would find it a struggle in an environment that is not conducive to business, where there is no law and order.

With that analogy, the next sections examines at the three factors with a view to discussing how they affect performance.

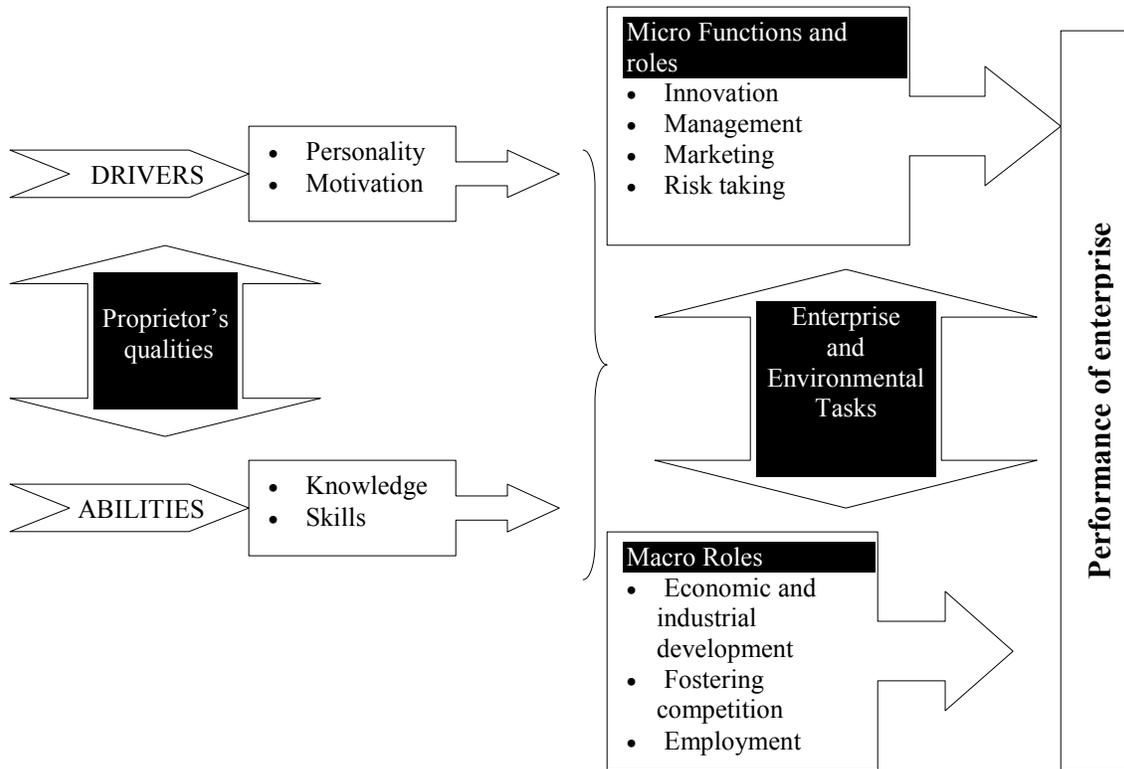


Figure 2.2: A summary of SME growth variables

2.3 The Proprietor

A proprietor is a person who creates a business enterprise and subsequently makes the major decisions in an enterprise. In small businesses the owner is normally the manager, also referred to as the owner/manager. Huuskonen (1993) asserts that the ideas of a proprietor dominate strongly the choice of strategy, organisational form and other major decisions. The success of a firm, therefore, is highly dependent on the capabilities of the proprietor as shown in Figure 2.2. Most studies carried out to identify business failures have indicated that proprietor related reasons stand out on top of the list (Said and Hughey, 2001; Xulei and Alan, 1999; Young, 1977; Dandridge and Sewall, 1978). As a result, for a long period of time, numerous studies have been devoted to understanding and harnessing knowledge and skills possessed by successful proprietors.

In many instances successful proprietors have been labelled entrepreneurs. This inference has drawn a lot of literature on entrepreneurship. Many propositions have been made by

academics and practising managers, for example, that not all proprietors are the same (Aldrich and Auster, 1986; Brockhaus and Horwitz, 1986; Schumpeter, 1934). The second proposition is that entrepreneurship is a learned and is not a borne phenomenon (Drucker, 1985). Such assumptions have led entrepreneurship theory to feature prominently in SME literature. The topic is worth exploring further in order to paint the portrait of an entrepreneur. The portrait is sought a view to harnessing knowledge, skills, personality and motivation of such individuals influence in operating enterprises.

2.3.1 Identikit of an entrepreneur

Like many other scholarly subjects there have been numerous debates on the merits, truths and practicality relating to entrepreneurship theory. Very little common ground has been reached in developing the identikit of the entrepreneur. This led to Wilken (1979) summarising the efforts of economists and other scholars like psychologists, are futile in attempting to have a unified agreement over the characteristics of an entrepreneur. The entrepreneur remains a mysterious business alien. However, despite the disagreements there is a linking thread in the literature on entrepreneurship. The portrait of an entrepreneur has often been painted in at least three identifiable ‘colours’ namely, role-function, motivation and personality (Miettinen and Hedberg, 1993). Many scholars have often incorporated this colour scheme in the identikit or definition of an entrepreneur, for example, Philipsen (1998) observed that entrepreneurs operate at both macro and micro level and this aspect is explored in the next discussions.

2.3.2 The role and functions of an entrepreneur

The former is the role of the entrepreneur as viewed from a macro (strategic) point of view while the function may perceived at the micro (operational) level. It must be said though that the demarcation is often blurred. We examine each view in the next sections.

- ***Role of an entrepreneur***

The role of an entrepreneur in the economy was first recognised by an 18th French economist, Richard Cantillon, as that of an economic agent who marshals factors of production, namely land, capital and labour, into a wealth-generating venture (Cantillon, 1931). The view was

supported another French economist, Jean Baptise Say, who described an entrepreneur as a person who shifts economic resources out of an area of low productivity to one of high productivity and greater economic return (Vosloo, 1994).

Formaini (2004) noted that Francios Quesnay, the 18th century scholar added the role of entrepreneur as that of introducing of new methods and products and a search for new markets. The observation could be earliest identification of the concept of innovation. The concept of innovation has now been realised as one of the major functions of the entrepreneur by various gurus on the subject including Schumpeter (1942, 1934) and Kirzner (1985). According to Marshall (1961) and Drucker (1985), the ability to innovate is what distinguishes entrepreneurs from ordinary proprietors.

Schumepter's work (1934, 1942) has been hailed as the most pioneering in the modern entrepreneurial thought particularly, by extending the role of entrepreneurs from a macro to a micro economic level (Vosloo, 1994). Schumpeter identified the role of an entrepreneur in the economy, his functions in the enterprise and the necessary qualities needed to achieve success. The entrepreneur upsets and disorganises markets by using innovations, which appear in the form of:

- i) introduction of a new good or quality of a good,
- ii) introduction of a new method of production,
- iii) opening of a new market,
- iv) utilisation of some new sources of supply for raw materials or intermediate goods, and
- v) reorganisation of the industry.

Supporting Schumpeter's theory of innovation, Drucker (1985) asserted that what is common to all successful entrepreneurs is not the personality or motivation but commitment to systematic practise of innovation. It is the means by which the entrepreneurs either create new wealth-producing resources or enhance existing resources with a sharpened potential for creating wealth. The function of an entrepreneur, therefore, is very specific - innovation (Drucker, 1985). Kirzner (1985) joins Drucker in this modern school of thought by asserting that innovation is actually spontaneous un-deliberate learning. It is the means by which

entrepreneurs either creates new wealth-producing resources or enhances existing resources with a sharpened potential for creating wealth.

It is noteworthy that while most scholars may agree on the key functions of the entrepreneur mainly that of innovation, there has been disagreements on the state of the market prior to the entry of the entrepreneur. Neo-classic economy postulated that the forces of the market operate to bring it in equilibrium. The theory was premised on the notion that the economy must always seek equilibrium. On the contrary, Schumpeter (1934) argued that equilibrium is destroyed by the very nature of, and entry of the entrepreneur. For Schumpeter (1934) the ability for the entrepreneur to identify new opportunities in the market is a central entrepreneurial activity, which creates disequilibrium or creative destruction.

Kirzner (1985) agreed with Schumpeter on innovation but differed regarding the effect of the actions of the entrepreneur on equilibrium. Kirzner (1985) emphatically noted that the market is always in disequilibria. According to Kirzner (1985), the entrepreneur notices the disequilibria in the market and comes up with an innovation which will bring back equilibrium.

Perhaps a contemporary view is best summarised by Formaini (2004) who observed that, economic equilibrium exists in theory but not in practise. Secondly, it does not matter whether the entrepreneur is viewed as disrupting the pre-existing equilibrium or as creating a new equilibrium. Entrepreneurs are individuals who are alert and ready to exploit the imperfections of the market (Formaini, 2004). Therefore, the entrepreneurs are individuals who take certain actions based solely on a perception of market opportunities and the desire to exploit them.

- ***Function of an entrepreneur***

The function of an entrepreneur comes at an industry and enterprise level and various scholars have identified a number of activities that entrepreneurs need to perform to have a successful enterprise. The entrepreneur, for example, must perform all the managerial functions (Marshall, 1961). The functions are planning, organising, leading, coordinating and

controlling as proposed by Fayol (1967) and to these we add those of Mintzberg (1975) namely interpersonal, informational and decisional managerial functions (though referred to as roles). It is opportune to add with hindsight from previous discussion that the involvement in these functions diminishes as the enterprise grows and delegation of duties increases.

Some scholars seem (Deamer and Earle, 2004) to agree on a few extra functions, for example, marketing is a crucial task in developing and sustaining a business venture or commercialising an innovation, for example, what Say (1845) described, as a 'tolerable accuracy in estimating demand' is tantamount to marketing services or products. Marketing is about identifying the needs of consumers and then estimating effective demand and matching it with a supply of services (Kotler and Armstrong, 1991).

Other scholars (e.g. Knight, 1971; and Mises, 1963) have suggested that risk taking may be should be included in the list of functions. Others (e.g. Yamada, 2004) have suggested that it is a function which may be passed on to, say financiers, once the entrepreneur has brought forward an innovative idea. This may be true for large enterprises but most often for SMEs, entrepreneurs carry all the risk especially in the infancy of their businesses when the financiers are not willing to finance them. Furthermore, for those who leave employment to start businesses, risk is not only about money, but risking losing social status, career, income security and power that may be commensurate with employment. In environments, akin to most of the developing nations, the availability of savings as start-up capital is a sign of the risk that proprietors take on.

The above discussion highlights two of the colours of an entrepreneur - the roles and functions performed at a macro and micro level. They reinforce the observation already made in Section 1.3 about the role of SMEs in an economy. The next colour scheme looks at the personality of an entrepreneur.

2.3.3 The Personality of Entrepreneurs

There are suggestions from literature that apart from the ability to innovate, entrepreneurs exhibit extraordinary traits as individuals that endow them to pursue their innovations

successfully (Brockhaus, 1982 and Smith, 1967). Burnett (2003) argues that skills associated with entrepreneurship are rare in supply. Table 2.1 shows examples of the descriptions that scholars have used for entrepreneurs. Note that the ability to innovate has also been identified as a trait but in this discussion it remains to be viewed as another role of the entrepreneur.

Table 2.1: Descriptions of entrepreneurs as identified by various scholars

<p>...have qualities of judgement, perseverance, knowledge of the market, tolerable accuracy in estimating demand, capabilities of production and the art of superintendence and administration. (Say, 1845).</p>
<p>...have the ability to inspire others (visionary leadership) and do not accept boundaries of structured situations (innovation) (Schumpeter, 1934).</p>
<p>... have judgement, ambition, need for achievement and locus of control (Brockhuas, 1982;McClelland, 1987; Long,1983).</p>
<p>...self achievement, avoiding risk, feedback of results, personal innovation and planning for the future (theory of inducement systems); desire to achieve through one's efforts, a desire to make moderate risks, desire to a clear index of performance, a desire to introduce innovative solutions and desire to anticipate future possibilities (Miner, 1984).</p>
<p>...intelligent and analytical; effective risk manager and networker; possesses a strong set of moral, social and business ethics; exhibits a basic traders instinct; and is dedicated to long life learning in its many forms (Morrison, 2000).</p>
<p>... are alert to opportunities; innovative; experienced in the industry of business; networks and share common values with key players in the market; personal knowledge of business partners; ability to mobilise intangible assets (Kuznetsov <i>et al.</i>, 2000; Drucker, 1985).</p>
<p>... have a good nose for business, desire to take risks, ability to identify business opportunities, ability to correct errors effectively, and the ability to grasp profitable opportunities (Littunen, 2000).</p>

From Table 2.1 it is clear the list of characteristics of an entrepreneur is never exhaustive. Moreover, the abilities of entrepreneurs seem so vast that very few people can exhibit them all in the same combination. However, some descriptive aspects are common, for example, good judgement, perseverance and knowledge of business and need for achievement have been cited by almost all scholars. The last characteristic indicates that it is important to have driving force to fulfil the roles and functions.

Motivation explains why people are in business and not, for example, in employment. The reason they are in business may further explain their ultimate performance and hence their desire to grow. Psychologists and socialists have led the way in explaining not only characteristics of entrepreneurs but their motivations. Psychologists have examined the individual's inner self while the sociologists have studied the influence of the environment on the individual.

Huuskonen (1993) argued that there are three sets of motivations namely general background (sociological), situational or contingent factors and personal factors (psychological). McClelland (1987) noted that the need for achievement is the driving force for entrepreneurship. Rotter (1966) focused on the internal locus of control while Dyer (1994) added risk taking as part of the entrepreneurship drive.

Sociologists have associated the entrepreneurship drive with an individual's background influences such as gender, culture, ethnicity, origin and education. Huuskonen (1993) pointed out that background, experience, values, attitudes, personality and needs have an influence on the kinds of observation that a person makes on business opportunities. People use prior knowledge and value system to select, classify and generalise incoming information on a daily basis to exploit opportunities. People are most likely to form favourable beliefs and value about business if they worked in a small business or have been involved in their parent's or a relative's business before (Bowen and Hisrich, 1986).

Morrison (2000) observed that the cultural context in which persons are rooted and socially developed plays an influencing role in shaping and the degree to which they make entrepreneurial behaviours desirable. Culture also affects our decision making process including going into business and the decisions we make while in business. The term entrepreneurial culture has been coined to illustrate the comparative levels of entrepreneurial intensity between nations (Bateman, 1997). Entrepreneurial culture is not only geared to giving hope and future aspiration to business but to society in a given country (Weber, 1976). Entrepreneurs respond to the changes of a particular market by being receptive to changing demands, innovations, products, opportunities and technologies. Entrepreneurship

programmes should therefore emphasise the differences, rather than offering globalised, conglomerate and sanitised practices of large corporations (Morrison, 2000).

Baumbach (1988) concur with Huuskonen (1993) that situational or contingent factors may lead individuals to venture in business. A study by Robertson *et al.* (2003) highlighted that entrepreneurial intensity was greatest amongst those who started their business, followed by those who purchased it and lastly those who inherited it. Success was lowest for those who were promoted or brought in the enterprise to be partners. Robertson *et al.* (2003) divided situation factors into two, namely push and pull. Push factors include (Brockhaus and Horwitz, 1986):

- i) lack of job opportunities arising from being fired from work, retrenched, retired or lack, employable qualifications, and work frustrations e.g. not being promoted
- ii) the appearance of an opportunity or chance to make money,
- iii) being enticed by a government policy to join the bandwagon of business people, for example, empowerment policies (affirmative actions, indigenous, minority), diversification policies, or incentives for remote location,
- iv) taking over a business due to incapacitation or loss of a relative,
- v) political upheavals, for example, confiscations or nationalisations of businesses.

Pull factors include (Stanworth and Curran , 1973) independence by being an own boss; doing enjoyable work; serving the community, desire for earnings, profit, growth, freedom, quality; provide a personal service; creating a successful enterprise that will provide self-esteem and recognition.

Therefore, research relating to business motivation whether is due to psychological, sociological or situational factors underpins the fact that not all proprietors have the same drive towards the businesses they pursue. Therefore, if some businesses do not grow it may be due lack of motivation.

2.3.4 Turning a proprietor into an entrepreneur

The preceding discussion has highlighted that entrepreneurs have special capabilities in terms of personality and motivation and which combine to form an entrepreneurship package consisting of special skills and abilities. The discussion has shown that growth and sustenance of business lies in innovation (MacAdam and McConvey, 2004). Scholarly work on entrepreneurs can be of great use in shaping ordinary proprietors to emulate the success of entrepreneurs. According to Marshal (1961), Drucker (1985) and other scholars noted individuals can be taught to acquire the abilities that are necessary to be an entrepreneur (Burnett, 2003). In addition, Drucker (1985) noted that entrepreneurs are neither born nor are they a genius breed. He emphasises that the attributes of entrepreneurs are neither mysterious nor genetic. Entrepreneurship is a learned ability, requiring great discipline. Therefore, like any endeavour, innovation requires talent, ingenuity, knowledge and perseverance. Like any talent, it also requires unlocking. It is one the most encouraging piece of information in the theory of entrepreneurship because it means entrepreneurs can be bred, their potential exploited and the national entrepreneurship intensity increased. In world today, increasing the stock of entrepreneurs is one of the major aspirations of any modern and market oriented nation.

Proprietors need to acquire the basic business skills, the correct motivation and personality required for business management. In a further attempt to explore the subject of entrepreneurship, the research community has developed frameworks that link entrepreneurship with ordinary business owner. Smith (1967) provided a continuum which characterises entrepreneurs as opportunistic and craft oriented. The former reflects an individual who reacts to a broad range of cultural issues, exhibits breadth in education and training, high level of social awareness and involvement, flexibility, confidence and an awareness and orientation towards the future. The opportunist individual is motivated by the desire to achieve economic gain and to build an organisation. They are hence a growth oriented and less likely to feel that living at a particular level of success is comfortable. A craftsman reflects the opposite on each dimension of the opportunist. They are motivated by being able to (i) do want they want (ii), meet their personal and family needs and (iii) avoid

working for others. A synthesis of the above description of an entrepreneur is summarised in Table 2.2 in form of role-functions, personality and motivations.

The discussion has attempted to provide an understanding of the identikit of an entrepreneur with a view of harnessing the skills and transferring them to the proprietor. It has shown what a proprietor needs to do for an enterprise to achieve above average performance. The roles, functions and behavioural traits have been highlighted which are necessary for running a successful enterprise. The appreciation includes understanding the contribution of a financial management systems would make in achieving success. The next section discusses issues relating to the enterprise, in its own right.

Table 2.2: Summary of the attributes of an entrepreneur

Attribute	Description
Role - functions	Industrial and economic development; fosters competition; creates employment : macro level Innovation, management functions (planning, coordinating, leading and controlling) and roles (interpersonal, informational and decisional) : micro level
Personality	Inexhaustible but impartment ones are alertness, judgement, networking, risk taker, knowledgeable, perseverance, willing to learn
Motivation	Inexhaustible but main ones are achievement, internal locus of control, wealth maximisation.

2.4 The Enterprise

It is difficult to separate the enterprise from the owner especially in SMEs where there is a close relationship. The problems of the owner and enterprise tend to be intertwined. However, there are specific problems associated with enterprises as entities arising from their size, age, growth and the resulting perceptions held by key stakeholders against the enterprise including employees, creditors and suppliers.

2.4.1 Nature of enterprises

Enterprises are like *homo sapiens*, they are born, grow, mature and some ‘die’. However, unlike the home sapiens a number live on in perpetuity. Again like their human counterparts, whose journey through adulthood is riddled with challenges and problems, enterprises are

constantly challenged by the need to survive and grow. Survival is brought by competition for resources both in the inputs and output markets and other environmental issues. Thus, it is important to discuss enterprise development to underscore some of the challenges they face in their growth and development and in particular the role played by both the entrepreneur and the business environment. In a way this dynamics has a knock-on effect on the manner in which the financial management systems are developed and managed. The discussion starts with a brief discussion of some theories of enterprise growth and development.

2.4.2 Theories of growth of SMEs

The research community has established two aspects in relation to small businesses namely, enterprises seek to grow or not to grow (Stanworth and Curran, 1973). Secondly, both situations create problems and challenges to the enterprises. This section is more concerned with the challenges of growth and development.

The journey of growth of enterprises is riddled with challenges, surprises and opportunities. SMEs experience a pattern of functional problems, priorities and issues as they develop necessitating responses of different sets of managerial knowledge, techniques, styles and approaches (Kazanjian and Drazin, 1990). Scholars have hence developed models seeking to shed light on the growth process of businesses (e.g. Vozikis and Glueck, 1990; Greiner, 1972; and Churchill and Lewis, 1983). The frameworks attempt to provide an explanation of how challenges affect business aspects such as performance, structure, communication, management style and strategy. Most models have been founded on the premise that growth proceeds in distinctive stages and in almost a linear fashion.

Most of the models are explicitly and implicitly based on the premise discusses in Section 2.2.2 that performance and growth are functions of three variables namely, the proprietor, enterprise and the business environment.

The models point to the fact that the growth of small firms is driven by interactions of the following aspects:

- i) Profile of the owner-manager in terms of personality, motivation, education, management style and skills, age, family history and cultural background (Storey, 1994; Gibb and Davis, 1990).
- ii) Business profile which includes age, size, legal form, ownership regime, succession plans and financial structure (Gibb and Davies, 1990).
- iii) Organisational development profile development profile which focuses on the importance of how the business fits in its environment (Poutziouris, 2003).

These aspects look at the learning process and competence of the enterprise for its core and support activities and how they strategically fit in a dynamic market environment and how this affects performance and growth (Kaplan and Norton, 2000). The growth models give an insight of how growth necessitates internal changes which involve as according to O’Gorman and Doran, 1999:

- i) a need by the owner to learn more skills.
- ii) changes in organisational structures, systems and procedures.
- iii) introduction of a professional management style as the organisation becomes complex making a change from ‘doer’ to manager and hence greater delegation.
- iv) changes and introduction of more sophisticated communication and information systems.

Another analysis of the growth models was conducted by Gibb and Scott (1990) who noted that that growth may be hampered by the personality, vision, personal goals and capabilities of the owner-manager. Secondly, the enterprise may also be hampered by organisational development: in terms of how the organisation seeks to influence changes in the markets, finance, ownership and control for its benefit. Lastly, lack of effectiveness in areas of functional management (planning, organising, leading and control) and formal strategic orientation may hamper growth and performance.

All these views underscore one aspect, that failure to appreciate the stage-wise nature of growth of enterprises, however vague the stages are, may inhibit progression to the next stage. The enterprise may either stagnate or shrink, a view reinforced by Cashmore and Lyall (1991) when analysing Greiner’s growth model. In addition, to sparking off crisis of

leadership, autonomy, delegation, coordination and collaboration, each growth stage requires developing an appropriate information system. Cashmore and Lyall (1991) emphasised that the information and communication systems should evolve from informality to formality, from simple book keeping to efficient and effective management and financial accounting systems with fully fledged procedures for processing information to aid decision making.

As a summary, one of the most relevant aspects arising for the growth models is that they continue to reinforce the notion that key variables pertinent to enterprise performance are the proprietor, enterprise and business environment. While the interaction between the three variables is a dynamic one, they must be in sync with each other for enhanced performance and to foster enterprise growths. In particular, the models emphasise that the proprietor and enterprise characteristics combine to affect several aspects of business performance. The growth from a small to a large enterprise is a challenge to proprietors and management who have to make decisions about investments, markets, products and systems including PBFMS. The greatest challenge is to make them efficient and effective as the enterprise grows. The next section examines the last factor, the external environment in the PEE framework developed in Section 2.2.2.

2.5 The Enterprise External Environment

Organisations, including SMEs, do not operate in a vacuum (Gartner, 1985) but interact with an external environment, or business environment, referred to as here as simply the environment. The environment is that sphere of influence for which the enterprise has no control (Brooke *et al* 1991) as in direct contrast with the internal environment, which, is in the ambit of the proprietor and enterprise. Most often the environment influences and affects the conduct and performance of SMEs (Baker, 1985). Adegbite (1986), comments that the challenges of business are best appreciated within the context of these environments since they provide business opportunities but equally foster threats to enterprises.

Environments may be divided into two layers which according to Brookes *et al* (1991), may be viewed as micro (also referred to as the task, market, industry or sector) and macro (or

general) environments. The micro environment interacts more directly with the enterprise, for example, customers, suppliers, creditors, trade associations and tax authorities. The macro environment refers to loose interactions and influences due to political, economic, social and technological aspects, normally abbreviated as PEST.

The argument being made here is that the changes of the macro environment may affect the micro environment, or the enterprise directly. In both cases the effect of the macro environment will affect the PBFMS through the enterprise. From that point of view the discussion will concentrate on the micro environment which is closer to the enterprises and whose effect will be felt more by both the enterprise and in most cases by the PBFMS. However, using the PEST framework a few relevant aspects are noted.

2.5.1 Political

The political environment is associated with the decisions and actions of a political system in as far as they affect business policies. The level of stability of the political environment highly affects the business environment. Without political stability, there is hardly any business investment, both from internal and external sources. Adegbite (1986) noted that the stability of government is of particular importance to enterprises because businesses need stable policies and if there is a change it should be gradual. Secondly, politics affects the state of the economy and hence business. In the context of construction, Jaselskis *et al* (1998) commented that governments directly influence the public construction sectors by setting the (i) level of expenditure and hence development, (ii) the contractual relationships and thirdly by proclaiming policies which affect the procurement regime. The influence can be in form of policies and legislation regarding licenses and permits, sanitary and building codes, minimum wage rates, corporate taxes, rules of importation of materials and spare parts, terms and availability of financing for construction. A typical example of such policies is that of preferential procurement in South African aimed at black empowerment (see also page 90).

2.5.2 Economic environment

Another aspect related to the macro environment is the overall economic state of the country (or region or provincial) where the enterprise is located. It is noteworthy that in today's

world, the economic environment goes beyond geographical borders in the sense that a global economic phenomenon may affect an enterprise thousands of kilometres away. The economical environment may be described using four states namely stable, boom, recession and inflationary, each with its own effect on business (Brookes, Berridge and Quy, 1991). Business leaders prefer a stable economy with a moderate growth, stable value of the currency and prices. Brookes, Berridge and Quy, (1991) that noted boom state produces rapid growth in the economy and hence demands for goods. It may appear as an opportunity but albeit a short one. If not well planned and managed boom times may produce adverse results such as economic overheating which results in inflation. Recession produces the opposite effect of a boom where demand is low resulting in idle capacity, labour lay offs and often ends in financial woos for business. Brookes, Berridge and Quy, (1991) continued to observe that an inflationary state, where prices are persistently rising and most likely the value of the currency is falling, is an undesirable state because of the difficulty it causes to planning and business management.

The interpretation and forecast of the economic effects on business is what is most elusive to proprietors. Decision making, planning and controlling of business operations becomes a nightmare in rundown economies. The economies are characterised by an eroded value of local currency, high interest rates, high inflation, scarce foreign exchange and a very unstable economic base. In his study on Nigerian SMEs, Mambula (2002) observed that some of the problems found in developing nations include lack of foreign exchange to purchase necessary equipment, plant tools, spare parts and materials. Mambula further noted that in such economies, corruption, nepotism, bureaucracy and inefficiency on part of the government machinery is the order of the days; all 'aimed' at stifling the business. Regulations designed to conserve foreign exchange have the effect of preventing the importation of vitally needed equipment and machinery and their spare parts (Harper and Soon, 1979). Moreover, even if there is a liberal foreign exchange regime, as the case has been with most countries under the Structural Adjustment Programmes, the exchange rate between local currency and hard currencies is not affordable for a local entrepreneur. Bad business replaces good business both in terms of conduct and character.

2.5.2 Social environment

The social aspect of environment deals with the value, moral and cultural aspects that relate and that govern the business environment. In other words it deals with the way society is organised in terms of cultural, moral, beliefs, values and ethics which affect the behavioural patterns and perceptions of both the proprietor and other stakeholders (customers, family members, employees, politicians, community and competitors). Proprietors need to understand the social environment in order to interpret the social needs which may be turned into markets for services and goods or threats for the business or threats for the business.

2.5.3 Technology environment

The last aspect of the PEST framework is the technological aspect which seeks to explain access, contemporariness, cost and appropriateness of the technology available for use by businesses. There are a few enterprises that able to isolate themselves totally from technological changes (Brookes *et al*, 1991). Few enterprises can resist the economies of scale and advantages of quality and reliability offered from emerging technologies. Innovations may be a threat or an opportunity and their impact on management, production of goods and services and management of information is a tantalising but challenging prospect.

Having highlighted the challenges the macro environment may pose to the enterprise and perhaps even the PBFMS, the next section looks at the construction industry, the major focus of the study.

2.6 The Construction Industry

The previous section discussed SMEs in general terms, highlighting the challenges and problems associated with performance, growth and development. This section pursues the same subject albeit focussing on small and medium construction enterprises (SMCEs). While challenges and problems of SMEs are similar across all sectors of the economy, each industry has its own peculiar features. The proceeding discussion will entail a brief mention of the features of the industry, described most often by scholars as unique. The role of the

construction industry in economic and industrial development will also be highlighted. Specific problems of the industry as a whole and in particular the SMCEs will be examined. These will be discussed in the context of how PBFMS may be designed and operated in such environment.

2.6.1 The unique characteristics of the of the CI

Various scholars (e.g. Peurifoy *et al*, 1996; Smith, 1998; Ashworth, 1999, Hillebrandt, 1989; Adrian, 1986; Lucas, 1984) have noted that the construction industry is a unique environment. The assertion compels to briefly discuss the unique nature of the construction industry and how it may affect the decision making process particularly in the areas of financial management.

Uniqueness of the construction industry is perceived from a comparative point of view. It is based on how business is conducted and operated in the construction industry throughout the entire supply chain as compared to other sectors of the economy, for example, manufacturing. The comparison starts from planning, designing and acquisition of inputs for production, to the delivery of a project. It may be arguable that other sectors of the economy posses similar characteristics inherent in the construction industry. However, it is how the characteristics combine and dynamics they foster for the enterprises that makes the industry unique. The unique features of the construction industry may be identified as being the (i) structure of industry (ii) project based form of organisation of work (iv) fluctuating demand for construction services and (v) issues related financial management. Each is briefly discussed below.

• *Structure of industry*

The first feature of the construction industry operated under the traditional procurement system (TPS) is the separation of the design from construction as already mentioned. What is being added here is the resulting relationships among the various project players. The interactions are never smooth and most often are characterised by blame and misunderstandings. This may be due to the overlapping roles and responsibilities and conflicting interests brought about by the fragmentation of the project players.

Most often the TPS project structure lacks co-ordination in effort and information flow among the stakeholders of the project. This normally leads to errors, misunderstandings and disputes during the construction phase, for example, each discipline involved in a project carries out its own activities without much thought of how it fits into the activities of other disciplines (Sarshar and Maratunga, 2004). This renders the concept of integration and information sharing problematic (Moizzo and Ivory, 2000).

Secondly, the electronic representation of design data typically in a CAD format reflects the design point of view. It however, does not provide the necessary migration that may be useful for construction perhaps due to limited existence and support for standards for exchanging data in the industry (Moizzo and Ivory, 2000). Thus lack of appropriate applications software to utilise the design data at the construction site prohibits reaping the contemporary advantages of computer aided production which characterises an integrated design and production process.

Furthermore, Ogunlana and Butt (2000) observed that clients often engage consultants for the project design that neither have site experience nor any link with sites to get feedback information to improve their designs. As a result, contractors have difficulties in trying to construct structures that do not relate to site conditions. When this happens, designs are normally changed during construction to suit site conditions or requirements, culminating in scope changes and variations that create delays and cost overruns. In some worst cases, projects commence with incomplete drawings or with drawings with numerous errors (Smith, 1995). The effect on the project is very clear; budgets are rendered either inadequate or irrelevant by the changes and so are project programmes.

• ***Project based work organisation***

Operations and projects share many characteristics; for example, they are (i) performed by people (ii) constrained by limited resources and (iii) planned, executed, and controlled (Graham, 1999).. However, operations and projects differ primarily in that operations are ongoing and repetitive while projects are temporary and unique (PMI, 2004). The temporary

and unique nature has serious implications on the planning, and management and control of the production process.

The nature of the production process in construction sector can be best appreciated if it is compared with the manufacturing sector, for example, the aircraft or automotive assembly. For the latter, three significant differences arise namely the (i) integration of design and production, (ii) the ability to produce a prototype and (iii) a fair deal of repetitiveness in design and production of each unit produced. Integration allows better communications between design and production functions and improves relations between the two functions. Prototyping allows innovation, controlled mistakes and is a cheaper way of producing innovations. Both prototyping and homogeneity of a product, allows manufacturers to learn by using information and experience from prototypes to the rest of the production batches. Through repetition, firms gain experience and become more efficient in production, perfect their service delivery and lower their cost.

On contrary the nature of construction production has a unique combination of characteristics namely (i) custom designed and built, (ii) produced away from the head office at the client's site, and (iii) produced in the open space and hence subject to the inclement weather (Smith, 1995). Furthermore, construction projects are of varying sizes, specifications, monetary values and require the use of different trades and materials. The variation renders the experience and information obtained from one project to another less useful and a lost opportunity to learn. This reduces incremental innovation and efficiency as compared to the manufacturing sector.

In addition, problems arising from distant and constantly changing production locations have been well-documented (Canter, 1993; Hillebrandt, 1989). Transporting materials or labour for long distances is normally not cost effective. The solution may lie in the use of local materials, labour and sub-contractors. The difficulty in this scenario is the need to gather information on the availability and quality of local material, labour and plant. Secondly, distant locations create problems in collecting; processing and effectively using relevant

information relating to cost, usage, and productivity of input resources. Ferry and Brandon (1999) and Ogunlana and Butt (2000) observed that there are problems associated with site feedback, such as, (i) incompatible information formats between foremen and estimators (ii) variation of labour productivity from site to site due to several factors, such as, complexity of the project, weather conditions and level of supervision (iii) variation of material usage from site to site, and (iv) variation of plant efficiency and cost from site to site. Lack of permanent and covered production sites exposes construction activities to the vagaries of the weather. This may sometimes cause a need for re-work some stages, resulting in delays and cost escalation.

- ***Labour intensive and high usage of subcontracting***

Construction is one of those sectors of the economy whose activities are labour intensive. This is normally evident from its high employment contribution portion to the total national labour force. Secondly, it is a sector which requires a variety of skills in form of trades. A building project, for example, may need the services of masons, plumbers, carpenters, bricklayers, electricians and painters. Therefore, sub-contracting is a normal feature in the construction industry because of the numerous trades needed on a construction project.

Labour intensive operations coupled with a high portion of sub-contracting require intense logistics and supervision effort. The use of labour intensive methods has been identified as one of the major factors inhibiting the construction industry from being innovative, quality oriented and a productive sector. While the motor industry has improved its productivity, quality and innovativeness through the use of automated systems including robots and other CAD systems, the construction industry has stagnated behind mainly due to its labour based production methods.

- ***Turnover of construction services***

One of the tenets of strategic planning is that a business should be able to forecast the turnover of its services, to a certain degree, for the strategic planning period in question. This in turn facilitates the planning of capacity in terms of funds, assets, labour and production space. Secondly, from a tactical planning point of view, a firm should be able to forecast achievable turnover for the proceeding financial year. This enables budgeting for the required

working capital and absorption of overheads. This may be based on the turnover of the preceding year or some other method of revenue forecasting. In a tendering system environment of construction industry the workload may fluctuate beyond comprehension thus not affording enterprises to forecast workload (Ssegawa, 2002). Table 2.3 illustrates how turnover can fluctuate over the financial years for the two construction enterprises (CE1 and CE2) as compared to a retail enterprise (RE).

Table 2.3 The fluctuating nature of construction turnover

Enterprise	2003	2002	2001	2000	1999
CE1	19,566,425	45,653,031	30,405,953	n/a	n/a
CE2	n/a	n/a	449,333	853,733	555,669
RE	n/a	2,034,446	2,187,245	2,146,789	2,0678,499

n/a- not available;

Source: Financial auditing firm (name of firm and enterprises due to confidentiality pledged)

The fluctuation in work load is brought by a number of factors, for example, except for developers and government, most organisations or individuals who demand construction services do so once in a life time perhaps. This is perhaps due to the durable and expensive nature of construction products. The once off manner in which the products are procured also limits the demand for new projects. In developing countries, there is a further complication for the construction industry. In most cases, the biggest client happens to be the government. Most government finance their development budgets from revenue obtained from exports of primary commodities, for example, diamonds in Botswana and Namibia, copper in Zambia and tobacco in Zimbabwe. The amount of revenue from exports depends on the vagaries of the world markets and internal production capacities. In turn, the export revenue determines the level of capital development expenditure from which construction projects are procured. It may also be added that the government monetary, fiscal and social policies may add to the menu of factors affecting project procurement. The need to balance the budget, control inflation, increase the level of employment or secure a healthy balance of payment are some of the underlying factors for government project procurement. Therefore, forecasting demand (work load) based on the government decisions becomes a very challenging feat for enterprises.

- ***Pricing and profit determination***

Related to the issue of fluctuating turnover is the challenge of the setting the right price. Price determination is a key decision for the profitability of an enterprise. An inappropriate price, whether too low or too high, results in a loss on the project. The easier an industry sets a price for its services, the more it can manage its planning and profitability. As an example, most governments, including Botswana, set the price of a litre of fuel. Fuel stations owners only need only to manage their overheads and market their services in order to determine their total volume and hence margin. Examples of price setting mechanisms for various markets (industries) are shown in Table 2.4

Table 2.4: How prices are set in various markets

Competitive	Price mechanism but competitors have a chance to ‘spy’ on each others prices
Government	Government sets price of fuel
Monopolist	Monopolists use their market muscle to either fix price or quantity.
Cartels	Cartels (just like monopolists) agree on price and quotas (oil, diamond, drugs, etc)
Bidding	Bidding process where the service provider makes an offer as in construction

The most common method of getting work in the construction industry is by tendering, and in most cases by an open tendering system. The process determines the price of a project. The tendering process in a traditional procurement system is a unique environment in that once the tenders are opened; there is no price retraction, bargain or negotiation. If an inappropriate price is set the job is lost. If the job is obtained but an unnecessarily low price was set, a financial loss occurs. The challenge lies in acquiring accurate information for setting a competitive price by computing accurately the direct costs, overheads, risk allowance and setting a competitive profit margin. Under absorption and over-absorption of overheads may lead to financial losses or loss of jobs, respectively. The complexity of setting an appropriate mark-up, among others, arises partly from the inability to ascertain the value of workload (turnover), and match (allocate) it with overheads for the financial period; the intensity of competition on the project, and project risk.

Another challenging issue pertinent with construction is the issue of profit determination in contracts that straddle over the financial year. Most construction projects take more than a

year to complete. Even if they are of a shorter duration, they may straddle over an enterprise's financial year. This makes it difficult to match costs and revenue earned in the respective accounting period. The most common accounting method used is to allocate percentage completion in proportion with cost and value. This method assumes that costs and values are linearly related to time. However, it is well known that costs and on a greater extent revenue follows an S-curve.

In addition, in terms of financial management the straddling of projects in a financial year provides another challenge in determining the amount of distributable profits payable. Despite the various methods that have been formulated to solve the problem, none gives a precise answer (Adrian, 1986). It therefore, opens a lot of temptations for entrepreneurs to pay dividends that do not match the revenue earned during the financial year and undermine the concept of capital maintenance and cashflow management.

- ***Mode of payment***

The method of payment in the construction industry is progressive and always in arrears. Furthermore, though most contracts stipulate a 14 day payment period after submission of an invoice, contractors are never paid on time. The period between invoicing for the work and the money being credited to the contractor's bank account may vary between one to eight months (Ssegawa, 2002). Bureaucracy, particularly for public jobs, often causes delays in payments. Sometimes this is exacerbated by disputes over the value and quality of work. Payment delays result in uncertainty of cash inflows, low profit margins, and increased interest rates, damaged relationships with creditors, project time and cost overruns. Perusing through financial statements of most construction enterprises, one will always see an overdraft entry as a means of bridging finance not as a voluntary financing strategy but a great proportion of it due to forced circumstances.

For the monthly valuations a retention amount of, between 5% and 10%, is normally imposed for each progress payment of which 50% is released at practical completion. The retention amount is meant to force the contractor to make good any defects. Clients normally retain 50% of the retention sum which is then refunded six months after the practical completion of

the project. Retention money creates a short fall of cash especially given the fact that costs are borne in full by the contractor. Moreover, in some cases the final account which releases the remaining 50% of the retention money is never finalised until two or more years later (Sentongo, 2005).

Clients also require a guarantee that once contractors are selected at the beginning, they will be able to complete the project. Contractors provide the assurance through the payment of performance bonds. Though the bond is repayable on successful completion, it increases the start-up cash requirements of construction enterprises on any undertaken project.

- ***Use of information and communication technologies***

Information is one of the major resources of the organisation but most often the most neglected until something happens. For any organisation to stay competitive it needs to process information and make decisions at a much faster rate in order to keep with the pace of the changes (Edum-Fotwe, Thorpe and McCaffer, 2000). The business environment is becoming ever so competitive, complex and turbulent. Most sectors of the economy are turning to Information and Communication Technologies (ICT) to give them a competitive edge.

However, the situation is different in the construction industry. Even though ICT has been used for while in the construction sector, its proliferation in project construction work is still wanting. Construction is one of the most information dependent of all industries with its diversity of information ranging from drawings, cost analysis sheets, budget reports, risk analysis charts and contract documents to name but a few (Tucker and Mohammed, 1996). Yet, information exchange in construction has primarily been in way of physical documents in form of drawings, quantities and specifications and contractual agreements (Gyampoh-Vidogah and Moreton, 2003). This robs the project players of the elegant features that ICT provides for those who can harness the technology.

The reason for the low ICT usage lies firstly in the gap between management's own understanding of the nature of the construction business and any effort to use ICT and

support its investment (El-Ghandour and Al-Hussein, 2004). Both Tucker and Mohamed (1996) and Gyampoh-Vidogah and Moreton (2003) view the reluctance to the use of ICT as a 'sectoral cultural' problem which is created by a perception by senior managers that available ICT is neither mature nor flexible to aid their business process because of the perceived complexity of construction. Management also perceives the temporary nature of the project information as a disincentive to invest in ICT systems moreover located at temporary sites. Andersen *et al* (2000) backs the observation by adding that lack of investment in ICT as a major obstacle in effective adoption and application of the technology in the CI. In addition, when ad-hoc systems are devised, it is normally production personnel that capture the data for which Adrian (1986) observed that the interest of production staff and other employees of the firm, for example, accountants and quantity surveyors, are not normally congruent. Ferry and Brandon (1999), also added that arising from the problems of feedback, many contractors hardly keep data obtained from distant locations because of what is perceived as diminished value for future use. CI has been required by both competition and client, to reduce profit margins. Investing in ICT systems may be seen as an additional overhead, moreover of a rapidly changing environment. In addition ICT may necessitate training of personnel which is often seen as a disruption to production work.

Related to the use of IT is the issue of automation in the industry. Automation is one of the tenets of a modern production system which reduces cost and lead times while increasing quality, productivity, choice and eventually profits. In most industries automation has been achieved using ICT. The barrier to the use of ICT means that the drive towards automation is slow in the sector. However, trends have been emerging in the area of using prefabricated items. Indeed even on a low level project a number of items can be prefabricated off-site and assembled on-site including doors and window frames, trusses, toilet components and shower units. Prefabrication has a number of advantages in both design and construction. It shortens the design process and construction process, thus allowing quicker occupancy times by clients and quicker letting by developers (Miozzo and Ivory, 2000). When prefabrication is augmented with automated erection, using robotic cranes, the speed of project development is greatly increased.

From a developing nation's point of view, it will be a while when a greater part of the project development, particularly the construction process, is fully automated. A switch to full prefabrication and automated erection means (i) investing in automated plant and systems and (ii) re-training skills, in both the prefabrication process and operation of the complex automated machinery. In developed countries, where prefabrication is on a high rise Miozzo and Ivory (2000) reported that it is more expensive than the traditional building methods but the costs are on the decline as more economical and efficient methods of building are being developed. The adoption of this technology thus requires well thought out strategies that do not lead to unemployment and high cost of housing. The change to full ICT and automation will see a more changed PBFMS and increased efficiency and effectiveness in project planning and control.

Before leaving the above issues which individually presented the uniqueness of the construction industry, it is important to reiterate what one writer noted. Smith (1998) observed that it is the manner in which the characteristics combine and interact which gives the construction industry its uniqueness. This interaction of factors makes planning, forecasting and control of project in the industry, a challenge.

With those observations the next section highlights the role of the construction industry in development as a further justification for the motivation that led to studying the sector.

2.6.2 Role of the construction industry

It is often stated that the barometer to measure the pace of economic development in any economy is the level of construction activity (Seddon and Atkinson, 1982). Bon (1992) links the rate of consumption of the building materials industry (e.g. steel and cement) to the process of industrialisation and urbanisation. In addition, the products of industry are used as measures of economic development, particularly their quantity, quality and capacity. Thus for any country to boast of sustained development, it must have a buoyant and profitable construction industry.

This section examines the role of the construction industry in fostering economic development. The roles have been recognised as being (i) contribution to fixed capital formation, (ii) multiplier effect, (iii) housing, (iv) contribution to GDP and (v) employment. It is almost futile to discuss the role of the construction industry without particular reference to any country. In this case Botswana's construction industry will provide the basis of discussion. In a way, it will be an appraisal of the performance of the industry and a very handy proposition to the study objectives. The discussion of the industry will also not be complete without a comparison with one or two other industries from other countries. Thus a comparison with the construction industries of Namibia and Zimbabwe will provide an appropriate balance.

- ***Fixed Capital formation***

Fixed capital goods include construction products (e.g. buildings, roads, aerodromes, factory shells, etc), machinery and equipment. In most countries, construction products form over 50% of the fixed capital goods and are vital to the economy of a modern state because they form a major part of the production process as factors of production. Secondly, they form long-term investment assets for firms, individuals and the government. Like most developing countries, the construction industry. Contribution to gross fixed capital formation (GFCF) in Botswana has been around the 50% mark, though in the recent years, it has been slipping below the 50% level as illustrated in Figure 2.3. In absolute terms, the industry's contribution to GFCF amounted to P2,054 million (about US\$375) in 2000 (CSO, 2002).

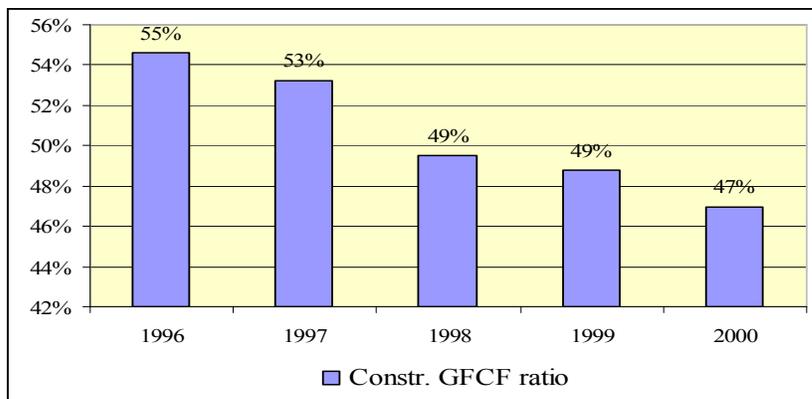


Figure 2.3: Construction industry's contribution to GFCF in Botswana

Source: CSO (2002)

- ***Multiplier effect***

From an economic point of view, construction industry contributes to the economy through the concept of multiplier effect (West, 1994). Expenditure on construction projects acts like an 'economic seed', which multiplies economic activity as a result of its implementation. The result is to increase aggregate demand for services and products in other sectors of the economy that are directly or indirectly connected to the project (Seddon and Atkinson, 1982). The overall effect is not only to increase income levels but also to spread it to a wider population (West, 1994). The impact, for example of the multi-billion Lesotho Highlands Water Project estimated at US\$8 billion, though spread over 30 years, may be bring to Lesotho is forecast to be enormous (IRN, 2005). In Botswana, the North-South Water Carrier project estimated at US\$37 million and spread over three years caused a tremendous change to the economy (WU, 1998).

Canter (1993) estimates that 40-55% of the total project cost goes to materials and another 20-30% goes to labour costs. Implementing projects of this nature implies increased turnover for material suppliers (e.g. sand, cement, gravel and aggregate) and labour contractors. The necessity to transport inputs to site implies that the transport industry (e.g. haulers, fuel and oil distributors and garages) and possibly hospitality sectors (for accommodation) also benefit from the project. The overall effect is that as project is implemented other sectors of the economy benefit from the project disbursements.

The multiplier concept also explains the structural make up of industries which exhibit both vertical (backward and forward) and horizontal linkages. Through backward linkages, the construction industry plays an important role in supporting the local manufacturing entities which produce construction materials. Many aggregate, sand quarries, brick and block manufacturing and cement factories are sustainable due to the demand created by construction activities. The forward linkage means, for example, delivering buildings to property and estate sector for residential and commercial rent and investment.

Empirical studies have confirmed the link between a viable construction industry and sustained economic growth and development (Turin, 1973; Ofori, 1988; Wells, 1985; Ruddock *et al*, 1996; Lopes, 1998 and Drewer, 1998). The link is evidenced by the interdependence that exists between the construction industry sector and the rest of the economy. All economic sectors need some form of built space for production and communication in form of transport systems, for delivery of goods. Hence the construction industry provides the basic platform for business operations.

Support and sustainability of local industries by construction industry has an added advantage. Many countries reduce the importation bill and save their meagre currencies as a result of using locally manufactured construction inputs in what is known as import substitution (Yahya Saad & Associates, 1997). The net result is an improved balance of payments.

- ***Housing***

The construction industry provides housing as one of the basic human needs. Unfortunately, there is no accurate data on the level of housing in Botswana. Scanty information exists regarding the total number of houses built. However, the growth of formal housing in Botswana has been phenomenal since the late 1980's after the drought period which stretched from 1984 to 1988. In recent times some estimates have put the number at over 120, 000 units in the last fourteen years beginning 1992 (BHC, 2002). Of that number, Botswana Housing Corporation (BHC) built over 66,000 units in the urban centres (BHC, 2002), making BHC the leading player in house construction in the country in a country of 1.8 million inhabitants. However, the national capacity to build has been diminishing due to number of factors, including the escalating cost of land, lack of serviced land and the high interest rates on mortgages resulting in a high cost of construction (BHC, 2002).

One important point to note about housing in developing countries, including Botswana, is the large number of people still living in traditionally constructed houses which do not require approval of building plans by the local authorities. As a consequence traditional

building activities are not recorded in the national statistics, leading to the understatement of construction activities in national statistics.

- ***CI contribution to GDP***

GDP is one of the main yardsticks for measuring economic development. The construction industry's GDP ratio is also a good measure of the sector's contribution to economic development. The construction industry share of GDP consists mainly of the value added activity and therefore a rise in absolute value of GDP could mean more procurement of projects when inflation is minimised by the use of statistical figures at constant prices. GDP therefore, is also used as a means of assessing the performance of the construction industry.

The size of Botswana's construction industry in the years 1996 and 2001 is highlighted by the data in Table 2.5. To get a feel of its size it is compared with two of its neighbours, Namibia and Zimbabwe in the same period.

Table 2.5 Size of the construction industry in Botswana (and its neighbours)

Country	1996		2001	
	Own currency ¹	US\$ ²	Own currency	US\$
Botswana (P'million)	746	204.6	1,023	180.9
Namibia (N\$'million)	337	72.0	520	64.5
Zimbabwe (Z\$'million)	541	40.7	435	9.8

Source: ¹Economic Intelligent Unit (2003); ²CSO (2002) for currency conversion

In absolute terms, the Botswana's industry has been the largest since 1996, followed by Namibia. In 2001, it was estimated at P1.023 billion (not that it actually contracted in US\$ terms from US\$204.6 million to US\$180.9 million from 1996 to 2001, respectively). All the construction industries of its neighbours showed significant contraction. Zimbabwe's construction industry has been the smallest and has shrunk almost four times in the six years.

West (1994) provided a word of caution regarding the use absolute figures of national statistics in the comparisons of country statistics. Factors such differential inflation and levels are some of the problems of comparing statistics of different countries. Therefore, an improved assessment of the performance of the construction industry and for inter-country

comparison requires using the GDP ratio. The GDP ratio (ratio of construction industry to GDP) tells a similar story as illustrated Figure 2.4

From 1996 up to 2002, Botswana construction industry has had the most consistent performance and the highest GDP ratio, averaging 6.1% annually. This is followed by Namibia, with a fluctuating GDP ratio averaging 2.6%. Zimbabwe's construction industry contributed least to the economy and averaged 2.0% in the period between 1996 and 2002.

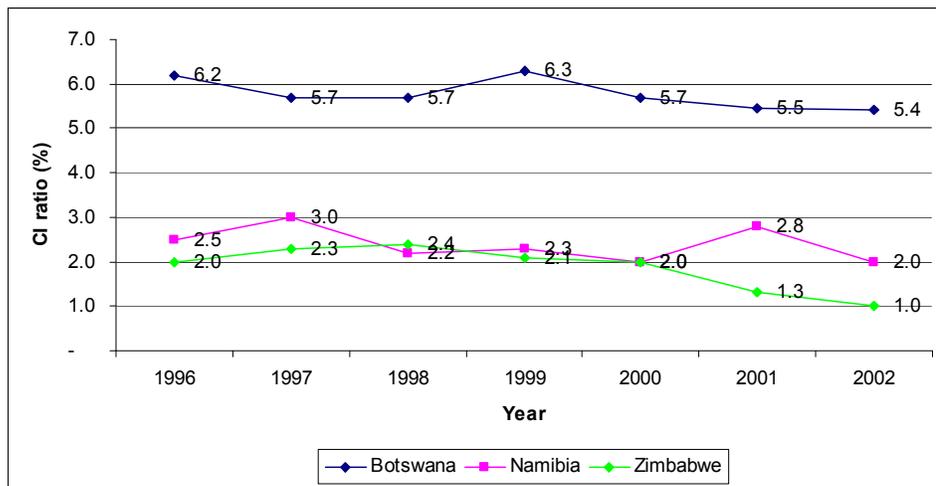


Figure 2.4 Construction industry GDP ratios for Botswana and its neighbours

Source: Economic Intelligent Unit (2003)

Maletsky (2000) noted that the Namibian industry has continued to experience less and less activity in the years resulting in some companies to close. This observation is in agreement with the GDP ratio data in Figure 2.4 which shows that the industry has been contracting from a 1997 level of 3.0% to 2.0% in 2002. As for Zimbabwe, the activities in the industry have dwindled to the level that has pushed many smaller contractors against the wall or out of business altogether (ZBCA, 2003). The GDP ratio data shows that the industry went from a high of 3.0% in 1998 to a low of 1.0% in 2002. The ZBCA (2003) further noted that in 1999, there were 100,000 people employed in the industry and by 2003 the number had dwindled to 20,000, job shrinkage of 75%.

The performance of the construction industries of the three countries may be viewed from the context of the work of Wells. Wells (1985) made two propositions after making a

longitudinal study of performances of the construction industries of various nations in terms of capacity and output. Wells suggested that for sustained growth and development, the rate of growth of CI must be higher than the GDP growth rate; and there are minimum values of CI's output as measured by the GDP ratio that facilitate sustained development. Wells (1985) gave the minimum values as 3.6% for less developed (low income economies), 5.2-5.4% for middle developed (lower and upper income economies) and 7.3% for developed (high income economies) countries.

The first proposition relates to the capacity of the construction sector being able to sustain the annual demand of the economy (Turin, 1973). This implies that the CI must provide the basic business and social infrastructure at faster rate than the economy to sustain economic growth. Khairuddin *et al* (1998) added that if the construction capacity fails to grow faster than the economy then inadequate capacity becomes a constraint to achieving sustained socio-economic development. This implies that the supply of CI does not meet national demand resulting in, for example, lack of office and residential accommodation which may lead to lack of operating space resulting in escalating office, industrial and residential rentals.

Wells first proposition may be applied to the performance of Botswana's CI and its two neighbours using the data presented in Table 2.6. The table shows the rate of growth of the respective industries and economies.

Table 2.6: Growth rates of the CI of Botswana, Namibia and Zimbabwe

Country		1997 (%)	1998 (%)	1999 (%)	2000 (%)	2001 (%)
Botswana	Construction GDP	5.5	4.4	11.4	2.4	9.1
	Economy (GDP)	3.0	5.4	1.6	5.1	5.7
Namibia	Construction GDP	8.9	15.3	-13.9	-4.4	49.4
	Economy (GDP)	18.7	3.4	3.2	3.1	1.7
Zimbabwe	Construction GDP	16.6	6.0	-11.1	-15.0	-14.0
	Economy (GDP)	0.2	-0.5	-2.7	-4.8	-7.7

Source: Economic Intelligent Unit (2003);

In the period of 1996-2001, Botswana's CI grew consistently faster than the economy, for example in 1997 it grew at a rate of 5.5% compared to the economy which grew at 3.0%. In 2001, construction grew at 9.1% while the economy grew at 5.7%. Both the Namibian

economy and the CI have been inconsistent in their performance, for example, in 1996 the economy (18.7%) grew faster than the CI (8.9%); in 2001 growth was reversed and the CI (49.4%) grew faster than the economy (1.7%). The Namibian phenomenon illustrates an example of turbulence in most industries characterised by booms and downturns. It also shows the lag that exists between demand due to the needs of the economy and supply resulting from the CI output.

At the extreme end, while the Zimbabwe's economy was shrinking, so too was the construction industry, for example, by 2001 the construction industry was receding at twice (-14.0%) the rate of the economy (-7.7%). This means both the economy and the CI were contracting with CI contracting faster than the economy.

Well's second proposal may be examined using the data in Table 2.6. The UNDP and World Bank classified the Botswana as an upper-middle-income nation and Namibia and Zimbabwe as lower-middle- and lower income nations, respectively (World Bank, 2003; UNDP, 2003). Therefore, in terms of Well's category, Botswana and Namibia would fall in the middle developed category where the GDP ratio should not be less than 5.2 (i.e. should be in the 5.2-5.4% band). Zimbabwe falls in the less developed and the GDP ratio should not be less than 3.6%. According to this categorisation, it is only Botswana's CI which appears to be in the target band predicted by Wells. Botswana's CI thus guarantees sustained development since it has an average GDP ratio of 6.1% well above the required band of 5.2-5.4% band. The rest have a low GDP ratio of 2.6% and 2.0% for Namibia and Zimbabwe, respectively and fall below the required minimum of 3.6%.

The case of Namibia and Zimbabwe shows a chicken and egg dilemma. The CI cannot do well if the greater economy is not performing well. Both countries depend on export revenue to procure construction projects. It is only when the government gets enough revenues from its principal sources (mainly exports) that it is able to procure construction projects. Since in most developing nations, the government is the biggest client of the CI, the effect is significant. In most cases where the government revenues are dwindling, as the case of Zimbabwe, the private sector is in also in the same boat: unable to make long term

investments of construction nature. On the other hand if the CI is not delivering new projects to both the private and public sector, there is an increase in both office and residential rent. The infrastructure, particularly communications and the transport network, also deteriorates resulting in increased cost of doing business. In any case Lopes (1998), noted that in most cases the construction sector does not lead but rather lags behind economic growth or decline.

• **Employment**

When it comes to employment, the construction industry has a special position compared to other sectors of the economy. The sector offers the first employment opportunity for unskilled and semi-skilled people. It also provides a further training opportunity for these cadres for absorbing them into formal labour market (Yahya, 1997).

In absolute terms, Botswana’s construction industry was the smallest employer with 20,000 and 30,000 employees in the years 1996 and 2002 respectively as shown in Table 2.7. The Zimbabwe’s construction industry has had the largest labour force, although it has contracted to almost a half (from 77,500 to 41,300) in by the year 2002. However, in terms of the overall contribution to national labour force, Botswana’s CI contributes a larger portion than Zimbabwe’s CI (just as it was for the GDP): an annual average of 9.6% compared to Zimbabwe’s 5.0% in the period 1996 to 2002 as shown in Table 2.8. (Namibian figures for construction sector employment were not available because of the manner in which the statistics are reported).

Table 2.7 Construction Employment for Botswana and Zimbabwe (absolute figures)

	1996	2002
Country	(No.)	(No.)
Botswana	20,000	30,000
Namibia		No data
Zimbabwe	77,500	41,300

Source: Economic Intelligent Unit (2003)

Table 2.8: CI employment ratio for Botswana, Namibia and Zimbabwe

Country	1996	1997	1998	1999	2000	2001	2002	Average
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Botswana	8.7	8.5	10.3	10.7	10.2	10.2	10.6	9.9
Namibia	No data							3.9*
Zimbabwe	6.1	5.9	5.9	5.3	4.3	3.5	3.8	5.0

Source: Economic Intelligent Unit (2003); *NEPRU (2003)

The data in Tables 2.7 and 2.8 is not recent because of the need to compare the industries of Namibia and Zimbabwe using available. However, recent figures for the construction industry in Botswana show a shrinking industry as shown in Figure 2.5. The figure shows that the industry recovered from a down –turn in 1997-8 where the employment and GDP ratios were 8.5% and 5.7%, respectively and peaked at 10.7% and 6.3% in 2000. The industry stabilised for sometime but started descending towards 2004. Figure 2 shows that from 2005 to 2007 the down turn was very evident.

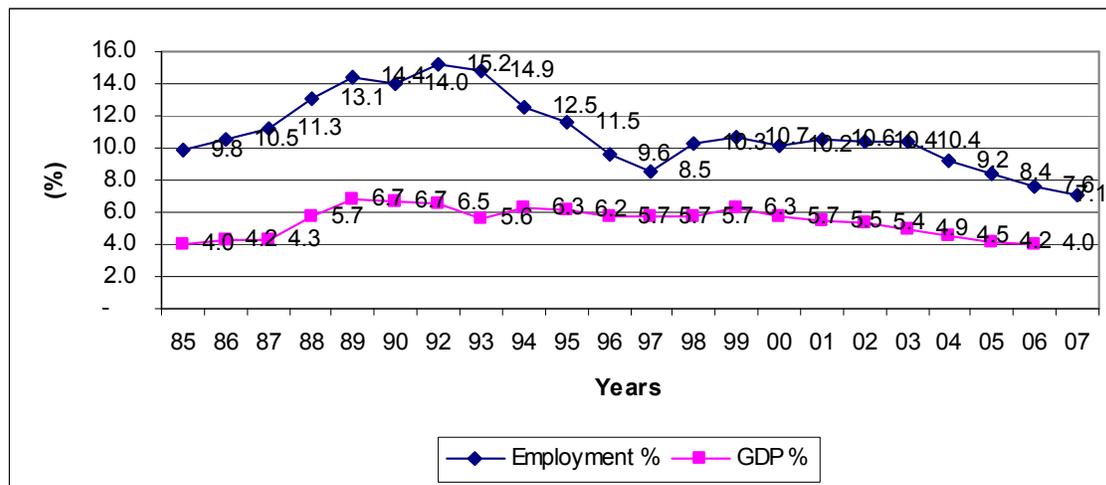


Figure 2.5: Recent GDP and Employment ratios for the construction industry

Source: CSO (2006)

In summary, the role of the CI may be viewed in terms of its contribution to the provision of infrastructure, substitution of imports, formation of fixed assets, provision of entrepreneurial outlet and generation income, provision of housing, contribution to GDP and provision of employment.

2.6.3 The Role Players in CI in Botswana

A number of aspects relating to the CI in Botswana have already been alluded to, for example, the size and past performance of the sector. This section briefly discusses the structural make up of the industry by looking at the entities from a supply and demand point of view of the industry. It also outlines the regulatory regime by highlighting past and present government policies relating to the industry in Botswana.

- *Demand side of the CI*

Like most of the developing nations, the construction industry in Botswana is dominated by the government and its affiliated organisations such as local authorities and parastatals. When all these entities are combined, they procure over 80% of the construction work in the country (Ssegawa, 2002), although recently the figure has gone down to about 65% (Ssegawa and Ngowi, 2007).

The central government is the major consumer of construction services due to its need for providing infrastructure requirements (e.g. transport, public buildings, and water reticulation systems). The projects are conceived and initiated by the respective ministries concerned, for example, school buildings by the ministry of education. However, the planning, administration, supervision of the design, construction and maintenance of the facilities is carried out by two departments namely Department of Building and Engineering Services (DBES) and Department of Roads (DR). The former deals with building facilities while the latter deals with roads. Another department is the Department of Local Governments and Development which assists local authorities in the planning and implementation of projects, for example, sanitation systems. Connected to this delivery chain is the Public Procurement and Asset Disposal Board (PPADB) which evaluates and awards all tenders relating to central government procurement and asset disposals.

The next group of clients are the local authorities grouped into city councils; town councils and district councils, which are two, five and nine in numbers, respectively. In terms of project procurement, the authorities are charged with the planning, administration, supervision of the design, construction and maintenance of the basic physical and social infrastructure (e.g. water provision, primary schools and clinics construction) to the local

communities. They evaluate and award project tenders through the council procurement committees.

Another group of clients are the parastatals organisations, which are 100% government owned which include the Botswana Housing Corporation (BHC), Water Utilities (WU), Botswana Power Corporation (BPC), Botswana Telecommunication Corporation (BTC) and Botswana Development Corporation (BDC). BHC and WU are the major clients of the industry in this group. BHC deals with the housing needs of the urban and peri-urban locations in the country. The WU has also planned and implemented several water related projects in the urban centres.. At one time the corporation implemented the biggest project by value in the country worth US\$ 37 million, the North South Water Carrier Project. The project transfers water from the North to supply the high water demand areas in the South East of Botswana as well as some villages along the route of the pipeline. It necessitated the construction of a dam, laying of a 360 Km of a water pipeline and construction of a number of pumping stations along the pipeline way (Fairweather, 1997).

Private sector involvement in the procurement of construction services is very small and sporadic. During boom times, it is common to see a number of mushrooming commercial buildings, malls, office buildings and residential houses. Unfortunately, there are no statistics are available to show the contribution of each group over the past years.

- ***Supply side of the industry***

The supply side of the construction industry represents all entities responsible for bringing a project to completion and its maintenance. This includes contractors, consultants and associated ancillary service providers. This group of players are usually contracted to provide various services on a project. They are of varying sizes (small, medium and large) and domiciles (citizen, foreign and joint ventures between the two)

Contractors are mainly of four categories namely building, civil, electrical and mechanical. The next significant group of players are the consultants in form of architects, engineers (e.g. electrical, mechanical and geotechnic), quantity surveyors, landscaping architects, material

testing experts and land surveyors. There are also other entities that provide services or materials related to project work, such as material suppliers, scaffolding and plant hire.

Kaboyakgosi and Sengwaketse (2003) noted that of the six categories of contractors, categories OC, A and B are exclusively for 100% citizen owned companies; categories C and D are for citizen majority owned joint ventures (51% and above citizen owned) while category E has no restrictions of ownership. Kaboyakgosi and Sengwaketse (2003) further noted that the majority of construction firms, (58 %), are registered in Gaborone, the capital city of Botswana. This could be due to the fact that most business opportunities are in Gaborone, though Ngowi, Iwisi, and Rwelamila (1997) ascribe this to logistical problems faced by the smaller firms in moving personnel, equipment and materials to various parts of the country. Kaboyakgosi and Sengwaketse (2003) further noted that 71% of the firms registered with the PPADB are locally owned. 61% of these are in categories OC, A and B contracting work on low value projects. Sentongo (2005) observed that Category E is dominated by foreign firms, which are better resourced in terms of plant, equipment, finance and trained human resources than the locally owned firms. It is these firms that contract most of the high valued projects and they currently perform about 80% by values of the construction work (Sentongo, 2005).

It would be a missed opportunity not to mention the training entities as regards labour supply. There are quite a number of institutions providing manpower training related to construction. It ranges from artisans, technical, graduate up to postgraduate level in various areas including building, civil, architecture, land surveying, project management, and various trades (e.g. masonry, plumbing and painting). These are scattered in the various parts of the country although majority are located in Gaborone, including the University.

- ***Government policies***

Since the government is biggest player in the industry, it plays a dual role as a client and as a regulator. The client role has been discussed leaving the latter for a brief mention.

The World Bank (1984) noted that in most developing countries, the government formulates and implements policies and legislation concerning licenses and permits, building codes, minimum wages, corporate taxes, rules on the importation of materials and spare parts, and the terms and availability of financing for construction. This is also true in the context of construction industry in Botswana. There are a number of aspects that have led the government to intervene including poor performance of the industry on public projects, particularly by local contractors; malpractices in the industry, the concern of citizen contractors in as far as competition is concerned.

In response to the above and at different periods of time the government has legislated and developed various policies and regulations directed towards the construction industry. Some of them included the establishment of the:

- i) Construction Industry Trust Fund (CITF) in 1994, to train and produce local craftsmen, thus aimed at increasing the quality and quantity of the artisan cadre.
- ii) Integrated Field Services Construction Services with the objective of assisting construction companies, particularly the proprietors, to improve their performance in terms of product output (e.g. estimation, planning, and project management).
- iii) Venture Capital Fund to provide risk capital to citizen owned projects and joint ventures between citizens and foreigners.
- iv) Citizen Contractors' Fund with 50 million Pula aimed at assisting citizen owned companies involved in public works but having problems in completing projects. The policy was started in 1996 ended in 1999.
- v) Procurement policies which include the Work Reservation Policy, which stipulates that 30% of all building work, including related mechanical and electrical work be reserved for citizen contractors. Another scheme was the Public Procurement Preference where citizen companies enjoy a price preference of 2.5 % when they compete for work with foreign companies in classes D and E; provision of mobilization in form of 5% cash, and 10% in materials, of the total project value; and the waiving the requirement to provide performance bonds for the contractors in the lower classes (OC, A and B).

Other assistance policies not specific to construction but which may be utilised by contractors, have also been established, for example, the Citizen Entrepreneurial Development Agency (CEDA) which offers assistance in the form of: financial - in the form of loans to citizens at subsidized interest rates (7% as opposed to 18% and above charged by most banks); training, monitoring and mentoring programme which provides citizens with assistance from local private sector business consultants and facilitates access to other government programmes to train, monitor and mentor businesses in management and marketing skills.

2.7 Challenges and Problems of SMCEs

There are a number of common problems among SMEs regardless of the economic sector in which they operate. However, each sector has its own peculiar constraints and challenges. The problems normally lead to poor performance which may lead to (i) poor project delivery (ii) business failure, (iii) or both. There are several factors leading to the phenomena and therefore, the next sections are devoted to discussing some of the issues related to these problems.

2.7.1 SMCEs business failures

Business failures are not a unique phenomenon in any sector of the economy, except as mentioned Section 1.3 that the construction sector tops the list of business failures in most economies e.g. in USA (Dun and Bradstreet, 1976 and 1987) and Botswana (Kgabo *et al.*, 1999). The impact of the failures affects both the owner and stakeholders (e.g. clients, community, creditors and employees). The viability of construction enterprises is thus of major concern, not only to scholars, but for policy makers because of the vital role they play in fostering economic development through infrastructure provision as mentioned before (in Section 1.3). Their performance, that is, the ability to deliver projects within specified objectives but remaining viable, is a desirous attribute for all concerned stakeholders (researchers, professional, trade associations, clients, policy makers, suppliers and financiers).

2.7.2 Project delivery failures

As already noted the biggest challenge for the construction industry is to deliver projects within agreed conditions. Many studies conducted in most countries on this issue have had similar conclusions, that is, frequent poor project delivery by construction enterprises. Assaf *et al.* (1995) for example, studied the delivery times of construction projects in Saudi Arabia and noted that delays were frequent. Tah *et al* (1993) stated that poor performance of projects in terms of time and cost overruns was still ubiquitous in the USA's construction industry. This was also supported by Arditi *et al* (1985) who observed that construction projects can delay as much as four years in the USA. Similar observations were noted in the developing world, and in particular Nigeria (e.g. Aniekwu and Okpala, 1987 and 1988; Okpala and Aniekwu, 1987; and Elinwa *and* Buba, 1993).

The results of the studies noted that the most frequent problem encountered in the construction industry are (i) delays in the completion of the project and (ii) cost over-runs of the estimated project sum. A study by Elinwa and Joshua (2001) in the Nigerian construction industry concluded that on average, 62%, 32% and 6% of the time, time over-runs are caused by the client, contractors and others, respectively. They also found that time overruns were most experienced on public procured projects (89% late completion of projects in Nigeria were Government owned).

Intertwined in the two problems of cost and time over-runs is the third problem of quality. When a quality problem is encountered extra work and time, which was not budgeted for in the project programme, is needed to rectify the problem. Most often, quality leads to increased costs and delays due to time taken to rectify the defects. Trainor (1983), for example, estimated construction rework to be in the region 8%, while Burati *et al* (1992) estimated it at around 12% of the project cost. A study in Australia estimated that the cost of rework amount to about 10% of the project sums (CIDA, 1995) and following on to this Love and Li (2000) estimated that the resulting cost of remedial work would cost the Australian clients approximately A\$ 4.35 billion a year.

Delays, quality and cost overruns are usually symptoms of many other causes or constraints, for example, material shortages could cause project delays while inflation escalate costs. It is evident that in most of the studies on the subject of time and cost over-runs, the interrelatedness and overlap of constraints makes it difficult to formulate an appropriate framework for analysis. In addition, it is difficult to identify factors which cause delays without cost overruns and vice versa. Kaming *et al.* (1997) observed that some cost overrun factors may result in late project completion, whereas some may have no effect on completion time. However all delays usually cost money either to the client or to the contractor or both. Ultimately delays inconvenience the intended beneficiaries of the project.

▪ ***Framework for analysing causes of poor performance***

A number of frameworks have been developed to create an understanding of the causes of delays and cost overruns. Rashid and Morledge (1998), for example, observed that constraints in the process of procurement could be either due to one or a combination of two or more of the following factors: unavailability, insufficiency or inappropriate use of resources, functions or institutions. Antill and Woodhead (1989) divided time overruns into those over which (i) neither party to the contract has any control; (ii) the client (or representative) has control; and (iii) the contractors (or sub-contractor) has control. This categorisation is in line with the work of others (Arditi *et al.*, 1985 and Kraiem, 1987) who classified delays as (i) excusable with compensation (ii) and excusable delays without compensation and (iii) non- excusable delays or contractor responsible. Majid and MacCaffer (1998) examined at a micro level the causes and effects of time and cost overruns. Their work shows the interrelatedness of the many factors associated with cost and time overruns. Another framework by Adams (1997), observed that poor performance of projects is caused by factors in the (i) business environment, (ii) client and representatives and (iii) contractor deficiencies.

How do all these frameworks tie in with the study? During the discussion of SMEs, in Sections 2.2.2 three factors were identified as crucial to performance namely, proprietor, enterprise and business environment. The same theme is repeated here albeit with some modifications, resulting from the work of Adams (1997) namely client/representatives. The

factor is added because the actions, decisions and behaviour of the clients and their representatives are crucial in the successful delivery of a project. Enterprise and contractor deficiency as factors are merged together as illustrated in Table 2.9.

Each of the factors is discussed in next section but bearing in mind that interrelatedness of the factors, for example, the proprietor and the enterprise especially when the company is young and small.

2.7.3 Contractor deficiencies

While the role of the contractors has been appreciated, a lot of criticism has been levelled against them regarding the manner in which they pursue business. The criticism may be divided into two (i) lack of prior experience before coming into business and (ii) what (decisions, actions, attitudes, and perceptions) they do after they are in business. This is in line with a report by and Dun Bradstreet (1987, 1976) which noted that the major reason for small business failure is not external environment (economy or government red tape) but simply management incompetence and inexperience.

Table 2.9: Constraints which inhibit performance of construction enterprises

Major factors	Sub-Factors
Constraints from the Client/ Representative	<ul style="list-style-type: none">▪ Inappropriate contract conditions▪ Incomplete contract documents▪ Poor contract management▪ Inadequate supervision by the client▪ Delayed interim and final payments
Constraints from the Business Environment	<ul style="list-style-type: none">▪ Structure of the industry▪ Fluctuation of the work load▪ Lack of access to finance▪ Shortages of skilled labour▪ Uncertainties in supplies and prices of materials▪ Access to cost effective working plant and equipment▪ Intense competition from foreign contractors▪ Lack of integrated government policies towards SMCEs▪ Lack of appropriate supporting infrastructure.▪ corruption▪ denial, poor management styles,▪ lack of business skills,▪ lack of technical skills,
Constraints from enterprise/ Contractors Deficiencies	<ul style="list-style-type: none">▪ failure to attract skilled staff,▪ liability of smallness and newness,▪ inadequate systems▪ contractor's practices and attitude towards work and enterprise aspects

Contractors display similar deficiencies like their counter parts in other sectors but theirs is aggravated by a lack of understanding of the unique nature of their business environment. Their deficiencies may be identified as poor performance denial, poor management styles, lack of business skills, lack of technical skills, failure to attract skilled staff, liability of smallness and newness, inadequate information structure. These are discussed next.

▪ ***Performance denial***

Some authors (Franklin and Goodwin, 1983; Adams, 1997; Ssegawa, 2000) have intimated that the problem of contractor deficiencies starts with a denial about their incompetence. Adams (1997) observed that small business owners, including contractors, are over optimistic about their competence and often blame external factors for their business problems. Yet contractors have deficiencies which they do not want to accept and change but desire to find an external aspect to blame for their lack of performance, for example, competition from foreign firms.

In most developing countries like Botswana, the emergence of local contractors is a relatively new phenomenon because most of them were established after independence which in most cases on average is 40 years. Thus, most of the contractors are on the low end of their learning curves (Zawdie, 2000). They lack experience and, consequently, face numerous constraints arising from a denial of their own deficiencies.

- *Management style*

Poor management style happens to be a major stumbling block to the performance of contractors. Most of the construction firms in developing countries are normally dominated by the owner (or few owners), who in most cases has interests in other businesses (Ofori, 1991). Eyiah and Cook (2003) provided a clearer picture by noting that in Ghana almost all local construction companies are run as a family business. The directors are usually the owner and his or her spouse. Problems of owner-manager dominance in terms of management, vision, decision making and financial control have already been highlighted. The contractors have a paternalistic and highly personal management style (Ofori, 1991). As a result, they are, in most cases, reluctant to delegate responsibility to others, especially where this involves monetary transactions.

The concentration of authority, decision making and inability to delegate induces other problems such as the failure to manage transition within the firm's growth cycle (Churchill and Lewis, 1985). As the firm becomes actively involved in business, receiving many orders from clients, one individual cannot manage and supervise all functions of production, purchases, and financial control. Inevitably if the manager does not succumb to delegating authority, inefficiency will surface and the firm will fail. This is made worse by the construction environment where the work is done at the client's site, away from the head office. Another closely linked problem which may surface is that of overtrading. In construction industry, it may mean leaving interim payments uncollected for a long time through no fault of the client.

Poor business management proliferate many areas of the enterprise, for example, poor planning of work at site and poor materials control. At the root of this problem is the lack of

management and operational skills (ILO, 1987). According to the World Bank (1984), many of the ailments afflicting the construction industry are only symptoms of the underlying problem of weak enterprise management. Coupled with this is the lack fiscal discipline and effective financial regimes. According to Ssegawa (2000), it is the poor financial management, in particular, lack of fiscal discipline, poor managerial and financial practices coupled with the attitude of neglecting financial matters, which contributes to their dismal performance. For many contractors, their skills and interests lie in construction work (if at all) and often neglect administrative work like book-keeping.

- ***Business management skills***

Lack of commercial judgment is an affiliated problem of poor business management which has been cited as one of the problems facing contractors (Litvak and Maule, 1980). This may manifest in many ways, for example, failure to identify which projects to or not tender. Tendering is a time consuming and an expensive overhead which needs a well thought out strategy (Smith, 1995). A firm bidding and winning a big project when it has not marshalled the necessary management and technical skills, and resources may be heading for doom. Furthermore, some contractors diversify into areas for which they have no technical or business competency even though they are still related to construction sector but different from normal core activity. For example, diversifying into road construction from building construction may be an ill-conceived idea which may result in over stretching the firm's resources including finances.

Palalani (2000) observed and castigated people who perceive the construction industry as cash cow where a quick buck may be harvested and taken elsewhere instead of ploughing it back into the business. Palalani was of the view that such individuals exist in industry in sizable numbers and give the industry a bad name with their shoddy and unprofessional conduct (Palalani, 2000). According to Kirmani (1988), contractors in developing countries are often viewed as dishonest businesspersons who do poor-quality work, delay completion of work and who try to maximize their profits at all costs. In this way their business and professional ethics is always questionable.

Another area often neglected is the poor marketing of the enterprise's offerings. Marketing ensures that the services of the firm are well publicized to would-be customers and that there is a sustained level of satisfaction of current customers. Arditi and Davis (1988) described the function of marketing in a construction firm in a broad manner. It was viewed as the finding of new markets; evaluating job potential, establishing contacts with potential clients; gaining information regarding market conditions, potential customers and projects; pre-qualifying with clients (Arditi and Davis, 1988). The aspect of marketing is most neglected because of the one-off nature of the construction product and because the product does not exist in the first place (Shearer, 1990). A study by Yisa *et al.* (1995) revealed that a small amount of time and money is spent on the marketing function in firms. However, Miles (1979) noted the basic marketing strategy for a firm is its past clients and claimed that a sizeable number of orders come from the references of past customers. It is important therefore, to keep them satisfied and reminding them of the firm's continued existence.

- ***Lack of technical know***

Lack of technical know-how, experience and skilled personnel contributes to the inability to provide quality workmanship. According to Ofori (1991), low levels of technical and managerial skills of contractors is a major problem facing the construction industry, particularly in developing countries. As a result, they lack the ability to provide reliable tenders and yet most often are unable to afford the fees of professional advisers. Furthermore, in developing countries there is little estimating guidance for the small and inexperienced contractor as there are no commercially published estimating guides, like those in developed countries (ILO, 1987). In addition, many of the contractors are sometimes unable to meet contract bid or project deadlines.

Most contractors are unfamiliar with the legal aspects of contract work, particularly in the areas of contract law, and in the preparation and negotiation of claims against contract variations (ILO, 1987). Many contractors do not know their legal standing, obligations and their own rights. According to the ILO, contractors must have sufficient technical and legal understanding to know the limits of their responsibility (ILO, 1987). Because of these limitations, many contractors are unable to communicate effectively with the client and to

negotiate, for example, variation claims. The same limitations make it difficult and sometimes impossible to resolve disputes with clients.

- ***Lack of skilled staff***

Nothing can be done in an enterprise without people since the proprietor cannot do it alone. Personnel problems facing SMCEs include hiring, training, and retention of skilled staff (Said and Hughey, 2001).

Whereas small firms provide a favourable working environment arising from the informal relationships, flexibility and a lean bureaucracy, a study by Levy (1996) revealed that SMCEs find it difficult to obtain skilled and competent workers both at technician and supervisory level. The problem may have something to do with the perception of potential and actual employees regarding employment satisfaction. Employees consider a number of factors for prospective employment including the fact that most SMCEs do not provide:

- i) a competitive salary in respect to pay and benefits as compared to larger enterprises (Friedlander and Pickle, 1968; Said and Hughey, 2001).
- ii) a progressive career path for employee development for career growth,
- iii) lack training policies for employees or simply cannot afford training (Mambula, 2002).
- iv) job security as a result of the domineering, unstructured and bossy environment perpetuated by the owner-manager. In some instances, there is hardly any 'corporate culture' to provide a sense of belonging, participation and pride in the enterprise, (Friedlander and Pickle, 1968).
- v) adequate working conditions, adequate equipment and sometimes reasonable working hours.

Thus the problem is usually a combination of the management style of the proprietor and the profile of the enterprise. Most of the contractors are unable or unwilling to employ qualified personnel. This is despite the fact that many of the contractors themselves lack the technical know-how (Ofori, 1991; ILO, 1987). The few that are employed are not retained or get frustrated and leave because the owner is unwilling to delegate responsibility, formulate a career development path and provide decent remuneration. The paternalistic and personalized

style of management does not provide an atmosphere conducive for creative ideas and thus stifles the firm's ability to grow and expand. Yet a business enterprise is about getting ideas, contacts, winning jobs and building a team to ensure effective production and delivery.

▪ *Liability of smallness and newness*

To be small and/or new in business is a liability (Kale and Ardit, 1998). Size and age of a business enterprise correlates positively with survival rates (Malinen, 2001). The perception of stakeholders is that smallness is synonymous with being non-viable, powerless and vulnerable (Kale and Ardit, 1998). However, separating the effects of newness and smallness tends to be difficult since most of the newly established firms tend to start small. Most business failures are more common among the newly formed business compared to the older ones (Kale and Ardit, 1998).

Liability of newness arises from the effects of external processes, such as, establishing stable exchange relationship with clients, creditors, suppliers and other organisations (Kale and Ardit, 1998). To economically get access and procure input resources for production requires special effort and knowledge. Thus understanding the dynamics of the market is an important factor which requires a learning process. The second aspect of liability of newness is internal and relates to learning and inventing new roles, developing trust and cooperation among organisational members. Therefore, as the organisation survives infant mortality, there is a high chance that it will gain legitimacy and competency in its activities through organisational learning.

Liability of smallness also influences the chances of survival (Aldrich and Auster, 1986). Smallness fosters many other problems including lack of financial resources and financial support from creditors. Said and Hughey (2001) provided specific examples of liabilities of smallness in what they termed a merchandising problem. Small firms lose on economies of scale and hence price themselves out of the market as a result of losing on discounts offered by large purchases. As a consequence, SMCEs are forced to pay items on a cash basis and yet they may be offering customers credit terms (Mambula, 2002). The result is a cashflow problem due to mismatch between sales and receipts. Thirdly, small businesses have problem

of not keeping satisfactory inventory or not planning for inputs leading to delivery problems which in turn lead to loss of sales, customers and reputation. When they do have inventory, it may be too much, leading to high carrying costs, obsolescence and deterioration, all which manifest in liquidity problems and loss of reputation.

▪ ***Inadequate information systems***

A number of studies have indicated that a high percentage of business failures stem from instances where the record-keeping regime has been poor (Miles, 1979; Upson, 1987; and Dun and Bradstreet, 1976). Many firms face a complete lack of organised information system. For those which have some form of rudimentary system, it may lack the necessary ingredients for facilitating managerial decision making, for example, monitoring resources, reporting performance, liquidity position and ascertaining income. Said and Hughey (2001) identified causes of poor information systems as being:

- i) the unawareness on the part of the owner of the significance of record keeping in managerial decision making
- ii) inability to afford qualified accounting staff,
- iii) inability to design suitable accounting systems, and
- iv) abuse of financial systems and controls.

A combination of these inadequacies manifests in poor cost estimations, pricing, cashflow shortages and lack of profitability on turnover. Banks have been unwilling to deal with small business due to their lack of financial planning and control and fiscal discipline. In most cases, proprietors have asked consultants to write business plans for them, conduct business analysis and appraisal for them which they do not implement or follow or even understand. Thus smallness has got a number of side effects that affect performance and growth. Lack of resources, such as, finance, skilled workers, credit and good information systems are some of the stumbling blocks of SMCEs. This is exacerbated by the perception of external stakeholders who view them as risky and non-viable entities.

The next section looks at the challenges clients and representatives normally foster to the performance of SMCEs.

2.7.4 Constraints from the client/ representatives

The common constraints arising from clients and their representatives include inappropriate contract conditions, poor contract management, incomplete contract documents, inadequate supervision, delayed payments, and corrupt activities. Each is briefly discussed.

- ***Inappropriate contract conditions***

Aniekwu and Okpala (1988) noted that effectiveness of any contractual system can only be suitably assessed by its productive efficiency, that is, the ability to accomplish projects within a given time, for a given financial incentive, in a given contractual relationship. In reference to most commonwealth countries which use contractual systems inherited from UK as part of the British colonial legacy, Aniekwu and Okpala (1988) contended that the contracts were not designed to directly cater for the developing countries and are consequently often inadequate in dealing with situations in these countries. The view is supported by Rwelamila and Mayer (1999) who noted that nine out of the twelve SADC countries use the traditional procurement system for delivering projects. In this environment, projects have often performed poorly in terms of balancing project objectives. Most projects experience serious problems with quality of constructed work, which result in extensive delays to planned schedules, cost overruns and a general increase in claims and litigation (Rwelamila and Mayer, 1999).

The World Bank (1984) also noted that there are problems of language in the wording of the contract, particularly when archaic or excessively complex terms are used. The World Bank (1984) further drew attention to the fact that contractors are victims of one-sided contracts in which the onus of risk is unfairly placed on them. In such contracts, the contractor is subjected to all kinds of penalties for failure to meet the contract conditions, while penalties against the client in cases of failure to meet his obligations are rare. The World Bank gave the example of lack of compensation for delays in payments by the client, some of which according to Sonuga, Aliboh, and Oloke (2002) reflect a breach of contract. The imposition of unrealistic contract conditions, together with the unwillingness to renegotiate contract deadlines in relation to unforeseen delays in the availability of materials, compounds the

problem. According to Larcher (1998) under the traditional contracting system contractors in developing countries are forced to accept a proportionally greater contractual risk than they are able to bear.

- ***Incomplete contract documentation***

The second aspect related to the client factors is the supply of incomplete contract documents to contractor during the invitation to tender. Palalani (2000), in his appraisal of the Botswana construction industry, noted that the quality of information issued to contractors for construction purposes is generally not adequate. The ILO (1987) identified a tendency among clients or their representatives to assume that the contractor has the ability to figure out construction details, even if they are not adequately covered in drawings and specifications. There is a need to realize however, that with emerging contractors, the more clearly the clients indicate their requirements, the easier it will be for the contractors to meet the requirements. Closely, related to this problem is the issue of constant design changes and hence changes to the scope of work. Poor site investigation has also led to various aspects, for example, delays in the project arising from the need for redesign or rework and disputes.

Another problem is that methods and materials prescribed for a project do not take into account locally available alternatives. Specifications are based on performance judged on the basis of a standard or code of practice that is set in industrialized countries.

- ***Poor contract administration***

Poor contract management is also another thorny issue by clients. Within government departments, according to Larcher (1998), there is little experience and capability to prepare and administer contract documents, supervise contractors and measure and certify work completed for payment. Lack of capable representatives inevitably leads to client's poor contract management. Larcher further points out that although consultants can be hired by government departments to undertake design work, prepare contract documents, tender and select contractors, supervise their work and authorize payments, this does not eliminate the need for an understanding of contract procedures within the departments.

The capacity constraints within government departments inhibit their ability to adequately monitor projects. Palalani (2000) attributed this problem to poor remuneration of government employees compared to their counterparts in the private sector, and differentials in remuneration between citizens and expatriate staff. According to him, these two factors lead to loss of enthusiasm and commitment to work, poor productivity and a brain drain out of government service.

Inadequate supervision on the part of client can be a major obstacle to project performance. On many projects in developing countries, the level of site supervision is often inadequate (ILO, 1987). Palalani (2000) blamed clients who employ clerks of works (COW) who are inexperienced, lack the necessary qualifications or are not committed to their work. In some cases, the problem of lack of experience extends to the consultants (e.g. engineers, architects and quantity surveyors) hired by clients. The World Bank (1984) warned that care should be exercised when selecting supervising consultants and recommended that only the services of firms with proven experience, and which are capable of giving the full service required should be selected. However, though this is a valid point, the World Bank's approach presents developing countries like Botswana with a problem. In these countries, in order to develop the indigenous construction industry, it is very important to make sure that the indigenous consulting sector is also taken on board. One of the things emerging citizen consulting firms need is exposure and work opportunities. If they are denied work on account of their lack of experience, they will for ever be ostracised (Palalani, 2000).

- ***Delayed payments***

No factor has received more prominence in construction literature than delayed payments, perhaps because of its crippling effect on project implementation. Public clients are the most notorious for late payment (Aniekwu and Okpala, 1987). This must be viewed in the context of the fact public clients procure the highest value and number of projects. Delays in payment from public client may be due to lack of adequate financial planning; unforeseen economic problems which may lead to temporary or complete stoppage of the projects, or blatant mismanagement or misappropriation of the project funds (Adams, 1997). The ILO (1987) noted that in developing countries delayed payments are pervasive in public sector work due

to (i) bureaucratic delays in processing payment certificates and authorizing payments (ii) failure on the part of government departments to make adequate forecasts of their expenditure and (iii) inadequate numbers of civil service inspectors, especially in rural areas.

Larcher (1998) noted that contractors are dependent on regular payments to retain staff, pay wages, obtain material supplies and maintain good relationships with their creditors. Thus apart from creating cash flow problems and additional financial costs for contractors, delays in interim payments create other problems, such as, the need to leave the site and travel to collect payments. This may happen several times often leaving work unattended.

In most developing countries, final payments, including the release of retention money, are typically made after a period of six months from the completion of projects. While this is an important safeguard of the client's interests, in case of defects start emerging in the structure, for too many emerging contractors it presents an added cashflow problem. The ILO recommended a reduction in the proportion of the retained portion on small contracts or a bond in lieu of retention (ILO, 1987).

2.7.5 Constraints from the business environment

Constraints in the business environment were discussed in Section 2.5 in a general manner and their impact on the financial soundness of enterprises, particularly in developing countries. The discussion here is specific to the construction sector. While the environment is harsh to all contractors, it is much harder to small than large contractors; and more so to local contractors than to foreign firms (Kirmani, 1988). Business environment constraints specific to contractors include a number of issues some of which are discussed next.

- ***Structure of the industry***

The structure of the construction industry, especially where projects are delivered in a traditional procurement systems has often been cited as a challenging environment. Aniekwu and Okpala (1987 and 1988), divided the constraints due to the business environment into two, systemic factors and structural factors. The former relates to the application of systems not suitable to the environment, in particular a contractual conditions of delivering a project

while the latter refers to the structural set up of the industry resulting from the inherent conditions and practices within the environment which do not enhance project performance. Rwelamila and Mayer (1999) identified factors which inhibit performance such as (i) organisational fragmentation (ii) lack of coordination and communication between key project parties (iii) adversarial contractual relations (iv) a lack of customer focus (v) inferior working relationship and (vi) poor industrial relations. Aniekwu and Okpala (1987) proposed that the environment may be readjusted by enhancing a contractor's productivity through the formulation of special provisions in the contractual system.

For his part Larcher (1998) attributed the undeveloped nature of the construction industry in developing countries to the lack of a supporting framework for the industry, for example, high taxes (Materu, 2000); high interest rates (Arditi, Korsal, and Kale, 2000), heavy operating expenses coupled with insufficient profit (Arditi, Korsal, and Kale, 2000); and lack of credit facilities (Kirmani, 1988).

▪ ***Fluctuation in the work load in the industry***

Like any business, a work load of adequate size is a necessity to breakeven, yet for the contractors, obtaining work regularly is one of their biggest problems (World Bank, 1984, ILO, 1987, Materu, 2000). In developing countries, this is mainly due to the weak economies which are unable to sustain infrastructure development projects and yet they are the largest clients of the industry (Materu, 2000). Ofori (1991) noted that the weak nature of the economies of many developing countries constitutes a basic factor underlying many of the problems of the construction industry. In most developing countries, the construction industry relies on public sector contracts but this overdependence contracts exacerbates the problem. Governments only undertake projects when funds are available (Larcher, 1998) and as a result, the public sector's investment in construction is cyclic (Ofori, 1991) resulting in a considerable fluctuations in the workload for the industry and hence the enterprises. Lack of work continuity for enterprises has often led to idle equipment, retrenchments and financial strains. On the other hand too much results in 'artificial booms' stretches the resources of the enterprises and industry as a whole, often leading to shoddy work (Palalani, 2000).

Another issue relates to economic structural adjustment programmes which were instituted in a number of countries (e.g. Zambia, Uganda, Tanzania and Zimbabwe) and which invariably involved cuts in government capital investments (Ofori, 1984 and 1991). This, in turn, meant less expenditure on development projects by governments. Structural adjustment programmes have led to the closure of parastatal/government institutions that were major sources of business to the construction industry (Materu, 2000).

▪ ***Lack of access to finance***

Like all enterprise access to finance is an important ingredient in the performance of construction enterprises. For construction firms it is even more critical because as compared to other businesses, construction firms have a high need for working capital requirement. This is due to the amount of materials required, relatively large amount of staff wages and equipment hire costs. They also need long-term capital to cover the costs of expanding business and financing the purchase of equipment (Larcher, 1998). Despite this, small and medium-sized contractors in developing countries have limited access to funds due to reasons which include;

- i) financial institutions see construction as a high risk venture and therefore unwilling to lend to contractors, especially the emerging ones (Ssegawa, 2000);
- ii) contractors are seldom able to convincingly prepare and present their financial plans to bankers (ILO, 1987),
- iii) they are unable to provide the necessary collateral (Lacher, 1998; ILO, 1987; Olugboyega, 1997; Word Bank, 1984).
- iv) advance payments by clients are rare and interim payments for work done are in many cases delayed (Olugboyega, 1997; Sonuga, Aliboh, and Oloke, 2002; and Materu, 2000).
- v) many of the contractors lack fiscal discipline and effective financial regimes (Ssegawa, 2000; and Olugboyega, 1997).

Lack of access to financial assistance is a symptom of other related problems, including lack of information on sources of finance, inadequate low risk capital, lack of collateral, and complicated lending procedures of financial institutions (Republic of Botswana, 1998; Frese

et al., 2002). Financial institutions which respond to the financial needs of construction enterprises have been criticised for:

- i) charging small firms high interest rates,
- ii) asking for a high level of security, in the region of 100-400% of the net borrowings,
- iii) being conservative in their outlook as to purposes for which finance is being sought,
- iv) inappropriate terms of the loan, including the size of the loan, its term and repayment schedule which are not flexible enough to cater for the needs and cashflow situation of the borrower (Morewagae *et al.*, 1995).
- v) sometimes being incompetent and inefficient in dealing with procedures for credit assessment.

Financial institutions normally take the wrath of the business community and policy makers for ignoring the financial plight of SMCEs. Hall (1989) pointed out that the disadvantages SMCEs suffer in their relationship with capital markets have existed for over fifty years in Britain. For developing nations, the situation is even worse because the capital markets are limited or non-existent. There is normally an absence of preference shares, bonds, factoring services, credit facilities from suppliers, and lease and hire arrangements and loans from financial institutions due to the undeveloped nature of the business environments or the very nature of small businesses. When contractors are shunned by banks, some contractors resort to the services of private money lenders. However, this tends to compound the problem rather than provide solutions because of the high interest rates charged (ILO, 1987).

Another aspect to note is that internally generated funds require thriftiness. This in turn requires commitment, patience, discipline and skills to sustain thriftiness. Many proprietors do not have these attributes and most often funds are squandered on transactions unrelated to the business. Financial institutions hence view SMCEs as risk ventures. When donor agencies or government intervene in to fill the gap they exacerbate the problem by giving loans to people who have not learned to save (Morewagae *et al.*, 1995).

- ***Shortage of skilled labour***

Shortage of skilled construction labour is another problem which often affects the cost and duration of projects. Shortages of both unskilled and skilled labour are a common occurrence in many nations experiencing a construction boom. However, shortages of skilled labour are also frequent occurrences regardless of the industry cycle. In construction, it is the skilled workers and the foremen who play a major role in determining the quality of work done and the profitability of the contract as a whole (ILO, 1987). Furthermore, contractors need employees who are not just supervisors but who can manage risks because risk is a daily occurrence during construction during construction (Kirmani, 1988).

Most indigenous contractors, especially in the developing countries, have difficulty in recruiting and retaining suitably trained and skilled labour. There are three underlying causes of this problem. Firstly, there is a lack of training facilities in some countries and hence lack of a pool of trained labour from which the industry can draw. Secondly, where the labour is available, many small and medium-scale contractors lack the financial resources to recruit and retain such personnel. Obviously, the skilled workers themselves are reluctant to take up employment with such firms because of job insecurity (ILO, 1987). Thirdly, even when there is availability of skilled labour the low level of productivity of the available labour poses an additional problem.

- ***Uncertainties in material supply***

Most often enterprises experience uncertainties in supplies and prices of materials in a number of industries. In a study carried out by Aniekwu and Okpala (1987), shortage of materials was identified as one of the biggest causes of delays for construction projects in Nigeria. Jaselskis and Talukhaba (1998) noted that this was a problem in the construction industry in Kenya while the ILO (1987) and Zawdie and Langford (2000) noted the problem extends to other developing countries. Shortage of essential materials such as cement, steel and fuel are a frequent occurrence. In addition to shortages, material prices may be too high or may fluctuate too often to be accommodated in the project budget. To compound the problem, according to Turin, (1973) and Ofori, (1985) most developing countries use a very

high proportion of imported construction inputs in form of technology, skills and materials. This is despite the fact that these countries have balance of payments which make foreign exchange scarce (Ofori, 1991). In a study of the Tanzanian construction industry, Materu (2000) noted the frequent devaluation of the national currency plus the high content of imported resources as a major problem in the Tanzanian construction industry. Materu further noted that the low quality of materials (especially steel and cement), frequent fluctuation in fuel prices and high transport costs are additional problems to the industry. Ofori (1991) also points to the fact that the terms under which contractors obtain their inputs are generally unfavourable and of course the smaller firms are at the worst end of the problem. Palalani (2000) mentions the dumping of poor quality materials by some emerging Asian nations as adding to the industry's problems in Botswana.

▪ ***Uncertainties with cost effective working equipment***

Studies (e.g. ILO, 1987; and World Bank, 1984) have intimated that access to working and cost effective plant and equipment is also a problem. The purchase of plant and equipment, and its subsequent maintenance involves foreign exchange which in most developing countries is scarce. For individual contractors, maintenance of construction equipment is also a major operating expense (Kirmani, 1988). Interest rates on loans for the purchase of plant and equipment are also high. High taxes on imported equipment further compounds the problem. In addition, Larcher (1998) pointed out the difficulty of obtaining spares as an additional problem for equipment maintenance.

Furthermore, the level of demand for construction services in these countries is rarely sufficient to justify the setting up of extensive and sophisticated hire facilities. In the facilities are available, low demand causes high hire charges and transport costs. According to Materu (2000), in a country like Tanzania, new or used equipment is not readily available and what is available breaks down frequently leading to high operating costs.

However, a study by Kirmani (1988) also questioned the rationale of contractors in developing countries investing in expensive equipment in the face of insufficient workload. This is an important point which questions the understanding of the contractor's

understanding of capital decision making process. There is also the problem of poor management of the few existing equipment. This observation is in line with the ILO's (1987) assertion that the contractors rarely need to be concerned with hiring equipment because most of them own the basic equipment they need. Although it is felt that there is need for heavy plant and equipment among small contractors involved in civil works projects, it is felt that because small contractors are unaccustomed to the use of heavy plant, they are unlikely to use it efficiently.

- ***Competition from foreign firms***

Most often there is a cry by emerging contractors about competition from foreign contractors (Palalani, 2000 and Materu, 2000). This may be caused from the fact that in most developing countries, the construction industry is dominated by foreign contractors who are better experienced and resourced than their indigenous counterparts. Naturally, they are more resourced and can tender more competitively and execute contracts more effectively. As a result, they are a source of fierce competition to the emergent citizen contractors who tend to be under resourced due to the numerous constraints that they face. In Botswana, the citizen contractors traditionally have faced competition mostly from South African firms. However, the arrival of the Chinese firms in the late 1980's added another item on the competition menu. The Chinese firms are very aggressive and competitive in their strategies, especially pricing. Even the other foreign firms are finding it hard to compete with them, not only in Botswana, but even in South Africa (Sentongo, 2005; and BOCCIM, 2005).

- ***Lack of integrated government policies towards SMCEs***

As already indicated before most countries, having realised the potential of SMCEs in fostering development and as a result they have embarked on creating an enabling environment in terms of clearly defined SME development objectives and the required institutional mechanisms to guide and implement such policies (Republic of Botswana, 1998). However, in some countries, SMCEs are still subjected to a barrage of complex, rigid and excessive government laws and regulations that stifle their operations and hence growth. When trying to comply with statutory or regulatory requirements, entrepreneurs spend so

much effort, time and money complying with such requirement like filling in forms for permits, attending meetings or receiving government officials for inspections.

Where SMCE policies have been promulgated they are either not well implemented, lack focus, do not address the problems on the ground or information about them is not disseminated. Many entrepreneurs are normally not aware of the specific assistance programmes targeted to assist them to develop their businesses. While a criticism may be levelled against them for their ignorance, the government is also equally to blame for not promoting the schemes in an appropriate and relevant manner. Moreover, those who are aware of the financial assistance have indicated the following problems difficulty in completing applications and compiling the necessary information (Molefi, 2003). Secondly, delays are also encountered due to inefficient, inept and sometimes jealous officers who process the applications. This may result in malpractices such as favouritism, nepotism and sometimes corruption in awarding the assistance.

Thirdly, Bureaucracy especially on public jobs has been cited as a constraint. According to Ofori (1991) contractors in many countries have to contend with bureaucratic contract administration procedures. Bureaucracy is experienced everywhere, be it payment, obtaining permits for building, work, material extraction (e.g. gravel and sand). Long, *et al* (2004) estimated that 20-40 percent of capital investment in construction is lost due to poor management, for which bureaucracy and bribes are major contributors.

Despite the commonality that researchers have found when studying construction industry of various nations, there are still differences in the problems faced by contractors in the various countries in terms of their nature and severity. This is another factor that provided the motivation for the study.

Another aspect related to the policy issue is the lack of data on SMCEs. Data is very difficult to collect due to lack of infrastructure to collect data and also due to the lack of formalised information systems on SMCEs. As a consequence of information scarcity, it is difficult to plan, research and fully understand the challenges and problems facing the SMCEs. Relevant

data for planning and which would assist in benchmarking may include (Republic of Botswana, Palalani, 2000; 1998 Sunny and Babikanyisa, 1993) number of firms in a particular category or class; registration, survival and growth rates; job creation rates; linkages (vertical and horizontal) to other sectors; size and geographical distribution of markets (demand); capacity (supply); ownership; demographic data (age, gender, education, training, etc); and sources of finance, and sectoral accounting data (significant ratios, like ROI, liquidity, margins, etc).

- ***Lack of appropriate infrastructure***

Harper and Soon (1979) noted that there are basic services which essential before any industrial development takes place, for example, lack of office space. Fielden *et al*, (2003) observed that there was a lack of affordable premises for small businesses in the UK. A study in Botswana indicated that 70% of SMEs, operated their businesses in residential areas (Daniels and Fisseha, 1992).

Another aspect in that in most developing nations, channels of distribution and other supporting infrastructure are either expensive or are poorly developed. Mambula (2002) identified poor infrastructure, which includes bad roads, water shortage, erratic power supply, poor banking network, and poor and unreliable communications systems as obstacles to growth of SMEs in Nigeria. The cost or lack of these aspects increase the firm's overheads and diminish its competitiveness.

- ***Corruption***

Corruption has also been cited as an emerging and a serious constraint on the client side. Materu (2000); Olugboyega (1997); Sonuga, Aliboh, and Oloke (2002); and BOCCIM (2005) raised the issue of corruption. According to Sonuga, Aliboh, and Oloke (2002), corruption grossly affects project implementation as corruptive tendencies by government officials usually cause unnecessary demands on projects. The World Bank (1984) attributes this problem to irregularities in the complex, contradictory, or inconsistent government policies and regulations and poor salaries paid to public staff. Lack of transparency in tendering

procedures and discriminatory pre-qualification criteria (Materu, 2000, ILO, 1987) are also cited as contributing to the problems of securing work.

2.8 Chapter Conclusion

This Chapter has provided an overview of the environment in which SMCEs operate and hence PBFMS are designed, developed and operated. The framework of proprietor-enterprise-environment was used to highlight the fact that PBFMS could be affected or influenced by each of these factors. Thus because of the influence of the three factors, it was worth highlighting how they fit in the overall picture.

This firstly was done by highlighting that the growth and development of an enterprise affects the nature and effectiveness of the PBFMS. Secondly, the decisions, actions, awareness and skills of the proprietor also affect the PBFMS, for example, in regards to the investment, support and its use. It was also noted that the external environment impacts on the enterprise, which in turn affects the performance of both the projects and the PBFMS.

Subsequently, the construction industry was described at length and in particular the local industry of Botswana. The aim was to provide a holistic picture of the nature of the industry in which SMCEs, operate. The role of the industry in social economic development was also highlighted. In trying to demonstrate the industry's contribution to development, the performance of Botswana's construction industry was discussed and some instances compared with its neighbours Zimbabwe and Namibia. The last part of the section discussed the challenges and problems faced by contractors highlighting three issues, mainly the contractors/ enterprise deficiencies, client and their representatives and the business environment.

In a nutshell the discussion has highlighted developing a construction industry involves focusing on all of its participants and improving the policies, reforming the systems and building the institutions which promote and regulate the environment in which the participants operate. Contractors are only one of the participants. Although they play an

important role in the construction industry, they cannot produce the expected results unless policies are right, the industry infrastructure is sound, the institutions strong, and all the participants observe the rules of the game. Ofori (1991) added that contractor development in developing countries must be a planned and co-ordinated national effort. Larcher (1998) reinforced this view by maintaining that it will be necessary to initiate and develop organizations which can provide the necessary support framework. Lastly, the World Bank (1984) maintains that efforts for developing the domestic construction industry will require concerted actions and need to be sustained over long periods. It warns that the efforts will only succeed if governments are committed and are willing to sustain the actions and implement the necessary reforms.

CHAPTER 3: PROJECT BASED FINANCIAL MANAGEMENT: THEORY AND PRACTICE

3.1 Introduction

The previous Chapter provided a discussion of the environment in general and in specific terms. It discussed the possible impact of the environment on the enterprise and hence PBFMS. In Chapter 1 a PBFMS was defined in terms of the role it plays in the enterprise. This Chapter goes further to define the functions of an affective PBFMS. It firstly, recognises the fact that the human element is crucial in the decisions relating to the development and management of the PBFMS. It then discusses and describes functions and corresponding processes and activities that an effective PBFMS out to facilitate in construction enterprise as obtained from literature. Finally, it proposes a model on which the study is based Thus the next section briefly looks at the importance of the human element in the PBFMS.

3.2 Human Element in PBFMS

The definition in Chapter 1 noted that a systematically arranged collection of knowledge, tools, technique, procedures and policies that facilitates the carrying out of the roles and functions of an enterprise. These include the provision of information for decision making at all levels of management in order to fulfil the primary objective of delivering projects efficiently and effectively so as to fulfil the mission of the enterprise

The definition emphasised that the presence of *adequate skilled personnel* plays an important part in the effectiveness of a PBFMS. It is the personnel who make decisions, take actions and use the PBFMS. At the operational level, they design PBFMS infrastructure in terms of the procuring the necessary equipment and software in case of an IT based. They coordinate, organise and plan for work related to the PBFMS functions. Through the deployment of their knowledge and skills, they are expected to use the most appropriate techniques and tools when capturing data and processing financial information for projects. At the strategic level, they also formulate policies, regulations and procedures and use efficient and effective

practises when managing, developing and sustaining the PBFMS operations. In a construction enterprise, such persons include a project manager, estimator, project planners, accountants, IT personnel and management (or/and the owner).

Of all the personnel mentioned, the latter is of crucial importance because of the decisions they make, for example, the need to invest, support and use the PBFMS (Fortune and White, 2006). They need to use the PBFMS to obtain project performance and financial information in order to control enterprise/project activities and resources. In addition, they also need to comply with the set policies and procedures, particularly those which relate to financial transactions. In this vein Basu *et al*, (2002) observed that management need to be committed to every aspect of the enterprise whether it is at strategic level or at operational level. Kearns (2007) broke down the concept of commitment into two by observing that management needs to support and be compliant to enterprise activities. Support meant the participation and involvement of management in the affairs of the enterprise including the PBFMS. Compliance meant that employees and in particular management especially of small enterprise need to observe enterprise's policies, best practices of financial management and all aspects of good governance.

Having emphasised the need for management commitment to the PBFMS the discussion moves on to its functions in a construction enterprise.

3.3 Identifying the Functions of a PBFMS

The position of this study is that generic financial management systems found in enterprises of non-construction sectors of the economy are not well suited for SMCEs because of their inability to address the nature of the project oriented work organisation (Halpin, 1985, and Peterson, 2005). In particular, they do not adequately integrate both the financial, project and construction aspects found in SMCEs. However, an appropriate model may be adapted and developed from the various frameworks available in literature and thus be able to document the functions of a PBFMS.

This section therefore, looks at an *overview* of relevant frameworks available in literature with a view of analysing and developing a more *detailed* model for adapting as the best practice PBFMS model for the SMCEs. Included in the discussion are the (i) generic frameworks and (ii) construction specific scholar-developed models as discussed next.

3.3.1 Generic models

Three generic frameworks namely the (i) planning-control, (ii) accounting, and (iii) project management models have been identified and are each discussed.

- ***Planning and control framework***

The planning and control model is a basic model that assumes that a PBFMS should be based on two major functions performed by all enterprises, namely planning and controlling (Shai *et al.*, 2006), as illustrated in Figure 3.1

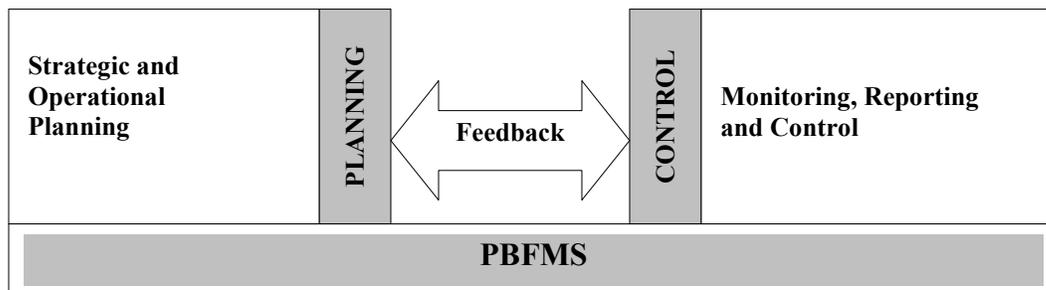


Figure 3.1: Planning and control as roles of PBFMS

Planning involves two aspects, strategic and operational. Strategy involves charting a future direction of the enterprise from which operational plans are derived. Naturally falling from planning is the control function which has three elements namely, monitoring, and control. Each of these aspects is discussed in detail later.

- ***Accounting framework***

This framework is based on two well established branches of accounting namely financial and management accounting. It presupposes that a PBFMS should be related to the two accounting functions as illustrated in Figure 3.2.

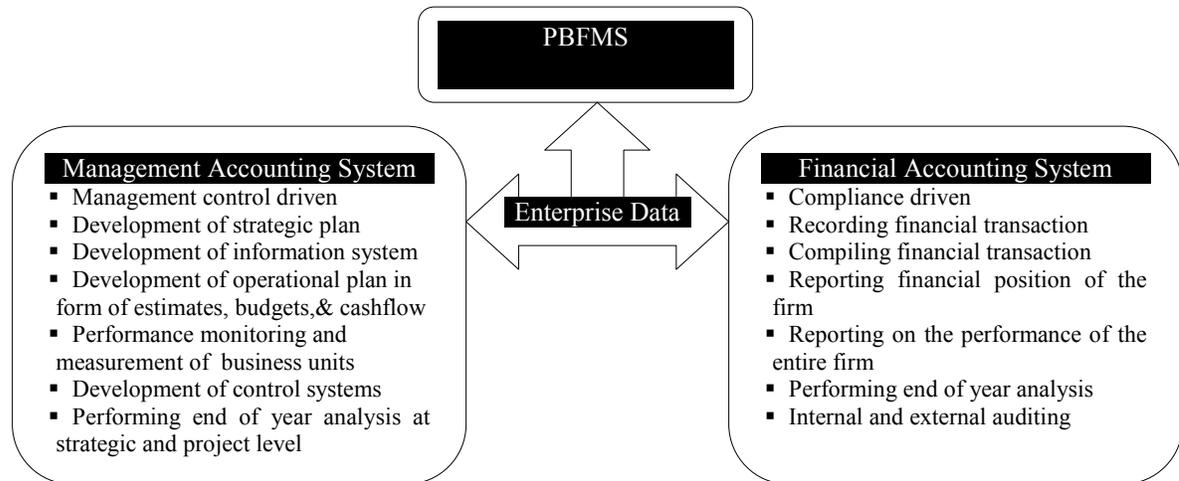


Figure 3.2: Financial and management accounting as sub-systems of a FMS

The financial accounting branch of an enterprise deals with the recording and compiling of financial transactions using generally accepted accounting principles (GAAP) and standards. The information is then used to produce financial reports for use by a wide range of stakeholders, particularly external parties including shareholders, investment analysts, government departments (e.g. tax and statistics), creditors, suppliers and other parties (Antony *et al.*, 1992). The financial reports are aimed at providing periodic information about an enterprise regarding its trading performance, financial position and changes thereof (Glauttier *et al.*, 1991). Financial accounting is historically oriented and places much emphasis on precision, evidence, standards and compliance. It views a firm as a whole and not its business units, divisions or projects. The financial reports form the basis for determining enterprise's tax burden and appropriation of after-tax profits.

On the other hand, management accounting is a non-legal function, purely driven by management needs for obtaining timely and relevant information for use in making sound decisions (Garrison, 1981). Management accounting provides information for internal use in a format that is best understood by users and hence does not have to conform to GAAP. It is future oriented, pays more attention to business units of an enterprise (e.g. programmes, projects or phases of a project). Management accounting facilitates both strategic and operational planning and control. It therefore, provides a greater share of the information needed that a PBFMS should produce. The planning aspect provides future direction and

permits enterprise organisation, coordination and resourcing to achieve its objectives. The control function ensures economic and efficient use of resources by minimising wastage and abuse of resources and assets.

In Figure 3.2 data flows is shown to flow in both directions in the two systems. This is because though each branch of accounting has a different focus, when combined they provide the necessary holistic information needed by an enterprise, for example, the performance of the previous year as compiled by the financial function is normally the starting point for decisions relating to the setting of turnover targets for the following year. However, the distinction between the two sub-systems normally increases with the size of the firm. For the purposes of this study the roles and functions of a PBFMS will be more inclined to those of management accounting function because of the need to guide management in the operations of the enterprise, that is, projects. It will have less to do with the production of financial statements.

▪ ***Project management body of knowledge***

Project management consists of a number of processes as espoused by the various project management associations. The processes are normally detailed through a body of knowledge (BoK) developed by each association. This section briefly describes the relevant knowledge areas for which project management contributes to documenting the PBFMS functions.

The BoKs are generic in nature and are meant to provide guidelines that suit all types of projects, including construction projects. In addition, the knowledge in each BoK is arranged differently, for example, the PMBoK of the Project Management Institute (PMI) and the APMBok of the Association of Project Managers have different items related to projects as summarised in Table 3.1. Inevitably the arrangement emphasises different aspects of project management and in so doing differentiates the focus of each model.

The 4th Edition of the APMBok (APM, 2005), for example, emphasises that projects must be utilised as a means of achieving organisational strategic plan (Morris *et al*, 2006). This aspect is also emphasised by Meredith and Mantel (2003) who noted that project conceptualisation

and selection must be a response to the environment’s opportunity but in alignment with the strategic plan of the organisation. In case of a construction enterprise which executes already conceptualised projects, the role of a strategic plan should be to guide the identification of target markets where the enterprise selects its projects and responds to clients’ project tender adverts. The APMBok provides seven sections and 52 sub-themes depicting the knowledge

Table 3.1 Knowledge areas of the two BoKs

APMBok (APM, 2005)	PMBok (PMI, 2004)
<ul style="list-style-type: none"> ▪ Project management in context ▪ Planning the strategy ▪ Executing the strategy ▪ Techniques ▪ Business and commercial ▪ Organisation and governance ▪ People and profession 	<ul style="list-style-type: none"> ▪ Project management integration management ▪ Project scope management ▪ Project time execution management ▪ Project cost management ▪ Project quality management ▪ Project human resources management ▪ Project communications management ▪ Project risk management ▪ Project procurement management

areas required in managing projects. Several aspects of these areas have been identified and selected for inclusion in the proposed PBFMS. However, while the link between Strategy and projects is provided, there is no guideline on how this may be operationalised.

On the other hand, the PMBoK (PMI 1996, 2000 and 2004) provides a set of guidelines which are closer to what happens in a construction enterprise. The nine knowledge areas, though not specific to the construction industry, detail what an enterprise should do right from identifying a client’s tender.

The PMI (2004) noted that once the tender documents are obtained from the client, there is need to establish an integrated project planning programme to guide the rest of the planning processes. Thus Hegazy (2006) noted that once the project plan is in place there is need to identify all the pieces of work required by the client and placing the pieces logically together to create a full picture of the job requirements –scope planning. This includes cataloguing the quality standards, specification of workmanship and all requirements for all pieces of work to be done.

The next step is to create a sequence in which the work will be done in form of a project schedule or programme. Following on to this is the estimation of the durations (time) of each activity making up the work. The establishment of the schedule leads to the identification of resources required to carry out each job activity and the subsequent estimation of the cost of activities. In addition, a risk plan for each piece of work may be formulated at this stage and aggregated into a project risk plan.

Once scope, quality, time and cost have been planned, several pieces of information may be derived or added, for example, budgets may be compiled, a price quotation for the project tender may be formulated by adding an appropriate mark-up to take care of risk, profit and overheads.

On implementing the project, another important function is executed, that of project control. However, PMI (2004) insists that project control must be an integrated process embedded in the planning and implementation in each of the project metrics. Since part of the project management framework is adapted as one of the input to the PBFMS, the above aspects will be dealt with in detail in subsequent sections.

After evaluating the contribution of both BoKs to project management, one major aspect may be noted. The APMBoK emphasises that there must be a link between programmes and projects undertaken by an enterprise and its strategic intent. It emphasises that the projects must add value to the organisation, that is, they should be used as strategic vehicles. However, the APMBoK does not provide operational guidelines for the linkage between the strategic plan and the operational plan, that is, how the projects should be selected to contribute to organisational goals. Therefore, the link between the strategic plan and operational plan was considered weak as illustrated in Figure 3.3. As for the PMBoK, it is only in the latest, 3rd Edition (PMI, 2004:7) that the need to link projects to strategy was briefly mentioned. The rest of the standard is directed towards operational planning after a project is conceptualised.

The view taken in the study is that both strategic and operational planning must exist and must be efficiently and effectively carried out. In addition they must be linked with the operational plans being devolved from the strategic plan. Therefore, the contribution from the two BoKs to the PBFMS may be viewed as illustrated in Figure 3.3.

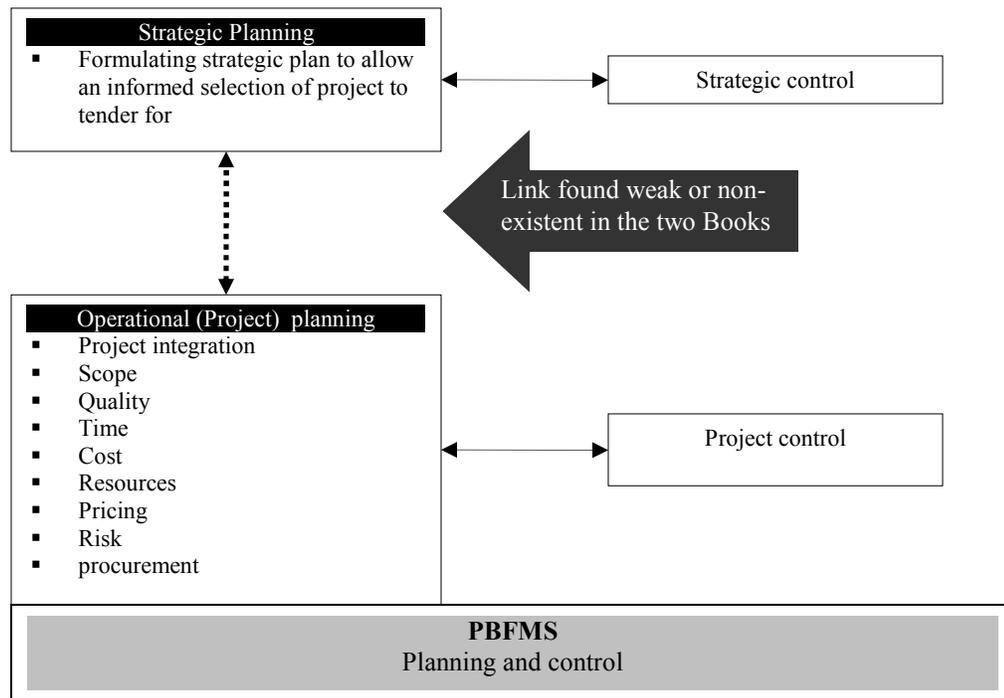


Figure 3.3: BoKs contribution to the PBFMS

3.3.2 Scholar-developed frameworks

Various scholars (e.g. Gitman and Madura, 2003; Peterson, 2005; and Smith 1995) have come up with several frameworks identifying specific functions of a PBFMS. Some of these are captured in Table 3.2. An analysis of the frameworks shows that there are several areas of commonality. Some of these functions are used to form the basic building blocks of best practice of the functions of a PBFMS and they include the following:

- i) strategic planning which includes defining of markets, environment scanning, formulation of goals and strategies and development of a strategic plan.
- ii) operation planning of project resources and metrics in terms of scope, quality, time, resources, cost, risk, pricing and cashflow forecast,

- iii) control of project activities and resources and hence project metrics,
- iv) valuation of work performed, and
- v) information management associated with the above processes in terms of project monitoring, reporting, analysing and taking corrective action.

While each of the above functions will be discussed in detail in the proceeding sections, it is worth highlighting why some of the functions mentioned by scholars are left out in the proposed model, particularly, the treasury function, funding decisions and asset management (Gitman and Madura, 2003; and Peterson, 2005). It is not to down play the role of each of these functions in an enterprise but it is recognition that SMCEs do not get deeply involved in these areas, for example, treasury functions are usually found in large corporations where there is need to source for funding, invest excess cash and determine the most optimal capital structures for new businesses. In some instances, large enterprises may deal with various situations requiring an examination of interest rates for borrowed money or exchange rates in case of cross-border trade.

Ordinary SMCEs operating in Botswana do not operate across borders as all their jobs are local in nature and their major material suppliers are also local (Sentongo, 2005). Their main worry is to deal with interest rates resulting from short term loans obtained once in a while to procure the basic equipment and overdraft to cater for shortage of cashflow. In any case financial institutions are not so many and hence interest rate shopping is not so much developed. Moreover, in the construction industry, most of the equipment is hired and hardly any company affords to own all required equipment when they are not sure of the next job. Thus SMCEs own very basic assets (equipment and plant) where the decisions of selection, acquisition and disposal of assets do not require complicated financial number crunching.

In view of the above discussion the proceeding sections discuss in detail each of the functions identified in the PBFMS namely strategic and project planning and control as the second and third components of the proposed PBFMS (the first being the human element). The discussion begins with strategic planning

Table 3.2: Specific frameworks for identifying the functions of a PBFMS

Author	Identified functions of a PBFMS
Gitman and Madura, (2003)	<ul style="list-style-type: none"> ▪ Strategic and operational planning ▪ Treasury management dealing with the sourcing, and investment of funds, management of exchange and interest rates. ▪ Funding decisions determining the capital structure of the enterprise and required return on capital and Asset management decisions relating to selection, acquisition and disposal of assets, including hiring or leasing. ▪ Control of enterprise resources and activities, including performance measurement. ▪ Working capital management which deals with the purchase of inputs, sale of goods, management of stock, work in progress and debtors, and creditors. ▪ Information management which deals with data capture, processing, storage, reporting, dissemination and the associated infrastructure.
Peterson (2005)	<ul style="list-style-type: none"> ▪ Costs and profit management which ensures cost standards are developed, marks-up are formulated, projects are monitored and controlled and profitability is analysed. ▪ Cashflow management ensures both project and corporate cashflow is forecast and shortfalls arranged for taking cognisance of timings of the inflows and outflows ▪ Selecting among financial alternatives especially in deciding the market area and in making in-house/outsourcing and equipment purchase decisions. ▪ Resource accounting which ensures a proper accounting system is put in place to accurately track costs, bill clients and pay for commitments, prepare financial statements and analyse them.
Cheng <i>et al.</i> (2001);	<ul style="list-style-type: none"> ▪ Planning – allocating resources for performing contractor’ s activities ▪ Estimating – determining the cost of construction activities and the right price for bidding for a project ▪ Cashflow forecasting – assessment of the future capital demands at both corporate and project levels in order to maintain the desired liquidity levels. ▪ Valuations – the determination of the amount to be paid for the completed amount of work at agreed periods. ▪ Cost control-comparison of the anticipated and actual costs of work items to arrest any unpredicted variations. ▪ External sources to the information generated by other parties transferring to the contractor for carrying out construction work. ▪ Accounting – the recording, processing, analysis and reporting of financial data.
Ndekugri and MacCaffer (1988);	<ul style="list-style-type: none"> ▪ Planning –planning the project work activities and resources ▪ Estimating of time and cost, including associated budgets ▪ Cashflow forecasting resulting from in flows (client payments) and outflows (projects costs and overheads) ▪ Valuations of completed work ▪ Cost control resulting from a comparison of planned expenditures with actual costs incurred ▪ Accounting for the project transactions including procurement and payment processing

3.4 Strategic Planning

This section discusses the essence of strategic planning and management. The process of strategic planning has evolved as a result of a turbulent business environment where opportunities exist as well as serious threats (Mintzberg, 1994). In order to survive, enterprises must respond to the dynamics of the market by ensuring that they eliminate their weaknesses while using the full might of their capabilities. Thus the essence of a strategic planning and its operationalisation is to provide superior performance in the market. Since there is dearth of literature (e.g. Kotler, 2000; Newkirk and Lederer, 2005) relating to strategic planning or management the discussion is centred on the major aspects of the process.

3.4.1 The process of strategic management

The process of strategic management aims at developing and implementing a strategic plan. According to some scholars (Junnonen, 1998; Kotler, 2000) strategic management in enterprises is unstructured, unprogrammed, non-routine and non-repetitive. Kalafatis *et al* (2000) added that it is an iterative and not a linear process, with overlapping sub-processes. However, despite its unstructured nature, models have been developed to represent best practices of the process.

Strategic management begins with the development of a strategic plan consisting of (i) vision and mission statements (ii) an environmental scan and assessment (iii) goals/objectives and (vi) strategies (Hill and Jones, 2005; Newkirk and Lederer, 2005), as illustrated in Figure 3.4.

3.4.2 Vision and mission statements

Modern enterprises need to formulate vision and mission statements as a source of inspiration and fulfilment for to guide the purpose of their existence. The vision thus defines the desired and ultimate destination of the enterprise in terms of its selected business (mission). The mission statement facilitates defining target markets in which potential customers and competitors are identified, for example the building/civil or public/private sector markets.

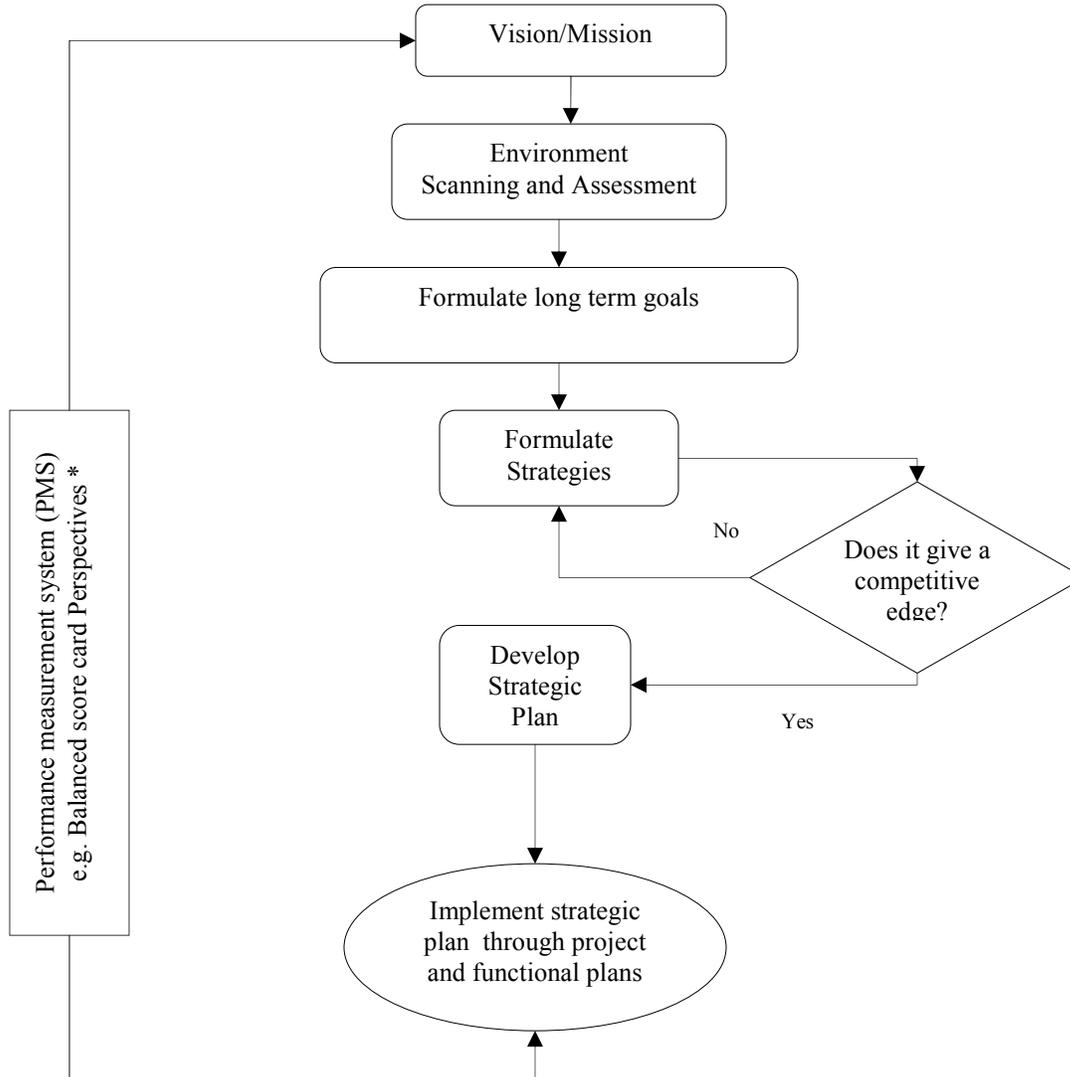


Figure 3.4: A summary of strategic planning processes

Adapted from various e.g. Ehlers and Lazenboy (2007);Thibodeaux and Favila (1996)

It thus enables an enterprise not only to identify the needs and expectation of the market but to develop offerings that satisfy that need. The formulation of the vision and mission statement is line with the views of competitive advantage concept which recognises that a target market must be selected first before resource capabilities reassembled (Hooley and Broderick, 1998 and Hooley *et al.*, 2001).

In order to fulfil the vision, goals and specific objectives must be set within the context of the mission. However, this must be set within the perspective of the internal capabilities and the external opportunities in order to have a strategic fit. This requires scanning and an assessing environment (a situational analysis). This aspect is discussed further.

3.4.3 Environment scanning and assessment

The environment assessment stage aims at formulating a competitive position in relation to the market offering by making a thorough evaluation of the market's needs and the enterprise's capabilities. The assessment process continuously:

- i) identifies the needs and wants of customers in the targeted market to identify available opportunities,
- ii) assesses the enterprises capabilities and weaknesses to see whether it is still in position to match the needs and expectations of customers in a sustained manner, and
- iii) reviews the conduct of competitors and any other business environment aspect that may cause a threat to its operations.

A number of tools have been developed to aid the assessment process. The most common one being the Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis which looks at the threats and opportunities posed in the target markets and the strength and weaknesses of the enterprise. Since part of competitive advantage emanates from the enterprises capability, an assessment is needed to review the strength of the firm's resources, process, policies, procedures and systems. The process allows a review how the enterprise is posited to take advantage of the opportunities in the changing environment. Teece *et al.* (1997) and Prahalad and Hamel (1990), noted that internal capabilities permit the adaptation, integration, reconfiguration of internal organisational skills, resources and functional competencies to suit a dynamic environment. Checklists have been developed to aid the process, for example, for the assessment of the effectiveness of the quality and quantity of owned assets (e.g. capacity, age and obsolescence) and human resource (e.g. number, skill and age) and the effectiveness of the information system.

Furthermore, Porter (1980) observed that profitability of an enterprise could be reduced (and vice versa) in the market if the intensity of competition is reduced; if the product provided is differentiated; if barriers can be erected; if the bargaining power of suppliers can be reduced; and if the bargaining power of the enterprise can be increased.

Loosemore *et al*, (2003) noted that the macro environment may be appraised by examining the impact of political, economic, social and technological factors (PEST). This has already been discussed in Section 2.5. However, it is suffice to say that in most cases the major worry for the construction industry is the state of the economy as it controls public and private demand for projects.

Another useful tool is the value chain analysis (Porter, 1985) which is for analysing the efficiency and the level of integration of core and support activities and the respective value created within and out side the firm. The framework aims at reducing non-value adding activities and hence reducing cost, expedite decision making and delivery time while improving quality as some of the pre-requisites for gaining a competitive advantage. Though cost reduction is an internal perspective, while value is a customer perspective, both are geared at increasing the competitiveness and profitability of the enterprise. The completion of the assessment stage leads to the formulation of enterprise goals.

3.4.4 Goals formulation

During the assessment stage, gaps in the enterprise capabilities and performance which could hamper the achievement of the enterprise's mission are usually identified. The intention of formulating goals is to close the performance gap identified in the internal and external environment. In doing so an enterprise should move from its baseline performance to a projected competitive position. As a caveat, for goals to facilitate the achievement of the enterprise mission they must be specific, measurable and achievable within the planning period. An enterprise may wish, for example, to set its goal as the increase in its market share by 10% in five years from the current figure of say of 15% as illustrated in Figure 3.5. For a construction enterprise, increasing market share is broad goal which implies increasing the success rate of bidding and increasing profitability.

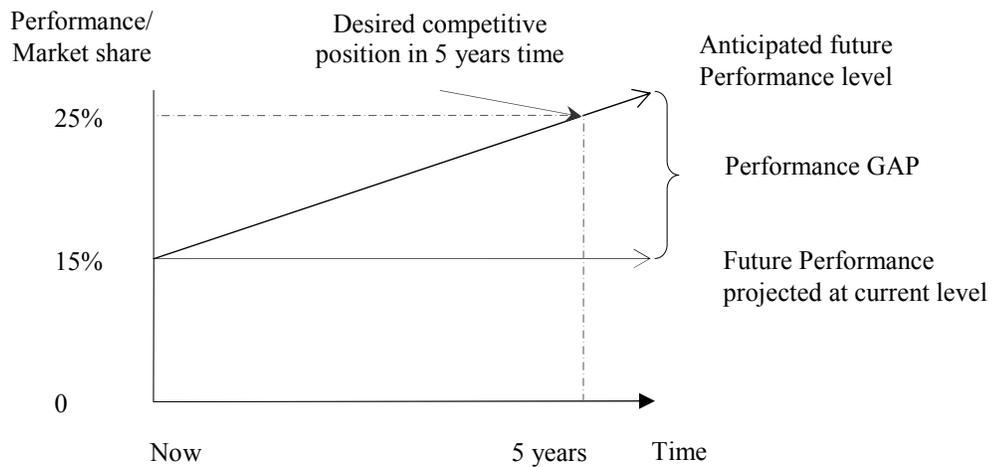


Figure 3.5 Projected performances due to formulated objectives

Source: adapted from Ansoff (1968)

Traditional means of performance measurement, which are financially based have been questioned as to whether they facilitate in achieving the enterprise mission through measuring the enterprise value. In response to the challenge scholars have proposed models some of which include performance matrix (Keegan *et al.*, 1989); balanced scorecard (Kaplan and Norton, 1992); performance prism (Neely *et al.*, 2000); integrated performance measurement for small firms (Laitinen, 2002). The emphasis of the model is that when setting goals, an enterprise should look at other aspects, beyond finance, for example, enterprise image and customer satisfaction. For construction enterprise and at an operational level, the most well known goals are those focusing on clients namely delivering projects within budget, at a specified quality and within specified period. Unless these three goals are seen in a wider context, achieving them at the expense of others may be catastrophic. Achieving customer satisfaction when the rate of site accidents is beyond acceptable limits may lead to numerous litigations or industrial action, all which may result in financial haemorrhage. Thus at a strategic level cost, time and quality are a result of well articulated strategic goals. In other words, the delivery of projects within the agreed metrics of time, cost and quality is a result of a well crafted strategic plan.

Whichever model is used, it is important to identify critical success factors (CFS) which are crucial to the achievement of the set goals. Similarly associated, performance indicators (PI) must also be identified to provide means of monitoring and tracking project performance. Performance indicators are monitored through a performance measurement system, which is embedded in the enterprises PBFMS. Performance measurement is discussed later. However, it is of critical importance to note that goals cannot be simply achieved as if everything were static; as if competition does not exist and as if customer needs do not change. Strategies must be crafted to act as a vehicle for achieving goals in the ever changing environment as discussed in the next section.

3.4.5 Strategy formulation

Strategies provide a means of seizing opportunities while mitigating threats in selected markets, thus ensuring that a competitive advantage is defended, sustained and goals achieved. No one strategy is enough to achieve the mission of an enterprise. Normally enterprises employ multi-prolonged strategies, perhaps with a dominant one. Ansoff (1957) provided a set of grand strategies, specifically aimed at increasing the market share of an enterprise and which could be implemented in any combination. They form a product-market matrix namely (i) penetration of markets (ii) development of products and markets and (iii) diversification. Examples in the construction industry would be, for example: moving from one class of contractor class to another to increase the scale and hence value of projects (new market); venturing into building, civil works and roads (new product); being able to take on projects in distant locations or outside national borders (geographical market spread); and vertically integrating (diversify) through acquiring material suppliers or developing a real estate.

Porter (1985) identified another set of strategies aimed at gaining and sustaining a competitive advantage namely (i) being able to perform contracts at a lower cost than the competition (cost focus); (ii) the ability to perform contracts in a way that clients perceive it unique in relation to the competition and thus attract a premium fee (differentiation focus); and (iii) and being able to carve out a niche market due to some unique competence or offering (Porter, 1991), for example, choosing to operate in a remote location that no firm

wants to conduct business. While cost leadership is an achievable strategy in construction, differentiation is rather difficult to realise as Betts and Ofori (1992) noted that the construction industry is characterised by intense competition because construction work is a service which is difficult to differentiate or brand. Perhaps what may be differentiated is the reputation packaged in delivering projects within budget, schedule and with a high quality of workmanship. Kale and Arditi, (1998) reinforced the observation by noting that construction services do not have many attributes that can be manipulated or modified to provide a differentiation strategy especially at the construction phase of the project.

3.4.6 Implementing a strategic plan and performance measurement.

A strategic plan is implemented through the devolution of functional and project plans and their implementation. Functional plans refer to the normal plans of functional departments, such as estimation, accounting and human resources. Project plans refer to the selection and planning of projects.

The success of strategic plans is measured in the success of operational plans. However, this only happens if the operational plans are aligned to strategic plan. Furthermore, success implies that the plan has not deviated from the expectations. Thus performance measurement of strategic plan is tightly linked to the measurement of operational plans, particularly projects plans; for example, continuous loss of tenders or financial loss on projects will never deliver the desired goals of increased market share or profitability. The monitoring of strategic plans is essential because it is practically impossible to keep plans on track due to many reasons such as (i) the changing environment, (ii) wrong assumptions on which the plan was based and (iii) internal deficiencies. The performance indicators already indicated are the major means of monitoring, measuring performance and controlling projects.

3.4.7 Strategy planning in SMCEs

There has been an evolution from strategic planning to strategic management due to some scholars (e.g. Mintzberg, 1994; Robinson and Pearce, 1983) questioning the role, purpose and value of strategic plans. Their scepticism has arisen due to firstly, the uncertainty and complexity in the business environment which often renders strategic plans obsolete before

they are implemented (Mintzberg, 1994). The market place often changes and the competition frequently moves business goal posts in a manner not anticipated in the plans. Secondly, most managers mistake strategic plans to be a destination as opposed to being an en-route to the destination. They rarely refer to them after preparation. Moreover in some cases they are forced to produce plans by creditors, which in addition are sometimes developed by consultants resulting in a lack of internalisation of the contents. Thirdly, it has also been argued that the formalisation of strategic plans depends on the size and stage of growth of a firm (Camillus, 1975). Hannon and Atherton (1998) observed that in large firms, the strategic planning process is essential, formalised, systematic and separate from operational planning. In small business, where there is a high centralisation of authority, informality in communications, and where the owner-manager dominates the decision making process, formalised planning process hardly works.

On the hand there is a school of thought that sees value in strategic planning (Meredith and Mantel, 2003; Cox and Ireland, 2000). Many studies (e.g. Welch, 1984) have provided quantitative and qualitative evidence to support the positive relationship between strategic management and enterprise performance. They argue firstly, that strategic plans serve as a means of coordinating the strategic direction; communicating to relevant stakeholders (e.g. employees, shareholder and customers); controlling activities and resources; creating responsibility in terms of authorisation and accountability; is a basis for measuring performance; getting inputs from other employees as a buy-in strategy; creating continuity in case of a change in management; and affording a chance to critically review the goals of the enterprise so that expected results are known. Secondly, there is a strong argument (Meridith and Mantel, 2003; Klastorin, 2003) that operational plans must be devolved from strategic plans, for example, Lyles *et al.* (1993) argued that strategic planning should be linked to operational plans and thus integrate the management functions of planning, organising, staffing, leading and controlling as espoused by Fayol (1984) to strategy.

In construction, strategic intent should guide the nature of contracts for bidding, for example, prudent companies should avoid contracts that are too large for their size; beyond their experience range; those that are likely to stretch their available resources, including cash;

those which outside their normal geographical area of operation; and those with unusually onerous contract conditions. One important aspect need to be emphasised here that project selection process (identifying the markets to serve and projects to tender for) must be guided by the strategic plan in order to establish and maintain a link between the strategic plan and operational (project) plan. No project should be selected which does not fulfil the aspirations of the enterprise as contained in the strategic plan. To put it in another way, project objectives should contribute to achieving the enterprise's strategic goals. The success of a project fulfils the strategic goals and hence the strategic plan.

Having discussed strategic planning, and concluding that it must feed into operational plans, the discussion now turns to operational planning and control processes.

3.5 Project Planning

In a project based environment, which characterises the construction environment, operational planning is synonymous with project planning. Moreover, since the project is already conceptualised and designed, the word '*tender*' is added to note the difference that the planning is for construction not for design.

Each construction project must be planned for because of its unique characteristics. This is based on the premise that tender plans facilitate implementation, performance measurement and control of project resources and activities. Project tender planning is the commitment of organisational resources in the most economic, efficient and effective way to execute the tender (Moder, 1983). In doing so an enterprise seeks to control project cost, time and quality.

Project tender planning in construction firms attempts to answer the following questions: How do we proceed with the process? - project programme (Smith, 1998); what needs to be done and at what standard? – scope and quality definition (Marchewka, 2003); who will do the work and when will they do the work? -responsibilities; how long will it take? - scheduling; what is needed to complete it?- resources planning?; how much will it cost? -

budgeting; what are the chances of succeeding? -risk assessment; and what are our returns on the job? – pricing/profitability.

Project planning is essential but laborious and consumes resources and time and costs money especially given the fact that there is no guarantee of being awarded the tender. Most contractors pay lip service to the process with dangerous consequences. Those who plan, do so with some varying level of detail due to a number of factors which include (Cooke, 1992 and Smith, 1995) the degree of keenness of the contractor; the size of the firm; complexity of the project; size of project, and familiarity with the type of work.

MacCaffer and Baldwin (1995) are of the view that the tendering process in an enterprise should be developed and refined until it reaches an efficient level in terms of producing consistent and reliable estimates. Project maturity models have been developed to measure the level of competence of an enterprise in handling projects, including project planning (Kerzener, 2001; and Klastorin, 2004).

This section discusses project tender planning in terms of necessary information infrastructure required for the various decision making points in the process.

3.5.1 Tender planning programme

A tender project planning programme is necessary to ensure that the planning and tendering processes are economically, efficiently and effectively executed within the client time limits (MacCaffer and Baldwin, 1995). The major planning process programme activities include the following preliminary project study; estimation, tender adjudication, budgeting, and tendering as illustrated in Figure3.6.

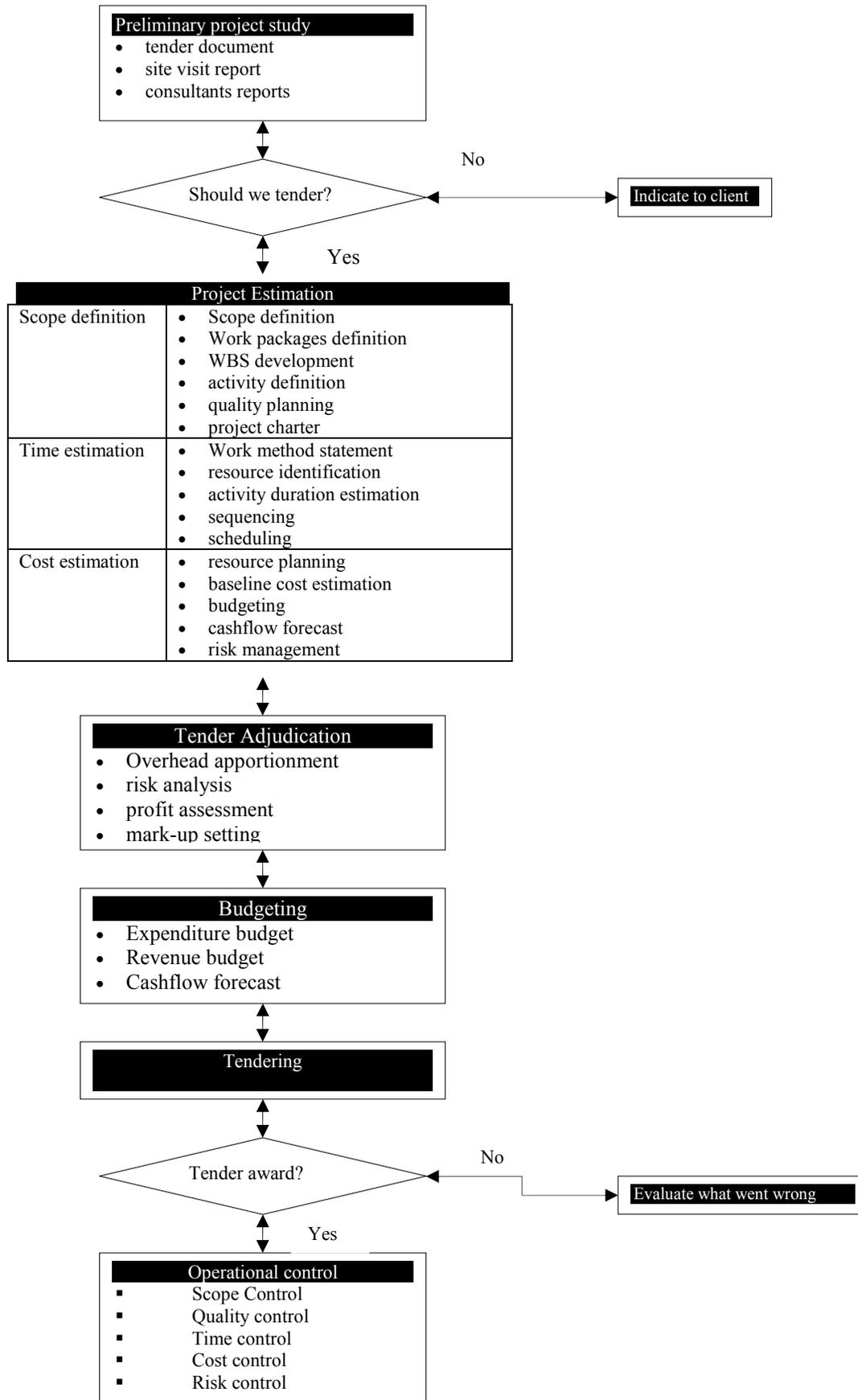


Figure 3.6 Project tender planning and control system

It is important that planning process programme is carried out in an integrative manner. This requires coordinating and systematically carrying out the mentioned activities of the programme. This ensures that firstly, no internal inefficiencies put the tendering process at risk. Secondly, it ensures that internal and client deadlines are met. Thirdly, all tasks are given adequate consideration and time subject to client time limits. Lastly, guess-estimates which lead to poor bid performance or project losses are avoided.

A note before each is briefly discussed. Though Figure 3.6 lists tender planning processes in a linear manner with distinct tasks, in reality the tasks are iterative and overlap.

The arrows point in both directions to signify that no process is an end in itself. Another aspect to note is that quality and risk management are not indicated as separate processes but are embedded in the scope, time, cost and adjudication processes as discussed later. We now look at each task of the programme (which are essentially part of the functions of the PBFMS).

3.5.2 Preliminary project study

The preliminary project study entails two activities namely the examination of the tender documents, and a project site visit. For most construction contracts the common project tender documents consist of drawings; specifications; bills of quantities (BoQs); tender form; contract details, and a list of nominated subcontractors and suppliers (Forster, 1989). The major aim of examining tender documents and visiting the site is to ensure that ambiguities and discrepancies are identified, understood and where necessary acted upon before it is too late (MacCaffer and Baldwin, 1995; and Smith, 1995).

In addition, a study of the project tender documents ensures that all documents have been received, particularly all relevant construction drawings; the programmer and estimator obtain a good understanding of the work required in the BoQ; programmer assesses the degree of risk involved on the project in terms of conditions of contract, project time scales, tendering time scale, requirements of the bid, for example, performance bonds and liquidated

damages; any errors, discrepancies and ambiguities in the specifications, drawings and quantities are identified.

A preliminary project study is a very important task because it may reverse the decision to tender (see Figure 3.6). The study may be regarded as a tendering feasibility study, which determines among other things the risk profile of the project based on factors such as, complexity, availability of resources, onerous contract condition and time scales. The firm may also realise at this stage that the project will load the resources or there is too much competition and to warrant wasting estimating resources.

After a decision to tender has been made project estimates namely, schedule, cost and cashflow are developed. To arrive at these estimates, a systematic and well coordinated programme requiring the use of various tools, techniques, information and experience is needed (White and Fortune, 2002). Before the schedule and budget is developed there is need to unpack the job requirements by looking at the tender documents particularly the drawings and bill of quantities discussed next.

3.5.3 Project scope and quality requirements

From a contracting (construction enterprise's) point of view, scope planning is the 'downloading' of a client's tender requirements in order to deliver what is needed contractually. Thus scope planning requires a detailed study of the tender documents, site and consultant reports in order to understand, identify and interpret the work required.

Scope planning ensures that firstly project objectives are identified. Secondly, it breaks down the project into more manageable parts by defining all the work with its associated deliverables and activities. This ensures that no work is omitted and that work which is not required is not included since the client will never pay for it. Following on to this point scope planning reduces risk as changes to work are reduced or controlled. Thirdly, it facilitates the assignment of responsibility in a clear and concise manner. Lastly, scope planning provides clear lines of communications for the project in relation to various stakeholders.

The commonly used tool for scope planning and control is the work breakdown structure (WBS). The WBS allows a decomposition of a project into smaller independent and manageable work packages, tasks and activities (Klastorin, 2004). This facilitates cost and time estimation, resource allocation and monitoring and control. A WBS is hierarchical in nature as it begins with the final end product, followed by the major deliverables which are then sub-divided into work packages. The number of levels of decomposition depends on the detail required to support other future project processes, such as risk, time, cost and control management (Klastorin, 2004; PMI, 2004).

Apart from facilitating the definition of activities the WBS is useful in defining responsibility and accountability for project stakeholders and provides project communication and reporting lines. There is a dearth of literature relating to the purpose, merits, application and development of a project WBS, for example, Klastorin (2004) and Charoengam and Sriprasert (2001) provide eloquent guidelines for developing a project WBS.

During the definition of the deliverables or work packages, attention is focused to identify and define the expressed and expected quality standards and specifications. This is not only because they are client requirements but because quality affects time and cost. A brief discussion of project quality follows.

3.5.4 Project quality management processes

The current paradigm is that quality should be planned in and not only inspected in. Quality considerations must begin at the planning stage and not during the implementation stage of a project. This ensures that the quality management process focuses on customer satisfaction. This paradigm ensures that a project product, for example, a water reticulation system, provides water fit for drinking and conforms to the specified and expected standards. Failure to meet quality requirements for any project deliverables has far reaching repercussions on other project objectives. Additional work or repeating project activities due to errors will extend the project duration and increase its cost. The cost of quality therefore, is cost of conforming to standards as well as not conforming to them. The former implies the cost of

building quality in the product and its processes while the latter refers to the cost of re-working.

Project quality management involves three sub-processes namely quality planning, assurance and control. Quality planning refers to the identification of quality standards specified for the project and documenting them with a view to meeting them during implementation and hence satisfying the customer. Quality planning aims at avoiding mistakes because correcting them later in the structure is an expensive undertaking. Worse still if a fault goes undetected but emerges later, the reputation of the firm is ruined. Quality planning begins at identifying the specifications of the deliverable, performance standards of each trade of work as specified or expected by the best practices or as given in the tender documents. It is important to identify the quality features of deliverables because they have implications on the methods of construction, time and hence cost.

Quality assurance is the planned and systematic process which provides confidence that the relevant quality standards exist or have been part of the project. Quality assurance should be a pro-active process and not reactive process. Practical aspects considered in improving quality are the (i) recruitment and retaining of a skilled force that requires less supervision during work; (ii) the need to strengthen the purchasing process to ensure that materials are procured, inspected and tested for conformation to specified specifications and standards; and (iii) the supervision of workmanship. Kitchen (1996) noted that testing proliferates most of the construction projects and a budget should be set for testing costs which may include travel time and production of reports.

The completion of scope and quality management leads to another important process, that of time estimation which is discussed next.

3.5.5 Project time estimation

Project time estimation deals with the planning of the time of project activities. According to the PMI (2004) project time planning involves the sub-processes of activity definition, sequencing, duration estimation and project schedule formulation.

- ***Activity definition***

The activity definition process involves identifying the activities which must be performed for each work package (deliverable or sub-deliverable) identified in the WBS. The output of this exercise is a list activities and their related deliverables, for example, to deliver a water reservoir, a number of associated activities must be undertaken including construction of a foundation (excavation, concreting, hardcore, etc.) and reservoir installation. The definition of activities allows the estimation of their durations and cost which in turn is amalgamated to determine the cost of the work packages, deliverables and hence the project.

- ***Activity sequencing***

Activity sequencing determines the interdependency and relationship between project activities. In essence the task identifies which activities will be done first and in which sequence, that is, either sequentially or in parallel. The order of execution of activities is determined by the type interdependence between activities.

There are mainly three types of interdependences. First are the mandatory dependences, where one activity must wait for another to be completed before it is executed, for example, installation of a pump must wait for the construction of a pump house. Secondly, are discretionary dependences, where the relationship is decided by the project team based on their experience on the most appropriate way to execute the concerned activities, for example, the laying of reticulation network in a water project is independent of the completion of boreholes, whereas the laying of pipes from the boreholes to the reservoir depends on the borehole sites. Thirdly are external dependences which typify relationships between project and non-project activities, for example, a project activity may need the issuing of a permit from a local authority.

- ***Activity duration estimation***

In order to estimate the duration of the project, the duration of each work package must be estimated. This is done by estimating the duration of each activity comprising the work package. To be able to estimate the duration of each activity, the manner in which an activity

is executed and the baseline resources required to complete an activity must be determined. In construction projects, this is achieved by a statement of construction method (SCM). A SCM is essentially a group of construction methods statements relating to how activities identified in the WBS will be executed (Ndekugri and MacCaffer, 1988) using optimum resources, at a minimum cost and at a suitable level of production flow (Forster, 1989). The SCM, like the WBS integrates the scope, time and cost planning processes (Gyampoh-Vidogah *et al*, 2003). A knowledge of the baseline resource quantities (e.g. gangs of labour, machines or their combinations) is needed. In addition, knowledge of the output of the baseline resources (labour productivity, plant output and their combination output), and site restrictions and other work impediments as identified and recorded from site visit report is also essential.

Following the production of an SCM, various estimating techniques are used in estimating project activities. Generally, estimation techniques may be divided into two broad groups bottom-up and to-down. Bottom-up estimation is where the baseline duration of each activity is estimated and the project duration is then a summation of the critical activities. Top down is the opposite of bottom and is where a time frame is given as the final duration by which all activities must be completed. Event based projects like a stadium for the Olympic Games follow this type of estimation.

Estimation of activity durations is not an exact science and project planners often have to use their experience and judgment to come up with more reliable time estimates. Most costs are time related and an inaccurate duration estimate leads to a wrong activity cost. Time is one of the major objectives of clients and thus particular attention must be paid to its accuracy in order to control project duration.

- ***Project schedule***

The project schedule maps the sequence and duration of activities of a project on to an actual calendar time scale. A project schedule also shows the activities making up the project, start and end times, their duration, their sequence and their dependencies (depending on the tool used).

A project schedule is best documented using diagrammatic means (Gantt or network diagram). While a detailed discussion relating to the development and application of these tools may be found in various literature sources (e.g. Steyn *et al*, 2003; PMI, 2004; Dreger, 1992) a few aspects are worth highlighting, particularly for the project network.

A project network diagram is a schematic way of displaying the logical relationships and interdependencies among all project activities. It also identifies critical and non-critical activities of the project. A critical path on a network denotes those activities which are critical to the completion of the project. Under no circumstances should these activities be delayed otherwise the project incurs an extension of time which is undesirable for the client and the contractor. The duration of the critical activities also defines the project total duration. Once the critical activities have been identified, they guide a project manager to look out for any problem that would let the activities slip out of plan. Should there be a time slippage, it may necessitate increasing resources to make the project return to schedule. Increasing of resources is one of the strategies of mitigating the effects of schedule slippage risk. This may however, involve increasing the budget. However, if the cost increase is higher than the liquidated damages that may be incurred, it may not be worth pursuing the option.

Non-critical activities are those which are not on the critical path and which have a time float. An activity float, on the other hand is the time that an activity can be delayed without becoming critical. It is the difference between the early start time and late start time (or early finish time and late finish time).

A project network and Gantt chart allow the insertion of project milestones. A project milestone is a significant or an important achievement or event that provides evidence that a deliverable has been completed or that a phase is formally over (Marchewka, 2003). Deliverables must be completed at a certain time, for example, the successful completion of testing of a water reticulation system is significant to signal the end of the project and may be construed as a milestone. Ideally if a project team succeeds in meeting all its milestones then

the project should be a success. Steyn *et al* (2003) makes an analogy of a road milestone and a project milestone by noting that a milestone provides a means of looking back at what distance has been covered since the journey began and looking ahead at the distance is left.

The production of a project schedule is an important input to the next process of project cost management as discussed in the next section.

3.5.6 Project cost estimation

Project cost estimation is a process that quantifies, in monetary terms, the resources required for project activities. It involves two processes namely resources planning and cost estimating (PMI, 2004).

Though the process is presented as a discrete item, in reality it is integrated and overlaps with other project processes of scope, quality and time management. In small projects, it is not uncommon to find scope, time and cost management being performed as single process and most likely by a single individual. Similarly, the two sub-processes of cost management are normally merged as a single process on small projects or in small firms. This does mean the exclusion of any sub-process that should provide a reliable project estimate.

While scope management quantifies the required outcomes, project time and cost management quantifies the required inputs for completion of project activities in monetary terms as a result of their deployment for certain duration. The purpose of cost management is to establish the baseline cost of resources below which it is uneconomic for a firm to carry out the project (Smith, 1995). In addition, the baseline cost is used in controlling project cost during the execution process. Each of sub-processes of resources planning, cost estimating, cost budgeting and cost control is discussed below.

- ***Resource planning***

Resource planning determines the physical resources needed for the project activities identified in activity definition. Essentially the process requires determining or identifying the quantity of work to be carried out. A well defined and clear scope definition provides

valuable input to the process. Decisions as to which resources will be outsourced (subcontracted) are made during resource planning. The decision may also be guided by company policy, for example, it may infer that the level of specialisation for an activity under consideration determines whether it should be sub-contracted or not.

Having decided which resource should be sub-contracted, quotations for all resources required for execution of project activities should be sent out to suppliers, including sub-contractors, in order to facilitate the cost estimation process. Ndekugri and MacCaffer (1986) noted that the resource plan should include where each resource is procured. This means developing an easy to access of supplier database with various attributes like the delivery terms, lead times and conditions of supply. It is possible that some components may need more time to be fabricated and therefore, lead times need to be noted and factored in the planning process.

The estimator's major focus is thus directed to those activities which are performed in-house. To arrive at the correct quantity of resources, an estimator needs to know the output rates of plant and labour and in addition the usage rate of materials. The former depends on estimator's knowledge and experience relating to the baseline gang sizes and the labour skill, for example, mix; plant type, site conditions and layout and effect of weather conditions.

Material usages must include allowances for wastage, shrinkage, bulking and overlaps. Akintoye (2000) noted that a resource planner has to consider the required input resources (material, plant, labour and sub-contractor) in terms of quantity, quality, lead times and performance and other factors affecting the performance of these resources to arrive at the total resources required and hence the cost for completion of project activities. One of the skills that an estimator needs to have is being able to define the best configuration of resources that optimises time and cost. Inherently this means determining gang sizes and equipment. Thus, successful resource planning requires past project information (project time, output, usage and cost data base), experience and judgement.

The output of the resource planning process is a list of resources, their descriptions, specifications, quantities and duration of use. The resource plan may be presented in different formats to serve various objectives. It may be presented by linking it to each or summarised for each type of resource (material, labour, plant and equipment requirements, including sub-contractors), or for each stage of operations. The resources may be broken down into categories which describe the respective trades or expertise, for example, labour may consist of labourers and pipe layers. Once the resources have been identified, specified and quantified, the direct cost of undertaking the work described is ascertained as discussed in the next section.

- ***Baseline cost estimation***

Cost estimating is a technical process of predicting future building costs (CIOB, 1997). In order to produce uniform and consistent estimates, the estimator must maintain a reliable and up-to-date database from which to extract the various input costs particularly all-in-rates (Kitchens, 1996).

Once all the relevant information has been assembled including receipt of quotations from suppliers and sub-contractors, the estimator proceeds to estimate the cost of the activities. Several authors for example, Brook (1993), MacCaffer and Baldwin (1995), Mudd (1984) Smith (1995), and Canter (1993) have provided detailed principles for deriving all-in rates for the three resources of plant, labour and material, for the various construction activities commonly found on sites and how to deal with subcontractor fees in the cost estimate. It is not appropriate to duplicate their work but rather to note that there are two major methods of estimating construction costs namely the unit cost and the operational method.

Smith (1995) noted that the unit (also called analytical) method of estimating uses predetermined output rates for labour and plant in conjunction with a price per unit for materials to calculate a rate per unit (e.g. m, m², m³, No, Kg, tonne, etc.) for some measured item of work or activity (e.g. excavating). Thus for each resource the unit rate calculation involves the output or usage rate combined with unit cost. An output rate is the work quantity per hour (e.g. volume in m³ of excavation per hour) and the usage rate is the time or resource

quantity needed to do a fixed quantity of work, for example, the number of bricks needed for a square metre. To arrive at the direct cost of an item of work, all-in rates of labour, plant and material are calculated first and then multiplied by the usage rate or output as illustrated in Figure 3.7.

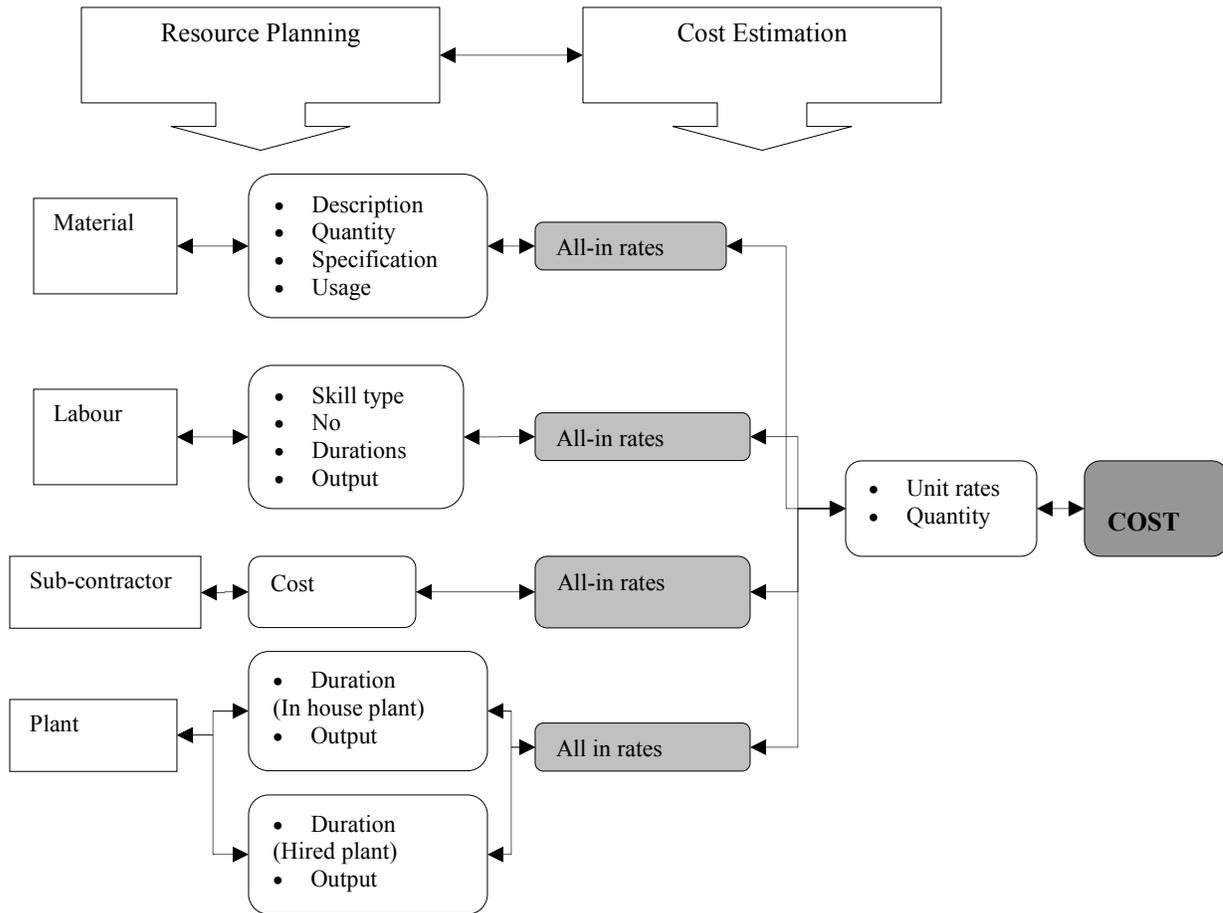


Figure 3.7 Resource planning and cost estimation processes

On the other hand operational estimating aims at calculating the total cost of a complete operation of a work package. The steps may be as follows: first, the total quantity of work is estimated first in the relevant units (m, m², m³, etc). Secondly, the total time required for completion of the entire operation is estimated to determine how long the resources will be engaged. Thirdly, the labour required is determined in terms of gang size and output and its cost using all-in rates. Fourthly, the cost of material required for the quantity of work in the bill of quantities is determined in terms of quantity and specification using all-in rates. Plant is also treated similarly.

Thus to price the bill of quantities the total cost of the operation is broken down accordingly into the separate items of the bill. Despite the differences in the rates obtained by the two methods Canter (1993) noted that no method is superior to the other but it is important to be consistent by using one method when estimating for a project. However, the unit rate method of estimating is most appropriate to use when pricing the bills of quantities because the rate derived for an item is directly inserted into the bill of quantities. Secondly, clients prefer the method because of the ease of comparing the rates of different tender bids. Thirdly clients prefer using it when preparing interim valuation payments, using it as a basis for claims for additional payments. Thirdly clients also prefer to use it in case of a variation order and reimbursement of expenses incurred in case of an extension of time being granted (Smith, 1995).

On other hand Smith (1995) also noted that the operational method is favoured by estimators especially for plant dominated operations which are viewed as a whole. The method also links well with scope and time processes. However, it suffers the problem of not suiting it to the bill of quantities during pricing.

- ***Site overheads***

Project site overheads include costs and other expenses incurred to support construction activities and which cannot be directly linked to any particular project activity, for example, scaffolding (which may be hired and returned thus forming no part of the project product) and site office expenses.

Site overheads are of two types fixed charges and time-related. The former relates to work cost that is independent of the duration, for example, transporting, setting up and erecting a site crane. Time related charges depend on the duration of usage of a resource like the hire cost of a crane and the wages for the crane operator (Smith, 1995).

Most companies prefer to allocate the site overheads to the preliminary sections of the bill of quantities. However, Smith (1995) noted that it is common practise for some contractors to

move the money around the tender bills to provide a means of improving the cashflow (MacCaffer and Baldwin, 1995). The cost may also be included as a sum or percentage of the measured work and allocated in accordance with the project programme

- ***Behavioural aspects of estimation***

Estimating is both an intellectual and behavioural process. Estimators use their judgement to gauge how far to spend their energy on a particular tender item. Skitmore and Wilcock (1994) observed that the estimation detail is more pronounced for items whose sub-total is significant in relation to the tender total. This is an indirect application of Pareto’s 20/80 rule. For this reason some estimators do not estimate the cost of each item in the BoQs with the same detail. Skitmore and Wilcock (1994) further observed that the amount of detail and effort that goes into preparation of the tender is commensurate with tender keenness. A high keenness leads to a more detailed estimation and a more accurate project estimate.

3.5.7 Adjudication process

Adjudication is a process of reviewing the correctness and assumptions of the baseline project estimate and adding a mark-up to the estimate to obtain a tender price or quote as illustrated in Figure 3.8. The mark-up entails setting percentages that cater for risk, profit and overheads.

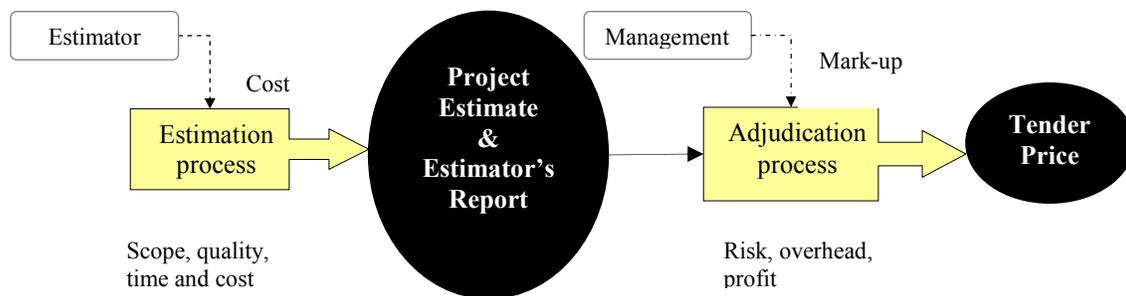


Figure 3.8 Estimation and adjudication processes

Unlike the estimation process, which is essentially technical in nature, adjudication is a subjective and intuitive process, with no systematic prescribed structure (Tah *et al*, 1994; Moselhi *et al*, 1993). The knowledge and information used in the process is often qualitative, unstructured, vague, and scanty. However, this is not to say that the mark-up is derived in an

arbitrary manner but is guided by some factual information including estimators report, office overhead expenditure, preliminary study report and the number of competitors tendering on the project as observed from the tender registration book.

- ***Estimators report***

The review of the baseline estimate by senior management involves revisiting the basic assumptions and decisions implicit in the estimate with a view to assessing the accuracy and the risks involved. The view is based on the estimator's presentation of the forecast of the labour, plant and material requirements in terms of quantity and cost, and associated plant and labour output rates and wastage assumptions. A review of these aspects acts as an important input to the risk assessment and planning process.

- ***Additions for risk***

PMI (2004) defined risk management as the systematic process of identifying, analysing and responding to project risks. All projects have a certain amount of risk. However, construction projects are inherently high risk undertakings. During the adjudication process, senior management are worried about two interrelated sources of risk. Firstly, an examination of the possibility errors could have been made in estimating project resources, durations and costs. Secondly, the possibility that threats within the enterprise or in the environment may cause a negative impact on the project performance leading to its time, quality and cost slipping out of the desired planned level. Management therefore normally management has to develop a plan for managing risks.

In assessing construction project risk, management may follow the basic steps commonly provided by a number of literature sources (e.g. PMI, 2004; and Kitchen, 1996). Firstly, the need to identify risk by determining which risks might affect the project and documenting their characteristics. Developing a checklist for use during this stage is important to ensure that none is ignored. Kitchen, for example, provided a list of possible sources of risks on construction projects (Kitchen, 1996:19). The second step requires quantifying risks by determining the probability (p) and impact (i) of risks and hence estimating the outcomes on project objectives. As a follow up of this step, is the prioritisation risks with the greatest

probability/impact (pi) score. Thirdly, a risk response planning entails developing procedures and techniques to reduce threats to project objectives including how risks will be monitored and controlled.

Threats and opportunities present themselves without warning and therefore risk monitoring should focus on a monitoring project metrics for triggers which flag that the risk may have occurred. Various tools can be used for risk monitoring and control, for example, risk audits, risk reviews and risk status meeting and reports.

For large firms, the risk management process may be an elaborate process which may involve the use of very elaborate risk management processes involving computer systems modelling. The output of a risk planning process is a risk plan for which the generic risk responses may be used depending on the situation, for example (i) avoidance or eliminating the risk together, (ii) reduction of the probability of occurrence or impact or both, (iii) acceptance or ignoring the risk where probability of the risk occurring is low or the impact is low (iv) risk transfer to another party which can best handle the risk, for example, sub-contracting or purchasing insurance.

For small firms, risk management simply involve the estimator simply identifying and noting the risks and assumptions made during scope, time and cost planning processes and presenting them in a report form to management. Whatever the size of enterprise and project, senior management will finally have to examine the risk of the project and make a risk response plan. The commonly used plans in practice are buying insurance, sub-contracting and making a provision for the risk through contingency sums. One of the components of the project mark-up is a percentage to cater for the risk which may be in the region of 0.5-3% of the estimate (MacCaffer and Baldwin, 1995) depending on how management may have perceived its level on the project.

- *Additions for overheads*

The other aspect that senior management has to deal with is the need for a project to absorb part of the head office expenses or overheads. The head office incurs expenses many of

which are intended to support administrative duties in terms of soliciting for work and supporting work, for example, estimating and the management of claims. Each contract undertaken must absorb a certain proportion of the head office and general expenses. The annual figure of office overheads is normally provided by the accounts department. The task of the adjudication committee is to determine how much of the overheads should be absorbed by each project being tendered for. Smith (1995) and Canter (1993) noted that for firms operating in a competitive environment there must be a business plan which shows the relationship between the level of overheads that a company can support, the amount of business activity in the company in terms of turnover and the level of profit that can be achieved.

Overhead absorption is one of the challenges that management of construction firms face. Unlike in other sectors where the load of work is estimated with some certainty, a construction firm will not be sure of the likely number contracts it might secure during the year, their value and hence the apportionment.

- *Additions for profit*

Normally, the strategic plan, gives an indication of the expected return on investment (ROI) and hence the profitability required on the projects. The mark-up proportion of the profit should be related to the investment put in the firm. A required ROI target set in the strategic plan is related to profit, turnover and capital employed. The profit percentage may easily be set as the other parameters will be known from past results and taking cognisance of the prevailing market conditions and the competition on the project.

The basic assumption in setting the ROI is that market conditions will be the same in future as during the time of developing the plan. In practise, the final profit percentage will depend on the market conditions other than the firm's strategy. When the competition is high on a project and the firm is keen on the tender, a lower margin than the one prescribed by the strategic plan may be set. If a firm wants to penetrate a particular market, it may set a low profit margin to lower the bidding price in what is known as a penetrative pricing strategy.

- ***Mark-up***

Individual percentages for risk, overhead and profit when combined provide a project mark-up. Enterprises may use different approaches, with some allocating percentage mark-ups for each item, while others using a single mark-up for the three items. No method is wrong as long as the desired effect is achieved, that is ROI.

The mark-up may appear in the final tender submission in two ways, as a lump sum, normally inserted in the preliminaries leaving the rates in the BoQs 'net' (Smith, 1995). Alternatively, it may also be inserted as 'grossed-up' rates of items in the BoQs by adding a mark-up on each rate in the BoQs. Firms normally use any one of the methods provided the implication, especially in case of a variation, is known.

The gross method may lead to three scenarios, firstly front loading where items executed first in the programme are quoted at a higher rate. This enables the firm to realise a higher cashflow in the early parts of the project. The second scenario is back loading which does the opposite of front loading. The last one is spot loading where some items are given a higher rate than the rest, especially where variations are expected or where risks were high. However, whatever method is used, the tender price is supposed to be same.

The setting of the mark-up is equivalent to what is pricing in the non-project based management systems. The completion of pricing facilitates the drawing up of the expenditure, revenue and cash budgets as discusses next.

3.5.8 Budgeting

Budgeting refers to the allocation of financial to the elements of the WBS. PMI (2004) also defined cost budgeting as the allocation of the overall cost estimates to individual work packages in order to establish a cost baseline for measuring performance. The budgeting process is a natural progression from the cost estimate of activities. The cost of activities making up the work package is summed up, and the total becomes the budget. In addition the total of all the work packages becomes the project budget.

Best practice requires that a project budget should be formulated after the adjudication process because it is only after this process that the project revenue and cashflow can be compiled (the expenditure having been established). Thus the budgeting process should produce project expenditure, revenue and cash budget. However, before discussing each of them, it is worth highlighting the need for cost codes related to budget items and their role in the monitoring and control function.

- ***Cost codes***

Cost codes are tags that uniquely identify a work package, activity, task or resource. Therefore, work packages may be transformed into cost centres with unique identification codes. A WBS forms a logical starting point for such a breakdown and hence the cost codes may be developed in line with the WBS. The codes may be cascaded as the according to the levels of the WBS, for example pipe laying (e.g. code 2000) may have two sub deliverables, which take on the 'parent' code (e.g. inflow pipe network with code 2100, outflow with code 2200). This could be broken down further until we have the lowest level of the basic resources of material, labour, plant and subcontractor. The codes could also be developed in such a way that they combine both alphabet and numeric characters.

Charoenngam and Sriprasert (2001) noted that a good code design must be able to provide a unique identification for each cost item and be flexible enough to cope with expanding cost data and accommodate future projects without requiring a complete redesign. Secondly, it must be compliant with the WBS structure in order to facilitate data collection, control and identification of the cost status of the activities (the level of detail must be sufficient to facilitate control). Thirdly it must be in line with the enterprise accounting system and codes in order to facilitate compatibility of documents used at site and finance department at the head office.

The design of the codes must take cognisance of the fact that there are expenses that may not be captured by the WBS design yet they are specific to the project, for example legal fees, interest charges and some site-overheads like security. The coding system is thus bound to have a wider span of items than the WBS. An important point being made here is that the

cost code should be part of an effective PBFMS to provide the advantages of best practices in data collection, accumulation and subsequent cost control.

We now look at the three project budgets project expenditure, revenue and cash budget.

- ***Project expenditure budget***

The project expenditure budgets are normally derived in a bottom-up manner. The cost of resources, that is, material, plant, labour and sub-contractor are summed to provide an activity cost. The costs of all activities making up a work package are added up to make a work package budget. In turn the budget of each work package is summed to make a deliverable budget on the next level. This is done until a project budget is compiled. Moreover these could be compiled in accordance with the project schedule to provide an indication of the timing of the cash outflows.

- ***Project revenue budget***

The project revenue budget may be developed in two versions. The first, being the value given by cost-plus a mark-up for the various work packages and deliverable. Secondly, by the timing derived from the terms of the contract given by the client, most probably through monthly valuations.

- ***Project cash budget***

A cash budget is the same as a project cashflow statement. It consists of two components the cash outflow and inflow and the respective timings of the transactions. The former is provided by the expenditure budget while the latter is provided by the revenue budget with a small.

Once the budgeting process is completed the next step is the tendering process discussed next.

3.5.9 Tender submission

Once the adjudication process is completed the estimator is expected to make changes noted during the adjudication process and then prepare bid documents. The documents may include (the list being not exhaustive) the proposed work plan in form of project schedule; schedule and budget, of resources (labour, plant and material), list of subcontractors; confirmation of any required documents or permissions from government agencies; cashflow statement which incorporates the manner in which the client has agreed to pay; and resumes of proposed project personnel and project experience of the enterprise.

Once the required signatures are appended the bid is submitted to client. If the enterprise is successful in winning the project tender, the project plan is put into action to execute the project. This is where project monitoring and control begins to ensure that things proceed as according to the baseline plan. The next section discusses project motoring and control processes.

3.6 Project Monitoring and Control

This section discusses the management and control of the projects progress of work, resources and associated costs using a project monitoring and control systems. Control is an act of reducing the difference between plan and actual. Therefore, it is imperative that deviations are managed in systematic and procedural manner. Cost control arises out of the need to manage budget changes that may occur during execution and also to ensure stewardship of a project's resources (Meridith and Mantel, 2003). Budget changes are bound to occur because however immaculately a project is planned, it is bound to encounter changes due to a variety of sources such as, the client, the environment, project team and suppliers. Moreover, budget changes to the project, like any other business transactions, may give rise to confusion, misunderstanding, conflict and legal wrangling.

The basis of effective project control is a good output of the planning process. In addition, planning and control are iterative and not linear processes as already mentioned. However, any change in any one metric usually has an implication on cost and hence profitability, for example, changes of scope or schedule, normally have an implied cost element. The control

system also encompasses risk management, for example, efforts to ensure project costs do not spiral out of control is a budget risk mitigation process.

To An effective control system needs a monitoring process in order to identify and determine that a change has occurred. A control system requires a monitoring process to supply timely and accurate information to manage changes to the project plan. Monitoring acts as link between the plan and control process as discussed in the next section.

3.6.1 Project monitoring and reporting

Project monitoring is the collection, recording, processing and reporting of information concerning any aspects of the project performance that project stakeholders wish to know (Meredith and Mantel, 2003). For a monitoring function to be effective, it should ensure that project stakeholders have relevant information (reporting) on a timely basis in order to exercise control over the project. Since the objectives of the project are the backbone of project success, the monitoring system should gather data relating to all project metrics (scope, cost, time, quality, and risk. Wsocki (2003) noted that a monitoring and reporting system should track project progress by determining the status of the project activity in terms of its metrics; process the data to determine any variance from the plan; provide an assessment of the health of the project through the generation of concise and timely reports (e.g. exception, variance, and graphical reports). In doing so the monitoring and reporting system should provide a project manager with information, in an appropriate format, necessary for decision making.

The major challenge for enterprises is to create and develop an efficient and effective PBFMS that can facilitate the monitoring of project performance and resources.

- ***Ingredients necessary for developing a monitoring and reporting system***

Creating an effective monitoring system requires several considerations such as identifying the key stakeholders who need the reports. Secondly, it requires identifying success factors

for the project, in addition to project objectives. Related to this a monitoring system requires the identification of specific characteristics of performance or standards (indicators). Thirdly, it requires selecting appropriate methods of measuring and collecting such data. Fourthly, it requires determining the nature of output in terms of format and level of detail, and determining the envelope or amount of deviation in which the measured performance could be tolerated. Fifthly, it requires assessing the most appropriate frequency of reporting. The last aspect is development of an appropriate communication infrastructure for reporting.

Reporting requires some form of medium and several combinations may be used on a single project including verbal, paper or IT based reports. For the latter real time monitoring and reporting is the ultimate scenario where data is gathered, processed and immediately made available to the stakeholders by putting the information in a central location. This may be in form of a computer data base, where it can be accessed by relevant and authorized stakeholders.

- ***Types of reports***

Steyn *et al* (2003) divided project reporting into various categories including milestone, trend analysis, variance analysis and progress meeting. Milestone reporting reviews project performance at specific agreed points in time when certain events have been achieved, for example, practical completion of construction, thus necessitating commissioning of a project. A trend analysis report uses available data to forecast what might occur with respect to the project metrics. It provides a project manager with time to respond to a possible disaster. Statements like *'it will need five weeks instead of the planned three or \$3 million instead of the budgeted \$2.5million to complete the remaining work'* result from trend analysis reports.

Variance analysis is another type of report involving comparing actual results with a baseline plan Kerzner (2003) defined a variance as any deviation from a specific plan, be it schedule, technological performance, cost or resource usage. Variances must be tracked and reported in order to empower a project manager in determining trouble spots in the project in order to take appropriate actions.

In construction, progress meetings are intended to review the status of the project and make decisions on the future performance. It is a forum used both for reporting and communicating by various project stakeholders. The reports may be verbal or written or both. In fact all the above categories of report could be part of the various reports that may be presented in a meeting. For meetings to be effective, the minutes captured in a meeting should be such that they have an actionable component to facilitate the process of control.

3.6.2 Project control systems

Cost control requires immaculate recording of project transactions in order to monitor project performance; detect variances from the baseline plan; and prevent incorrect, inappropriate or unauthorised changes from being included in the cost baseline plan. There are basically two control systems used in the construction industry, the traditional parametric and the earned value management (EVM) system. The former uses the project cost-time and percentage of work completed-time relationship as independent and unlinked measurements. It uses the bill of quantities as the basic reference point and the system ignores the time element (Lock, 2000). This gap in information led to the development of the EVM: the necessity to combine project progress, time and cost (Klastorin, 2004). Earned values analysis becomes an indispensable tool as the project's scale, scope and sophistication becomes enormous.

A detailed discussion of the traditional system may be found in, for example, Barret (1981) and Canter (1993) while the earned value analysis may be found Burke, (2003), PMI (2004), (Meredith and Mantel, 2003) and Anbari (2004).

As a final rejoinder an effective control system of an enterprise should encompass two areas (i) regulation of performance results in form of control process or system and (ii) stewardships of assets. The former has been discussed while the latter is briefly discussed next.

3.6.3 Stewardship of organisational assets

Stewardship of organisational assets means management (planning, procuring and controlling) of both tangible and intangible assets of the project including human,

information and financial resources. The emphasis on stewardship arises because of the knock on effect it has on other project activities and tasks.

Physical assets and financial resources need to be controlled to prevent abuse, misuse, pilferage and fraud. Project proprietary information resources need protection from being corrupted, destroyed and being leaked to unauthorised individuals. Human resources need not only to be supervised and controlled from unproductive behaviour but also need motivation to enhance team work and higher productivity. The common financial controls must be adhered to by ensuring that there is segregation of duties leading to clear assignment of responsibility and accountability. Secondly, there is authorisation and approval of transactions and use of assets by relevant and authorised individuals. Thirdly, there is physical security and safety of project assets. Lastly that there is management support and vigilance in ensuring that control systems are developed, maintained and adhered to.

The overall theme of project stewardship is to ensure that there is no wastage, pilferage, fraud and loss of project assets which may result in a project financial loss. Finally management itself is expected to exhibit exemplary behaviour by adhering to company polices and practices of good governance.

3.7 Conclusion

Through a search and synthesis of literature, this Chapter has proposed PBFMS model which is supposed to adequately provide SMCEs with improved performance, both in project delivery and financial returns. In essence the model consists of three major components namely the (i) strategic planning; (ii) the operational (project) planning and control and (iii) the human element, particularly in terms of management commitment to the two other components. The components are schematically illustrated in Figure 3.9.

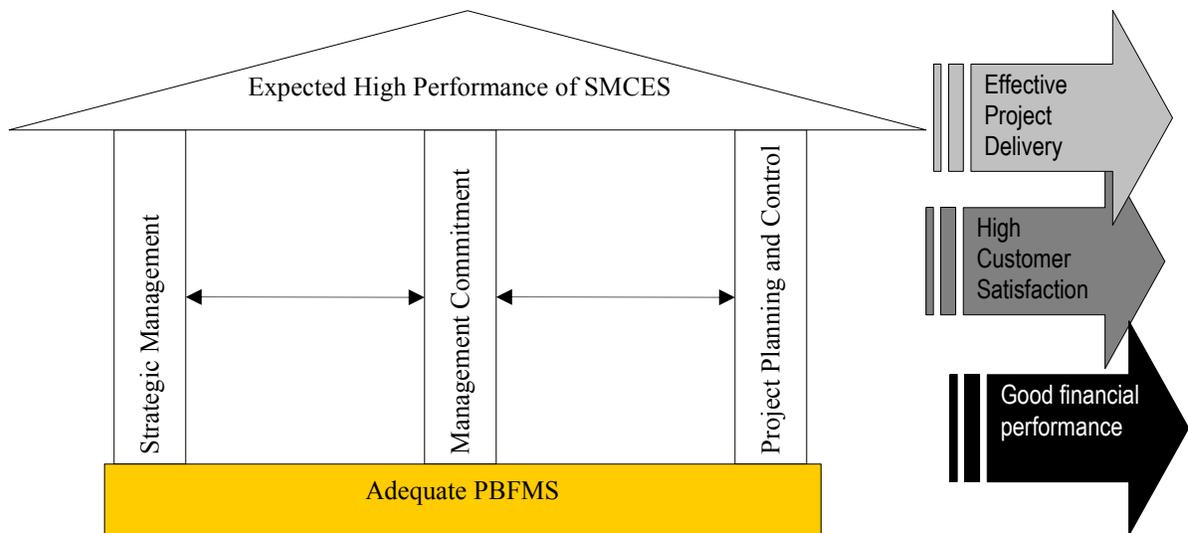


Figure 3.9: Major of components of a PBFMS

In pursuit of developing a PBFMS model, this Chapter has highlighted the role and function of PBFMS in SMCEs. The major role was under pinned as that of providing information for decision making in the broad areas of planning (strategic and operational), coordination, organisation and control of enterprise’s resources and activities. This role requires maintaining information databases by collecting, processing and storing data; producing reports and disseminating information to the various levels of management and other stakeholders. The PBFMS is also charged with performance measurement, both at strategic and operational level.

The effectiveness of the PBFMS was also defined in terms of how it performs its functions and roles. Particularly emphasis was made on the nature of information provided in terms of its accuracy, completeness, relevancy, accessibility and the formats and economy.

In addition, several function performed by PBFMS were identified beginning with strategic management. It was emphasised that strategic management aims at creating a competitive advantage in the market place by formulating and implementing strategic plan. Key components of the plan were highlighted as (i) setting a long term aspiration (vision); (ii) defining the purpose of the enterprise’s existence (mission); (iii) setting long-term targets (goals and objectives) (iv) scanning and assessing the environment and (iv) formulating

strategies for achieving targets. An important point was made that strategic plan must be rolled out through operational (functional and project) plans

The Chapter also discussed in detail what constitutes best practice in project planning and control, in particular project tender planning. It also emphasised that financial planning in a project does not deal only with cost planning but with all other project metrics namely scope, quality, risk and time. The premise was that the metrics are so much integrated that a change in any of these metrics affects cost and has an impact on finance. Thus, it was also shown that efficient and effective cost planning entails plans of scope, risk, quality and time. Moreover the fact that the role of PBFMS is that of provision information, it was imperative that the discussion went beyond cost and financial matter but include issues which affect cost. The Chapter linked planning and control by emphasising that effective control is only achievable from a quality plan. Three aspects were emphasised the need to monitor (record and compare), report and correct project activities. Control and performance measurement, at both strategic and project levels, are information led processes and this is where the PBFMS is most needed.

Finally two systems of control used in the construction industry were mentioned, the traditional system and the earned value management (EVM) system. However, it was noted that traditional system which monitors and reports scope-time and cost-time independently was described as a simple to use and hence popular system but not very informative for project control. The EVM was considered as the most suitable system for project control because of its ability to simultaneously monitor and report progress for scope, cost and time. It was however reported as being very complicated to use and hence not very popular. The section also highlighted that whatever system is in use, there are some basic reports expected for purposes of achieving performance measurement and control. These include variance analysis, project/phase profit and loss account, exceptional reports and other normal financial reports relating the entire corporation. The frequency of production of these reports was highlighted, for example, as being at any agreed milestone, monthly progress meetings or any exceptional situations.

CHAPTER 4: RESEARCH METHODOLOGY

4.1 Introduction

Leedy and Ormrod (2005) described research methodology as an attempt to systematically find an answer to a research question with the support of demonstrable facts. Thus research is a process of inquiry and investigation which is systematic and methodical. A synthesis of literature (e.g. Blumberg *et al* 2005; Gay and Airasian, 2003; Silverman, 1985; Sekaran, 1992; Fox, 1969) would suggest that research process would proceed in steps as illustrated in Figure 4.1 (the arrows point in both directions to depict the iterative nature of the process):

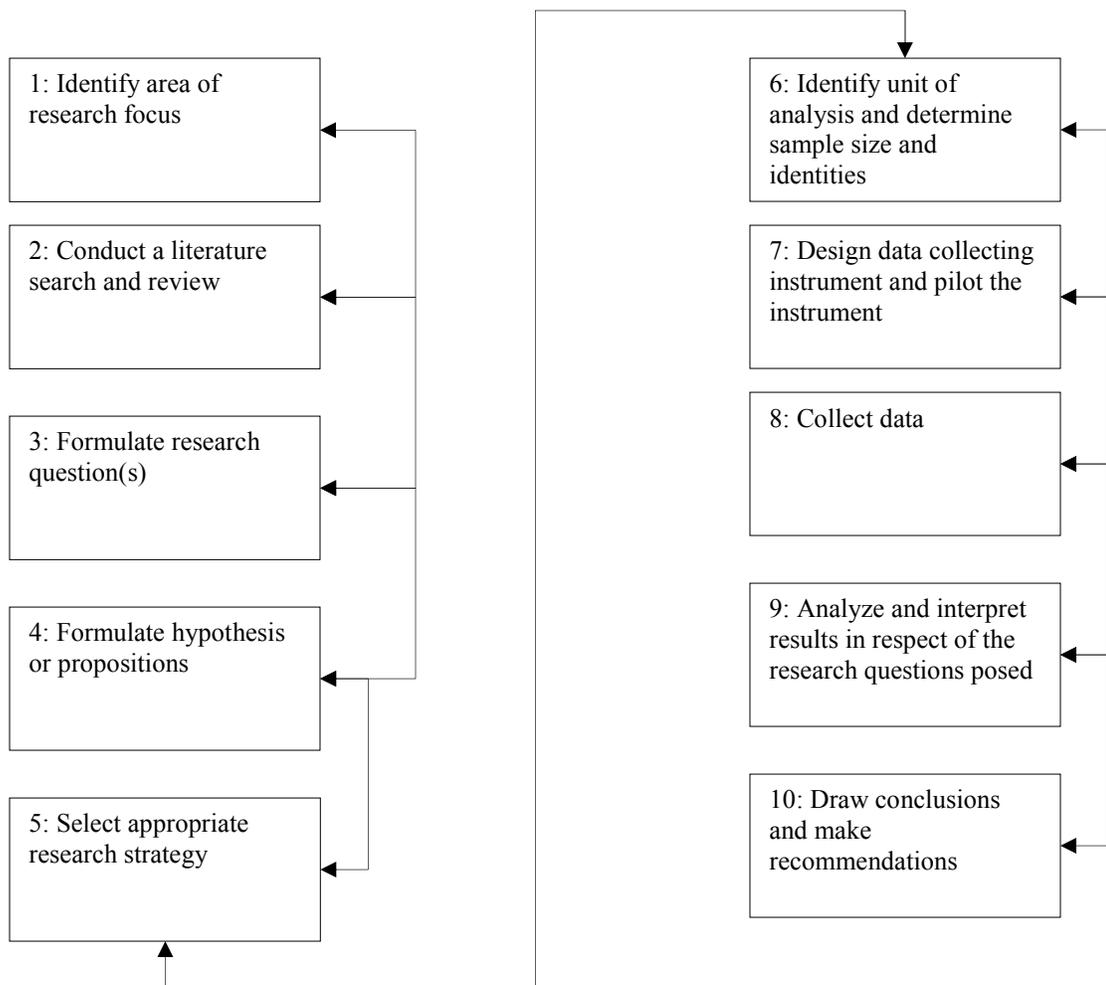


Figure 4.1: Generic steps for a research process

In line with steps in Figure 1, Chapter one introduced and described the research problem in terms of the aim of the research, associated objectives and research questions. The problem in question relates to the *theory and practice of project based financial management systems (PBFMS) of small and medium construction enterprises (SMCEs) in Botswana*. In Chapter two the environment in which the SMCEs and hence the PBFMS operate was discussed. It provided exogenous factors which could impact on the performance of the enterprise, project and the PBFMS. In Chapter 3 the PBFMS was discussed in terms of its role and functions in the enterprise. It evaluated and synthesised literature relating to the theory and practice of financial management in a project based environment in order to propose a PBFMS model which could potentially make the SMCEs more effective in conducting their business.

In this Chapter, the research process and design are discussed. The Chapter commences with a reiteration of the research questions stated in Chapter 1 as a means of focusing the design process. This is followed by the contextualisation of the study in the body of knowledge of the research philosophy leading to the selection of an appropriate research approach. A detailed discussion of the research approach follows, which includes the identification of unit of analysis, the population, sampling design and lastly the design of the data collecting instrument.

4.2 The Research Questions

It is of critical important to reiterate the research problem that guided the research design process. Reports from research studies from Nigeria, Tanzania (Larcher, 1998), Vietnam (Long *et al.*, 2004), and other countries (Kirmani, 1988), indicated that over the years there has been a trend of poor performance of SMCEs in project delivery despite the facilitation they receive from respective governments and institutions. A similar trend has also been observed in Botswana (Sentongo, 2005; and Palalani, 2000). In addition, there have been also incidents of enterprises experiencing financial difficulties while others have been suspended from carrying out government projects because of poor performance. While there could be many reasons for poor performance of construction enterprises, lack of effective financial

management has been shown (see Chapter 2) to play a major role in their failure. This being the subject of investigation, research questions (RQs) are reiterated as being:

RQ1 *Do SMCEs have adequate PBFMS that facilitate the effective delivery of projects for enhanced financial performance?*

RQ2 *Is there a relationship between the adequacy PBFMS and poor performance of SMCEs?*

The next sections discuss two major research philosophies in the context of the research study. This is to contextualise the research questions in the major research paradigms as a way of providing a basis of the research process.

4.3 The Research Paradigms

A research philosophy or paradigm is the basis on which an understanding of a phenomenon is constructed. The phenomenon here refers to the research problem of a study. The paradigm is seen as a world view representing peoples' values, judgments, norms, standards, frames of reference, perspectives, ideologies, myths and theories about research (Remenyi *et al*, 1998).

▪ ***The two research philosophies***

Two paradigms have dominated the research horizon for centuries namely the *positivist* (also referred to as quantitative, objective, scientific, experimentalist, traditionalist or functionalist) and the *interpretivist* (also known as qualitative, subjective, phenomenological, constructivist, post-modern or humanistic) philosophies. This section is not aimed at duplicating the plethora of literature by various authors (e.g. Saunders *et al.*, 2003; Collis and Hussey, 2003; Creswell, 1994; and Burrell and Morgan, 1979) who have elegantly and eloquently discussed the topic. It is aimed at briefly placing the research study in the context of these major paradigms.

The basic position of positivist and interpretivist philosophies is based on the nature of society and nature of science and how each of these relate to ontology (how reality is construed), epistemology (how knowledge is acquired), human nature (whether it is predetermined or not) and methodology of gaining knowledge (Burrell and Morgan, 1979).

The first three relate to the assumptions of research while the last focuses on the principles of research.

The two philosophies contrast in their approach to research, for example, the positivists assume (i) a single tangible reality consisting of discrete elements, (ii) a division of discrete elements into causes and effects, (iii) independence between researcher and the research phenomenon (iv) the possibility and desirability of developing statements of truth that are generalisable across time and context and (iv) the possibility and desirability of a value free objective knowledge discovery (Holden and Lynch, 2004). On the other hand the interpretivist philosophy assumes the opposite on each of these axioms as summarised in Table 4.1.

Table 4.1 Axioms of the two research philosophies

Positivist (quantitative) philosophy	Interpretivist (qualitative) philosophy
There is a single reality made of discrete elements	Human beings construct multiple realities
The researcher and the phenomenon are independent	Researcher and phenomenon are mutually interactive
Elements of reality can be integrated into causes and effect	Phenomenon aspects cannot be integrated into causes and effects
It is possible and desirable to discover value-free objective knowledge	Inquiry is inherently value laden
It is possible and desirable to develop statement of truth that agree with generalisation across time and context	Research inquiry is directed to the development of idiographic knowledge

In the past, debates by the two research camps remained so heated to the extent that each questioned not only the results of the studies conducted from each camp but also their legitimacy in the world of research (Remenyi *et al.*, 1998). The positivists were so adamant that their philosophy is the only way to research because they contend that their results are provable, replicable and generalisable. However, as time went on and resulting from the positivist approach's failure to explain numerous social phenomena, it became clear, that the interpretivist method had a place in the world of research.

The unresolved debates between the two camps led to a position that is midway such that only a few scholars today hold extreme views of the assumptions espoused by the classic philosophies (see Table 4.1). Holden and Lynch (2004) noted that a midway philosophy (also known as realists or pragmatists) accepts the existence of a reality independent of human

beliefs and behaviour (positivist) yet it also concedes that understanding people behaviour requires acknowledgement of the subjectivity inherent in human beings (interpretivist). Furthermore, this pragmatic view reckons that reality is tangible yet humans have input in forming its context and texture. Though knowledge is not absolute, it can be accumulated, tested and either retained or discarded (Holden and Lynch, 2004). Such a discourse is reinforced by Gordon's (Gordon, 1991) assertion that the research community can qualify the research findings as contextually exploratory and perhaps generalisable rather than insisting that findings are absolutely certain.

Blumberg *et al.*, (2005) are more emphatic in embracing the two paradigms by asserting that one cannot decide whether qualitative or quantitative studies are better or more useful than the other. This implies there are no predeterminates for the appropriateness for the methods. Furthermore, Poggenpoel *et al.*, (2001) noted that the two philosophies are most often not in opposition but rather complement each other. They base their argument on the basis of both positions being on the path to scientific research and knowledge. In other words, each is used to form a building block for scientific inquiry because research is about observing a phenomenon and drawing conclusions as to what is happening (interpretivist). This is followed by hypothesising and testing the hypothesis to accept or reject the relationships that may have been developed following the observations (positivist).

Both Blumberg *et al.*, (2005) and Holden and Lynch (2004) attempted to explain why scholars dug in their position to defend each paradigm by noting that the strong preferences for either type of study may have arose most probably because of their previous training and hence their capability in applying the methods.

Another aspect arising from the pragmatic view is that neither philosophy is wrong but it is how each philosophy is applied to the problem. Thus inappropriate matching of the philosophy and the problem is what pragmatists consider a recipe for invalid results (Holden and Lynch, 2004).

Against that background, a pragmatic approach was considered a more suitable approach to solving the problem as discussed next.

▪ ***Philosophical context of the study***

Putting the two philosophies in a practical context requires an appreciation of the nature of the research problem. The nature of the problem provides a template on which basic questions (or assumptions) namely ontology, epistemology, human nature and thus methodology are based. The ontological question relates to what constitutes reality. Reality cannot be construed as a single unit or point. Multiple realities exist in a given situation especially in behavioural based research problems. Creswell (1994) noted that reality may be construed differently by those investigating, being investigated and those who read the investigation. Therefore, as Eisner (1991) noted the research process should recognise the personality and attributes of the individual involved in the research process. The observation perfectly suits the nature of SMCEs dominant characteristic that of proprietor-centred. Thus the performance of the enterprise depends on the commitment, determination, vision, energy, tolerance to risk and ambition of the proprietor (Hill and McGowan, 1999). Sustained performance of the enterprise remains consistently so because of the proprietor's commitment and ability to manage the enterprise's processes. This facet renders the ontological assumption skewed towards a philosophy which accepts a multiple reality –the interpretivist philosophy. To represent this world, means that the study must represent or reconstruct the world with multi-windows (Hall and MacGowan, 1999). Essentially this rules out, for example, the use of experiment as a means of investigating the problem because the results will point to the existence (or absence) of a single reality which will be a fallacy in any study relating to a human endeavour.

The second aspect is the epistemological question which simply stated is: *what is the relationship of (or distance between) the knower (or would-be knower) and what can be known?* (Kenley, 2003:5). The greatest stance of positivist is the issue of bias which they believe should be solved by the researcher maintaining a distance from those being researched. However, the need to understand the phenomenon in its natural and contextual setting requires that the researcher has to maintain an appreciable distance with the subjects

of study, in this case are the SMCEs (management or employees) as a trade-off. The researcher needs to interact with the subjects of study (for example, the proprietor) who are relevant to the financial management of SMCEs. As an addition, the position taken here is that reductionism, a common positivist strategy, will not enhance the study results as this will lead to a shallow understanding of the problem as opposed to viewing the problem in its reality (Holden Lynch, 2004). Essentially the study was skewed towards a qualitative approach though the use of a questionnaire meant that some ‘distance’ was created between the *knower and what can be known*.

The third axiom of the philosophies relates to methodology and methods. Kenly (2003:4) phrased the axiom in form of a question: *how can the inquirer (or would-be knower) go about investigating whatever she believes he or she can know?* The answer to the question is embedded in the selection of an appropriate methodology for solving the problem. The choice must be determined by the ontological and epistemological positions of a study and this will be achieved if the research horizon is brought into focus. Thus next section discusses methodology to be utilised in the research process with a view of selecting and justifying the most appropriate research strategy and data collection method.

4.4 Research Taxonomy

The selection of an appropriate research strategy and data collection method is based on a systematic appraisal of the research process. The framework chosen here is due to the combined work of Saunders *et al.*, (2003) and Yin (1994) illustrated in Figure 4.2. The taxonomy is in form of an analogy of an ‘onion’. The different layers of the onion represent the different facets of the research process. The first outer layer of the onion shows the two philosophies already discussed in the previous section. The other facets (layers) of the research process include the (i) research description or classification (ii) research strategies; (iii) research time lines; (iv) data collection methods and (v) classification of analysis. The last item (v) has been added by author from the work of Burns and Bush (2006). Each layer is discussed in the next sections and at the end of the discussion it is put in the context of the study

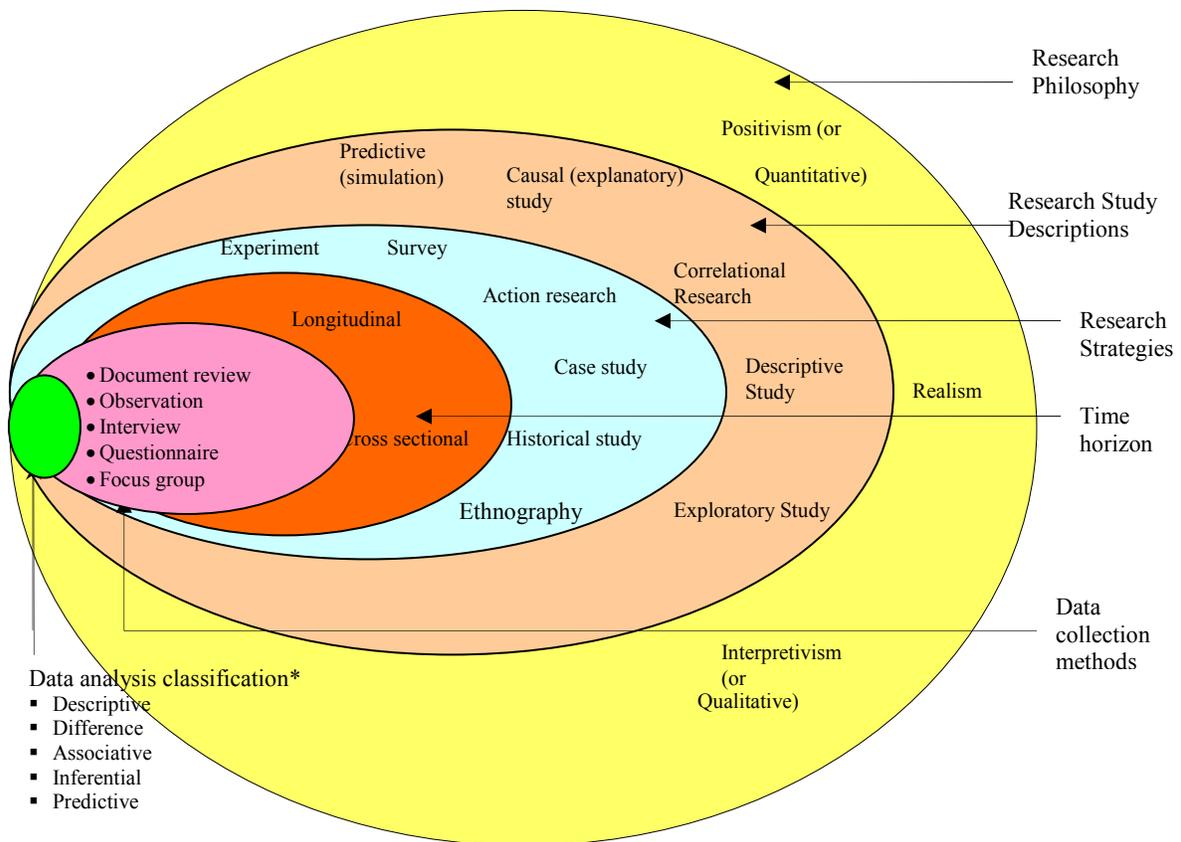


Figure 4.2: The research process ‘onion’

Adapted from: Saunders *et al.* (2003) and Yin (1994);* Added by author using Burns and Bush (2006)

▪ **Research study descriptions**

Research studies may be described in many ways. The major description relate to a *hierarchy of inquiry* illustrated in the second layer of Figure 4.2. It categorises research studies in manner which develops a hierarchy of understanding the phenomenon, for example, an *exploratory* study suggests that the phenomenon is little known, perhaps novel, with very little information on the subject in literature. Blumberg *et al.* (2005) noted that in such studies there is a lack of a clear idea of the problems to be encountered during the study. However, it is through an exploratory study that themes or patterns are identified and developed. Thus an explanatory helps to clarify concepts and issues in order for research study to move to the next stage.

Research may also be viewed as being *descriptive* in nature, which is a higher level of understanding the phenomenon than an exploratory study. In a descriptive study the nature of the existence of a phenomenon is described in clearer terms, for example, in terms of size, form or distribution of some variable. Thus a descriptive study attempts to answer the questions: what, when, who/which and where (but not how and why).

Following on to descriptive study is a *relational* study which attempts to identify variables in the phenomenon and the relationship between them. The studies attempt to answer the two questions: how and why. The study assumes that there is a relationship between the identified variables in the study. Relational studies are of two kinds, correlational and causal. *Correlational* studies merely state that the variables occur together in some specified manner without implying that one causes the other (Gay and Airasian, 2003. Blumberg *et al.*, (2005) noted that such weak claims occur when we believe that there are more basic causal forces that affect the variables or when we have not developed enough evidence to claim a stronger linkage.

On the other hand a *causal* study asserts the existence of a relationship and that a change in one variable causes or leads to a change in the other variable (Blumberg *et al.*, 2005). In other words there exists a cause and effect relationship where the variable that causes the change is called the independent and the other the dependent variable. Once a causal relationship been established and is proven for a number of times (replicated) the understanding in form of theory or model can be used in other instances to predict the outcome of a situation (generalisation). A research study involving this kind of situation is called a *predictive* study.

In summary, the discussion on research descriptions facilitated the road to justifying most appropriate research methodology, for example, the study could not be considered exploratory because the issues of project financial management or SMEs (and SMCEs) are not new except how they have hardly been combined on one study moreover in Botswana. Secondly, the study could not be considered causal as it was stated in Chapter 2 and 3 that there are other factors, other than the PBFMS, which affect the performance of enterprise. The nature of the problem favoured a descriptive form of study. However, instances where

the practices of the PBFMS in SMCEs required a correlational relationship were to be investigated.

▪ **Research strategies**

Carter (1999) noted that a research strategy is a resultant of mix of research intentions, opportunities, accidents, actions, philosophies, analysis and choices for solving a research problem. There are several research strategies available for use in the various disciplines, for example, Remenyi *et al.*, (1998) provided nine. However, the major approaches may be identified as being the case study (Yin, 1994), action research (Gummesson, 1991; Webb, 1989), grounded theory (Strauss and Corbin, 1990), ethnography (Creswell, 1994), survey (Leedy and Ormrod, 2005), archival or historical studies (Hussey and Hussey, 1997) and modelling and simulation as indicated in the third layer of the onion of Figure 4.2.

It would not be very useful to describe each of them here beyond the summary given in Table 4.2 as they are well described in most of the research books (e.g. Leedy and Ormrod, 2005; Hussey and Hussey, 1997) but a few points are worth noting in the context of the study. The research strategy provides a researcher with specific procedures to:

- i) identify the study subjects; enumerate the population and the identify of the subjects;
- ii) design a systematic method of obtaining a study sample;
- iii) determine the data required, its source, how to collect it (data collecting instrument design), and interpret it (Blumberg *et al.*, 2005; Hussey and Hussey, 1997).

The nature of the research problem fitted the survey research strategy, since the study required investigating the nature and practices of a representative sample of PBFMS as being the major contributor to poor performance of SMCEs.

▪ **Data collecting methods**

There are several data collecting methods available for a researcher some of which are captured in fifth layer of Figure 4.2. The methods are well described in many research methodology text books (e.g. Blumberg *et al.*, 2005; Leedy and Ormrod, 2005) and only their salient features are captured in Table 4.3.

Table 4.2: Summary of characteristics of the major research strategies

Strategy	Characteristics
<i>Ethnography</i>	Ethnography involves researchers immersing themselves in the environment of the subjects to study particular phenomena by participating in the rituals on a continuous period of time. Although the strategy was used to study ‘native tribes’, it is possible to use these days in studying organisational phenomena
<i>Historical</i>	The strategy involves studying past events through the use of documents, interviews, artefacts to provide insights or conclusions about past persons or events. It therefore requires collecting and interpreting information
<i>Case study</i>	Method is used to make in-depth review of selected cases., from one up to six to fully understand the phenomenon of investigation in the case. Unlike the survey it represents depth of information, rather than breadth. Thus the results suffers from not being generalisable to other situations
<i>Survey</i>	The strategy is used to collect and interpret information relating to preferences, attitudes, practices, concerns, or interests of some group of people.
<i>Action research</i>	Action research is more practically oriented, in that the research study is conducted to solve an actual problem in any human endeavour, be it social or work related. It aims at immediately changing or improving practices and mindsets in the human endeavour.
<i>Experiment</i>	The strategy aims at testing cause-effect relationships with a view of explaining how or why a phenomenon occurs. Experimental studies allow controlling of the environment through standard procedures.

Source: Blumberg *et al.* (2005); Saunders *et al.* (2003)

Each of the methods on its own can be used to investigate and obtain a solution to a research problem. However, there is a current trend that advocates the use of multiple methods in a single research project. A number of authors (e.g. Brannick and Roche, 1997; Carter, 1999 and Hill and MacGowan, 1999) have argued that research studies could employ both multiple methods in a technique called triangulation. They argue that the use of more than one method leads to a higher validation of results as a result of being able to explain the influence of both situational and voluntary factors while accounting for human activities. Walker (1997) further noted that quantitative approach may be employed in a situation requiring the testing of a hypothesis. However, when it comes to explaining the causal factors, a qualitative approach may be relied on to interpret and deduce the relationships. Carter (1991) noted that

studies that use triangulation avoid bias through seeking data from at least more than one source and thus requiring the use of multiple methods.

Table 4.3: Summary of data collecting methods

Strategy	Characteristics
<i>Observation</i>	Method requires the researcher to make measurements and record the phenomenon as it occurs in its natural or artificial setting. Normally the presence of the researcher can influence the behaviour of the participants. Observation is a very involving and expensive technique to use because it is time consuming
<i>Interview</i>	Data collection by <i>interview</i> requires the researcher to set up a face-to-face, telephone or video conferencing scenario. The questions may structured, un-structured or both. The method is appropriate when a researcher wants to fully understand the perceptions or experiences of a subject. The data can be deep and collaborated but can take a lot of time. The method is normally suspect in the sense that the interviewer may bias the respondent.
<i>Questionnaire</i>	Data collection method requires predefined questions which if well designed can cover a number of subjects in a short time moreover in a non-threatening way (anonymity). The method is inexpensive to administer and easy to compare and analyze and to refer to. The need to limit the number of questions implies that the subject of study may not be covered in depth.
<i>Focus groups</i>	<i>The</i> method requires identifying a group of participants (6-8) to explore a topic in depth through iterative group discussions in which they represent their reactions to a phenomenon under study. The method can be an efficient way to get greater width and depth of information in short time. However, it may be difficult to analyze responses and also needs a good facilitator to make the atmosphere conducive for discussion.

Source: adapted from MacNamara (2007); Saunders *et al.* (2003).

Despite the advocacy for the use of multiple methods, Scandura and Williams (2000) are of the view that there should be a principal method for the study and others being complementary, for collaborative purposes. That position was accepted for this study with the principal approach being the survey methodology

- ***Types of data analysis***

There are basically five broad categories of data analysis namely descriptive, difference, inferential associative and predictive analysis (Bush and Burns, 2006) as shown in the sixth

layer of Figure 4.2. There are also several statistical techniques associated with each category. While the statistical techniques are often discussed in many statistical books and software manuals, the former are less described. This section therefore, highlights the data analysis categories with a view of providing an insight and justification for the selected data analysis technique for the study. The salient features of each approach are summarised in Table 4.4.

Table 4.4: Summary of characteristics of the major data analysis categories

Strategy	Characteristics
<i>Content and factor analysis</i>	Mostly used in qualitative studies at an exploratory phase. Themes, or content are developed as a means of identifying patterns in a phenomenon. Factors analysis would be looking for factors causing a phenomenon
<i>Descriptive data analysis</i>	The analysis provides a picture of the nature and characteristics of the variables in the phenomenon by describing a pattern of response of a behaviour, opinion or practice of typical subject using statistics such as range, mode, median, percentiles, mean and standard deviation.
<i>Differential analysis</i>	The analysis looks for the differences between two or more groups of subjects studied arising from natural causes or artificial interventions. Statistical tests like the t-test and ANOVA are used for such analysis.
<i>Associative analysis</i>	The analysis requires the researcher to determine how two or more variables are related. Depending on the statistic used, the analysis may indicate the strength and direction of the relationship between two or more variables.
<i>Inferential analysis</i>	<i>The analysis</i> aims at drawing inferences from a small sample of subjects, in other words, inferential procedures allow a researcher to draw conclusions about the population based on the data drawn from the sample. This requires the researcher to formulate and test a hypothesis and estimate the population parameters using the sample statistics.
<i>Predictive analysis</i>	<i>The analysis</i> used already developed theory and model to test a case by predicting or forecasting the likely outcomes. Such analysis includes modelling through regression analysis, time series and simulation.

Source: adapted from Burns and Bush (2006).

Almost all the statistical analysis methods were used in the study, for example, content analysis was used to analyse the additional comments made by respondent at the end of the questionnaire (see end of Appendix 5). Descriptive analysis was used in the profiling of the

demographic characteristics of SMCEs while inferential analysis was used to test the hypothesis.

Before leaving the subject of analysis it is suffice to point out that there are two major types of statistical analysis, namely *parametric* and *non-parametric*. The application of each analysis depends on the nature of data collected. The use of parametric tests requires that data conforms to the assumptions of the sample being randomly selected, normally distributed, being homogeneous or equal variance and being representative of the population. Thus in selecting a statistical test there is a need to know the purpose of the analysis and in order to identify a suitable statistical test.

The understanding of the research process concepts provided a basis for selection of the most appropriate strategy, design and data analysis technique. The next section discusses the actual design of the study beginning with the role of hypothesis in guiding the research design.

4.5 Hypotheses

All research studies are guided by a construct, proposition or hypothesis. This section looks at the nature, role and attributes of an effective hypothesis. The discussion highlights the attributes used to formulate the various hypotheses of the study.

4.6.1 Role, nature and attributes of a hypothesis

A hypothesis is a testable proposition. In other words, it is a statement that may be judged as supported or not supported through testing in relation to an observed phenomenon (Blumberg *et al.*, 2005). Leedy and Ormrod (2005) further noted that a hypothesis guides a research study in seeking direction based upon a supposition (or a reasonable guess or educated conjecture) that is held in abeyance until facts are available and have been interpreted to support or reject the hypothesis. In this way, a hypothesis (i) serves to guide the direction of study, (ii) facilitates identifying the facts that are relevant to the study from a mass information, (iii) facilitates the selection of an appropriate form of research design that might solve the problem and (iv) finally provides a basis for making conclusions (Blumberg *et al.*, 2005). Leedy and Ormrod (2005) however, provided a useful distinction between a

hypothesis and an assumption by noting that assumptions are self evident conditions taken for granted that are embedded in a hypothesis.

There are three major types of hypotheses namely *descriptive*, *correlational* and *explanatory* (also called *causal*). These are related to research descriptions and statistical analyses already mentioned. A descriptive hypothesis is posited to test the existence of the nature or intensity of a variable in a phenomenon. It is thus tested to confirm the existence, size, form or distribution of a variable in a phenomenon.

The second type of hypothesis, correlational, tests the existence of a relationship between two or more variables in a phenomenon. The hypothesis merely states the strength or direction but does not fully explain whether one variable causes the other.

Thus the third type of hypothesis the, explanatory or causal which asserts the existence of a relationship between two variables. It further indicates that change in one variable, causes or leads to a change in the other by a certain magnitude or factor of change (Blumberg *et al.*, 2005). For explanatory hypotheses, the researcher needs to be able to identify which of the variables is the dependent or independent variable and the direction of the relationship (proportional or inverse).

All hypotheses require statistical testing of a null hypothesis in order to support or not support the proposition posited at the beginning of the study (Brewer and Asraf, 2004). Secondly, an effective hypothesis must have certain attributes to guide the research study. These include being adequate for the purpose; for example, a descriptive hypothesis must clearly state the phenomenon (condition, size or distribution of some variable in terms of value) in order for the research to be operational. If it is an explanatory hypothesis, it should explain the facts that gave rise to the need for the explanation. Secondly, the hypothesis must be testable, that is, a technique must be available for testing it (Blumberg *et al.*, 2005).

The above discourse provided a guiding hand in the framing of the study hypotheses which are stated below.

4.5.2 Study hypotheses

The research questions stated in Chapter 1 and reiterated at the beginning of this Chapter in section two were used to generate two major hypotheses (and associated sub-hypotheses) as follows.

H₀₁ *The PBFMS of SMCEs are adequate to facilitate the delivery of projects;*

H_{01.1}: The PBFMS of SMCEs do facilitate the strategic management process

H_{01.2} The PBFMS of SMCEs do facilitate the project planning and control process

H_{01.3} The level of commitment by proprietors of SMCEs facilitates the development and operation of an adequate PBFMS

H₀₂ *The adequacy of the PBFMS is positively correlated with the performance of SMCEs*

The hypotheses were part of a progression in the research decision making process. The next sections discuss the unit of analysis and the study population; sampling process; the design of the data instrument; and data analysis as the next discussion highlights.

4.6 Study population

The research problem required investigating the modus operandi of construction enterprises in Botswana relating to matters pertaining to financial management. Thus the unit of analysis were the SMCEs. Blumberg *et al.*, (2005) noted that the *unit of analysis* describes the level at which the research is performed and which objects are being researched. However, organisations do not talk and hence cannot be interviewed or surveyed and therefore, the individuals, representing the enterprises, respond on their behalf (Blumberg *et al.*, (2005) particularly, those who make strategic and operational decisions. In this case proprietors, estimators and accountants (internal staff) of the respective enterprises formed the primary target for the investigation. They provided the necessary responses on behalf of the SMCE because of their involvement in the decision making relating to strategic and operational planning and control.

Returning to construction enterprises, the total number (population) of enterprises operating in Botswana was determined and their identities documented. This in turn facilitated the determination of the sample size and the names of enterprises in the sample.

A sampling frame in form a plausible source of enterprise list of names was needed. The most desirable list was one that is complete and current, listing all construction enterprise operating in Botswana by names and some form of contacts (telephone, postal and physical address). Secondly, since the study was dealing with SMCEs, some form of prior categorisation of enterprise sizes was deemed important when deciding on the most appropriate list.

4.6.1 Sources of information for construction enterprises

Once the unit of analysis was identified as construction enterprises (contractors), plausible sources of information for determining their number and identity were considered. The sources included the Central Statistical Office (CSO) Bulletin, telephone directory, Yellow Pages Directory, Confederation of Commerce Industry and Manpower (BOCCIM) membership, trade associations and Public Procurement and Asset Disposal Board (PPADB) list. The viability of each source was evaluated.

The CSO publishes quarterly statistics for Botswana which include the number of establishments in the various sectors of the economy. However, it only provides the number firms registered with Office of Registrar of Companies. According to the CSO, there were 1044 registered entities in the construction industry as on March 2005, (CSO, 2006). This number only provided a guide to the maximum possible population of the companies in the construction industry. This number includes all consultancy services (architects, quantity surveyors, engineers, material testing, plant hire, etc) and contractors (mechanical, electrical, civil and building).

The next source of information was the telephone directory. The entries in the directory are in sense voluntary and for only for subscribers to the Botswana Telecommunications Corporation (BTC) telephone system. In addition, since the coming of the cell phone

networks to Botswana in 1998, a number of contractors do not subscribe to the BTC lines. Furthermore, the directory does not list enterprises in accordance to their sizes (small or medium). In fact it may be difficult to know from the directory entries which enterprises deal with construction (building, civil works and maintenance).

The Yellow Pages directory was found a better source in that enterprises are listed in accordance with the type of business they operate. However, it does not classify the enterprises into sizes and the entries are also voluntary.

Another option was the BOCCIM construction sector list of members. Unfortunately, the BOCCIM construction sector does not deal with individual enterprises but its membership which is made of trade associations (for example, architects, quantity surveyors, engineers, material suppliers, contractors and training institutions). Among its members are the only two contractors' association in Botswana namely Tshipidi Badiri Builders Association (TBBA) and Association of Botswana Building and Civil Engineering Contractors (ABCON). It was also discovered that not all enterprises belong to the two trade associations. Thus BOCCIM, TBBA and ABCON lists were also ruled out as comprehensive sources of information. However, they were found useful sources particularly for filling in missing information especially, for example, contacts and location of enterprises when an appropriate list was finally constructed.

PPADB was left as the principal source of information. The choice made practical sense in that since the government is the biggest client of the industry, annually offering about 80% of the work by value as of 2000 (Ssegawa, 2000), it was most probable that most of the enterprises are registered with PPADB. However, as already noted in Chapter 2 PPADB compiles the lists of contractors by proxy in that though it is supposed to register and categorise contractors, the responsibility has been delegated to the Department of Building and Engineering Services (DBES) and Department of Roads (DR). Therefore, the best source of information was with DBES and DR. In fact even the local authorities use the same list compiled by the two departments.

Permission was then requested and granted by DBES and DR to obtain a list of contractors. This allowed the determination of the *total* number of enterprises in the classes as shown in Table 3.3 (no values are given for OC and E because the enterprises were excluded from the study resulting from the definition of small and medium mentioned in Chapter 2). In Section 1.4.2 it was also noted that the enterprises registered for building and civil jobs will combined into one group (There is no special registrations for maintenance work). In any case there are several companies registered in both categories. Table 4.5 shows number of enterprises registered in the various classes and category of work as of 2005 (DBES, 2005; DR, 2005). The figures indicates two aspects firstly, there are less numbers of enterprises as the size increases from A to D, for example, there are 68 enterprises in class A while there are 35 enterprises in class D registered for building work. Secondly there are fewer enterprises registered for civil work as compared to building for all classes. The two aspects relate the need for increased resources as one moves up the class and also as one ventures from building to civil work.

Table 4.5: Size and number of construction enterprises in Botswana

Class	Enterprise size	Building (No)	Civil (No)	Contractors in class*	Total in size (No)	Proportion in %
OC	micro	Not included in the study				
A	Small	69	18	57	102	59%
B		57	35	45		
C	Medium	41	36	39	71	41%
D		35	27	32		
				173	173	100%
E	large	Not included in the study				

*Duplication due to duo registration removed;

Source: DBES (2005) and DR (2005)

After removing duplication due to some companies having registered for both building and civil work, a total of 102 and 71 enterprises were obtained in the small size (class A and B) and medium size (C and D), respectively. This makes the proportions of the two sizes as 59% and 41%, respectively as shown in the last column of Table 4.5. The *identities* of the enterprises (contractors) were constructed in a form of a list of names by size (small and

medium) and listed in alphabetical order. This facilitated the next stage of the research design, determining the study sample.

4.7 Sampling Frame

After identifying, classifying and listing the enterprises, the next step was to determine an appropriate sampling strategy to identify the specific firms in terms of number and identities (sample) to be studied. A background to the sampling concept is deemed important in order to justify the selection of an efficient and appropriate sampling method as discussed next.

4.7.1 Sampling methods

When resources and time are available, the entire population should be studied as it provides the most accurate results possible. Thus concept is used in a national census. However, resources are never abundant and time is never infinite. A strategy that can achieve a significant level of accuracy without studying the entire population is then called into question - sampling then provides an appropriate solution.

Sampling is a technique of selecting willing members of the population and involving them in a study such that the results are representative of the entire population. It is a convenient and cost saving approach to a research study (Asraf and Brewer, 2004). To obtain a representative sample that truly reflects the population, a researcher has to look carefully at the nature and characteristics of the population (Leedy and Ormrod, 2005) to determine the type, method and procedure for sampling.

Two sampling categories exist, non-probability and probability. The former is subjectively carried out, with each member of the population having no known chance of being included in the selection (Blumberg *et al.*, 2005). On the other hand probability sampling allows each member to have an equal chance or probability of being selected. It is for this reason that probability sampling was chosen over non-probability sampling because of its precision and reduction of researcher bias.

Probability sampling can be carried out in a number of ways, with each method solving a particular problem related to the characteristics of the population. Leedy and Ormrod (2005) provides five probability sampling methods and their suitability to the different research situations. They include *simple random, systematic, simple stratified, proportional stratified and cluster sampling*.

In order to choose the best sampling method, there is need recap that the study deals with small and medium enterprises and of varying sizes. Literature review indicated that firms of varying sizes differ in their profiles relating their competencies and endowments. It would be useful therefore, to employ a sampling method that acknowledges the fact that there is heterogeneity due to size differences and perhaps homogeneity within a class. Thus proportional stratified sampling seemed to be the most suitable method.

Leedy and Ormrod (2005) specifically noted that if a population is made up of definite strata with differing characteristics and each stratum has different proportionate ratio in terms of the number of members to every other stratum, then proportional stratified sampling should be the most appropriate method for a study.

A justification of the method of selecting the identity of members from each stratum is needed. As already noted, the procedure must be probabilistic, that is, the elements in each group must be randomly selected. Leedy and Ormrod (2005) identified some practical randomisation methods namely roulette wheel, lottery and random numbers method. Trochim (2006) and Blumberg *et al.*, (2005) however noted that the proliferation of computers and application software has made randomisation easier, for example, the use of the function RAND() in MS Excel makes life quite easy. This option was found most convenient and was selected for use in the study as described later.

4.7.2 Sampling frame

Leedy and Ormrod (2005) noted that data is dynamic because the subjects are dynamic. What is here today may not be there tomorrow, for example, people may move to another location,

they could have died and so on. Enterprises follow a similar sort of pattern, some are registered after a list is compiled, while others cease trading for a number of reasons including death of a shareholder, relocation, insolvency or being blacklisted. Therefore, in some situations, it is difficult to ever know the exact population of the subjects being studied. This is when a researcher resorts to the concept of a sampling frame, a population which approximates the real entire population. Therefore, the numbers given in Table 4.5 provided a sampling frame for the study, implying that the population can never be exactly known with accuracy at the time of data collection. Sampling procedures however, require determining the sample sizes, that is, the minimum number of enterprises to be studied in each group (small and medium).

4.7.3 Sample size

Study sample can be said to consist of two attributes the size and the identity of the study subjects. Krejcie and Morgan (1970) compiled a table for determining the sample size based on confidence level (95%) needed from a given population. The table has been improved by others (e.g. Isaac and Michael, 1981) who have added another level of confidence (90%) as shown in Appendix 2.

If a population or sampling frame (N) is known, the sample sizes (n) is simply read off from table, for example, a population of 100, requires a minimum sample size of 81 and 51 at 5% and 10%, levels of precision, respectively (see Appendix 2). However, one may note that some population sizes are missing from table, and hence size may not be determined directly. Trochim (2006) noted that there is no need for wasting time trying calculating the sample size using the formula, because the exact population figure is missing in the table. Instead some interpolation may be used by taking two numbers in which the population falls for example, 105 falls within figures 100 and 125 which are given in the table. The sample size therefore lies between 81 and 96 (for 5% level of precision) and average of the two numbers may be taken as sample size. Better still the size which is the larger of the two (e.g. 96) may also be taken as the sample size since the table is for the minimum required sample.

The actual sampling frame of enterprises compiled of the SMCEs was 173. Stratified sampling requires that a sample size be determined first and then distributed in accordance to the proportion in which the strata exists in the natural population. From the table with 5% degree of accuracy, the sample size was determined as 122 enterprises. However, in a questionnaire survey, there is never a guarantee that the response rate will be 100%. There is need therefore to increase the number of questionnaire sent out in order to cater for non-response as discussed in the next section.

4.7.4 Catering for the non- response

According to Lynn (1996) non-response generates a problem of reducing the sample size and increasing sampling errors and hence the standard errors of estimation. Lynn (1996) argues that if the response rate is known, the sampling size can be increased by the response rate factor.

There are few empirical studies conducted in Botswana relating to studies that used mail survey to study construction enterprises. However, one such study was that of Sentongo (2005) which investigated the cause of poor performance of 100% citizen owned contractors in classes OC, A and B. In this study a response rate of 55% was obtained through several rounds of questionnaire mailing and using several strategies, such as, drop-and-collect and telephone reminders. Ssegawa (2000) conducted another study to investigate the prevalent financial management practices of construction enterprises in Botswana and got an aggregate response rate of 60% through a number of mailing trials.

From the two studies two aspects, became clear that a higher mailing number was needed to get the sample size and several rounds of questionnaire mailing were also needed. In view of that scenario and using a conservative aggregate response rate of 80%, 152 ($122/0.8$) questionnaires were considered for mailing. The number was divided in proportions of 59% and 41% representing the enterprise size strata resulting in 90 for small and 62 for medium size enterprises (the actual strata in the sample size of 122 should be 72 and 50 in the small and medium category, respectively) as shown in Table 4.6.

Table 4.6: Sample sizes for each strata

	Small	Medium	Total
Strata proportions	59%	41%	100%
Sample frame	102	71	173
Sample size	72	50	122
Addition for possible non response	18	12	30
Mailing numbers	90	62	152

The second aspect of sampling is the procedure for obtaining the identity of the actual members making up the sample strata. The procedure is described next.

4.7.5 Selecting the identities of the enterprises

The actual selection of the identities requires a systematic procedure. This is given in Figure 4.3

1. Two lists of names of enterprises were produced, one for small and medium sizes, in an excel worksheet in accordance
2. Random numbers were then generated using the Ms Excel function RAND() for each list
3. The names were then sorted into ascending order
4. A calculation was made to determine the selection interval $k=N/n$ which is $102/90=1.1$ or approximately 1 (note 102 is total number of enterprises in small class while 90 is the required mailing number from the class to get 72 the required sample size). This meant skipping at one member from the list and thus requiring multiple trials.
5. A coin was tossed to determine whether list should be started - bottom or top
6. Every k^{th} member, in this case 2, was selected until the desired number n (72) is reached.
7. If the list fell short of the desired number, the list was randomised and selection was repeated (steps 2-6).
8. In case of non-response or cooperation by companies twenty names were put on stand by as replacement.
9. A similar treatment was done for the medium enterprises.

Figure 4.3 Guideline step form selecting members of each sample

4.8 Research design process

Three aspects of the research design have been achieved so far since the beginning of the discussion in this Chapter: the philosophical context of the study was underpinned; research hypotheses were formulated and stated and study subjects were identified. In other words, all the necessary ingredients necessary for the research design process are in place. What is left is a description of the design of the data collecting instrument.

The research design process requires developing a research instrument for collecting data. In context of the research strategy selected, this in form of a questionnaire, made up of measurement questions formulated from the research question. Hussey and Hussey (1997) termed the process a funnel effect. It resembles a funnel in the sense that we are moving from the general (wide) investigative questions to developing specific (narrow or focused) measurement questions in a hierarchy of inquiry. On the other hand, one may look at it as the shrapnel effect where one investigative question produces several measurement questions. Measurement questions are the interface between the researcher and respondent and therefore used as a means of mining data for an empirical measurement.

To ensure a high design quality, the process was divided into two stages, namely preliminary and piloting. The preliminary stage involves formulating the measurement questions in form of a draft research instrument. The research instrument was then given to three personnel consisting of an academic, a quantity surveyor and an estimator from a construction enterprise with the aim of providing input for improving the quality of the measurement instrument. The piloting stage tested the instrument on four enterprises (one from each class A, B, C and D). The enterprises were not members of the identified sample. In addition a few more design principles are considered important for discussion to underpin the desired quality of design namely the administration approach used for the questionnaire and the concept of measurement.

4.8.1 Questionnaire administration approach

An administration or communication approach relates to the manner in which the measuring instrument is to be delivered to the study subjects. The main method of administration was by a self-administered survey using a combination of delivery methods including drop-off, fax, postal and e-mail. The method was selected because of its ability to yield more data by covering a greater population in an economical and efficient manner (Proctor, 2000). In contrast to personal or telephone interviewing, it naturally allows time for the respondents to think about the answers and carry out some consultations with documents or colleagues. The drop-off technique was incorporated and relied on because of its efficiency in increasing the response rate (Ibeh and Brock, 2004). This was further made possible due to the fact that most (58 %) of the construction enterprises are clustered around Gaborone City (Kaboyakgosi and Sengwaketse, 2003).

The approach however, suffers a serious problem of low response rates (Trochim, 2006) and strategies were needed to alleviate the problem. These included identifying specific individuals in the target enterprises for which the instrument would be sent using personalised mail and where necessary advance contact was made prior to sending the instrument (Hussey and Hussey, 1997).

In addition self addressed envelopes with postage stamps were also enclosed in the questionnaire. A return date was politely indicated in order to set in motion reminder phone calls for those who had not returned the instrument within three weeks as recommended by (Blumberg *et al*, 2005)

4.8.2 Concept of measurement and type of data

Research studies seek to measure objects, their properties or indicants of properties (Blumberg *et al*, 2005). In order to measure properties, three processes must be completed. The first process requires selecting an observable empirical event. This is best done by developing a measurement question. The second process requires developing a set of mapping rules for assigning numbers or symbols that represent aspects of events being measured (Kerlinger, 1986). A mapping rule requires careful consideration in terms of determining the type of data involved and considering how the respondent will react while

applying the mapping rules to each observation of the event being measured. When the concept of measurement is combined with the nature of data, it provides the researcher a holistic view of how to mine data from the research subjects.

There are basically four data types namely *nominal*, *ordinal*, *interval* and *ratio*. Their characteristics provide a basis on which statistical manipulation is conducted as summarised in Table 4.6

Table 4.6 Data type, use possible statistical treatment

Scale type	Nature	Purpose	Statistical treatment
<i>Nominal</i>	Mutually exclusive and collectively exhaustive data e.g. gender male or female	classification	Mode, percentage values, χ^2
<i>Ordinal</i>	Ordered (< or >), interval sizes not specified e.g. the class of enterprises (A, B, C and, D)	As above including ordering of objects and their properties	As above including , median, percentiles rank, rank correlation
<i>Interval</i>	Equal interval; or degrees of difference but zero point is arbitrary	Descriptive purposes	As above mode, mean, range, standard deviation, T-test, F-test and product moment correlation.
<i>Ratio</i>	Equal interval and an absolute zero point is arbitrary e.g. age of company or turnover	For all purposes including inferential	All statistics including Geometric and harmonic mean, percent variation

Source: Leedy and Ormrod (2005); Blumberg *et al.* (2005)

Briefly, nominal data reflects information that is mutually exclusive and collectively exhaustive, for example, an enterprise belongs to one class and all class sizes must be listed to allow for efficient mapping and selection by the respondent. However, nominal data has nor order or distance relationship and arithmetic origin. This renders it less powerful for statistical manipulation and hence restricted to frequency distribution in which the measure of central tendency is the mode.

Ordinal data on the other hand carries the characteristics of nominal data but is ordered in such a way that the data elements are related. This allows the use of ranking, with the median as a measure of central tendency and percentile and quartile as measures of dispersion.

Interval data adds on to the progression of features held by nominal and ordinal by incorporating concept of equality of interval (Proctor, 2000). Thus in addition to all the measures applicable to nominal and ordinal data, the arithmetic mean may be used as a measure of central tendency and the standard deviation as a measure of dispersion. It is important note that certain statistical techniques require measurement levels to be same and thus cannot be created artificially after the fact. This implies that in case of nominal and ordinal data, caution must be made on how to apply various statistical analysis and the interpretation there of.

Ratio data incorporates all powers of data manipulation already discussed with the other three data types. It however, adds on a very powerful feature of absolute zero which allows all various measures of central tendency to be calculated including, median, mode, arithmetic and where applicable geometric and harmonic mean. Similarly all measures of central tendency may be used including the standard deviation (Baker, 2000).

The questionnaire contained all of the above mentioned types of data. How each type of data is obtained requires examining two important concepts of measurement, that of scaling and the associated response strategies which are briefly described next.

4.8.3 Response strategies and scaling

The response to a measurement question presented to a respondent requires making judgement of the existence, category and the strength or weakness of a property (or attribute) being measured. Naturally this requires constructing a scale on which judgment will be based when a respondent is answering the question (akin to a calibrated measuring rule which measures the length of an object) (Leedy and Ormrod, 2005). The scaling procedure assigns numbers or symbols to a property being measured through a measurement question (Phillips and Pugh, 1994). Inevitably scaling reflects the nature of data involved and the response strategy to be adopted.

Measurement questions measure certain characteristics of participants or the subject they represent in the study, for example age of participant or enterprise. Alternatively, participants

may be requested to act as judges by measuring objects or properties of objects being presented to them, for example, how they perceive the state of the industry (down-turn or boom). The basis on which the scale is constructed is the objective of study or measurement, that is, the nature of what is being studied and the response strategy determines the design of the scale. In situations where the objective is to explore a wider territory, to discover opinions and degrees of knowledge of the participant scaling is not necessary (zero scaling) because the response strategy is an open-ended question or free response strategy (Blumberg *et al.*, 2005). This is very useful in exploratory research or in piloting.

However, where the participant's level of information or frame of reference is known or predictable and the researcher believes that the respondent understands the topic then; close ended questions are more suitable as response strategies. Some of the response strategies include dichotomous, multi-choice, checklist, rating and rank ordering responses. The scales needed for these response strategies are basically grouped into three types namely (i) *rating*, (ii) *ranking* or (iii) *categorising*. The rating scales require the participant to rate the object or its property or indicant but without comparing with something else. The ranking scale requires comparing, for example, two properties and ultimately ordering them. Categorising requires the respondents to classify themselves or the objects presented to them. In summary the data needed determines the response strategy which in turn determines the scaling desired.

As a last note scales may be multi dimensional or one-dimensional. Dimensionality relates to the referencing one property, for example, size of business (it could be small or large). In other cases the property may have extremes based on a continuum, for example, a question requiring a description of the type of service offered to clients (two extremes would be excellent or poor). There are some observations which require multi dimensional constructs, for example, contributors to effective management can be attributed to education, experience in industry, or technical skills. Each of these is a unidirectional attribute on its own but together they form a multidirectional attribute that measures factors that may contribute to management effectiveness.

The most commonly used unidimensional scale is the Likert scale where a respondent is asked to rate each item on some response scale, for example, they could rate each item on a 1-to-5 response scale where: 1 = strongly disagree; 2 = disagree; 3 = undecided; 4 = agree; and 5 = strongly agree. Other varieties of the scale are possible, for example, 1-to-7, 1-to-9, or 0-to-4). The final score for the respondent on the scale is the sum of their ratings for all of the items (Trochim, 2006).

4.8.4 Attributes of an efficient measuring instrument and question

What attributes are needed in the research design and measuring process in order to make it efficient and effective? Efficiency is defined in terms of the study's ability to gather a high amount of data (response rate) and moreover high quality data from respondents. The exploit requires recognising that there is a subtle difference between the measuring instrument and measuring questions. One such difference is that the measuring instrument is made up of measuring questions. Thus the two will be discussed separately starting with the instrument efficiency.

- ***Measuring instrument efficiency***

The desire to maximise information quality requires a trade off between the need to keep a clear, straightforward and reasonable length of the measuring instrument while maintaining participant interest (Baker, 2003). Various authors (e.g. Blumberg *et al.*, 2005; Baker, 2003; and Diaz de Road, 2000) have discussed the attributes of a well designed instrument expected to provide the desired efficiency. Since the subject is well covered in many literature sources such as those indicated above, it is considered more effective if a check list is given with some accompanying notes as shown in Table 4.7. The check list was used in ensuring that the design of the instrument achieves the required efficiency

Table 4.7: Attributes of an efficient measuring instrument

Attribute	Comment
<i>Theme coverage</i>	The instrument must cover the study themes
<i>Layout/structure/presentation</i>	Physical layout of questions in terms of: readable font ; spacing out of questions; use of graphics like answer boxes; leaving enough space for open ended questions;
<i>Length</i>	Appropriate length that maximises the information gathering but takes care of the participant time, effort and motivation
<i>Care for the respondent</i>	Explain purpose of instrument; personalised (if possible) covering letter ;courteous language; offer to include author in a list of the recipient of the study result; confidentiality and anonymity; empathy in terms of the difficulty, time and effort required to respond; enclose a self addressed envelope with prepaid postage

Source: Bush and Burns (2006)

- ***Measuring questions efficiency***

Leedy and Ormrod (2005) observed that data lie buried deep within minds or within attitudes, feelings, or reactions of respondents. The design of measurement questions require paying more attention to attributes which make them efficient not only in mining the data from respondents but in increasing their ability and willingness to participate. Various authors (e.g. Baker, 2005:347; Leedy and Ormrod, 2005; and Blumberg *et al.*, 2005:436-440) have provided a checklist of such attributes which are summarised in Table 4.8. The checklist is structured with the following themes objective, communication structure, data and ability and willingness to respond. The comments attached define the virtue of the themes most of which guided the formulation and design of the measuring questions. The discussion has centred on the measuring instrument and measuring questions. We now turn to the efficiency and effectiveness of the entire measuring process from design, administration to data collection.

Table 4.8: Attributes of an efficient measuring question

Attribute	Comment
<i>Objective/content</i>	Ensuring each question must have a purpose and must have the appropriate scope for a particular theme
<i>Question design</i>	To ensure the communication is clear, comprehensible and unbiased by : avoided: long sentences (loading) or too short (unnecessary brevity); ambiguity; leading question which lead to bias e.g. negatively structured question; assumptions which are not standard or universal; terminologies (technical and vocabulary) which are not explained or which are not standard; double-barrelled questions; asking of hypothetical questions (e.g. could and would you); asking questions that require recollecting;
<i>Question layout</i>	Effective flow strategy; ensuring skip patterns are well thought out; well thought out theme change; proper ordering of question within a theme.
<i>Response strategy</i>	Ensuring an effective response strategy which will make it easier to respond yet provide the needed data.
<i>Instruction</i>	Providing clear instruction for the needed response and where appropriate examples should be given

Source: Bush and Burns (2006)

4.8.5 Effectiveness of the measurement process

In terms of the measurement process, efficiency relates to how easily and economically measurement results are obtained. On the other hand effectiveness refers to the accuracy and reliability of the results. To examine both aspects the concepts of *practicality*, *validity* and *reliability* of measurement are discussed.

Practicality refers to the level of economy and convenience achieved during measurement (Thorndike, 1991). Economy relates to how much has been spent on the measurement in order to obtain data, while convenience relates to how easy it is to manage and administer (time and effort) the measurement. Clarity of the questions, appropriate method of administration communication and easiness of completion are some of the issues considered under practicality.

Validity is normally divided into, external and internal of which the latter is important for the measurement while the former is important for the study results External validity refers to the extent to which results or conclusions about a sample can be extended to the entire population

(from which the sample was drawn) moreover across time and setting. The idea of selecting a sample of sufficient size (as was done for the study – see section 4.8.3) is that conclusion arising thereof can lead to prediction, explanation and understanding of the general population (Holden and Lynch, 2004). It must be said that the concept of generalisation is deep rooted in the positivist philosophy as discussed in section 4.3 is more concerned about external validity.

On the other hand internal validity deals with the extent to which a measurement achieves the intended objective (measurement). The concept cautions researchers to be wary of any type of bias that may creep into the design, process and data and which ultimately may lead to false conclusions. Internal validity is divided into three components namely *content*, *construct* and *criterion validity*. Content validity is the extent to which the measurement questions cover the relevant issues or aspects relating to the subject being measured. Later this aspect reflects on the level of validity of conclusions. The use of experts on a particular subject during the pre-test and pilot phase was geared in increasing the content and construct validity of the study.

Construct validity relates to the concept of a construct. A concept is normally a proposition formulated to study an observed (measurable) phenomenon but which is difficult to isolate and observe directly (Leedy and Ormrod, 2005). Scandura and Williams (2000) noted that construct validity concerns itself with how well the measures employed fit the theories for which a test is designed. Construct validity is tested through correlational techniques and confirmatory factor analysis (Scandura and Williams, 2000).

Another form of validity is the criterion validity which may be viewed from the point of view of subjecting the data of a measuring instrument to see if it is highly correlated with equivalent data of the same criterion (Leedy and Ormrod, 2005)

Reliability is another form of validity which is concerned with the view that a measurement instrument should provide consistent results regardless of the time, the researcher, population and the setting. Like generalisability it is a very strong axiom of the positivists which need

some toning for human related studies. A specific survey is done once, but even if it were repeated, it may be difficult to get the same sample (e.g. some enterprises may have gone under liquidation or management may have changed) in the same setting in order that the results are comparable. These aspects were worth a brief discussion to contextualise the validity of the study and its results.

- *Alternative views on validity*

It must be added that the issue of validity is also deep rooted in the two paradigms mentioned before with some qualitative researchers rejecting the framework of validity commonly accepted in more quantitative research, for example, they reject the basic realist assumption that there is a reality external to our perception. In that vain, Guba and Lincoln (1995) proposed four criteria for judging the soundness of qualitative research and juxtaposed them to the more traditional quantitatively-oriented criteria as shown in Table 4.9. Each alternative criterion of the qualitative of research is discussed briefly.

Table 4.9 Validity philosophical axioms

Positivist validity criteria	Interpretivist validity criteria
Internal validity	Credibility
External validity	Transferability
Reliability	Dependability
Objectivity	Confirmability

Source: adapted from Guba and Lincoln (1995)

Credibility relates to establishing that the results of measurement are credible or believable from the perspective of the respondent in the research. Since the purpose of qualitative research is to describe or understand the phenomena of interest from the participant's eyes, the respondents are the only ones who can legitimately judge the credibility of the results (Trochim, 2006).

Transferability concerns itself with degree to which the results of a measurement can be generalized or transferred to other contexts or settings including those with different time scales. Again from an interpretivist perspective transferability is primarily the responsibility of the one doing the generalization. The interpretivist researcher can enhance transferability by doing a thorough job of describing the research context and the underlying assumptions central to the research (Hirschman, 1986). The person who wishes

to generalise the results to a different context is then responsible for making the judgment of how sensible the transfer is.

The positivist view of validity is based on the assumption of replicability or repeatability (whether the same results could be observed or obtained twice). In order to estimate reliability, positivist researchers construct various hypothetical notions to try to get around this fact. However, from interpretivist perspective it is impossible to measure the same thing twice as by definition if we are measuring twice, we are measuring two different things (Trochim, 2006). Leedy and Ormrod (2005) put it nicely when they noted that data are not only elusive, but ephemeral: facts and knowledge that a researcher is permitted to measure exists only for a split second.

The idea of *dependability*, on the other hand, emphasizes the need for the researcher to account for the ever-changing context within which research occurs. The researcher is responsible for describing the changes that occur in the setting and how these changes affected the way the research approached the investigation.

From an interpretivist perspective each researcher is expected to bring a unique perspective to the study subject and thus *confirmability* refers to the degree to which the results could be confirmed or corroborated by others (Hirschman, 1986). A number of strategies exist for enhancing confirmability, for example, the documentation of the procedures used in order to check and rechecking the data throughout the study. Secondly, a researcher can actively search for and describe *negative instances* that contradict prior observations. Thirdly, after the study, a *data audit* can be conducted to examine the data collection and analysis procedures and makes judgements about the potential for bias or distortion –study limitations.

- ***Sources of measurement errors***

While the philosophical debates have toned down, they clearly shape the perception of the study results among scholars. Moreover, more validity tests are being formulated as research techniques become more sophisticated and well developed. Despite the debates and the

numeracy of the tests, one thing is unacceptable from any study - the presence of errors because they make the conclusions inaccurate and unreliable. Bias and errors are brought about by mainly four sources namely, measuring instrument, measuring process, the researcher, and respondent as illustrated in Table 4.10. The brief notes on each source are assumed adequate and provided a contingency approach during design and the measurement process.

Table 4.10 Sources of measurement errors

Source	Errors
Measuring instrument	Instrument validity in terms of design
Measuring process	Sampling; administration and data collection process; analysis
Respondent	Assumed, frame of knowledge level; answerability and willingness (motivation)
Researcher	Deficiency is reflected in the design, administration, collection, and analysis

Source: adapted from Blumberg *et al.* (2005); Baker (2003)

4.9 The Design of the Measuring Instrument

This section describes the design of the measuring instrument. Several issues have been raised about measuring instruments including what they should seek to obtain from respondents, how they should be structured and how the flow should be maintained in the measuring instrument. Proctor (2000), for example, noted that measuring questions seek to obtain the following information: (i) facts and knowledge represented by beliefs and perceptions, (ii) opinions about an object of study, its properties, (iii) motive of e.g. action, decision, behaviour or choice, and (iv) past and future behaviour, decisions, or actions. On the other hand Blumberg *et al.*, (2005) classified measurement questions into three categories namely administrative, classification and target questions. The first deals with identifying the subject (respondent and enterprise). Classification normally provides means of profiling the demographic characteristics of respondents or what they represent which in this case are SMCEs. Target questions seek information that specifically addresses the research questions.

Bush and Burn (2006) suggested various sections for incorporation in the measuring instrument, where they should be located in the instrument and why they should be included in the instrument. Their suggestions are summarised in Table 4.11.

Table 4.11 Approach to measurement flow

Type of measurement questions	Location	Rationale
<i>Introduction</i>	Covering letter	To introduce researcher and subject of study
<i>Screens</i>	First questions	useful where there is random sampling from a none demarcated population
<i>Classification</i>	At the beginning	Those which classify the respondent of property being measured
<i>'Warm-up'</i>	Immediately after the screen	To generate interest – easy to answer to lure the respondent into perceiving the easiness of the instrument
<i>Transitions (skip)</i>	Prior to change of theme or change of type of response strategy	To indicate to the respondent of the eminent change of theme or response needed.
<i>Complicated</i>	Middle part of the questionnaire and close to the end	They seek more effort to answer but since the respondent has already committed him/herself, withdrawing may not be possible
<i>Thankfulness; & instructions to instrument dispositions</i>	Last section	Gratitude for participation and reminding the respondent what to do with the questionnaire after completion

Blumberg *et al.*, (2005) suggested two other approaches for the design and question flow. The first approach is the funnel approach, where measuring questions move from being general to specific (or wide to narrow). The second being the sections approach, where instrument is divided into sections which represent the various aspects of the study being sought, for example, the answers to the investigative questions. However, it is one thing having a structure and another ensuring the logical flow of the items (Janes, 1999). It is therefore, possible to combine the approaches but maintaining a dominant approach. The dominant approach adopted in the design of the study instrument is the sections layout. The layout is discussed next beginning with the introductory letter to the instrument, followed by respondent and enterprise profile, strategic management process and lastly by operational and control infrastructure sections.

4.9.1 Introductory letter

A covering letter when attached to the questionnaire serves to introduce the researcher to the participants. However, apart from the introduction, it serves several other purposes. First, that it is not only common courtesy but it is expected that researchers should introduce themselves before requesting any information (Burns and Bush, 2006). Secondly, the purpose of the study should be described in clear and simple manner in order to place the respondent in the right frame of mind as they complete the questionnaire. Thirdly, it explains why and how the respondents were selected, for example, in this case randomly. This instils confidence in the respondent and avoids a perception of being targeted for some sinister motive especially if the issue of study is a sensitive one. Fourthly, it is courteous and ethically correct to ask for their participation in completing the questionnaire and to request for compliance with the instructions (e.g. post it using a self-addressed and stamped envelope). It is also good practice to indicate the amount of time they may be needed for the completion of the questionnaire. In some surveys, the respondent may be told where the results may be disseminated as a means of feedback or to indicate whether they would want a copy of the study report. Fifthly, in situations where the enterprise's information is being divulged, some incentive is needed in form of anonymity or confidentiality. According Burns and Bush (2006) anonymity means that the responses will not be associated with personal names or title of office of the respondents. Confidentiality means that while the respondent may be known to the researcher, but the names and hence the responses are not divulged to a third party. Definitely neither the respondent nor the enterprise name is needed for the result. The last aspect of in the introduction is to provide questionnaire disposition instructions, that is, to request the respondent to post or to await the collection of the instrument. Based on these guidelines a covering letter was written and attached to the measuring instrument (see Appendix 3).

4.9.2 The questionnaire

The measuring instrument (or data collection instrument) in form of a questionnaire consisted of four major parts namely classification, strategic, operational planning and control and management commitment to the PBFMS (see Appendix 4). Each is briefly described in terms of what it sought to investigate.

- ***Classification questions (Question 1.1-1.11)***

Classification questions sought to identify the attributes of respondents and group them accordingly, for example, the classes of enterprise, age, number of people employed and location to name but a few. In other words the section provided the demographic profile of the respondents with intention of providing further explanations to some observed phenomenon.

- ***Strategic management (Question 2.1-2.11)***

The premise of the study was that in order to remain competitive and achieve growth an enterprise needs some form of a strategic plan to chart its future direction. Moreover, literature review showed that there is a correlation between strategic plans and performance and growth. In addition, operational plans should be developed in such a way that they are aligned with strategic plans. The section therefore, sought to investigate the existence and the nature of strategic planning process, the means of evaluating their success and the link with operational plans.

- ***Operational planning and control (Section 3, 4, 5, 7 and 8)***

Majority of the operational plan of construction enterprises is about projects tendering, though functional plans are also developed. In order to carry out the tendering work and the follow up in execution, there must be an efficient and effective project planning and control infrastructure. This must be integrated with the enterprise's PBFMS in order to provide relevant, timely and accurate information for the processes. As already noted, many aspects of the project affect its financial profile, for example, changes in scope, quality and schedule have a significant impact of cost. Therefore, the PBFMS should not only focus on financial matters but aspects that may change the financial profile of a project.

The section therefore sought to investigate the existence of a project planning and control projects infrastructure; the linkage between strategic and operational plans; the efficiency and effectiveness of the PBFMS is supporting the above tasks.

- ***Management commitment to PBFMS (Questions 9.1 - 9.9)***

The domineering attitude of a proprietor in an SME has been highlighted in Chapter 3 and how it affects areas of decision making including the development and support of PBFMS. The section sought to investigate the commitment of management in terms of support, attitude and behaviour in relations with development and operations of an effective FMS, for example, in recruiting qualified personnel, investing in necessary infrastructure and providing exemplary behaviour regarding supporting the financial control systems necessary for FMS to function.

- ***Capturing Idiosyncrasies (Section 11)***

Sections 3.4.7 alluded to the fact that both strategic and operational management issues, especially in SMEs (including SMCEs) are partially a ‘cognitive’ process where much of the decisions take place in the thoughts of a proprietor. It is therefore, possible that standard questions may leave out unique and yet important cues that may exist in a SMCEs. This being the case, the questionnaire had an open-ended section (Section 11 –see Appendix 3) where respondents were free to add additional comments resulting from their experience or which were important or unique in their organisations. It is hoped that the responses obtained in this section will ‘mine’ the soft issues, if any, which are not subject to paper trail.

4.10 Ethical Issues in the Study

Ethical issues in research refer to the moral principles, standards, or norms of behaviour that guide our choices of behaviour and our relationships with others during a research study (Blumberg *et al.*, 2005). The major cornerstone of research ethics is centred on avoiding causing harm, physically or psychologically, to the subjects of study or any other persons affected by the process. Generally research ethics relates to the appropriateness of the researcher’s behaviour in relationship to the rights of those being studied or those who consume the findings of the study (Saunders *et al.*, 2007). Saunders *et al.* (2007) identified several interrelated issues regarding research ethics which must be addressed by the research process in order for it to pass as being ethically constituted. The issues span the entire life span of the research process and are summarised in Table 4.12.

The study process addressed the issues in Table 4.12 in two ways namely through following the national research regulatory regime and through observing ethical guidelines.

Table 4.12: Summary of ethical issues that need addressing in a research process

Phase of research process	Ethical issue to address
Throughout the process	To acknowledge the work of others when used in the research process*
Throughout the process	Pursuing an objective principle in the research process
Solicitation of access	Respect to the right to privacy for would-be and actual participants
Solicitation of access	Right to know and hence consent to the process without any deception
Solicitation of access	Respect the right to voluntary participation; and right to withdraw from the process
Data collection	Respect through the maintenance of confidentiality for the data provided by individuals or identifiable or identifiable participants and their anonymity.
Data collection	Avoiding the harming of participants through physical pain or through psychological effects such as embarrassment, stress or discomfort when collecting data.
Data analysis and interpretation	Avoiding the effects that could eventually harm the participants arising from the way data is used, analysed and reported.

Source: adapted from Saunders *et al.* (2007); * added by author.

4.10.1 National research regulatory regime

The Government, through the Ministry of Labour and Home Affairs, require that any research activity must be preceded by an application for a research permit (Republic of Botswana, 2004). The research permit should be obtained prior to at least any collection of any data, otherwise preferably at the commencement of the research study. The spirit of the research permit is mainly to achieve two aspects, monitor and control research studies conducted in the country and also to enforce an ethical regime in the processes. To achieve this several pieces of information are required including a research proposal and other items specified in the application form, such as, the identity of researcher and study subjects; techniques/methods to be used in the investigation; study duration and budget; and how the findings will be disseminated. The permit is then issued, if in the view of the officers of the ministry the ethical issues have been addressed.

The above process was fully followed and a research permit was granted (see Appendix 5). However, the permit in itself does not necessarily guarantee a comprehensive ethical regime in the process but a self-regulatory and professional conduct is needed as discussed next.

4.10.2 Ethical guidelines

Ethical issues were further addressed in several aspects of the research process through the following of guidelines provided in several literature sources (e.g. Neuman, 2006, Gay and Airasian, 2003). The framework in Table 4.12 is used as a guide for discussing how the issues were addressed.

Firstly, through the use of the introductory letter (Appendix 3) which accompanied the measuring instrument, many ethical issues were addressed, for example;

- i) the consent and voluntary participation of the respondents was sought and presumed obtained by the fact that they willingly responded;
- ii) the right to know the purpose of the study and how the process was to be conducted was communicated in both the letter and the questionnaire. Instructions on how to complete the questionnaire and an estimate of how long the process would take were also communicated.
- iii) the right to confidentiality and anonymity was ensured by not soliciting the human and enterprise identities. In addition the data and information arising thereof was treated and reported in such a way that it would not be traced to any particular person or enterprise; and
- iv) respondents were requested to indicate if they needed a feedback that the report would be available when the study is completed.

Secondly, throughout the dissertation, the work of others has been acknowledged through the use of citations and references. In addition, the principle of objectivity has been adhered to throughout the research process including the design, data collection, analysis and interpretation of data. In particular, the analysis and interpretation of data has been conducted

in an objective way in order that the results do not to affect the participants or mislead those who read the thesis.

In view of the above it was felt that most of the ethical issues were addressed.

4.11 Chapter Conclusion

This chapter has underscored the fundamental research concepts underpinning the methodology adopted in the study. The journey was taken to justify the selection of the various methods and techniques of research. Firstly, the study was contextualised within the main stream research paradigms namely positivist and interpretivist philosophies. Secondly the research processes were described and discussed. In particular, the survey method based on the questionnaire as a data collecting method was discussed as the main strategy that was adopted for the investigation. The steps which underpin the survey method were then described namely identification of the subjects, determination of population size, determination of the sample size, and the selection of the identities of the members of the sample. In addition, methods of data analysis were discussed in a general manner with a view to being described later in practical details in Chapter 5.

Following on to the research process was the discussion on how to design an effective measuring instrument in form of a questionnaire. The main ingredients considered were discussed including measurement questions, measurement scales and data, issues of length, reliability and validity were also mentioned. These were discussed in order to avoid pitfalls that may befall a researcher in designing a questionnaire. Finally, the template or format of the measuring instrument was discussed and actual questionnaire was developed as an output of the Chapter.

CHAPTER 5: DATA ANALYSIS AND PRESENTATION OF RESULTS

5.1 Introduction

This Chapter presents data analysis and the results of the study that investigated the effectiveness of the PBFMS of SMCEs based on the research strategy described in Chapter 4. It begins firstly, with a description of the nature of response obtained during data collection resulting from a self-administered questionnaire sent to SMCEs. The third section of the Chapter describes the ‘demographic’ profile of respondents. The fourth section in general terms how data was analysed. The fifth section of the Chapter presents an analysis of the findings relating to the major themes which were addressing the conjectures posited in Chapter 1 relating to the components of an efficient and effective PBFMS.

5.2 Response Profile

As indicated in Chapter 4, the major method of delivering the questionnaire was through postal mail complemented occasionally fax and drop-and-collect methods. The latter were used mainly in cases where a respondent claimed not to have received the posted questionnaire. Prior to mailing, questionnaires were assigned identification codes, corresponding to a particular enterprise for the purpose of tracking response and non-response. The mailing of questionnaires was carried out in three rounds within a period of five months, beginning March 2007. What transpired in each round is briefly described.

5.2.1 Round 1

During the first round of mailing, a total of 152 questionnaires (as according to the number determined in Section 4.8.4) were sent to construction enterprises and only 38 were returned, recording a response rate of 25% as shown in Table 5.1. Quite a number of questionnaires 70 (or 46%) were returned in form of returned-to-sender (RTS) and 44 (or 28%) were not returned at all.

Table 5.1: Response profile for questionnaires

Round	Date in 2007	No of Questionnaires sent	No Returned completed	No of RTS	No. not returned	Response rate
Round 1	March	152	38	70	44	25%
Round 2	May	62	34	12	16	55%
Round 3	July	54	<u>29</u>	11	14	54%
Total achieved			101			83%

*RTS – return to sender

The high rate of RTS (see Appendix 6 for samples of RTS mail) was investigated with one of branches of the Botswana Postal Services. It was revealed that the high rate of RTS could have been a result of their recent strict adherence to the postal rent payment deadlines of 1st January every year (see Appendix 7). They further noted was revealed that as a result of non-payment, postal boxes were withdrawn from current owners and given to new customers. The clients of Botswana Postal Services were warned of the impending strict adherence to the deadline but a significant number did not heed the warning, thinking the situation would be as in the past where payment for rent remained unpaid for more than three months after deadline. The other explanation for the RTS mail is simply the natural attrition of companies, that is, companies ceasing to operate and thus giving up their postal addresses.

Due to the few completed and returned questionnaires, it became necessary to find new addresses for the companies where RTS mails were obtained. Thus another strategy was needed to increase the sample size to the required number of 122 enterprises as discussed in the next section.

5.2.3 Round 2

In Round 2 of mailing, it was decided to obtain the recent lists of contractors who had bid for jobs from the two major government departments dealing with construction projects, namely, Department of Building and Engineering Services and Department of Roads, and some local authorities (e.g. Gaborone City Council). The departments and the councils were approached and agreed to provide copies of the recent registers of tenders awarded. While some registers included both telephone numbers and postal addresses, for some only cellphone numbers

were indicated, particularly tenders for small sized enterprises. For the latter, the cellphone numbers were then used to contact the enterprise owners to obtain current addresses. However, before making any telephone call the enterprise names were checked to ensure that firstly, the enterprise was in the RTS and non-response category and thus in the sample list.

In this round of mailing 62 questionnaires were posted and the Strategy achieved a response rate of 55% (34 questionnaires completed and returned) as indicated in Table 5.1. However, the sample of 122 required responses was still not achieved as the total after Round 2 was 72 (38+34) questionnaires returned. Another Strategy was conceived as described in the next section (Round 3) to increase the sample size number.

5.2.4 Round 3

A number of decisions and actions were taken in this round. The first was to phone again the enterprises whose questionnaires had been returned (RTS) which were 12 in number. It transpired that some addresses were not recorded or written properly in the tender lists. In three cases the entrepreneurs indicated that they had ceased operating since they provided their addresses during tendering. Contact was also made for those who had not returned the questionnaires and several scenarios occurred. Some promised to complete the questionnaires, others claimed not to have received the questionnaire and requested for another copy while others had their cellphones were switched off permanently.

It was decided that where contact could not be established enterprises should be replaced by others left out when the stratified sampling list was constructed (also left out were those enterprises which had completed and returned the questionnaires). To avoid bias, the random sampling procedure discussed in Chapter 4 was followed again. This process allowed another set of 54 questionnaires to be mailed in which a response rate of 54% was achieved amounting to 29 questionnaires being returned. After the three rounds of questionnaire mailing a total number of returned and completed questionnaires stood at 101 representing an aggregate response rate of 83% in relative to the expected number of 122 (see column 4 and 7 of Table 5.1).

5.2.4 Response rate

After the three rounds of questionnaire mailing, spanning five months, it became very clear that it would be very difficult to get the required sample of 122 and hence mailing was halted.

Of the 101 enterprises that responded, 55% and 46% were small and medium sized enterprises, respectively as shown in Table 5.2. The response proportions turned out to be lower (from 59% to 55%) for the small sized enterprises and higher (from 41% to 46%) for medium sized enterprises.

Table 5.2 Response rate of small and medium construction enterprises

	Actual		Expected	
	Number	Percentage*	Number	Percentage*
Small	55	55%	72	59%
Medium	<u>46</u>	<u>46%</u>	<u>50</u>	<u>41%</u>
Total	101	100%	122	100%

*rounded

The response profile brought out two issues, the first which was not being able to get the expected sample size and the second was the failure to get the expected proportions (strata). In view of this situation a question may be posed: how accurate is the data especially in terms of being representative of the population being studied?

The position of the study is that the data need not to be circumspect, for a number of reasons. According to Lynn (1996), if the companies being studied are a homogeneous set of enterprises, for example, all are construction enterprises, then those which responded and those which did belong to the same sector and hence are a random sample. Had the study been targeting all SMEs, including those in manufacturing, retail and other service industries, one may have been made to believe that those which did not respond may belong to a particular sector and those which responded to a different one - a violation of the randomness and an intrusion of bias in the study.

The second and third aspects are related, that is, the lack of the expected sample size and the changes in expected strata proportions. A study conducted by Dun and Bradstreet (1987) in

the USA showed that, there are more construction business failures in the economy than any other sector. Kgabo *et al.* (1998) also concluded from their study that of all sectors of Botswana's economy, the greatest business failures occur in the construction industry. Taking this into account and the fact that the first sampling frame was drawn from a 'static list' dating back to 2005 which was provided by the two departments (DBES and DR), it may explain the discrepancy between what was expected and what was obtained when the actual data collection occurred. This may also explain the high number of RTS. Non-returns may be explained along the same lines that some proprietors may have closed businesses but still used the same postal addresses for personal or other business and saw no point of completing the questionnaires. In fact in one case a respondent was courteous enough to return the uncompleted questionnaire attached with a note saying *'please we are no longer in the construction business'*.

Another point raised by several authors (e.g. Hillebrandt, 1989; Smith, 1998; and, Drewer, 1998) which reinforces the issue of the changing strata is the cyclic nature of the construction sector. The sector attracts more proprietors in the industry during the boom period to 'harvest' what is perceived as windfall profits (Palalani, 2000) but many close during the down-turn. Moreover, the entry is higher at the lower end of the size continuum (small size) where the barriers of entry and exit are less stringent and similarly the attrition is higher at that end. Another reinforcing argument is the observation by local analysts about the state of the industry in the past few years. According to some experts (BOCCIM, 2005) the Botswana construction industry has been in a down-turn from late 2004 to mid-2007. The recent statistical figures for the GDP and employment levels (see Figure 2.5 Chapter 2) indicate a shrinking industry and thus confirm the premise of an industry down-turn.. One respondent commented that *'I had to trim my workforce because I had no jobs for over nine months, other simply left on their own...* while another exaggerated the situation by saying *'... it is better to toss a coin to decide the winner for the tenders...* The latter respondent was not only feeling the pinch from jobs drought but was more oblivious of the tendering system especially in local authorities – he felt it was no longer fair and transparent. With those insights there is a high possibility that recession could have caused a number of enterprises to go under voluntary or forced liquidation. Kale and Arditi (1998) and Aldrich and Auster

(1986) noted that small firms are more vulnerable to business shocks than their counterparts. This may explain the difference in the expected and actual proportion, with proportion of the small enterprises falling from 59% to 55%, implying the attrition in small sized enterprise was higher than the medium enterprises.

When all these issues are combined, it is highly possible that the population of enterprises based on the 2005-lists given by the two major project management departments (DBES and DR) and which was used to calculate the sample size was inaccurate for use in 2007. Thus actual populations of enterprises in 2007 could have been less and the actual sample population should also have been reduced accordingly. Secondly, this also implies that the proportions may have changed with the smaller companies closing down more than the medium companies as explained by Kale and Arditì (1998). Therefore, it is possible that the obtained sample and strata are closer to actual one. There is also a possibility that the actual total response obtained in the three rounds of mailing could even be higher than the required actual sample size, if the above arguments were to hold ground- and it is strongly held that they do. That being, it is highly possible that the sample was adequate, or even higher than required.

Following on to the argument for admissibility of the sample size and strata, the next section looks in general terms the manner in which data was analysed.

5.3 Data Analysis Management Process

This section explains how the data analysis process was managed including the choice of software programmes, data entry, nature of data encountered and choice of statistical tests.

5.3.1 Software Programmes and data entry

A combination of three software programmes were used namely MS Excel, MS Word and SPSS for analysis for the following reasons. Where it was felt that one programme was more convenient to use or was more powerful than the other, a choice was made to use that particular programme. All the data was entered in MS Excel because it was considered to be

an easier programme to use for data entry and then transferred to SPSS. The analysis was mostly carried using SPSS, of which some of the output was imported into MS Excel to draw the charts. Similarly, many of the tables were imported into MS Word from SPSS in order to get a tidier format.

5.3.2 Nature of data.

Majority of data used for testing the hypothesis was derived by using a 4- point measurement scale in the form of 3 (= *Always or For all projects*), 2(= *Sometimes or For some of the projects*), 1(= *rarely or For a few projects*) and 0(= *Never*) (see Sections 3, 4,5,7,8 and 9 of the data collecting instrument in Appendix 4). The 4-point scale was preferred to the 5-Likert scale, which apart from the two extreme ends of measuring a characteristic, allows respondents to provide neutral responses such as '*do not know*' or '*not sure*' to a question. On the contrary many questions in the study were probing the existence of, the level of usage, or strength of an attribute or aspect. In this scenario therefore, it required respondents to indicate a particular position or direction pertaining to their enterprise, for example, a question requesting to know whether an enterprise always has a business plan does not solicit an '*I do not know*' or '*not sure*' response. The required response was either an attribute or process does not exist or its degree of existence varies, say from project (or time) to project (or time).

While majority of the data is based on the 4 - point measurement scale, other data was categorical in nature and were analysed in a different manner from above. A summary of the responses to the various questions is given in Appendix 8. The summary links directly to the number of responses obtained for a particular choice of response in the question and this in turn is used to calculate the percentage proportion of the response or responses, for example, those at above 2(= *Sometimes*).

In addition and where appropriate, the comments made by respondents for each section on the blank page attached at the end of the questionnaire were also incorporated in the results through a content analysis, to provide further explanation to a particular issue.

5.3.4 Choice of statistical tests

Majority of the data used was considered to be from a one sample group, the SMCEs, and measured using the 4- point measurement scale. These two conditions meant that a one sample t-test was the most suitable (Leedy and Ormrod, 2005; Blumberg *et al.*, 2005) for most of the analysis. The test was chosen because the testing of majority of the hypotheses required comparing the mean of one sample with a hypothetical mean (Blumberg *et al.*, 2005).

To accept or reject a null hypothesis a cut off value or hypothetical mean of 2.00 was set, which is equivalent to *Sometimes* on the 4- point measurement scale. The premise of this position is that a mean of above 2 signifies the *adequacy* of an attribute of the PBFMS, lying in the region of above 2 (*>Sometimes*) and 3 (= *Always*). Conversely, if an aspect of the PBFMS is *inadequate*, a measured mean will be equal to, or less than the hypothetical value of 2 and thus lying in the region of 2 (*≤ Sometimes*) and 0=*Never*). Therefore, the formulated hypotheses had to be one-directional, requiring the use of the positive one-tailed t-test with a known (hypothetical) mean of 2.00 but where the null hypothesis is $\mu > 0$ and not $\mu = 0$ (Burns and Bush, 2006; Saunders *et al.*, 2003).

In interpreting the results after testing a positive directional hypothesis, Burns and Bush (2006) provides a rule of the thumb by noting that ***subtracting a hypothesised mean from sample mean must give a positive value if the null hypothesis is to be supported*** (if it was a negative based null hypothesis, subtracting a hypothesised mean from sample mean should give a negative value if the hypothesis is to be supported). However, there is also question of statistical significance and this requires another test. The positive null hypothesis will be supported at a 95% level of confidence if the confidence intervals (lower and upper limits) all lie above 2; will be rejected if they all lie below 2; and the evidence shall not be conclusive if the confidence intervals include a value above two (alternatively the calculated t value could be compared to see if it greater than the critical value of 1.64 obtained from the one-sided tables). Thus, since ***the hypothesised mean is not exactly equal to 2, the p-values shall not be used but instead confidence intervals shall be used for supporting the null hypothesis.***

In addition to the t-test, a test of the difference of means was also used where it was found appropriate to distinguish between two categories of SMCEs created by a difference in a particular characteristics e.g. adequacy/inadequacy or good performance/poor performance.

Test of the nature of associative relationship (correlation) was also tested in some instances. Percentages were often used to show the general trend or direction of a practice, attitude or attribute of SMCEs, or its personnel or a PBFMS.

5.3.5 Treatment of SMCEs in the analysis

It will be recalled that the study relates to PBFMS of SMCEs. However, apart from examining the SMCEs as a homogeneous group, it was found useful and of interest to investigate the differences in the various aspects relating to the two sizes namely small and medium enterprises. This was then followed up with an overall analysis of the entire grouping (SMCEs). SPSS was found particularly useful in manipulating the data to show how each size fared in terms of a particular characteristics, for example, the number of employees or the average of in each size.

With that brief explanation of the manner in which data was analysed the next sections examine the demographic profile of the enterprises which participated in the study.

5.4 Demographics of the Enterprises which Responded

This section provides an examination of the demographics of the enterprises which responded under the following themes identity of respondents, age of SMCEs, nature of markets served and anticipated growth levels.

5.4.1 The identity of respondents and the age of the enterprises

The identities of type persons who completed the questionnaire are shown in Table 5.3. In a majority (59%) of the SMCEs the company owner completed the questionnaire followed by the internal quantity surveyor (21%).

Figure 5.1 shows the proportions of the age brackets of SMCEs enterprises. Very few SMCEs are below five (5%) years or over 20 years old (13%). The medium age group was found to be 12 years old. In addition,

Table 5.3: Summary of some of the demographic variables

Estimator (not qualified as QS)	Internal Quantity surveyor	Accountant	Company owner
15%	21%	5%	59%

Figure 5.1 shows that 51% (9%+42%) of the small sized enterprises were below the age of ten years and a significant number (78%) was below the age of 15 years. For medium sized enterprises, no enterprise was below five years and majority (78%) were under 20 years. The finding shows that the medium enterprises are more mature than the small enterprises since 22% of them are above 19 years as compare to 6% of the small sized. This is in line with Kale and Arditi's (1998) observation that small sized enterprises are normally younger.

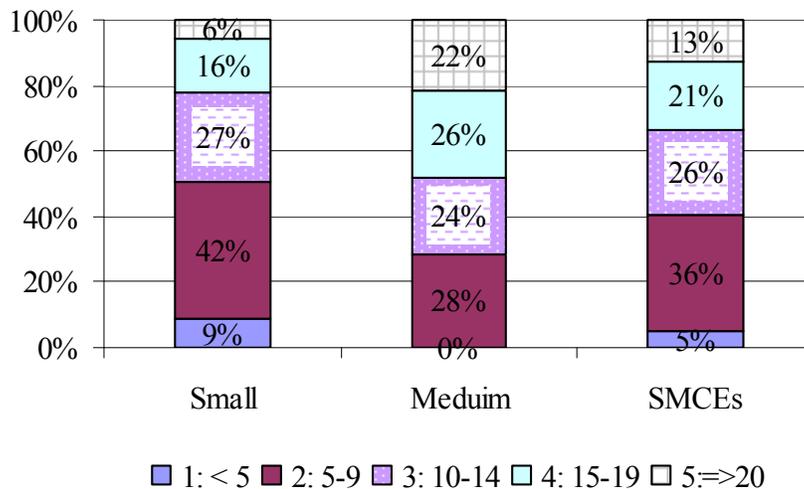


Figure 5.1 The age of the enterprises

5.4.2 Nature of markets served by enterprises

Four types of markets were identified namely category of work performed (building, civil, and maintenance); nature of contracting (main or sub-contracting), geographical area covered and type of clients served. Analysis of each is discussed next.

▪ **Category of work performed by enterprises**

Figure 5.2 shows that no (0%) enterprise performs civil work alone. However, a number (48%) of SMCEs perform building alone others (42%) perform both civil and building work. Few (11%) SMCEs are involved in maintenance work. Looking at each size individually, most (55%) of the small enterprises are engaged in building work, while a small number are engaged in both civil and building work (33%) and maintenance (13%). On the other hand medium companies do less (39%) building work alone, preferring to execute more of both (52%) building and civil work and far less (9%) maintenance work.

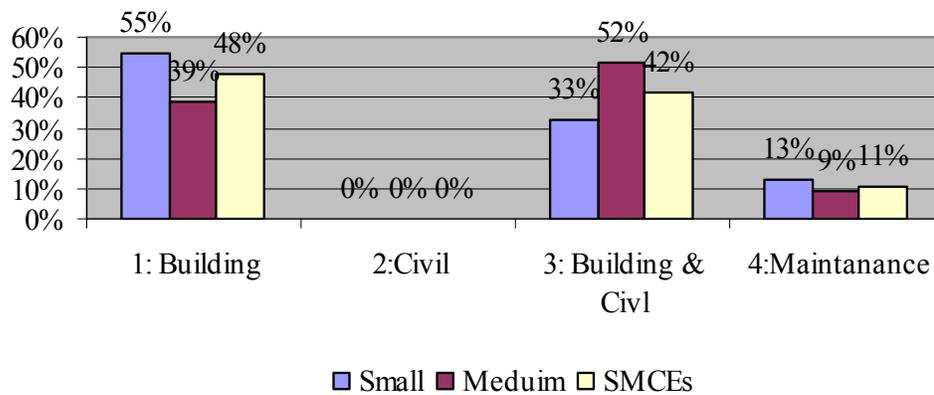


Figure 5.2 Category of work performed by the enterprises

The findings are as expected because building work is less complex and requires less capital equipment than civil work and thus a natural entry point for small enterprises. Secondly, though more paying than building, in reality jobs in civil works are fewer than building works and hence no entrepreneur would commit financial suicide by registering for civil work alone. Thirdly, the observed increase in the proportion of medium enterprises executing more civil works is due to the need for more resources, particularly, capital assets.

Maintenance work is less paying than the other two categories of work and hence the low proportions obtained. Moreover, jobs for maintenance work are also not that many since most

of the buildings in Botswana are relatively new, 20 years old or less, and just require routine but not major maintenance or refurbishing.

- ***Level of sub-contracting***

Figure 5.3 shows the extent to which the enterprises source work as sub-contractors. A zero percent (0%) proportion indicates that an enterprise does not sub-contract at all, that is, it works as the main contractor for all the jobs tendered for. The 100% proportion means all the jobs are obtained as a sub-contractor.

Majority of SMCEs (65%) do less sub-contracting preferring to work as main contractors. Sub-contracting is considered less lucrative because of a number of reasons. Firstly, the value of work is less because only a part of the main project is sub-let. Secondly, it is less flexible because the sub-contractor has to work within the schedule of the main contractor. Thirdly, in terms of payments the sub-contractor is at the mercy of the main contractor, often paid after the main contractor has received payment from client.

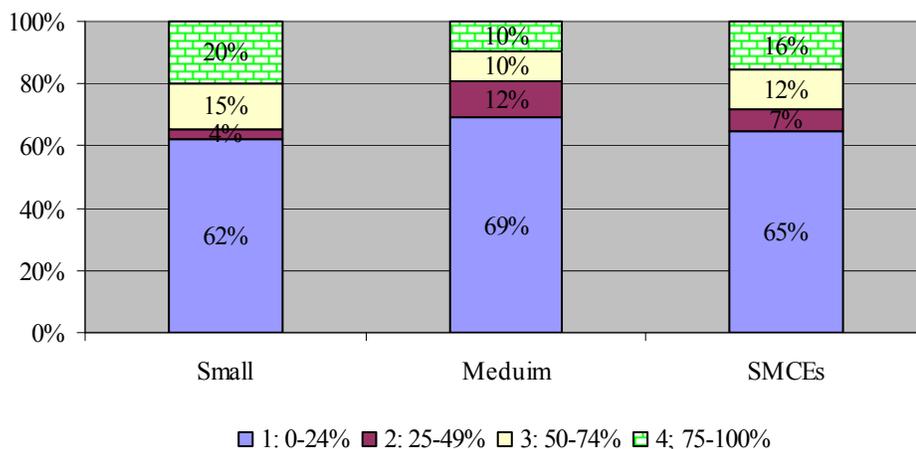


Figure 5.3: The extent to which enterprises work as sub-contractor

Figure 5.3 shows that medium enterprises seek more (69%) contracts as main contractors than small enterprises (62%) and conversely small enterprises work more (20%) as sub-contractors than medium enterprises (10%).

- ***Geographical area covered by enterprises***

Figure 5.4 that majority (60%) of the SMCEs work beyond 500 Km and above from their head quarters. This situation may be explained in terms of the geographical nature of Botswana. Botswana is a large country which stretches about 1000 Km, north to south and east to west borders (see Appendix 1). It is also a sparsely populated country. The public jobs, especially those from the local councils (37% of the construction market, see Figure 5.5) are spread all over the country.

However, the results summarised in Figure 5.4 show a clear distinction between the small and medium sized enterprises in terms of how from head offices they have ever executed a project. A large proportion (85%) of medium enterprises has executed jobs beyond 500 Km as compared to small enterprises (40%).

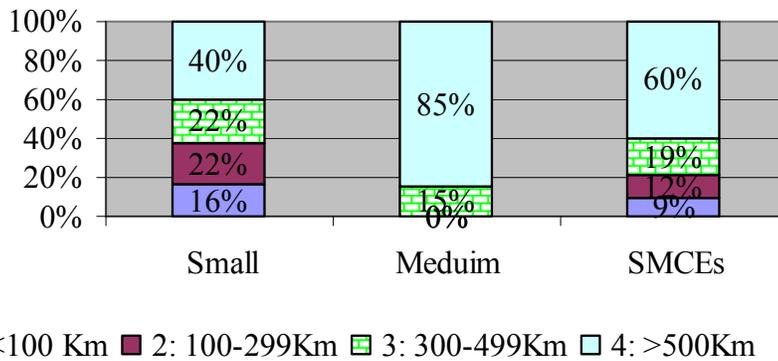


Figure 5.4 Geographical market covered by enterprises

The finding confirms what Baumbach (1988) observed that small enterprises normally operate within local confines from their head office. The difference in work spread between the two sizes may be explained basically in terms of the scale of available resources and logistical capabilities. Both Hillebrandt (1989) and Canter (1993) observed that operating away from head office is one of the biggest challenges that construction enterprises face. Not only does it require more resources and efficient and effective communication systems, effective management is needed. Greiner (1972) observed these capabilities of operations progress with age and size and this may possibly explain the difference in the observed capabilities of the two sizes.

- **Type of clients served by enterprises**

Figure 5.5 shows the distribution of services amongst the four groups of clients (other means individuals and private organisations). SMCEs of enterprises get their highest (37%) jobs from the local authorities of which the medium enterprises get the highest proportion (40%). This is followed by central government where all sizes get over a quarter (28%) of their jobs. When combined the public sector accounts for about 65% (37+28) of the jobs in the market for SMCEs and the non public sector accounts for the rest (33%) of the market.

The results clearly indicate that the public sector still dominates the industry as the major client. In other words the private sector has not grown much (offering only 35% of the market jobs). However, the results indicate a changing trend because the non-public sector has picked up from the 2000 level when it was offering only 20% of the jobs on the market (Ssegawa, 2000) while the public sector was offering the rest (80%)

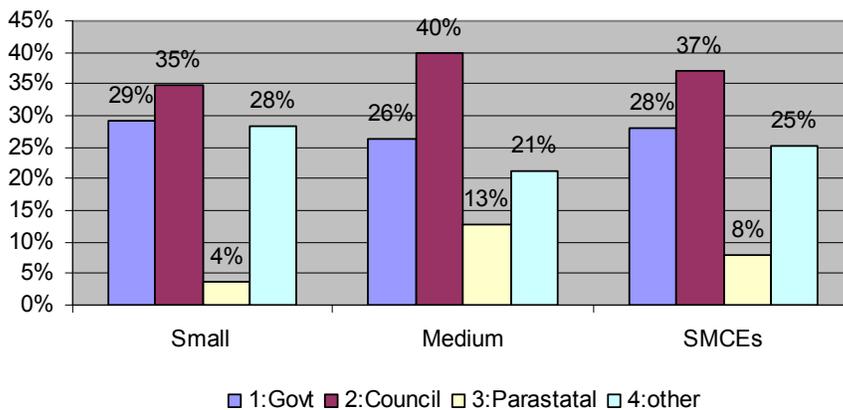


Figure 5.5: Client markets served

5.4.3 Growth of enterprises

Analysis of growth is performed using two aspects change in workforce and size of enterprise.

- **Current and past workforce**

Figure 5.6 shows the proportions of the current workforce sizes (under five to over 20 employees) of enterprises. From figure, a quarter of the SMCEs have less than five employees and almost three quarters have less than 20 employees. Thirty five percent of the

small sized enterprises have less than 5 employees with slightly over half (59%) of the enterprises having less than 10 employees. As expected medium sized enterprises have more employees, with most (44%) having between 15 and 19 employees.

Just like the progression in age (with medium sized enterprises being older), the medium sized companies have a bigger workforce. An almost equal number of SMCEs have a workforce of SMCEs of less than 10 (44% =25+19) and 14 and above employees (49% =20+29%). The result subscribe with the generic definition of SMEs in Botswana of 6-250 employees (Republic of Botswana, 1998) mentioned in Chapter 1.

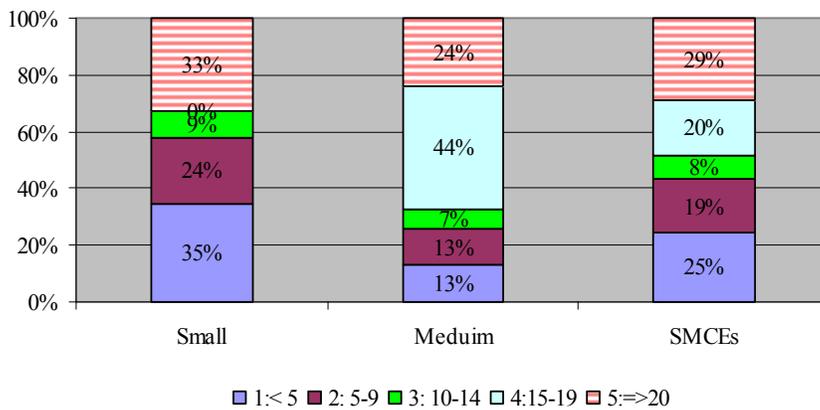


Figure 5.6: The size of the workforce of the enterprises

Figure 5.7 captures a snapshot of the growth of the work force at registration (shown as pre.) as compared to date.

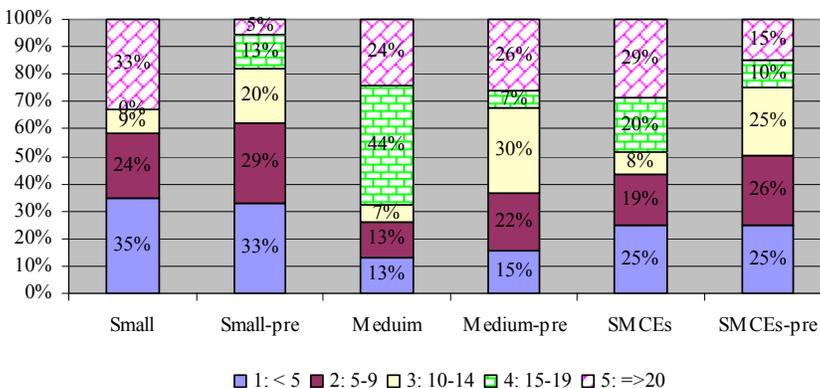


Figure 5.7: The workforce size at registration and now

The figure shows that the employment size structure in small enterprises has not changed much except some companies have moved in the upper employment bracket (≥ 20) which was previously 5% and is now 33%. Since the lower (< 5 and 5-9) brackets have almost not changed, the change has come from the middle and upper brackets (10-14 and 15-19). The growth of the workforce in the medium size has been in the upper middle (15-19) which was 7% and now is 44%. Like the small enterprises growth has come from the middle and upper brackets (10-14 and 15-19). The overall picture of SMCEs shows there are companies that have increased their workforce, for example, the top end (≥ 20) bracket has grown from 15% to 29% while there those which have remained stagnant as illustrated by the stagnation of the lower end brackets of the work force sizes (< 5 and 5-9). This finding confirms what Stanworth and Curran (1976) observed that among SMEs there are firms which are poised to remain small because the proprietors have decided that they do not want growth and there are those which grow rapidly because proprietors favour growth.

- *Change of size*

Figure 5.8 shows how the enterprises have grown since they were registered, that is, a movement in classes (OC, A, B, C and D) to where they are classified now. An enterprise may register for any class size e.g. OC and thereafter request to be re-classified for a higher class after trading for a certain period and illustrating a track record of competence including the possession of adequate resources.

Figure 5.8 shows that over half (68%) of the SMCEs were initially registered as micro-enterprises in the lowest class (OC) while an equal number (16%) was originally registered as small and medium enterprises. There were also some (16%) indications that enterprises were originally registered as medium enterprises and have remained in the same size. There was no evidence of some enterprises being moved to a lower class perhaps as a result of poor performance.

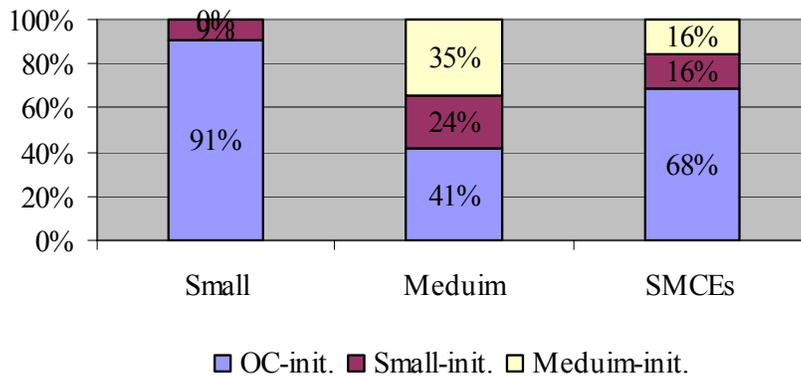


Figure 5.8: The growth profile of enterprises

Figure 5.8 shows that majority (91%) of the small enterprises were registered initially in class OC and grew to register as small sized firms (of class A or B) while a small number (9%) have remained in the small size (its is possible for firms to have moved from class A to B since both classes are grouped as small size enterprises). A sizable number (41%) of medium enterprises had moved from class OC to become medium sized enterprises, while 24% moved from small to medium leaving 35% as stagnant enterprises. It is observed that there was some appreciable growth in the medium size enterprise accounting for a 65% movement (41%+24%) but not as much as the small sized enterprises where a 91% movement was recorded. The growth rate shown by small sized enterprise is again as expected as noted by Kale and Arditì (1988) and Aldrich and Auster (1986) that while the infant mortality is highest with small enterprises, their growth is also usually phenomenal.

- ***Future desired size***

Figure 5.9 shows how the enterprises forecast their desired position in five years time. Overall, a greater majority (86% =35%+51%) of SMCEs indicated that they would desire a movement in size. The result is not very far from reflecting the past growth (see Figure 5.8) where 68% of the enterprises were in micro-size but moved to either small or medium size (note that the proportion of 14% of SMCEs who indicated to move into small size means a movement of class from A to B).

The figure shows that 25% of the small enterprises indicated that they will stay within the same size while 44% and 31% forecast a movement to medium and large size, respectively. A small minority (24%) of medium enterprises indicated that they do not foresee any movement, possibly from class C to D, while the majority (76%) indicated ambitions of moving to large size.

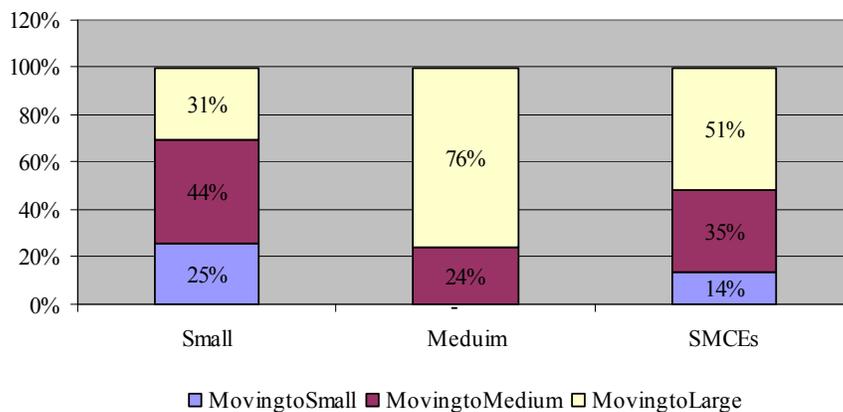


Figure 5.9: Desired size in five years

- ***Reason for anticipating growth***

Figure 5.10 show the reasons given by respondents as to why they anticipate achieving their set growth target. For small companies a greater number (42%) indicated that part of their strategy of achieving anticipated growth lies in increasing investment in resources. Quite a large number (45%) did not substantiate their preferred Strategy. For medium sized companies the strategy was to increase investment (30%) and market share (43%). The result is in line with previous observation in that it is the medium companies that have an increased propensity, for example, for going into civil engineering category of work and to bid work in local councils which are scattered (as indicated by distance from head office) all over the country.

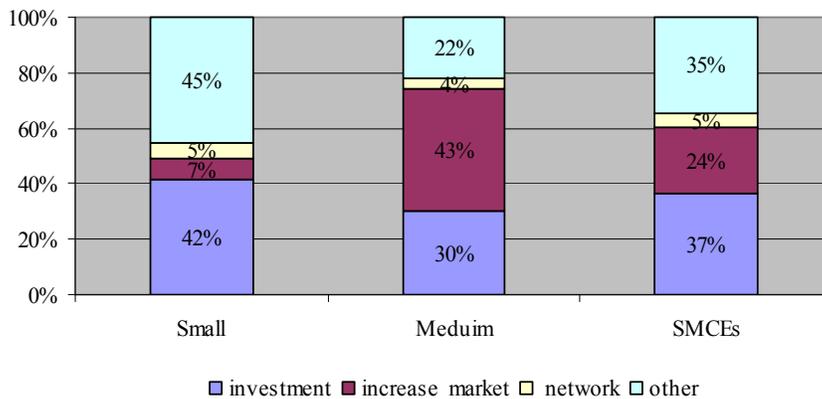


Figure 5.10: Reason for moving to desired size

In summary, a significant number of SMCEs were aged between 10-14 years; had between 10-14 employees; were main contractors; and obtained their jobs from the public sector (central and local government). In addition, a considerable number have grown in size over the years of their trading period as shown by a growth in the work force and change of class and size and thus being able to extend both their geographical market and the nature of work they do, from mainly building to civil work.

Having examined the demographic profile of the SMCEs that took part in the study, the next sections discuss results relating to the major themes of investigation of the study.

5.5 Adequacy of the Strategic Management in SMCEs

This section and others which follow concentrate on SMCEs, the gist of the study. However, where appropriate a distinction is made between small and medium enterprises as separate groups. It was noted in Chapter 3 that the proposed PBFMS must contain a strategic management component and hence the study instrument contained a number of questions that measured the existence and the nature and level of engagement of the strategic management process in SMCEs. The results of the strategic management process are discussed under three

themes namely situational analysis, documentation and strategic awareness after which the result of testing of one of the major sub-hypothesis is discussed as a conclusion to the section.

5.5.1 Situation analysis

The precursor to formulating any strategic management plan is a situational analysis (or an environmental appraisal). Some authors have suggested that it is not much of a formalised process but rather an intuitive or cognitive one (Junnonen, 1998). However, many agree of the need in order to channel the enterprise capability in an optimum way to have the ability to identify at least business threats, opportunities and strengths (Ehlers and Lazenby, 2007). This aspect was investigated by three major themes namely personnel involved in conducting a situational analysis, competitive advantage, business threat and opportunities.

- ***Persons conducting the situational analysis***

As a first step to strategic planning process, enterprises require to conduct a situational analysis in order to ascertain and identify market needs. This is performed to establish whether their offerings are still in line with the markets needs and also to find out where new opportunities exists and where business threats are bound to occur. The process requires the enterprise to create a mechanism to provide the necessary intelligence in the market. Though the information could come from any quarters (e.g. employees, customers, marketing and operational staff, management, suppliers and competitors), the analysis of the information should be done by competent personnel. Best practice (e.g. Newkirk and Lederer, 2006) advocates that those who perform the strategic planning process are best suited to carry out the situational analysis and in this case management. Furthermore, it is suggested that it should be a team effort and not left to a single person, to provide the much needed holistic

view of the market against the enterprise's capability as espoused by the strategic fit concept (Mintzberg, 1994; Kotler, 1991). Results of an investigation in the issue are summarised in Figure 5.11. In a significant (57%) number of SMCEs the owner conducted the situational analysis. It is only in relatively a few (25%) enterprises that team effort prevails. In some cases, though few (15%) enterprises relied on consultants to analyse the market situation. This is perhaps carried out when they need a business plan for funding purposes. Like most of the other issues investigated before, team effort was more observed in medium enterprises (32%) than small enterprises (19%) and vice versa for the domination of the owner.

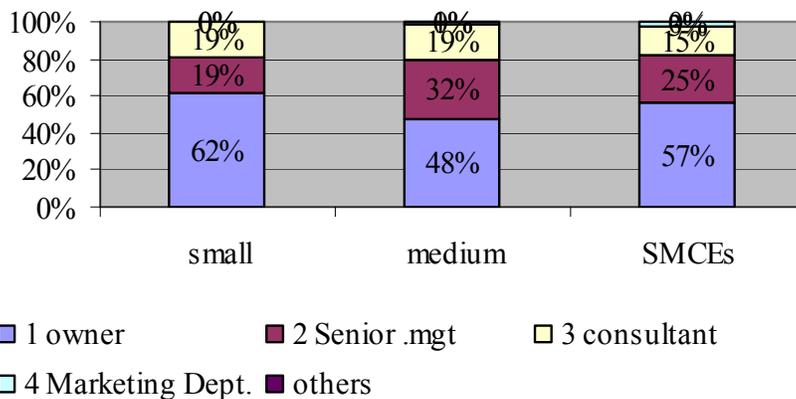


Figure 5.11 Persons involved in conducting situational analysis

▪ ***Business threat***

Figure 5.12 shows what SMCEs singled out as the greatest threat (38%) to their construction business –the lack of jobs. This factor was more pronounced in medium enterprises (54%) than in small enterprises (24%). The general observation was that they felt that the industry was depressed. However, the fact that the medium enterprises felt the crunch more may be

explained by a comment made by one of the respondents who said ‘... *the higher you go up in class [and hence size] the less are the jobs and the more the competition for the few jobs...*’

Two other aspects were also prominent and generally typical of SMEs, lack of finance (29%) and intense competition (24%). As expected these two were given equal (35%) prominence in small enterprises.

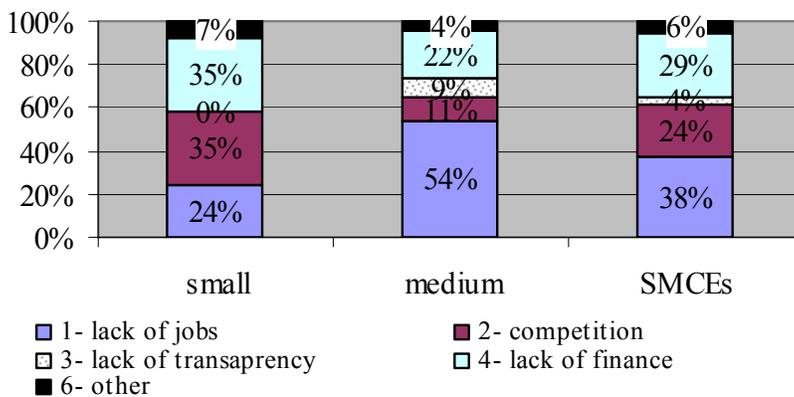


Figure 5.12: Major threats to business

- ***Competitive advantage***

To gain a further insight in the practise of situational analysis process respondents provided an indication of the source of their competitive advantage. There were three major factors identified with half (50%) of the SMCEs believing that they provide a superior service to their clients as illustrated in Figure 5.13.

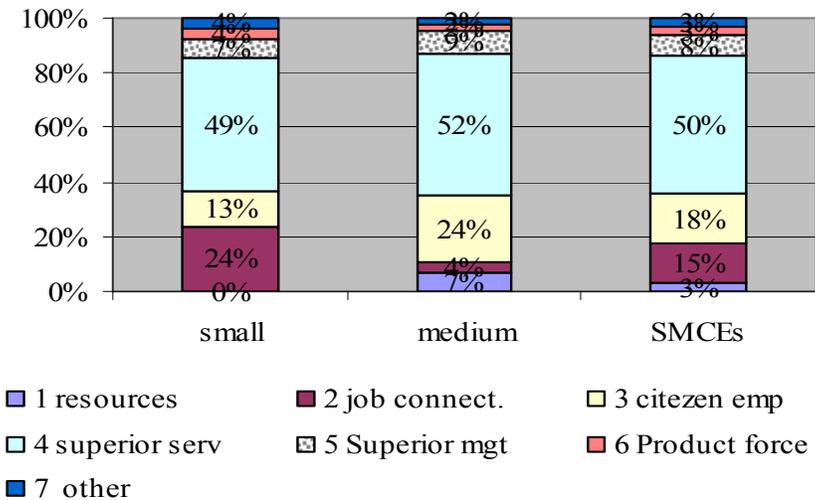


Figure 5.13: Perceived competitive advantage

The attribute of superior service as the source of a competitive advantage attracted close agreement between the two sizes, small (49%) and medium (52%). This may be a contested among stakeholders on the demand side of the construction industry, for example, the BOCCIM report (BOCCIM, 2005) indicated that a majority of clients and consultants see the poor performance of contractors, particularly small and medium enterprise, as a major concern and a constrain to the general performance of the industry.

Another factor identified as a major contributor to the competitive advantage was the citizen empowerment (18%). The aspect was pronounced in the medium (24%) than small (13%) sized enterprises. As already noted, citizen empowerment policies or preference policies are meant for those companies that have a majority (more than 51%) shareholding. All the small (class A and B) sized companies are owned by citizens (100% shareholding), so there is no advantage the policies provide (though the mere fact that foreigners do not register in these classes is a barrier to entry for more enterprises and hence an advantage). It is the medium enterprises where there is a mixture of citizen owned and non-citizen owned firms where

there is a perception of a competitive advantage by some firms due to the preference policies citizen empowerment policies.

A third major factor identified by SMCEs was job connections (15%), or perhaps what is normally called business networking. The factor was more pronounced in small (24%) than in medium (4%) enterprises. This may be explained by job situations which require no obligation for advertising project tenders; otherwise for open tendering it may be tantamount to corruption. Three situations present themselves, firstly it could be that smaller sized enterprises obtain part of their jobs from individuals and private companies (indeed as shown in Figure 5.5 where the portion marked 'other' is higher for small enterprises at 28% than medium enterprises at 21%). The other explanation is that they indicated that they carry out some work as sub-contractors (20% as compared to medium companies at 10% - see Figure 5.3) where personal contacts are important especially in cases of maintenance work.

The other factors namely superior management, highly productive workforce and superior resources did not receive much prominence. It is an appreciable fact that construction resources are the same at each level of capacity and hence hardly unique to provide a competitive edge. Moreover, the designs are provided by the client and the methods of construction at the lower end of the industry are more or less the same as suggested by Betts and Ofori (1991). As for the first two, it may be a case of ignorance on the part of the SMCEs for not knowing how much superior management and a highly productive force can do to create a competitive advantage. However, it may also be noted that most of the workforce of the construction enterprises is temporary, based on the duration of the project and hence productivity measurement is often difficult to ascertain.

- ***Business opportunities***

Through an open ended question, respondents were probed as to what perceived as the major business opportunity that their enterprise may currently have or in future. The respondents mentioned a number of issues. However, the responses were later categorised as negative and positive. Majority (69%) did not see any opportunity with some making comments like '*nothing at all*', '*not at all*' or '*no opportunities for us*'. Those who showed some sign of being positive the responses centred on the assertion that '*hope the industry improves soon*'. The comments reinforce the picture of a depressed industry at the time the study was conducted as discussed in Section 5.2.4

5.5.2 Business plan documentation

Respondents were probed as to how business plans (the word *business plan* was preferred to *strategic plan* for simplicity of comprehension and defined in the research instrument (Appendix 5) are documented in their enterprises and three themes were investigated namely the existence of a business plan, its form, period covered and whether specific goals are set.

- ***Existence of the business plan***

Figure 5.14 shows that all SMCEs (0%) indicated that they have some form of business plan and a significant number (52%) always had plans. As expected quite a significant number (67%) of medium enterprises indicated as always having business plans compared to the small enterprises (40%). The result also revealed that some (20%) of small enterprises rarely had business plans.

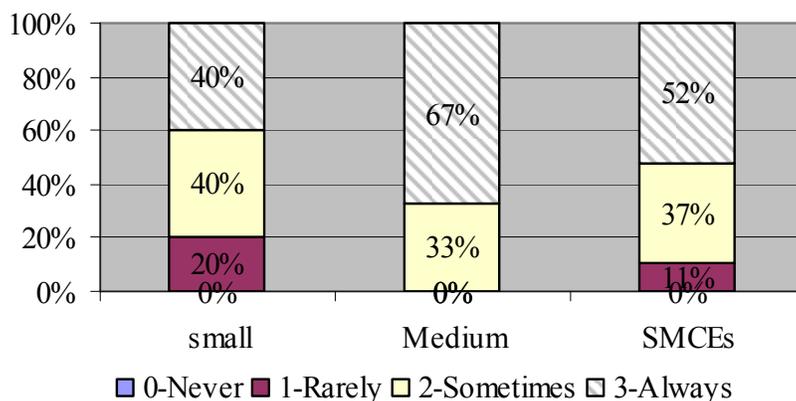


Figure 5.14 Existence of a business plan

- *Form in which the business plan exists*

SMCEs were further probed as to the nature in which the business plans exist. Figure 5.15 shows that a significant number (43%) of enterprises have a specific document called business plan while others (18%) have theirs in form of minutes for meetings, consultancy reports (10%) and with a good number (30%) not documented but often referred to by the owner (there by relying on an individual’s memory). Interesting enough, less documentation was more common in medium sized enterprises (39%) than small sized enterprises (22%).

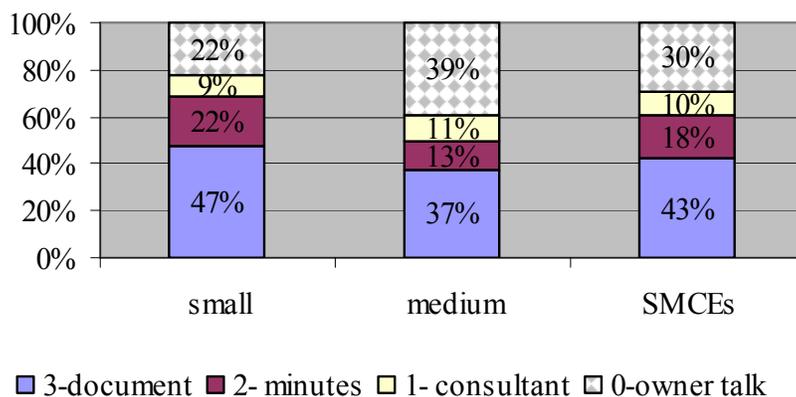


Figure 5.15: The form in which business plan are held

- *Period the business plan spans*

Figure 5.16 shows that quite a number (47%) of SMCEs claimed that their business plan covered a period of 1-2 years and this was followed by those who indicated they covered less than one year (33%). There was significant difference between small and medium enterprises regarding the most favourable period covered by business plans. Majority (67%) of medium enterprises preferred 1-2 year period while a significant (47%) number of small enterprises preferred less than one year coverage.

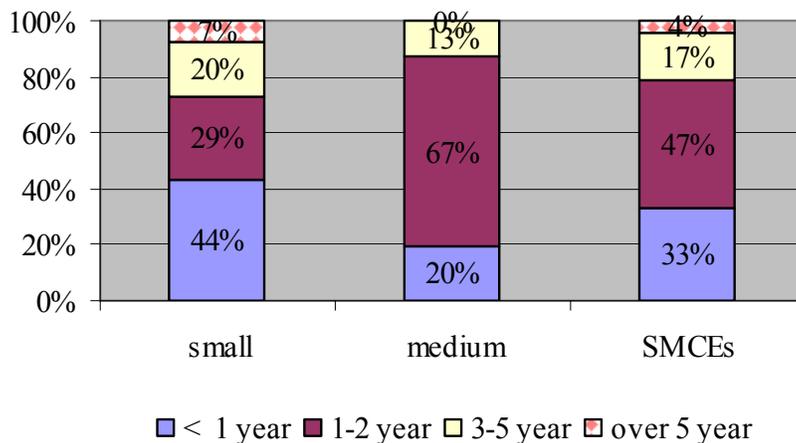


Figure 5.16: Period covered by business plan

- *Nature of set goals*

SMCEs were requested to indicate the nature of their goals contained in the business plans, if at all they existed. Figure 5.17 shows that a significant number (40%) of SMCEs do not have set goals and this is more pronounced in small enterprises. The results are line with those relating to existence of a documented plan. Clearly without a documented plan the goals may be difficult to articulate or even be consistently remembered.

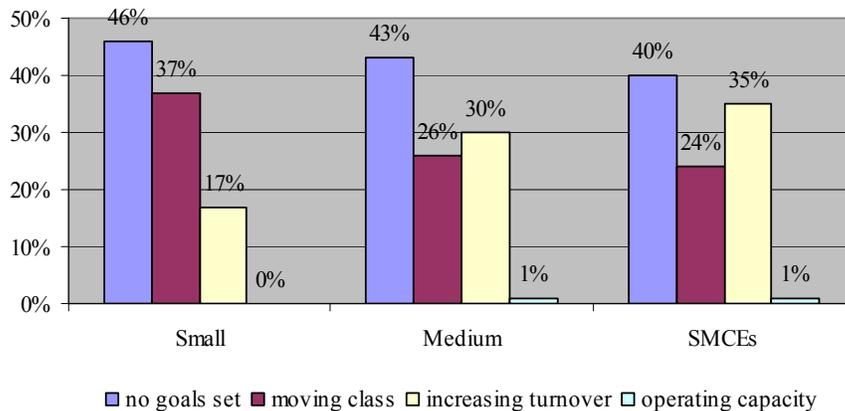


Figure 5.17: Nature of goals set

A fairly similar number of SMCEs identified moving into a higher class (24%) and increasing turnover (35%) as their set goals. However, this number could be a split between those who indicated that they have a documented business (43%) in the previous section.

5.5.3 Strategic process and review

The human element in the strategic process was probed and five dimensions were investigated namely who prepares the plan, whether the business plan is followed, who reviews the plan and how often. The results are discussed next.

- ***Person responsible for preparing the business plan***

Figure 5.18 shows that in over half (52%) of the SMCEs, the business plan is prepared by the owner. The result is anticipated as it is in line with observations from literature (e.g. Churchill and Lewis, 1983) that the owner in an SME, with no exception to SMCEs, dominates most of the enterprise's proceedings. The result is illustrated further if each enterprise size is considered, for example, for small enterprises, a significant number (62%) of business plans are prepared by the owner as compared to medium enterprises (58%).

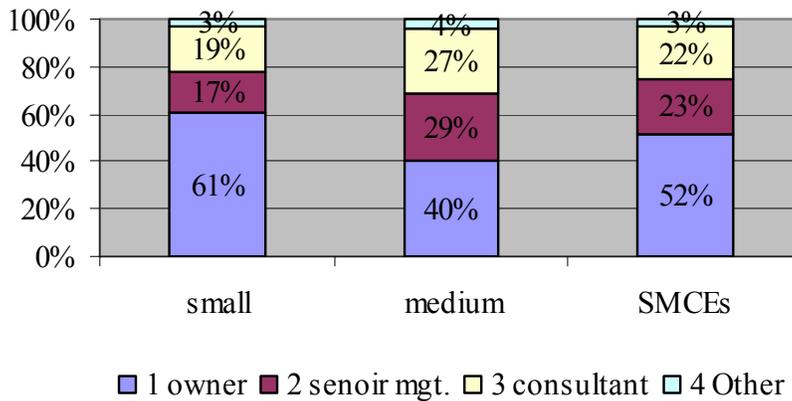


Figure 5.18: Person who prepares business plan

It was also interesting to note that in some (24%) of enterprises there is a collective effort for senior management to produce business plans and this was more pronounced in medium enterprises (31%) as opposed to small enterprises (19%). This confirms the notion that as the enterprise becomes bigger, decision making becomes more devolved from the owner (Cashmore and Lyall, 1991) and becomes a collective effort leading to an improved decision making process. It was also noted that an appreciable number (23%) of SMCEs use consultants to prepare business plans.

It is one thing to prepare business plans and quite another to adhere to them during the course of business. The next section looks at the results emanating from probing the issue of business plan implementation.

- ***Whether the business plan is adhered to***

Figure 5.19 shows that over half (55%) of the SMCEs rarely follow the business plans and interestingly enough this is more common (61%) in medium companies. Overall the small companies presented a better picture with some (45%) claiming to follow the plans more often while a few (4%) indicating they follow them all the time.

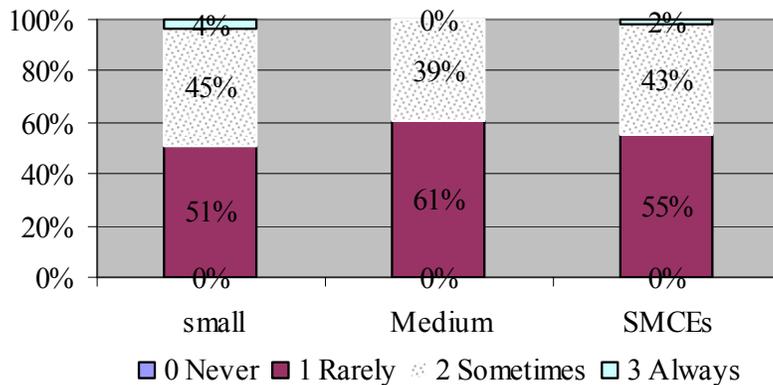


Figure 5.19: Whether the business plan is followed

The results could have meant two things that the plans are prepared but never referred to or the environment is so turbulent that plans quickly become obsolete. The latter could result from a lack of skills in planning that makes the plans obsolete as soon as they are completed because the industry. The former was tested using the next section.

▪ ***The frequency of reviewing the business plan***

The period of review for business plans varies from organisation to organisation and thus may vary from quarterly, bi-annually to annually. A shorter review period is normally preferred based on the philosophy that frequent reviews allow a quick arrest poor performance to be arrested quickly before it gets out of hand. While frequently reviews may be preferred, they require more effort, resources and an initial inclusion of targets for the earmarked period of review.

Figure 5.20 shows that great number (67%) of SMCEs review their plans annually with the small enterprises having a higher proportion (73%). Few (24% =12%+12%) review the plans in the periods under six months and also very few (9%) reported not reviewing their plans at all. The latter result shows that enterprises follow their plans but it is perhaps the business environment which is so turbulent that it not worth following plans ‘religiously’. Alternatively, as indicated in the previous section, it may be that the plans are not reviewed due to the fact that they are not well prepared or they are prepared for another purpose other than performance measurement. For example in cases where they are prepared for financial solicitation, they are ignored once the funds are secured.

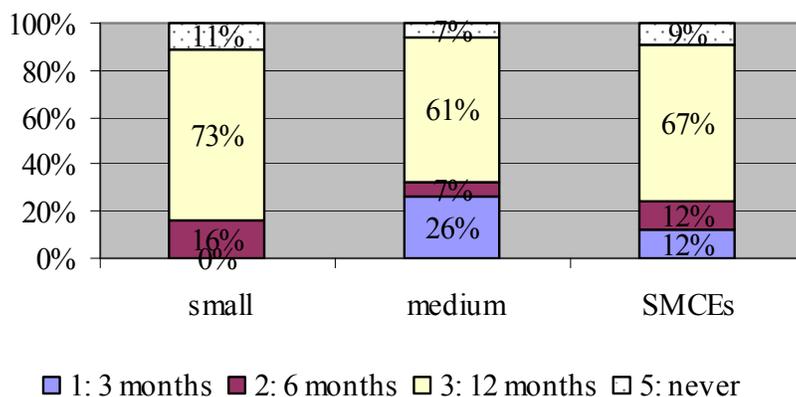


Figure 5.20: Frequency of reviewing business plan

The results of investigating the nature of business plan review was also in line with what was obtained for the period covered by the business enterprises. Most of the plans covered a 1-2 years period and therefore it is expected that a majority would review their plan in line with that period – it would be absolutely surprising to see majority of the plans covering six months period and majority are reviewed a year later.

- ***Performance of ratio analysis***

Ratio analysis and other financial evaluations provide an assessment of both the enterprise and project performance. It is during this process that the goals set in the business plan are reviewed.

Figure 5.21 shows that a significant number (71% =40%+31%) of the SMCEs hardly perform ratio analysis to ascertain the performance of the business and it is only a few (29%= 27+2 %) of the SMCEs, who endeavour to find out whether their businesses are performing well. The profile is similar in both small and medium enterprises.

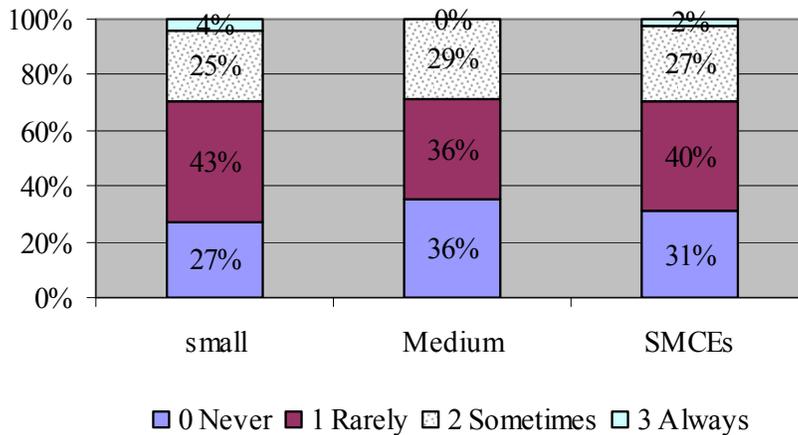


Figure 5.21: Frequency of performing ratio analysis

The next section looks at who reviews the business plan.

- ***Person responsible for reviewing the business plan***

Figure 5.22 shows that for a significant number (63%) of SMCEs, the owner undertakes the process of reviewing the business plan. As expected this is more (65%) pronounced in small enterprises than in medium enterprises (60%). Quite an appreciable number (33%) of the enterprises indicated that business plan review is a collective effort by senior management and it was more (35%) pronounced in the medium enterprises than (31%) in the smaller enterprises.

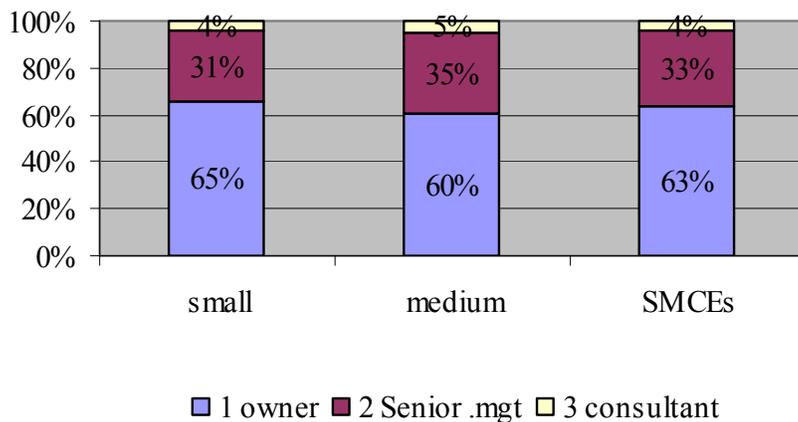


Figure 5.22: Person responsible for reviewing the business plan

A smaller number of SMCEs (4%) use consultants to review the plan. This implies that while quite a number (23% see Figure 5.14) of enterprises used consultants to prepare the plans, they were reviewed internally. This is a practical thing to do because the plans are then well internalised in the enterprises.

5.5.4 The adequacy strategic management process in SMCEs

The previous sections provided an insight in the nature of the strategic management process of SMCEs paving the way to testing of one of the major hypothesis of the study. The hypothesis tested the PBFMS adequacy in the facilitation of the strategic management process and was formulated as:

H₀1.1: The PBFMS of SMCEs do facilitate the strategic management process

In Chapter 3 it was emphasised that the strategic management process is completed when a strategic plan is implemented through project plans and hence the two must be linked. Therefore, to effectively manage the testing of the hypothesis (*H₀1.1*) two other directional sub-hypotheses were formulated, one testing the linkage of strategic plans to operational plans and the effect of strategic management on enterprise performance. Each was then tested separately as discussed below.

- ***Strategic management processes***

To investigate the adequacy of the strategic management process a null and alternate sub-hypotheses were formulated and stated as:

H₀1.1: The PBFMS of SMCEs do facilitate the strategic management process
(*H₀1.1.1: $\mu > 2$*).

H_A1.1: The PBFMS of SMCEs do not facilitate the strategic management process
(*H_A1.1.1: $\mu \leq 2$*).

Six items were selected for inclusion in the testing the sub-hypothesis which included existence of the business plan, form of plan, producer and reviewer of the plan, frequency of review. However, items in the situational analysis were considered inappropriate for inclusion because situational analysis is a cognitive exercise for which the outcome is neither wrong nor right (Newkirk and Lederer, 2006). It is only later, perhaps with hindsight, that judgment may be passed as to whether the situation was well analysed. The only issue that

would arise is when some of the enterprises indicate that they do not perform a situational analysis. From the results obtained in section 5.5.1, all enterprises indicated that they carry out a situational analysis.

Some data items in the constructs had to be transformed to make them homogenous (e.g. the direction of the scales) with others and then recorded into one variable called *strategicprocess* which was then used to test the sub-hypothesis of which the results are shown in Table 5.4.

Table 5.4: Adequacy of the strategic management process

N	Test variable: <i>strategicprocess</i> ; Test value = 2.00						Mean Difference	95% Confidence Interval of the Difference	
	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)		Lower	Upper
92	1.91	0.404	0.042	-2.123	91	0.036	-0.0089	-0.17	-0.01

From the Table 5.4 mean level of business (strategic) planning of 1.91 was lower than the hypothesised mean of 2.00 (the difference of the mean is negative i.e. -0.0089). In addition, the confidence intervals lie below 2 (lower: 2.00-0.17= 1.93, Upper: 2.00-0.01=1.99). This means that at a 95% level of significance, the sample mean value is significantly less than the hypothesised mean and this calls for not supporting the null hypothesis. Thus alternative hypothesis is accepted namely that SMCEs have do not have an adequate business planning process.

▪ ***Linkage between business and operational plan***

To investigate the linkage of business plans to operational plans a null and alternate sub-hypotheses were stated as:

$H_{O1.1.1}$: SMCEs business plans are linked to operational (project) plans ($H_{O1.1.1} \mu > 2$).

$H_{A1.1.1}$: SMCEs business plans are not linked to operational (project) plans ($H_{A1.1.2}$: $\mu \leq 2$).

The hypothesis was tested using the variable *busplanlink* whose results are summarised in Table 5.5.

Table 5.5: Level of linkage of business plans to operational plans

Test variable: <i>busplanlink</i> ; Test value = 2.00									
N	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
								Lower	Upper
96	1.04	0.794	0.081	-11.832	95	0.000	-0.958	-1.12	-0.80

From the table the sample mean of 1.04 was lower than the hypothesised mean of 2.00 (the difference of the mean is negative i.e. -0.958). In addition, the confidence intervals lie below 2 (lower: $2.00 - 1.12 = 1.88$, Upper: $2.00 - 0.08 = 1.92$). This means that at a 95% level of significance, the sample mean value is significantly less than the hypothesised mean and this calls for not supporting the null hypothesis. Therefore, business plans of SMCEs are not linked to operational plans.

- ***Adequacy of strategic management process of PBFMS***

Two null sub hypothesis ($H_{01.1}$ and $H_{01.1.1}$) were not supported and this implies that in a majority of SMCEs, the strategic planning process is not only inadequate but is also not linked to operational plans. Thus **the strategic component of the PBFMS of the SMCEs is inadequate.**

Although the overall state of the strategic component of the PBFMS was inadequate, there were some SMCEs with had adequate components. In view of this a further investigation was conducted to test the difference in performance of SMCEs with adequate and inadequate strategic management process component. A hypothesis was thus formulated as

$H_{01.1.2}$ *There was no difference in performance in the last three years between those SMCEs with an adequate and inadequate strategic management component of the PBFMS ($H_{01.1.3}: \mu_1 = \mu_2$).*

$H_{A1.1.2}$ *There was a difference in performance in the last three years between those SMCEs with an adequate and inadequate strategic management component of the PBFMS ($H_{A1.1.3}: \mu_1 <> \mu_2$).*

The results of testing the hypothesis are given in Table 5.6.

Table 5.6: Performance of the SMCEs with adequate and inadequate strategic management component of the PBFMS

	Nature of strategic component	N	Mean	Std. Deviation	Std. Error Mean
<i>Overallperformance</i>	Adequate (μ_1)	37	1.8337	0.68420	0.09488
	Inadequate (μ_2)	52	1.3595	0.42534	0.06992

Test variable: <i>Overallperformance</i>									
	Levene's Test for Equality of Variances			t-test for Equality of means					
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	12.865	.001	3.719	87	.000	.47297	.12717	.22020	.72574
Equal variances not assumed			4.010	85.668	.000	.47297	.11794	.23851	.70744

The results indicate that the null hypothesis is not supported since the means are different ($\mu_1 = 1.8337$, $\mu_2 = 1.3595$). Since the standard deviations are not equal, we use the lower part of the table to interpret whether difference is statistically significant. Since the t value of 4.010 is > the critical value of 1.64, we conclude the difference is significant. This means that at a 95% level of significance, the difference between the means is quite significant and the null hypothesis is supported. Therefore, there was a difference in performance, and in fact the mean performance of those with an adequate strategic component was significantly higher (1.8337) than those without an inadequate component (1.3595). The result **reinforces the need for strategic management in enterprise to provide superior performance.**

The next section exploits the adequacy of the operational and control component of the PBFMS of SMCEs.

5.6 Adequacy of Project Planning and Control in SMCEs

This section presents results of an investigation into the nature and adequacy of project planning and control of SMCEs as the second core component of their PBFMS. It should be recalled that in a project based environment, project planning is equivalent to operational

planning of a non-project based environment. The section tested the major hypothesis of the study stated as $H_{01.2}$ *The PBFMS of SMCEs do facilitate the project planning and control processes.*

In pursuit of that aim the section is divided into several themes which probed the nature and adequacy of project planning and control namely level of use of project planning tools, adequacy of the planning information database, level of IT usage, planning, and control information produced, and lastly adequacy and competence of planning and control staff.

5.6.1 Level of use of project planning tools

It was noted in Chapter 3 that for a project to be efficiently and effectively planned, there must be an adequate use of the most common tools for project planning which include WBS/BoQ; project schedule in form of a Gantt chart or network diagram; method statement; cost codes; overhead and risk checklists; and earned value analysis (EVA). Special attention was placed on the result of testing whether enterprises use earned value analysis (EVA), which is a more complicated planning and control system. All (100%) respondents indicated that they do not use the system in their project planning and control. The responses to this item were not included when investigating the sub-hypothesis to investigate the level of use of basic tools for project planning as it would distort the overall results.

To investigate the level use of project planning tool a sub-hypothesis was formulated as;

$H_{01.2.1}$ The level of use of project management tools is sufficient to support an efficient and effective PBFMS ($H_{01.2.1}: \mu > 2$).

$H_{A1.2.1}$ The level of use of project management tools is sufficient to support an efficient and effective PBFMS ($H_{A1.2.1}: \mu \leq 2$)

To test the sub-hypothesis for the responses of each item (tools) were transformed into a single variable called *plantools* using SPSS and analysed the results are shown in Table 5.7. From the table the sample mean of 1.7723 was lower than the hypothesised mean of 2.00 (the difference of the mean is negative i.e. -0.22772). In addition, the confidence intervals lie below 2 (lower: $2.00 - 0.3709 = 1.6291$, Upper: $2.00 - 0.0846 = 1.9154$). This means that at a 95% level of significance, the sample mean value is significantly less than the hypothesised mean

and this calls for not supporting the null hypothesis. The results indicate that level of use of the project management tools by SMCEs is inadequate to support an efficient and effective PBFMS.

Table 5.7: Level of use of project planning tools

Test variable: <i>plantools</i> ; Test value = 2.00									
N	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
								Lower	Upper
101	1.7723	0.72509	0.07215	-3.156	100	0.002	-0.22772	-0.3709	-0.0846

As additional information, respondents were asked generally why they do not use a particular tool were then asked to provide a major reason for not using the tool. Figure 5.23 shows that the first major reason SMCEs gave was pressure of work (41%), followed by lack of skills (40%) in using the tools. While the latter is an acceptable reason for not using the tool, the former is difficult to comprehend as it shows a lack of appreciation of the efficiency that tools may provide in planning and later project control.

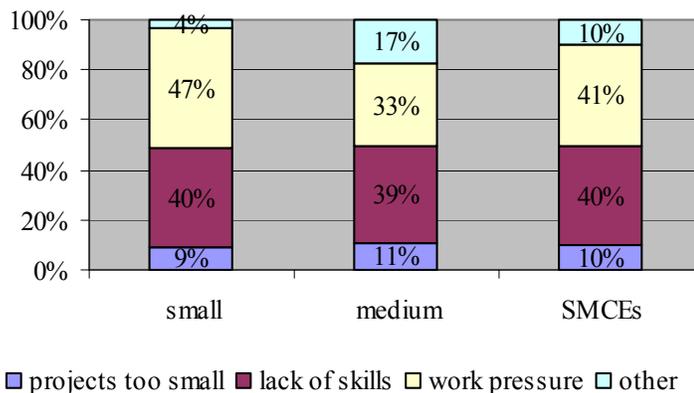


Figure 5.23 Reason for not using tools

5.6.2 Adequacy of the planning information database

For efficient project planning (referred to normally as estimation) particularly during tendering, enterprises need to develop and maintain a comprehensive database of estimation information. The database can only serve its purpose if the PBFMS adequately captures stores and updates the required information. The major items needed for this purpose range

from rates of resources usage, wastage, output and associated cost; an up-to-date register of assets and how they are deployed; supplier contacts; and company work load and cashflow positions. Each item of the estimation database was investigated for existence and concurrency in the SMCEs.

However, to investigate the overall adequacy of the database estimation information for efficient and effective planning, the items were transformed into a single variable called *plandatabase* using SPSS in order to test the following sub-hypothesis of which the results are given in Table 5.8.

H₀1.2.2 The estimation information databases of SMCEs are adequate to support the project planning process (*H₀1.2.2: $\mu > 2$*).

H_A1.2.2 The estimation information databases of SMCEs are adequate to support the project planning process (*H_A1.2.2: $\mu \leq 2$*).

Table 5.8: Level of adequacy of the project estimation information database

Test variable: <i>plandatabase</i> ; Test value = 2.00									
N	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
								Lower	Upper
97	2.3024	0.76550	0.07772	3.891	96	0.000	0.30241	0.1481	0.4567

From the table the sample mean of 2.3024 was higher than the hypothesised mean of 2.00 (the difference of the mean is positive i.e. 0.30241). In addition, the confidence intervals all lie above 2 (lower: $2.00+0.1481=2.1481$, Upper: $2.00+0.4567=2.467$). This means that at a 95% level of significance, the sample mean value is significantly greater than the hypothesised mean and this calls for supporting the null hypothesis. This implies that a significant number of SMCEs have an adequate estimation information database which is constantly updated whenever an enterprises gets a job.

5.6.3 Use of IT infrastructure

Project planning is greatly enhanced if an IT system is employed, for example, it may hold the estimation information database for use in project estimation (estimation software) and

also generate the necessary risk checklist. The adequacy of IT systems in terms of its existence and extent of use was investigated by a number of constructs placed at various positions in the measuring instrument (e.g. in the tools, estimation database and control sections). The results were then combined into one variable called *ITusage* to test the hypothesis:

$H_{O1.2.3}$ *IT systems are adequately used in project planning, implementation and control*
($H_{O1.2.3}: \mu > 2$).

$H_{A1.2.3}$ *IT systems are adequately used in project planning, implementation and control*
($H_{A1.2.3}: \mu \leq 2$).

The results of the test are given in Table 5.9.

Table 5.9: Level of adequacy of usage of IT in project processes

Test variable: <i>ITusage</i> ; Test value = 2.00									
N	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
								Lower	Upper
101	1.58	1.275	0.127	-3.278	100	0.001	-0.416	-0.67	-0.16

From the table the sample mean of 1.58 was lower than the hypothesised mean of 2.00 (the difference of the mean is negative i.e. -0.416). In addition, the confidence intervals lie below 2 (lower: $2.00 - 0.67 = 1.33$, Upper: $2.00 - 0.16 = 1.84$). This means that at a 95% level of significance, the sample mean value is significantly less than the hypothesised mean and this calls for not supporting the null hypothesis. Therefore, there is less usage of IT systems in SMCEs in project planning, implementation and control processes.

5.6.4 Project planning and control information

The planning tools, IT and estimation database discussed in the previous sections provide the necessary infrastructure to develop project estimates. Thus whenever an enterprise gets an invitation to tender for a construction project, it has to produce project estimates made up of at least project schedule, budget, cashflow and resources schedules This output of the planning process is very essential for downstream tasks of project adjudication,

implementation, valuation, monitoring and control. The effectiveness in which in which these project tasks are achieved depends on a sound and accurate project estimate. The propensity of SMCEs to produce project estimates that effectively facilitate down-stream processes was investigated and the results are discussed next.

- ***Adequacy of project estimates and bidding***

The adequacy of project estimates in facilitating bidding and effective project implementation and control was tested using the following sub-hypotheses.

H_O1.2.4 The project planning information produced by SMCEs is adequate to facilitate down stream processes (H_O1.2.4: $\mu > 2$).

H_A1.2.4 The project planning information produced by SMCEs is not adequate to facilitate down stream processes (H_A1.2.4: $\mu \leq 2$).

H_O1.2.5 SMCEs consider their bidding process as adequate (H_O1.2.5: $\mu > 2$).

H_A1.2.5 SMCEs consider their bidding process as not adequate (H_A1.2.5: $\mu \leq 2$).

Respondents were asked about the existence and the quality of pieces of information that makes up project estimates, for example, site plan organisation; budgets and schedules for inputs and activities; and cashflow. The adequacy of each item as a basis of effective planning was investigated and later combined into one variable called *projest*. Respondents were also asked in a number of probing constructs whether the information produced facilitated bidding and this was tested using the variable *bidinfo*. Results of testing both hypotheses are given in Table 5.10

From the table the sample mean of 2.37 was higher than the hypothesised mean of 2.00 (the difference of the mean is positive i.e. 0.372). In addition, the confidence intervals all lie above 2 (lower: $2.00 + 0.25 = 2.25$, Upper: $2.00 + 0.49 = 2.49$). This means that at a 95% level of significance, the sample mean value is significantly greater than the hypothesised mean and this calls for supporting the null hypothesis. This implies that SMCEs produce adequate project planning information to effectively facilitate down stream process of project bidding, implementation and control.

Table 5.10: Existence and level of adequacy of the project planning information

Test variables: <i>projest**and bidinfo**</i> ; Test value = 2.00;									
N	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
								Lower	Upper
101*	2.37	0.614	0.061	6.080	100	0.000	0.372	0.25	0.49
89**	2.21	0.3512	0.03729	5.163	88	0.000	0.18291	0.119	0.266

From the table the sample mean of 2.21 was higher than the hypothesised mean of 2.00 (the difference of the mean is positive i.e. 0.18291). In addition, the confidence intervals all lie above 2 (lower: $2.00+0.119= 2.119$, Upper: $2.00+0.266=2.266$). This means that at a 95% level of significance, the sample mean value is significantly greater than the hypothesised mean and this calls for supporting the null hypothesis. This implies that SMCEs produce adequate project planning information to effectively facilitate down stream process of project bidding, implementation and control. This implies that SMCEs adequately handle the bidding process.

- ***Monitoring and control***

After a tender is awarded and the project commences, various data is recorded and processed into relevant reports facilitated by the PBFMS. The reports aid three processes namely monitoring and control and valuation. This section is concerned with the first which require collecting data and comparing with the project estimates discussed above as a means of controlling a project. While several reports may be produced from the project activities, there are some basic but important reports without which, a project may become uncontrollable. These include, for example, reports on project variances; materials cost margins, wastage and usage and labour and plant time sheets. An investigation was conducted to determine the extent to which the reports were produced and used to facilitate project control (particularly whether *for all projects or not at all* as extreme ends of a 4-point scale). The investigation determined the capability of controlling projects.

The section is also concerned with the project review, evaluation or audit when the project ends. This performance measurement may be combined with project control mentioned above. It thus relates to the overall evaluation of performance when the project is complete. Its findings aid organisational learning for the effective delivery of future projects.

To gauge the overall adequacy of reports produced for effective project control by the SMCEs, the items were transformed using SPSS into one variable called *controlreports* to facilitate the testing of the sub-hypothesis namely.

$H_{O1.2.6}$ SMCEs produce and use control information to facilitate project control

($H_{O1.2.6}: \mu > 2$)

$H_{A1.2.6}$ SMCEs produce and use control information to facilitate project control

($H_{O1.2.6}: \mu \leq 2$)

In addition, to investigate whether SMCEs conduct project review relevant items were identified and their measurements were transformed using SPSS into one variable called *projectreview* to facilitate the testing of the sub-hypothesis namely

$H_{O1.2.7}$ Post-completion project reviews are performed by SMCEs ($H_{O1.2.7}: \mu > 2$)

$H_{A1.2.7}$ Post-completion project reviews are not performed by SMCEs ($H_{O1.2.7}: \mu \leq 2$)

The results of testing the two sub-hypotheses are given in Table 5.11.

Table 5.11: Level of adequacy of the project control information and review

Test variables: <i>controlreport*</i> ; <i>projectreview**</i> ; Test value = 2.00									
N	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
								Lower	Upper
101*	1.83	0.864	0.086	-1.920	100	0.058	-0.165	-0.34	0.01
97**	1.56	1.23	0.121	-3.321	96	0.001	-0.402	-0.68	-0.145

From the table the sample mean of 1.83 was lower than the hypothesised mean of 2.00 (the difference of the mean is negative i.e. -0.165). In addition, the confidence intervals lie below

2 (lower: $2.00-0.34=1.66$, Upper: $2.00-0.01=1.99$). This means that at a 95% level of significance, the sample mean value is significantly less than the hypothesised mean and this calls for not supporting the null hypothesis. This meant that SMCEs do not produce and adequately use project control information to facilitate effective project control.

From the table the sample mean of 1.56 was lower than the hypothesised mean of 2.00 (the difference of the mean is negative i.e. -0.402). In addition, the confidence intervals lie below 2 (lower: $2.00-0.402=1.598$, Upper: $2.00-0.145=1.855$). This means that at a 95% level of significance, the sample mean value is significantly less than the hypothesised mean and this calls for not supporting the null hypothesis. This meant that in addition to not adequately controlling projects, SMCEs do not review the overall project performance in order to learn from past experience for improved delivery of future projects.

- ***Valuation and cost/value reconciliation information for work done***

Valuation may be seen as a three stage process. Firstly, is the periodic valuation and certification of work completed, this is followed by invoicing and payment chasing. Valuation process is an important aspect for construction enterprises because it ensures their financial lifeline. The accuracy of valuations depends on the actual measurements and the rates applied as obtained from the project estimates. The speed at which certification, invoicing and submission of the invoices to the client is carried out plays an important role in shortening the cashflow cycle.

Valuation is another process which derives its efficiency and effectiveness from project estimates. Moreover, the sum of the monthly valuation should eventually lead to the total project tender sum. The monthly cost/value reconciliations should be conducted to ensure the measured value minus the costs and overheads charged adds up to forecast project profit, in other words. In this way the process becomes a profit tracking device during the project's life.

There was a need to investigate the adequacy of the valuation and reconciliation processes. The output of the former is the monthly valuation while that of the latter are the monthly cost/value reconciliation reports. The results of tests for the relevant constructs that were identified to measure the adequacy of valuation and cost/value reconciliation processes were

combined into variables *valuation and reconcilinfo*, respectively, to facilitate the testing of the sub-hypotheses below.

$H_{O1.2.8}$ The valuation process is adequately carried out in SMCEs ($H_{O1.2.8}: \mu > 2$)

$H_{A1.2.8}$ The valuation process is not adequately carried out in SMCEs ($H_{O1.2.8}: \mu \leq 2$)

$H_{O1.2.9}$ The reconciliation of cost/value process of SMCEs is adequately carried out ($H_{O1.2.9}: \mu > 2$)

$H_{A1.2.9}$ The reconciliation of cost/value process of SMCEs is not adequately carried out ($H_{A1.2.9}: \mu \leq 2$)

The result of testing the two sub-hypotheses is given in Table 5.12.

Table 5.12: Level of adequacy of valuation and reconciliation information

Test variables: <i>valuation*</i> ; and <i>reconcilinfo**</i> ; Test value = 2.00									
N	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
								Lower	Upper
101*	2.15	0.974	0.097	1.533	100	0.128	0.149	-0.04	0.34
96**	1.72	0.764	0.078	-1.780	95	0.049	-0.159	-0.37	-0.001

From the table the sample mean of 2.15 was higher than the hypothesised mean of 2.00 (the difference of the mean is positive i.e. 0.149). However, the confidence intervals indicate that the lower limit lies below 2 (lower: $2.00 - 0.04 = 1.96$) while the upper limit is above 2 (Upper: $2.00 + 0.34 = 2.34$). This means that the result is inconclusive, the null hypothesis can neither be rejected or supported. The SMCEs may or may not be adequately handling the valuation process to facilitate the obtaining of monthly payment. The results are in line with observation in literature (Smith, 1998; Canter, 1993) that in many instances there are disputes between contractors and client representatives relating to valuations arising from either the quantity and quality of work, issues arising from variation orders, or the value of unfixed materials.

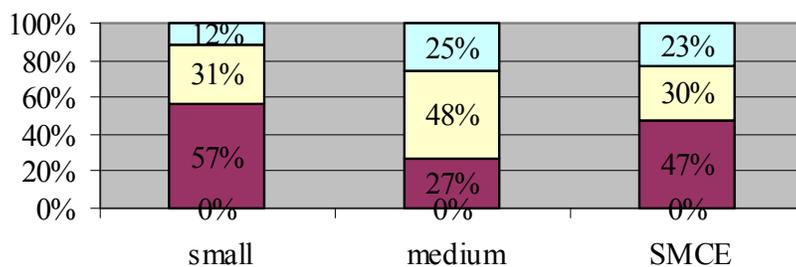
The table goes further to indicate the sample mean of 1.72 was lower than the hypothesised mean of 2.00 (the difference of the mean is negative i.e. -0.159). In addition, the confidence intervals lie below 2 (lower: $2.00 - 0.37 = 1.68$, Upper: $2.00 - 0.001 = 1.999$). This means that at a 95% level of significance, the sample mean value is significantly less than the hypothesised mean and this calls for not supporting the null hypothesis. Thus may mean that enterprises may find themselves being surprised at the end of the project when the forecast profit is not achieved due to the failure to constantly reconcile cost and value and hence profit.

5.6.5 Adequacy and competence of planning and control staff

It was underscored in Chapter 3 that the PBFMS infrastructure can only be efficient and effective, if the human resource managing it are adequate, have the necessary skills and experience. To test for adequacy of numbers was found insurmountable since the work load in each enterprise was not known. However, to test for adequacy of skills and experience was found more manageable though not absolutely. Two human resource competency areas which are key to an effective PBFMS were probed namely project scheduling/estimation and accounting.

- ***Scheduling and estimation***

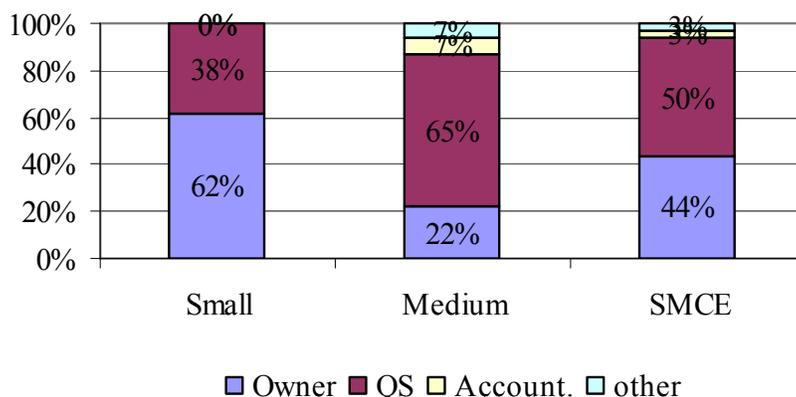
Figure 5.24 shows that a significant number of SMCEs use one person to develop the project schedule and estimate either in form of the owner (47%) or some other person (30%). In some SMCEs two separate groups are used for scheduling and estimating working in tandem (23%). As expected the increase in more people being involved in both tasks is more noticeable in medium companies (25%) while the majority (12%) of the small enterprises have a single person carrying out both estimation and scheduling.



■ 0: two groups working seper.
 ■ 1: the owner
■ 2: one person (not owner)
 ■ 3: two groups in cooperation

Figure 5.24: The people involved in scheduling and cost estimation

Enterprises were probed regarding the occupation of the estimator and the results are summarised in Figure 5.25 and which shows that half (50%) of the SMCEs use a quantity surveyor to estimate followed by the business owner (44%).



■ Owner
 ■ QS
 ■ Account.
 ■ other

Figure 5.25: The qualification of the estimator

Like the other issues probed before, the tendency to move away from the business owner was noticed in a number of medium enterprises (65%) where the quantity surveyor was used for estimating as opposed to the small enterprises where the owner is most often (62%) the estimator.

The experience of the estimator was also probed and over half of the SMCEs (52%) reported over nine year's experience while some (30%) had between six and nine years as shown in Figure 5.26. This pattern was not significantly different across the two sizes of enterprises.

The results show that the estimates are fairly experienced in a majority of enterprises since in half of them they have 10 years and over.

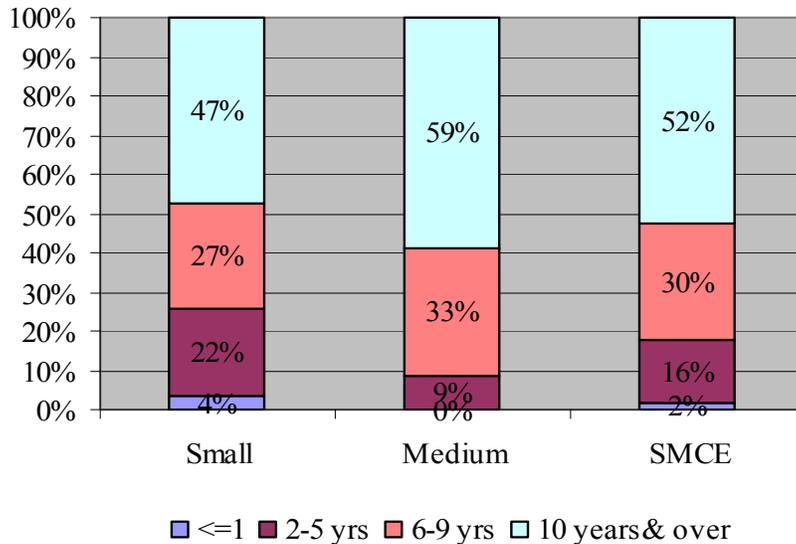


Figure 5.26: Experience of the estimator

- ***Estimate adjudication***

Chapter 3 provided an indication that before submission of a project tender an equally important process takes place in form of adjudicating the tender. Essentially it entails three aspects, evaluating the accuracy and assumptions made in the tender, setting a mark-up and thus determining the price. The mark-up requires an analysis of the situation in terms of competition, keenness of the firm, state of the industry, type of the client and nature of the project. Best practise (as advocated by e.g. Smith, 1995; and Smith 1998) would require that senior management, as a team, conduct the adjudication process to increase the quality of the pricing decision based on a thorough analysis of the situation.

Figure 5.27 shows the results of investigating the issue. In over half (51%) of SMCEs, the owner adjudicates the estimate. Relatively a few (26%) SMCEs use senior management team as adjudicators while some (15%) leave it to the quantity surveyor (QS) or consultant (8%) alone. The former results indicate that indeed there are enterprises which hire outside personnel to prepare the bids for them. The tendency of moving away from a team effort is again more

observable in small enterprises (only 31% use teams) than in medium enterprises (only 46% use teams).

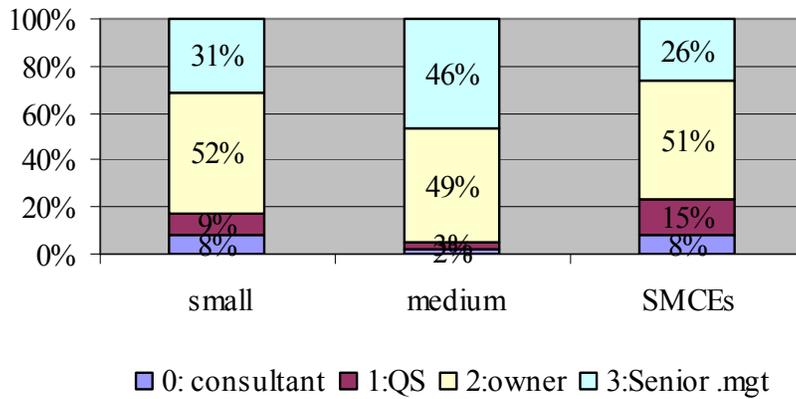


Figure 5.27: Person conducting the estimation adjudication

▪ *Valuation*

Valuation of work completed in period (usually a month) has already been mentioned as an important part of the PBFMS functions and a financial lifeline of an enterprise. Thus the need to investigate the competence of the personnel carrying out the task was inevitable.

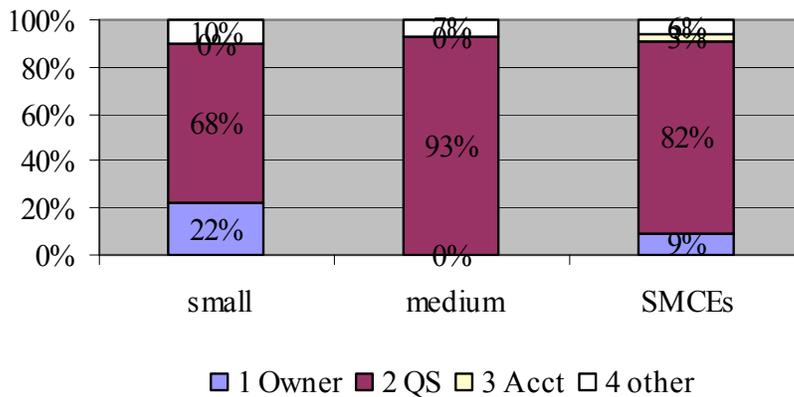


Figure 5.28: Nature of person performing valuations

Figure 5.28 shows the results of investigating. In majority (82%) of SMCEs, the QS is used to value the work. Ideally the QS should be the carrying out the monthly valuations, although in some SMCEs the owner (9%) and others (9%) including accountant perform the function. The result here is surprising when compared with the results obtained from project planning which

indicated that only half (50%) of the SMCEs use a QS for project estimates. So how can they use the QS for valuation by this magnitude and less in project estimates? Could it be that the two functions are seen as independent or was there some confusion in the question investigating the issue where by the external QS (client’s consultant) was confused with the internal valuer. More light is shed on the dilemma by the result of the next investigation as to who performs the accounting work

▪ **Accounting**

A substantial part of the information fed into the PBFMS is captured and processed by the enterprise’s accounting function and hence the need to probe the nature of the human resource involved in accounting in the SMCEs.

Figure 5.29 shows that the majority (79%) of the firms use a quantity surveyor as the main person to carry out the accounting function and this is remarkably significant (91%) in the medium enterprises. Business owners also act as accountants in a few (10%) of the enterprises especially in small enterprises where the proportion is a bit higher (19%). It is interesting to note that accountants are significantly (2%) not used in SMCEs, particularly in small enterprises.

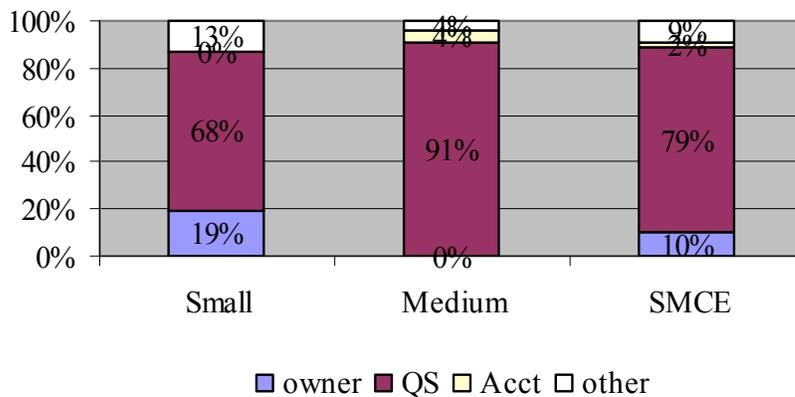


Figure 5.29: Person performing the accounting functions

The experience of the person acting as an accountant who in most cases is the QS was probed and over half (56%) of the SMCEs claimed experience of 10 years and over as shown in Figure 5.30. There was a similar resemblance in this result with that obtained for the

estimator which shows consistency. It was established that estimation and accounting work is mainly performed by the quantity surveyor(see Figure 5.24).

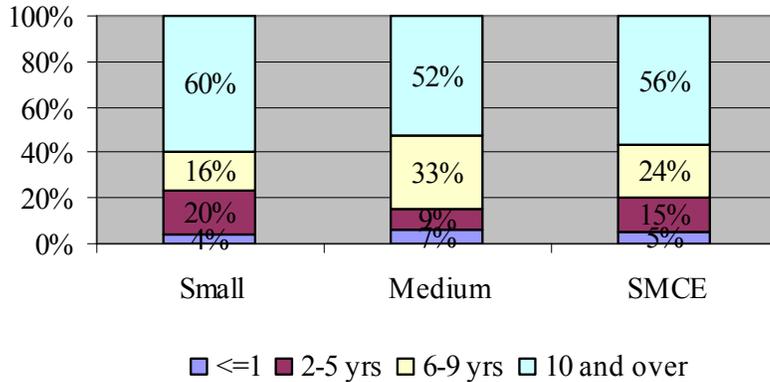


Figure 5.30: Experience of the accountant

The nature of the accounting system used was also probed and Figure 5.31 shows the results.

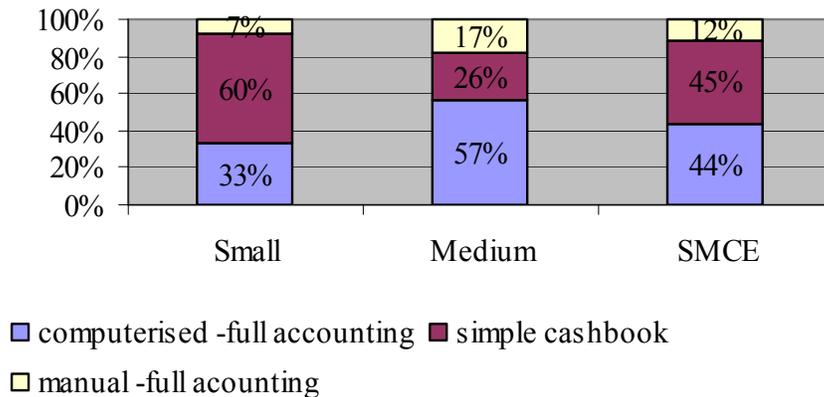


Figure 5.31: Nature of the accounting system

An equal number of accounting systems are either fully computerised (44%) or are simple accounting systems (45%). The medium enterprises have a greater proportion (57%) of their systems computerised while a significant number (60%) of the small enterprises operate simple cashbook based systems. The results are consistent with earlier results because the simplicity of a simple cashbook system favours business owners who may perform a number of tasks of the accounting function in the small enterprises.

5.6.6 Overall level of project planning and control

This section revisits one of the three major hypotheses of the study stated at beginning of Section 5.6. The hypothesis was stated with a view to investigate the overall state of project planning and control in SMCEs. The aim was to determine whether the PBFMS of SMCEs were adequate in the facilitating project planning and control processes. The null and alternative hypotheses were stated as:

$H_{O1.2}$ *The PBFMS of SMCEs do facilitate the project planning and control processes*
 ($H_{O1.2} \mu > 2$).

$H_{A1.2}$ *The PBFMS of SMCEs do not facilitate the project planning and control processes*
 ($H_{A1.2} \mu \leq 2$).

All variables of all sub-hypotheses in this section were transformed using SPSS into one single variable called *plancontrol* in order to test the hypothesis and the results are given in Table 5.13

Table 5.13: Overall project planning and control

Test variable: <i>plancontrol</i> ; Test value = 2.00									
N	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
								Lower	Upper
97	2.06	0.525	0.053	1.100	96	0.047	0.059	-0.05	0.16

From the table the sample mean of 2.06 was higher than the hypothesised mean of 2.00 (the difference of the mean is positive i.e. 0.059). However, the confidence intervals indicate that the lower limit lies below 2 (lower: 2.00-0.05=1.95) while the upper limit is above 2 (Upper: 2.00+0.16=2.16). This means that the result are inconclusive, we can neither eject nor support the null hypothesis at a 95% level of significance. Therefore, *the PBFMS of SMCEs were just adequate (borderline) to facilitate the planning and control processes of projects.*

5.7 Management Commitment to the PBFMS

A PBFMS does not only require up-to-date information and adequate and skilled operation human resource, it also requires a high level of commitment from management to ensure adequate resourcing and compliance with established financial procedures. Above all management needs to show a great level of interest in using the PBFMS information in order to make prudent financial management decisions. Thus commitment by management comes in form of support and compliance with the PBFMS. Before the results of an investigation into adequacy of management commitment to the PBFMS, background information was sought from respondents about the nature of management because of its possible effect and influence on support and compliance.

5.7.1 Background of management

Management background issues included education, training and nature of conduct of personal transactions.

- ***Educational and training background of management***

The education and training level of management has an influence on the type of support that is given to the PBFMS, for example, the quest and use of information from the PBFMS. The education and training level of management was probed based on the premises that most SMCEs management is not really a collective effort but in a majority of the cases the province of a single person. Figure 5.32 shows a summary of the results of investigating the educational background of the owner.

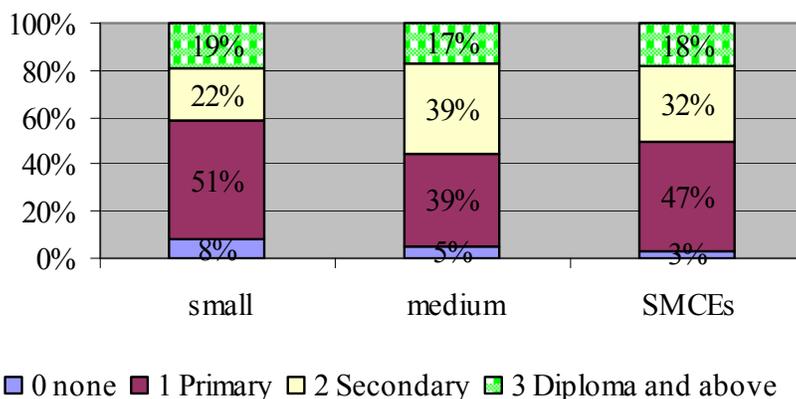


Figure 5.32: Educational background of the owner

Exactly half (50%) of the owner have secondary school education and above. However, a few (3%) of the management in SMCEs have never gone to school and this more pronounced in small (8%) sized enterprises.

Figure 5.33 shows the results of probing the type of training that management possessed. It was indicated that a good number (24%) had technical but not management training while and an almost equal number (28%) had management training but not technical training. In some SMCEs (38%) management had both management and technical training, a desirable state of affairs especially where human resource is very thin in the enterprise. In a few (10%) cases management never had any training, whether management, technical or both. A worrying phenomenon was the few (10%) of SMCEs where management's no educational background was very low and was neither trained in any of the two skills, technical or management.

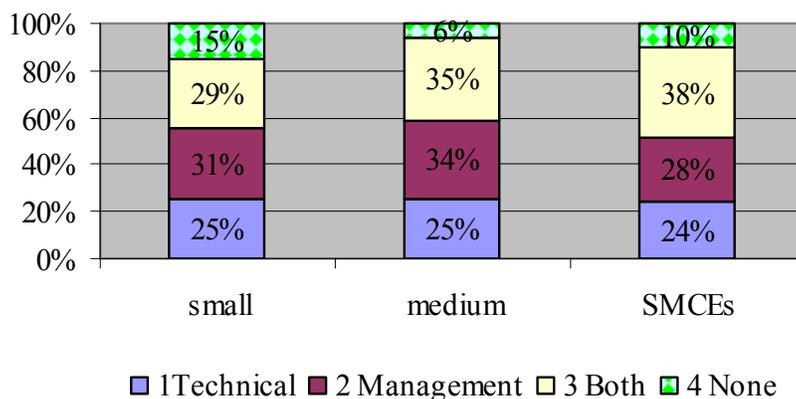


Figure 5.33: Training background of the owner

- ***Financial transaction of the owner***

The issue of the manner in which financial transactions are conducted and recorded in the SMCEs needed probing, particularly the relationship between the bank accounts used for business and personal use. Figure 5.34 shows that half (50%) of the SMCEs operate two separate and independent bank accounts. At the worst end, some (21%) SMCEs use one bank account to operate both personal and business accounts while a few (29%) though having two separate accounts, personal and business transactions are often mixed together.

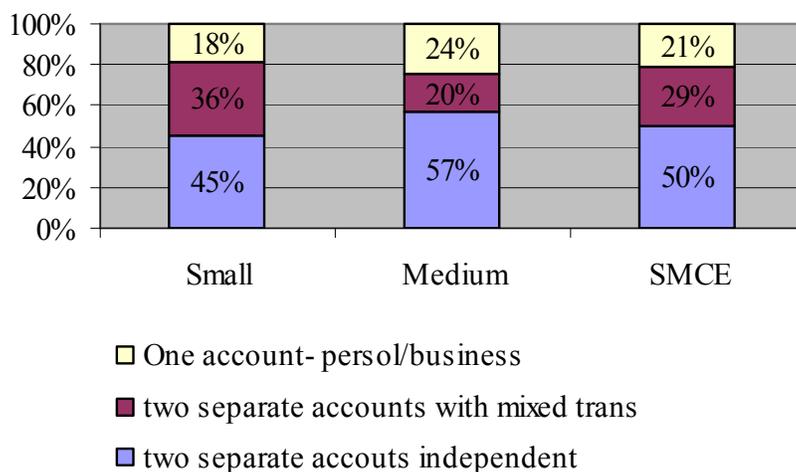


Figure 5.34: Nature of bank accounts operated

There was need to know whether the owner was paid a salary at all and at what interval. Figure 5.35 shows the result of this investigation and a significant number (74%) of enterprises reported that the business owner gets a monthly salary. However, getting a monthly does not preclude them from getting other payments such as withdraws and ‘loans to the director’.

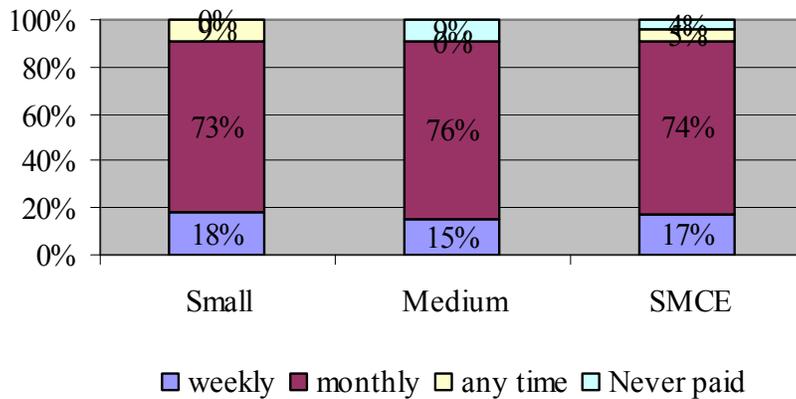


Figure 5.35: Salary system used for the owner

5.7.2 Management commitment to the PBFMS

The research instrument contained a section that probed the issue of commitment by management for the PBFMS in order to test the third major hypothesis and one which makes up of the last component of the PBFMS and stated as: *H_{01.3} Proprietors of SMCEs are committed to the development and operation of PBFMS*

As already indicated earlier commitment by management to PBFMS was viewed as composed of two constructs, support and compliance (Kearns, 2007). Thus for manageability, the hypothesis was split into two sub-hypothesis one testing for the support and another compliance. However, in the end the above hypothesis was also tested to provide an overall position of the third component of the PBFMS. The results of the three tests are presented next.

- **Management support of PBFMS**

Several items were used to investigate management support for the PBFMS and each was scored separately after which the scores were transformed, using SPSS, into a single variable called *mgtsup* to test the hypothesis:

H₀1.3.1 Proprietors of SMCEs support the developing and operating of PBFMS (*H₀1.3.1*: $\mu > 2$)

H_A1.3.1 Proprietors of SMCEs do not support the developing and operating of PBFMS (*H_A1.3.1*: $\mu \leq 2$)

The results of testing the sub-hypothesis are given in Table 5.14

Table 5.14: Results for testing for management support

Test variable: <i>mgtsup</i> ; Test value = 2.00									
N	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
								Lower	Upper
101	2.4337	0.58520	0.05823	7.448	100	0.000	0.43366	0.3181	0.5492

From the table the sample mean of 2.4337 was higher than the hypothesised mean of 2.00 (the difference of the mean is positive i.e. 0.43366). In addition, the confidence intervals all lie above 2 (lower: $2.00+0.3181= 2.3181$, Upper: $2.00+0.5492=2.5492$). This means that at a 95% level of significance, the sample mean value is significantly greater than the hypothesised mean and this calls for supporting the null hypothesis. **This implies that management supports best practices for developing and operating an effective PBFMS.** Thus management is willing to invest in capital assets and human resource and to support the design and operation of the PBFMS.

- ***Management compliance with the PBFMS***

In testing for management compliance with the PBFMS, several items were used, but the score for each was transformed, using SPSS, into a single variable called *mgtcomp* to test the hypothesis:

H₀1.3.2 Proprietors of SMCEs comply with best practices for developing and operating a PBFMS (*H₀1.3.2*: $\mu > 2$)

$H_{A1.3.2}$ Proprietors of SMCEs do not comply with best practices for developing and operating a PBFMS ($H_{A1.3.2}: \mu \leq 2$)

The results of testing the hypothesis are given in Table 5.15. From the table the sample mean of 2.5631 was higher than the hypothesised mean of 2.00 (the difference of the mean is positive i.e. 0.56313). In addition, the confidence intervals all lie above 2 (lower: $2.00+0.4626= 2.4626$, Upper: $2.00+0.6637=2.26637$). This means that at a 95% level of significance, the sample mean value is significantly greater than the hypothesised mean and this calls for supporting the null hypothesis. **This implies that management complies with best practices for planning, developing and operating an effective PBFMS.** Therefore, management of majority of SMCEs is in full compliance with controls, procedures, policies and processes relating to transactions of assets and money.

Table 5.15 Results for testing for management compliance with PBFMS

Test variable: <i>mgtcomp</i> ; Test value = 2.00									
N	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
								Lower	Upper
99	2.5631	0.50425	0.05068	11.112	98	0.000	0.56313	0.4626	0.6637

▪ **Overall commitment to PBFMS**

Having tested the two components of commitment the overall position based on the hypothesis below was sought:

$H_{O1.3}$ Proprietors of SMCEs are committed to the development and operation of a PBFMS ($H_{O1.3}: \mu > 2$).

$H_{A1.3}$ Proprietors of SMCEs are committed to the development and operation of a PBFMS ($H_{A1.3}: \mu \leq 2$)

The variable called *mgtcommit* was used to test the hypothesis and the results are given Table 5.16. From the table the sample mean of 2.49 was higher than the hypothesised mean of 2.00 (the difference of the mean is positive i.e. 0.494). In addition, the confidence intervals all lie above 2 (lower: $2.00+0.39= 2.39$, Upper: $2.00+0.59=2.59$). This means that at a 95% level of

significance, the sample mean value is significantly greater than the hypothesised mean and this calls for supporting the null hypothesis. **This implies that management in a majority of SMCEs are committed to the PBFMS procedures and policies and supports its planning, development, management and operation.**

Table 5.16: Management commitment to PBFMS

Test variable: <i>mgtcomit</i> ; Test value = 2.00									
N	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
								Lower	Upper
99	2.49	0.498	0.050	9.872	98	0.000	0.494	0.39	0.59

5.8 Overall assessment of the state of the PBFMS

The preceding Sections (5.5 - 5.7) have tested the adequacy of various parts of the PBFMS of SMCEs against the proposed model comprising of theory and best practices developed in Chapter 3. This section provides results of an investigation into the adequacy (efficiency and effectiveness) of the PBFMS in SMCEs in facilitating the enterprise major processes which are crucial for its effective performance. Thus the last investigation tested the hypothesis namely:

H_{01} *The PBFMS of SMCEs are adequate to facilitate the delivery of projects ($H_{01}: \mu > 2$)*

H_{A1} *The PBFMS of SMCEs are adequate to facilitate the delivery of projects ($H_{A1}: \mu \leq 2$)*

The major components of the PBFMS namely strategic planning, operational planning and control and management commitment and their associated variables namely *strategicprocess*, *plancontrol* and *mgtcomit* were used to test the hypothesis. This was achieved by using SPSS in transforming data in the three variables into a single variable called *PBFMSadequate*.

The result of testing the hypothesis are given in Table 5.17 and from the table the sample mean of 2.1929 was higher than the hypothesised mean of 2.00 (the difference of the mean is positive i.e. 0.19291). In addition, the confidence intervals all lie above 2 (lower:

2.00+0.1188= 2.1188, Upper: 2.00+0.2670=2.3670). This means that at a 95% level of significance, the sample mean value is significantly greater than the hypothesised mean and this calls for supporting the null hypothesis.

Table 5.17: Adequacy of the PBFMS in SMCES

Test variable: <i>PBFMSadequate</i> ; Test value = 2.00									
N	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
								Lower	Upper
88	2.1929	0.34982	0.03729	5.173	87	0.000	0.19291	0.1188	0.2670

In other words, the PBFMS are adequate (efficient and effective) and should [emphasis] be able to facilitate the major processes of strategic planning, project (operational) planning and control. In turn the PBFMS should facilitate enterprises to have enhanced performance. In essence, this result goes against the prior proposition of the study, that SMCEs do not have adequate PBFMS to facilitate both project and enterprise performance.

Having looked at the overall state of the PBFMS of SMCEs, the next section discusses findings relating to the performance of SMCEs.

5.9 Performance of Enterprises

This section reports results of an investigation into the past performance of SMCEs and how performance is linked to the adequacy of PBFMS of the SMCEs. The investigation pursued the premise which linked inadequate PBFMS found in SMCEs to poor performance. This was stated in a hypothesis form as:

H₀₂ The adequacy of PBFMS is positively correlated with the performance of SMCEs.

Thus the section is divided into two sub-sections one providing results on past performance and the other on results linking performance with the inadequacy of PBFMS.

5.9.1 Past performance

In the study, past performance was considered to be made of four dimensions namely bidding, time, cost and profit performance. They are based on the premise that an adequate PBFMS should facilitate excellent planning (both strategic and operational), bidding and control in project time and cost (quality was not considered due to the difficulty in its measurement as explained in Chapter 3). The first hurdle for any construction enterprise is to win a project tender based on the competitiveness of the bid. Although many aspects go into the pricing of a tender, one aspect remains clear cut; project estimates must be accurate as it forms the cost baseline from which the price is determined. Furthermore, when time and cost are contained (project control), this should lead to achieving the planned profitability. Both of these processes are facilitated by the PBFMS. It must be fully stressed though that time, cost and quality containment are not the only aspects that provide greater profitability as already mentioned for example, the state of health of the industry (see Figure 1.3 in Chapter 1).

The performance period for each dimension (i.e. bidding, time, cost and profit) was based on three years. Three years were considered long enough to measure performance and yet not too long to require much recollection from respondents. The investigation of each is discussed next beginning with rate of performance in bidding.

- ***Bidding performance***

Successful bidding for construction jobs is the only way to ensure profitability and survival of SMCEs. An accurate estimate is a major factor for achieving success in bidding because it is the baseline for which decisions are made, either to be keen on the tender or not to be. Tender keenness involves reducing the mark-up on the estimate to get a lesser profit. During adjudication decisions can only be made with a full knowledge of the baseline estimate. An effective PBFMS should facilitate in providing an accurate baseline estimate.

Respondents were asked to rate their average success rate in bidding in the last three years. Figure 5.36 shows that majority (68%) of the SMCEs were below the acceptable range which Canter (1973) and Smith (1995) put it between one and two tender awards for every ten tender attempted. Poor bidding rate was most noted in small (72%) than medium (32%) sized enterprises.

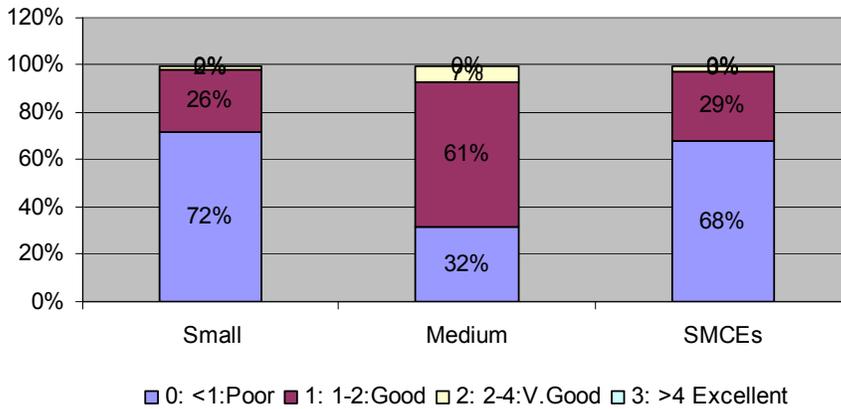


Figure 5.36: The success rate of bidding among SMCEs

- ***Time performance***

Respondents were asked to rate the performance of their enterprises over the past three years in terms of project time management - a project metric which is very important for both the enterprise and client. The results are depicted in Figure 5.37 (*always* means time overruns for all projects while *never* means no time overruns for all projects).

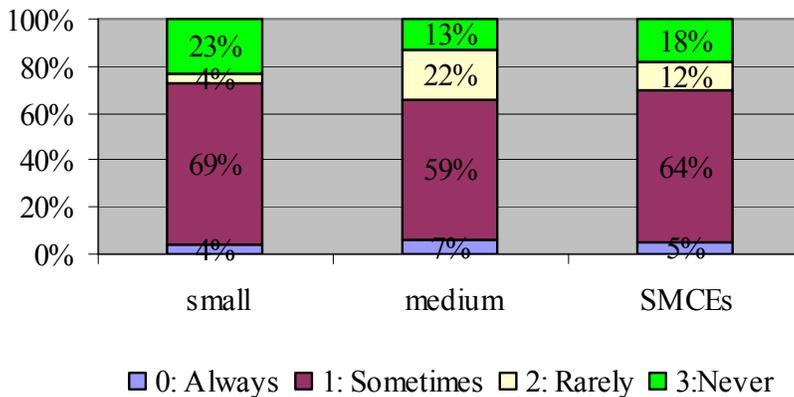


Figure 5.37: Past performance in terms of time

Figure 5.37 shows that only in a few (18%) case did the SMCEs deliver their projects on time while in majority (82%) of time SMCEs experienced time overruns on projects. Interestingly enough poor time performance was more experienced in medium (87% =100%-13%) than medium (87%%=100%-23%) enterprises.

- ***Cost performance***

An investigation into the rate of cost overruns over the past three years yielded the results depicted in Figure 5.38 (*always* means cost overruns for all projects while *never* means no cost overruns for all projects).

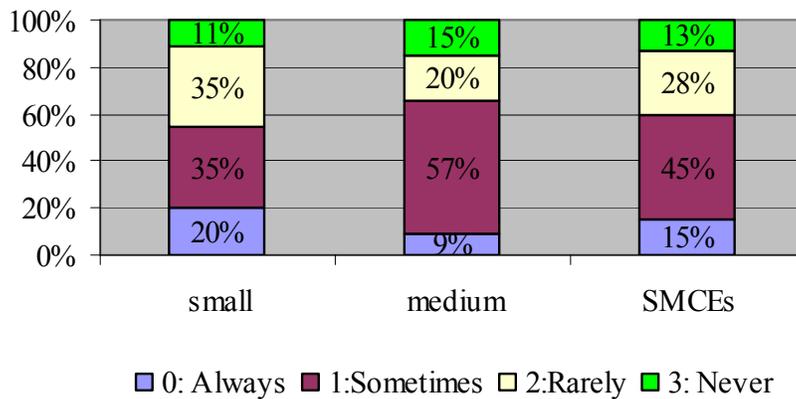


Figure 5.38: Past performance in terms of cost

Figure 5.38 shows only in a few (13%) occasions did SMCEs deliver projects within agreed tender sum while in a majority (87%) of instances the projects has cost overruns. Medium enterprises managed their costs slightly better than the small enterprises, that is, projects experienced cost overruns in 85% and 89% if the cases, in medium and small enterprises, respectively.

Comparatively, projects experienced more cost overruns (87%) than time overruns (82%).

▪ ***Profit performance***

Respondents were asked to rate the performance of their enterprises over the past three years in terms of profitability. The results are depicted in Figure 5.39.

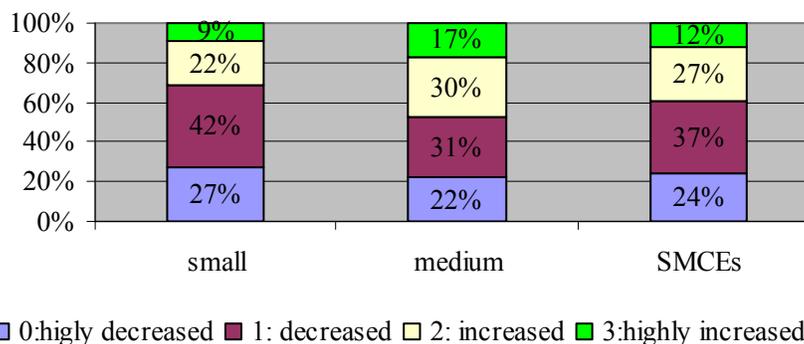


Figure 5.39: Past performance in terms of profitability

Figure 5.39 shows that some (24%) SMCEs reported as having had a significant decrease in their profits with a sizeable number (37%) reporting a drop in their profitability. This means that a 61 (= 24 + 37) reported as having had decreased profits over the period. The medium (53%=22+31) enterprises performed better than their counterparts (69% =27+42).

Having discussed the results of investigating the three performance dimensions, the next section provides results of investigating the overall performance of SMCEs.

5.9.2 Overall performance

The overall state of performance of SMCE was tested by combining data for the four aspects of bidding, time, cost and profit. Using SPSS, data in the four variables was transformed into one variable called *overallperformance* in order to investigate the overall performance of the SMCEs in the said period. The hypothesis was stated as:

$H_{02.1}$ *The overall performance of the SMCEs in the past three years was increased*
($H_{02.1} \mu > 2$)

$H_{A2.1}$ *The overall performance of the SMCEs in the past three years stayed the same or declined* ($H_{A2.1} \mu \leq 2$)

The results of testing the hypothesis are given in Table 5.18.

Table 5.18: Overall performance of the SMCEs

Test variable: <i>overallperformance</i> ; Test value = 2.00									
N	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
								Lower	Upper
98	1.5782	0.63055	0.06370	-6.622	97	0.000	-0.42177	-0.5482	-0.2954

From the table the sample mean of 1.5782 was lower than the hypothesised mean of 2.00 (the difference of the mean is negative i.e. -0.42177). In addition, the confidence intervals lie below 2 (lower: 2.00-0.5482=1.4518, Upper: 2.00-0.2954=1.7145). This means that at a 95%

level of significance, the sample mean value is significantly less than the hypothesised mean and this calls for not supporting the null hypothesis. The results imply that **the overall performance of SMCEs had declined in the past three years**. Clearly the results do not come as a surprise because most of the dimensions investigated were not achieved, for example, the bidding rate and time elements were very poor.

Having investigated the level of adequacy of the PBFMS and performance of the SMCEs, it was opportune to examine the nature of relationship between the two variables.

5.10 Relating the Past performance to PBFMS

The premise of the study was that an adequate PBFMS facilitates achieving better performance for the enterprise through the efficient and effective facilitation of the major processes. This is because, for example, the process of project planning would be carried out efficiently and in addition project resources and activities would also be effectively controlled. The net effect would be controlled project costs and time resulting in the facilitation of achieving planned profitability.

However, the results from the preceding sections showed that while the overall state of PBFMS was adequate for majority of SMCEs, their overall performance had decreased in the past three years. From the beginning of the study there was no illusion that there was a causal (one-to-one) relationship between PBFMS adequacy and performance. However, there was need to further exploit the relationship between the two aspects of the state of the PBFMS (adequate and inadequate) and performance. This was conducted in three steps, first a cursory look at how the two groups in each variable played out. This was followed by an investigation into the performance of each group and level of prediction the adequacy of the PBFMS has on enterprise performance.

5.10.1 Relationship between SMCEs with adequate and inadequate PBFMS

Enterprises were divided into groups composed of those which had an adequate and inadequate PBFMS and those whose performance had increased and decreased (a cut off

point of 2 for both variables was used). An investigation was conducted to test whether there was any difference in the performance between those which had adequate and inadequate PBFMS by testing the hypothesis:

$H_{O2.2}$ *There was no difference in performance between those SMCEs with an adequate and inadequate PBFMS ($H_{O2.2} \mu_1 = \mu_2$)*

$H_{A2.2}$ *There was a difference in performance between those SMCEs with an adequate and inadequate PBFMS ($H_{A2.2} \mu_1 <> \mu_2$)*

An independent sample t-test was conducted to test the hypothesis and the results are shown in Table 5.19.

Table 5.19: Performance of the SMCEs with adequate and inadequate PBFMS

	Nature of PBFMS	N	Mean	Std. Deviation	Std. Error Mean
<i>Overallperformance</i>	Adequate (μ_1)	64	1.6719	0.61576	0.07697
	Inadequate(μ_2)	21	1.3333	0.50553	0.11031

Test variable: <i>Overallperformance</i>									
Levene's Test for Equality of Variances			t-test for Equality of means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	1.029	0.313	2.277	83	0.025	0.33854	0.14865	0.04289	0.63420
Equal variances not assumed			2.517	41.119	0.016	0.33854	0.13451	0.06691	0.61017

The results indicate that the null hypothesis is not supported since the means are different ($\mu_1 = 1.6719$, $\mu_2 = 1.3333$). Since the standard deviations are not equal, we use the lower part of the table to interpret whether difference is statistically significant. Since the t value of 2.517 is greater than the critical value of 1.64, we conclude the difference is significant. This means that at a 95% level of significance, the difference between the means is quite significant and the null hypothesis is supported. The results show that **the enterprises with an adequate PBFMS performed better than those with an inadequate PBFMS.**

Apart from showing the difference in performance between the two groups, the results in Table 5.19 reveal that the performance of the SMCEs with an adequate PBFMS of 1.6719 was also significantly below the expected level of 2.00. **This result confirmed the proposition made at onset of the study, that inadequate PBFMS are contributors to the poor performance of SMCEs**

The results above led to a further investigation determine whether there is a relationship, if at all, between the adequacy of the PBFMS and SMCEs performance.

5.10.2 Relationship between PBFMS adequacy and SMCEs performance

A regression analysis was conducted to determine the nature of any relationship between, the adequacy of PBFMS and SMCEs performance. In other words, does the adequacy of PBFMS explain (facilitate) the variation in performance of SMCES. Burns and Bush (2006) provides a relative scale for the correlation between bivariate variables as shown in Table 5.20

Table 5.20 Strength of correlation of any two variables

Coefficient Range	Strength of association
±0.81±1.00	Strong
±0.61±.80	Moderate
±0.41±0.60	Weak
±0.21±0.40	Very Weak
±0.00±0.20	None

Source: Bush and Burn (2006)

A hypothesis was formulated as follows

H_{O2} *The adequacy of PBFMS is not correlated with the performance of SMCEs. (H_{O2}: R =0)*

H_{A2} *The adequacy of PBFMS is correlated with the performance of SMCEs. (H_{A2}: R ≠0)*

The results of testing the hypothesis are shown in Table 5.21 (since there was no intention to model the two variables only the relevant excerpts of the results are shown).

Table 5.21: A regression analysis of adequacy of PBFMS and SMCEs performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.288 (a)	0.083	0.072	0.58354

a Predictors: (Constant), PBFMSadequacy

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.547	1	2.547	7.481	0.008
	Residual	28.263	83	.341		
	Total	30.810	84			

The table shows the R-value is 0.288 implying that there is a relationship between the adequacy of PBFMS and SMCEs performance – a positive correlation between the two where the PBFMS is the independent variable. However, according to Burns and Bush (2006), the relationship, **is a weak positive linear relationship** (see Table 5.20) in which the adequacy of PBFMS only contributes an estimated 8.3% of the total variation in the performance of SMCEs. The result is in line with the thinking posited in Chapter 1 (also illustrated in Figure 1.3) in which it was indicated that contributors to poor performance of an enterprise are more than simply an adequacy PBFMS

5.11 Chapter Conclusion

Apart from the natural attrition of enterprises, there seems to have been a serious downturn in the construction industry in Botswana between the years 2005 and 2007 which caused many construction enterprises to close down. This explains the observed phenomena of many RTS questionnaires. This may have also reduced the expected ‘population’ and hence sample size used in the study.

For the SMCEs that responded, as expected small enterprises were in the majority (55%). Almost half (49%) of the sample were 10 years older and slightly less than half (41%) of them employed more than 10 employees. SMCEs have experienced appreciable growth in

work force and assets leading to many (68%) of them changing either classes or/and sizes in an upward trend.

SMCES major (65%) source of work is public works (government and local authorities) consisting mainly (53%) of building work alone and the rest is both (it was noted that no enterprise executes civil works alone). Due to the sparse settlements in Botswana, a greater majority (60%) of SMCEs perform work beyond 500 Km from their head office which is roughly half the distance between Botswana borders.

We now put the results in the context of the two research questions posited in Chapter1 namely:

RQ1 *Do SMCEs have adequate PBFMS that facilitate the effective delivery of projects for enhanced financial performance?*

RQ2 *Is there a relationship between the adequacy PBFMS and poor performance of SMCEs?*

As for the first question the findings of the study are that the PBFMS of the SMCEs are adequate to facilitate effective delivery of projects. However, the results have shown that the strategic management component of the PBFMS is inadequate. No conclusion could be made about the adequacy of the project planning and control. On the hand management was found adequately committed to the development of the PBFMS.

The finding of the second question was that the adequacy of a PBFMS was positively correlated to the performance of the SMCEs in the sense that those with adequate PBFMS performed better than their counterparts. However, the adequacy of a PBFMS partly explains the total performance of SMCEs, that is, PBFMS adequacy is a contributor or facilitator to performance.

CHAPTER 6: DISCUSSION OF FINDINGS

6.1 Introduction

This Chapter presents a discussion relating to the interpretation and implication of the study results presented in Chapter 5. The results were presented following the sub-themes investigated in the research instrument. However, the discussion here shall be organised around the themes related to the major hypotheses of the study in an attempt to answer two major propositions that formed the gist of the study namely

- (i) *small and medium construction enterprises (SMCEs) do not have adequate project based financial management systems (PBFMS) to facilitate strategic and project planning and control, and*
- (ii) *the lack of adequate PBFMS in SMCEs contributes to their poor performance.*

The first proposition was framed out of the position taken at the conceptualisation of the study that the PBFMS of SMCEs are inadequate (inefficient and ineffective). This was based on the observations made in various reports (for example, Dun and Bradstreet, 1987) and more specifically in Botswana (Kgabo *et al.*, 1999; Sentongo, 2005; and BOCCIM, 2005) that SMCEs performed poorly in terms of project delivery (cost, time and quality) and in many cases failed financially. To provide a meaningful interpretation of the results it was deemed necessary to discuss the three major components of the PBFMS which were identified in Chapter 3 namely strategic management, project planning and control and management commitment. It was observed that a systems view was needed to further understand the PBFMS as it operates both in an internal and external environment. In that vein Chapter 2 was dedicated to providing a link between PBFMS and the external environment and how the latter may impact on the performance of the former. Chapter 3 was dedicated to developing the envisaged PBFMS model and describing its components and best practices for its management as an internal process.

With that background, the discussion in this Chapter is basically divided into five parts; the first relates to the implications of the response profile obtained during the administration of the study instrument. An argument is being put forward to link the nature of the response

profile with PBFMS and enterprise environment in form of the state of the industry at the time of study. The second section of the Chapter discusses the results of the major themes, namely PBFMS adequacy and SMCEs performance. The third section discusses the overall adequacy of the PBFMS and its implication on performance. The fourth section re-visits the proposed model in view of the obtained results and emphasises the *study's contribution to the understanding of the financial management in a project based environment, and in particular in small and medium enterprises*. The fifth section looks at the limitations of the study and possible areas of further research. The Chapter ends with summary of the major findings of the study.

6.2 Implication of the Enterprise Response Profile

The first part of Chapter 5 (section 5.2) discussed the response profile experienced during data collection. Three rounds of mailing the questionnaires were conducted to get the required representative sample of the SMCEs operating in Botswana. Several RTS (return-to-sender) mails were received during the process and this was considered an astonishing phenomenon. It could not be explained by the normal argument of low response rates attributed to questionnaire surveys which, for example, according to Lynn (1996), could be as low as between 20% to 40%. In Chapter 5, the reason for the phenomenon was attributed to a combination of two factors namely that the industry was going through a down-turn during the period between 2005 and 2007 (where the former date is the time the list of SMCEs was drawn up while the latter is when the actual data collection was carried out). The down turn may have forced number of firms on the 2005 list to close down. In the world over, it has been observed that downturns are common in the construction industry especially for those which have a huge dependency on almost a single client for their work (Hillebrandt, 1989 and Smith, 1998) like those in the developing world. Indeed results in Chapter 5 showed that the central government and local authorities provide 65% of the construction market in form of public works (see Section 5.3.2), in Botswana. The second augmenting reason for the RTS was that of all sizes of enterprises, smaller firms were affected more by the downturns than the larger enterprises (Kale and Arditi, 1998), that is, attrition was higher in smaller enterprises. There was evidence that due to this phenomenon the observed ratio of small to

medium enterprises changed in the period from the 2005-level of 59% to the one obtained in the study (in 2007) of 55%.

The downturn normally results in withdrawing or reducing investment in resources including those relating to PBFMS. Borrowing a leaf from previous studies showed that slump in the industry, normally leads to major cut-backs in investment in assets and human resource especially those related to information systems (Pheng and Tan, 1994). The comment made by one of the respondents in the open ended section of the study instrument (*'I had to trim my workforce because I had no jobs for over nine months, others simply left on their own...'*) further attested to the situation although it was not specific as to which part of the enterprise lost employees as a result of job scarcity. Moreover, the situation was made worse by what Cashmore and Lyall (1991) noted that systems grow with size and there is always a challenge for proprietors to make decisions of how much to invest in systems they cannot see direct tangible results.

The argument being put forward is that the implication of the response profile points to the fact of a depressed industry at the time of conducting the study. It is argued that enterprises were under very strenuous operating and financial conditions at the time. This may have affected the performance or may have changed the nature of PBFMS of SMCEs. While the extent of the effect was not the gist of study, it is nevertheless a noteworthy factor when analyzing the performance profile of PBFMS.

The discussions above relating to the operating environment leads to the next section that examines the major question of the study, that of the adequacy of PBFMS of SMCEs.

6.3 Adequacy of PBFMS

The major thrust of the study was to investigate the state of PBFMS with a proposition that they are not adequate to facilitate the three major function of a construction enterprise and hence contribute to desired performance of the SMCEs. The motivation for studying PBFMS of SMCEs in Botswana was triggered by reports relating to frequent business failures (Kgabo

et al., 1999) and poor delivery of projects (BOCCIM, 2005; and Ssegawa and Ngowi, 2007). This was believed to be contributed by the inefficient and ineffective PBFMS which do not facilitate long term planning and operational planning and control. In turn this lead to failure to achieve long and short-term desired targets to ensure profitability and hence competitiveness.

It is against that background that the following hypotheses were formulated and tested as a means of investigating the proposition

H₀₁: The PBFMS of SMCEs are adequate to facilitate the delivery of projects

H₀₂ The adequacy of the PBFMS is positively correlated with the performance of SMCEs

To manage its testing the first hypothesis was divided into three parts identified earlier namely, strategic management, project planning and control component and management commitment. The results of investigating the adequacy of each of the three led to an overall knowledge and assertion about the state of the PBFMS in SMCEs. The three components of the PBFMS also form the major themes of discussion of the results in the next sections.

6.4 Implications of Findings- the Strategic Management Component

The issue of strategic management and its incorporation in the PBFMS model is a major deviation from the commonly prescribed financial management models for construction enterprises. The Project Management Institute (PMI) book of knowledge (BoK) edition of 1996 and 2000, for example, hardly linked enterprise strategy with project planning and control, emphasising only the latter components (PMI, 1996 and 2000). It is only in the 3rd Edition (PMI, 2004) that an attempt was made to incorporate strategy as an integral part of the project's life cycle. However, the discourse does not provide sufficient and practical guide on the process. The 5th Edition Book of Knowledge (BoK) of the Association of Project Managers (APM) emphasises the need to link strategy to programme and projects (APM, 2005). However, due to the generic nature of most BoKs, they do not offer a practical guide which construction enterprises can use. In addition, MacCaffer and Baldwin (1995) and Ndekugri and MacCaffer (1988) emphasised project planning and control but their

models hardly provided any guidance that links strategy to operational processes of construction enterprises. Instead they offered an elaborate guideline for the estimating and tendering processes. One of the major contributions of the study is linking of the strategic management process with project planning and control, and in particular of SMCEs.

In assessing whether SMCEs have a strategic management component commensurate with the envisaged PBFMS model, an investigation of adequacy of strategic planning process and its link to the operational plans was conducted to provide the overall state of the strategic management process and the results obtained in Chapter 5 (Section 5.5) are discussed in the next sub-sections .

6.4.1 Adequacy of the strategic planning process

It was emphasised in Chapter 2 that the strategic planning process should include the processes of defining the enterprise mission and goal setting, situational analysis, opportunity conception and strategy formulation (e.g. Newkirk and Lederer, 2006). These were considered as broad areas on which to investigate the strategic management status of the PBFMS of SMCEs.

The results of testing the null hypothesis that SMCEs do not have adequate strategic planning processes were in the affirmative. The inherent weaknesses that contributed to the inadequacy of the process included the fact that over half (52%) of the SMCEs did not have documented plans with quite a number (30%) relying on the owner/manager's recollection (Section 5.5). Moreover, those which were documented, a significant number (52%) were developed by one individual, the owner, while others were developed by consultants (23%) and who also reviewed them in some cases (4%).

However, the results of testing each item comprising the strategic planning process showed that there were vestiges of the processes and associated activities, though not adequate to facilitate sustained performance of SMCEs (a major premise of the study). Results indicated that enterprises were able to perform a situational analysis and thus identify business threats and opportunities. They were also able to identify where their competitiveness lies. They

were also able to state future desired growth in terms of class or size and how they thought the target could be attained.

The implication of the above results is that, firstly a business plan that is not documented is difficult to follow and review. This in itself implies that most of the decisions are taken on an ad-hoc basis. Secondly, the fact that many of the plans were made by the owners implies that employees were 'passengers' to what goes on in the enterprises. The worst scenario is when the plans were developed and reviewed by consultants without the participation of employees resulting in performance results not producing the desired change. Both of these scenarios are contrary to the contemporary thinking which emphasises teamwork in planning as a mechanism for employee participation, internalisation and buying-in the decisions of the enterprises (Newkirk and Lederer, 2006; Cox and Ireland, 2000) to create and manage change. It also ensures loyal and motivated employees who know the future direction of the enterprise. Therefore, lack of documentation and team effort in the planning process delineates employees to the enterprise operations, yet strategies are meant to serve as a means of coordinating the strategic direction of the enterprise to create a competitive advantage by galvanising creativity and effort and inculcating responsibility for improved performance.

6.4.2 Linkage to operational plans

It would have been surprising to encounter a situation where a strategic planning process is inadequate but yet well linked to operational plans. The results of investigating the linkage showed that business plans are not linked to operational or project plans. The results obtained were not surprising as earlier results indicated that most of the business plans are not documented. It is thus difficult to imagine how the linkage would flow from a void. Secondly, most managers use a plan as an end in itself instead of a means to an end. For some (23%) enterprises whose planning process is induced by external agencies, for example, financial institutions or funding agencies, they rarely see any major use in referring to the plans when the funding is secured.

Lack of strategic plans and its linkage to operational plans implies that SMCEs conduct business in an ad-hoc manner without appreciating its implication to the future. This makes

SMCEs highly vulnerable to the industry's cyclic trends especially during a down turn. This may partly explain why there is a high rate of reported (e.g. Kgabo *et al.*, 1999, Dun and Bradstreet, 1987) business failures in the industry.

The results obtained do not differ from what other scholars (e.g. Lyles *et al.*, 1993) have noted that operational plans must be devolved from strategic plans and both must be integrated as a continuous enterprise endeavour. The virtue of strategic planning lies in guiding the future of the enterprise through operational plans. Put in another way, strategic plans are implemented through operational plans. For each organisational goal set, there must be corresponding activities, resources, budgets and schedules in the operational plan which reflects how the enterprise hopes to achieve the set goals articulated in the strategic plan. This is the umbilical cord which connects the strategic and operational plans.

6.4.3 Strategic management process

The strategic management process was conceived as one which has a strategic planning and implementation process where the latter is the link between the strategic plans and project or (operational) plans. The overall results showed that:

- (i) the PBFMS of SMCEs in Botswana were inadequate in facilitating the strategic management process, that is, the strategic planning process is inadequate and not linked to project (operational) plans (Chapter 5 Section 5.4.4), and
- (ii) additional investigation showed that enterprises which had an adequate strategic component of the PBFMS performed better in terms of profitability than those which did not (Section 5.4.4).

The results in (i) above are akin to a number of studies conducted on the subject (e.g. Hannon and Atherton, 1997; and Robinson and Pearce, 1983) where it was noted that the strategic management in SMEs is not quite as formal as in large enterprises. Several explanations may be given for this including the (i) the nature or characteristics of SMEs, and (ii) the perception of 'content' versus 'processes' and (iii) nature of the construction industry. The first two are interrelated and hence discussed in unison as implications of the results to the (i) nature of strategic management process in SMEs and (ii) the construction industry.

- *Nature of strategic management process in SMEs*

It is argued and also emphasised by others (e.g. Baumack, 1988, Kale and Arditi, 1998) that the characteristics of small enterprises namely (i) scope and scale of operations, (ii) separation of ownership and management, and (iii) management style may provide a clue as to why the strategic management process appears to be inadequate. The dominant character of owner manager, associated management style and non-separation of ownership from management means that the decision making and hence strategic management is centralised in the hands of the owner/managers. They decide on matters of process, form, content and output of the plan leaving little room for teamwork and documentation trail. Robinson and Pearce (1983) argued that to look at documentation resulting from the process is therefore not a good way of knowing or studying whether process takes place at all as discussed later.

Another argument put forward for the inadequacy of the process, is that SMCEs, like other SMEs, have limited resources and scale of operation to engage in formal strategic planning. The effect of limited resources is that SMEs cannot have adequate and skilled personnel and those hired are deployed constantly on the 'actual' operational work like scheduling, estimating or supervision. Limited scale of operation implies that their impact is less felt in the market in terms of customer orders or in the geographical area (Cromie and Carson, 1989). Thus owner/managers prefer fire-fighting or ad-hoc plans than developing 'grandiose' strategies which they perceive may not have an impact on their businesses.

The situation described has led some authors (e.g. Hannon and Atherton, 1998; Price and Newson, 2003) to recommend that studies on strategic management in SMEs should be based on 'process' and not 'content, output or form'. They argue that content tends to be like an audit trail where evidence of strategic management must be produced, for example, business plans. Whereas if the studies concentrate on process, they would discover that indeed strategic management takes place in SMEs though not well documented in formal reports. Others (e.g. De Wit and Meyer, 1998) continue to argue that strategic management is a cognitive process in which the manager internalises the conceived strategy and pursues it regardless of whether it is on paper or not. It is thus argued that a manager/owner indeed

carries out strategic management by combining strategic thinking (intuition, creativity and synthesis), planning (analysis), and implementation (action) in one sweep and the trail is only seen in business results or failure and not in documents. They emphasise that at the SME level, strategic management should be more of a cognitive process that responds to the market needs other than putting down plans. The methods of investigation should therefore reflect that difference, inclining more on ethnographic or in-depth case studies than the normal survey strategy. Ethnographic or in-depth case studies, they argue would be more effective in ‘mining’ the idiosyncrasies behind the strategic thinking of the owner/managers.

That being the case the results in (ii) would appear to contradict the results in (i) but when looked in a kaleidoscope, they would seem to complement each other. It has been established in this study just as in literature sources, that all enterprises need a strategic management process regardless of the size or industry. The results showed that the enterprises which had an adequate strategic management component performed better than their counter parts (result (ii) Section 6.4.3). This is because it is through the strategic process that management’s thinking is crystallised and clarified to provide a sense of direction to employees and other stakeholders through the setting of objectives. If well conducted, it permeates all enterprise activities, creating the required inspirational and motivational aura that leads to superior business performance. However, the challenge is for managers to gauge how formal it should be given the limited resources and skills. This is the caveat that SMEs have to grapple with during their business life.

The last issue on this topic relates to whether the type of strategies available for a manufacturing or service oriented enterprises are also fully available for a construction enterprise. An investigation into what gives the enterprises a competitive edge yielded somehow similar responses centred on two metrics, time and cost, that is, delivering projects within agreed time and cost. In addition, when asked as to how they expect to achieve their desired targets, there were no surprising answers apart from common rhetoric found in responses of increasing assets and adding another work category (adding civil to building works). Therefore, the grandiose strategies of mergers, acquisitions, branding and ‘niches’

are not fully deployed since the biggest the market in industry is limited to one client (the public clients) as discussed next.

- ***Nature of strategic management process in the construction industry.***

A number of authors (Betts and Ofori, 1992; Kale and Arditi, 2002) have intimated that construction industries do not have the same options of exercising the normal strategies espoused by scholars like Ansoff (1967) and Porter (1980), particularly of differentiating their products or services or creating barriers, respectively. Betts and Ofori (1992) noted that given the fact that the construction design is already completed at the tender stage, especially in a TPS, there is little room for innovation. In that vain, Kale and Arditi (2002) concluded after a study into the competitive positioning of US construction enterprise, that it appears that construction enterprises are not equally endowed like their counterparts in other sectors of the economy to differentiate their products from the competition due to the limitation in influencing quality and innovation. In a nutshell, the implication of this discourse is that the strategic options available to a construction enterprises, moreover at the lower end of the size continuum, need not be construed as those of large firms and more so of firms in other sectors of the economy. However, what could be available for them are strategies relating to (i) increasing market share, (ii) developing a network of business connections to provide information on job opportunities, financial support and credit arrangements and (iii) developing and sustaining delivery capability.

The first aspect (i) above relates to strategies of increasing or changing, for example, the nature or category of work to execute, that is, building, civil and maintenance; the type of clients to serve (public works, parastatals, private companies and individuals); and geographical spread or coverage when soliciting work. The results showed that SMCEs have the strategic awareness relating to the need to increase their market share to increase the number of projects executed and hence the increase turnover.

The second aspect above (ii) ensures that an enterprise puts in place formal and informal but ethical channels for providing information on jobs opportunities in the market particularly those which are not advertised or which are not let by competitive means, especially those

from the private companies. In addition, strategies are needed to ensure a reliable network of suppliers of resources, for economical procurement of inputs. In addition, establishing a good relationship with financial institutions in order to obtain a reliable source of credit funds and guarantees at competitive prices is also one of the recommended aspects in financial management.

The third and last aspect above (iii) relates to developing both internal and external systems to provide the enterprise superior capability to deliver projects within agreed time, cost and quality (this is also limited to workmanship because other aspects of quality are normally specified in the designs). This would ensure that planned profit is achieved. This aspect requires an adequate (efficient and effective) project planning and control component as discussed in the next section.

In summary, the findings of the study indicate that strategic management component of the PBFMS is inadequate as the strategic planning process is not only inadequate but also not linked to project plans. In addition, the enterprises which had a better strategic management component performed better than their counter parts in the last three years, emphasising the need for strategic planning for all sizes of the enterprises in all sectors. However, some recognition must be made that the challenge lies in balancing the level of formality that must be engaged in the process in SMCEs to bring about the desired business performance.

The next section discusses the implication of the results of investigating the adequacy of the project planning and control component of the PBFMS of SMCEs.

6.5 Implications of Findings- Project Planning and Control Component

The previous section alluded to the need to ensure projects are delivered within agreed limits as the only means of achieving planned profitability and customer satisfaction. The position of the study was that a PBFMS with an efficient and effective project planning and control infrastructure will facilitate (i) successful bidding, (ii) delivery of projects within agreed metrics and (iii) achievement of planned profit margins. The three aspects will in turn ensure

excellent performance of enterprise both in terms of competitiveness and customer satisfaction.

In Chapter 3, the major items needed to ensure efficient and effective project planning and control were identified. In Chapter 5 the results of testing their adequacy was presented and an interpretation and implication of the results follows next. The discussion centres on the themes of planning infrastructure, competence of human resources involved and information outputs from the planning and control process.

6.5.1 Adequacy of the PBFMS infrastructure for bidding and control

Chapter 3 identified the main components of the envisaged PBFMS for facilitating effective planning for project bidding, implementation and control as being planning tools, estimating information database and planning systems (manual or IT driven) and site visit reports. It was also noted in Chapter 3 that since tender documents are provided by the client and hence not under the control of the enterprise, it was not appropriate to include them in the investigation. However, an analysis of their content by SMCEs is of cardinal importance to understand the intricacies of the tender conditions. A discussion of the results of each of the mentioned themes follows next.

- ***Estimating tools***

Project planning is geared mainly toward estimating the duration and cost of project activities after identifying the required project deliverables, work packages and their associated quality specifications. The application of project planning tools, such as, risk checklists and cost codes, is part of the necessary planning infrastructure. The results of investigating the adequacy of the project planning tools in Chapter 5 indicated that SMCEs do not adequately use the basic project planning tools (see Section 5.6.1). The major reasons for not using the tools were given as lack of skills (40%), pressure of work (41%) and projects being too small (10%). The first two reasons are presumed to be interrelated because firstly, many of tools, for example, network diagrams or cost codes require skills to efficiently apply them for project scheduling and budgeting.

The second reason stems from the first, that is, if one is using them for the first time a considerable amount of time is needed for familiarising. The time element is compounded if an IT system is not used as discussed later. However, if tools are used for every project planned, the time element may be reduced through a learning curve due to constant application.

The response that projects are too small as a reason for not using the tools received less prominence (10%). However, the reason may be viewed from another angle that SMCEs are at the bottom end of the size strata and hence the projects executed are small in scale and scope and may not require complicated tools, for example, network diagrams. For efficiency and accuracy even small projects do require the use of the tools, for example, they certainly need the use of at least a Gantt chart as opposed to a complex network diagram when developing a project schedule. Literature (e.g. Klastorin, 2004; Charoenngam and Sriprasert, 2001) emphasises that whatever size of project, the project duration can only be determined with a high degree of accuracy by identifying critical activities and hence the sum of their total duration. This therefore calls for the use of a network diagram. In addition, cost codes are definitely needed for all projects, small or large, for identifying budget items and collating expenditure in order to control costs. Their use will increase accuracy and thus reduce errors and mistakes which frequently occur in budgeting, valuation and performance measurement.

Project management literature (e.g. Charoenngam and Sriprasert, 2001; PMI, 2004; Klastorin, 2004; and APM, 2005) advocated the need to use tools as best practice in project planning, implementation and control as a means of providing a systematic and logical approach to estimating. The use of tools ensures accurate, consistent and understandable project estimates for the relevant persons in the enterprise, for example, management, project implementers and most often the client representatives. During adjudication (i.e. estimate review and pricing) process, it is of vital importance that the estimate has a clear layout in order for management to follow its logic, assumptions and to be able to identify errors and associated risks of project activities. Thus the use of tools provides a systematic approach and facilitates the required efficiency in the estimation process to ensure a sound and competitive bid and on implementation to provide the necessary effectiveness in project monitoring and control.

Normally estimates are developed within a tight schedule in a bid to meet client's bidding deadlines but yet they must be competitive to succeed in winning project tenders for the enterprise. In summary, there is nothing that can substitute the use of project planning tools if efficiency, effectiveness and accuracy in project estimation are to be achieved. The reason that projects are small, or there is too much work pressure is a recipe for producing uncompetitive bids. Moreover, a continued use of the excuse that projects are too small may act as a barrier for growth and readiness to upgrade to a higher class and hence execute larger projects.

- ***Estimating information database and use of IT***

In Chapter 3, an estimation information database was proposed for inclusion in the envisaged PBFMS model to complement the project tools in project planning. The view was also supported by literature (e.g. Charoenngam and Sriprasert, 2001; Meredith and Mantel, 2005; and PMI, 2004). It is further emphasised that enterprises need to develop and maintain an up-to-date project estimation information for reference and use in the estimation process. The estimation information database should include such items, for example, contacts for suppliers (including sub-contactors), output rates for plant and labour, usage and wastage rates for materials and cost rates for plant, material and labour. Given the tight schedule of tendering, an estimator should not waste time searching, for example, cost rates of inputs, try and derive rates from first principles (or in the worst scenario, guess estimate the rates. Searching for, or deriving rates) from first principles wastes time and effort guess estimating certainly makes the bid uncompetitive.

Results indicated that the estimation information database was adequate in a (Section 5.6.2) of SMCEs. This meant that the database existed and was up-to-date. However, the results are surprising when reflected on in the context of observations made in the previous studies. Some authors (e.g. Ogunlana and Thorpe, 1991) have noted that estimation information in the databases is never up-to-date because enterprises find the data from previous projects irrelevant to future projects. Thus information is not collected and analysed from the past projects to develop an up-date estimation information database. Enterprises that dwell on this point, normally base their argument on the fact that projects are unique due to several factors,

such as, topology, industry and site conditions. They argue therefore, that information from past projects may have no relevance to a future project which is different or implemented under different conditions. In addition, they argue that site staff are interested in completing scheduled work and feel overburdened to record information which does not directly relate to their operations. Thus due to goal incongruence between the estimators and site staff, the feedback necessary to develop and update estimation information database never takes place (Ogunlana and Thorpe, 1991). In the few instances when there is site feedback the estimating staff have to re-arrange the information to make it useful for their estimation purposes because the format in which the information is generated at site is normally not in the format that estimators need it.

Given that context what may explain why the information database was found adequate may be the role of the owner/manager who was indicated by the results as fulfilling more than the planning function in a number (41%) of SMCEs (Section 5.6.5). It was indicated that the owner/manager in some of the enterprises acts as the estimator, site administrator and conducts monthly valuations. In pursuing these roles, the owner/manager/estimator breaks the site feedback and goal incongruence barriers argued by previous studies. In this way, the owner/managers being involved with site work can easily and quickly update the estimation information database.

Another point of interest was whether IT was used in capturing, processing, updating and retrieval of information in the estimation database. The use of IT has been touted in literature (e.g. El-Ghandour and Al-Hussein, 2004; Gyampoh-Vidogah and Moreton, 2003) as an enhancer in the efficiency of any business process including project planning and control. However, results of testing for the use of IT in SMCEs indicated that many firms were not adequately using IT driven planning processes (Section 5.6.3), for example, in estimating to store estimating information electronically. Essentially majority of SMCEs were using manual processes consisting of hardcopy records or depended on human memory (Section 5.6.2- 5.6.3).

Lack of use of IT denies the SMCEs the advantages of efficiency and effectiveness in project planning, such as, compact, reliable storage of information, quick retrieval and referencing of information, accurate computation and easy correction of errors. It is noteworthy that when IT is not used in project planning, it is rare that it will be used in downstream process such as estimate adjudication and project pricing.

A number of studies (e.g. El-Ghandour Al-Hussein, 2004; and Gyampoh-Vidogah and Moreton, 2003) have attested that SMEs normally do not use IT systems basically for two reasons. First there is normally a lack of skills in the enterprises and secondly, the owners normally do not see a clear cut return on investment in terms of procuring and using IT assets which also require additional cost of hiring human resources with IT skills. Moreover, temporariness of projects makes it hard for IT systems to be installed at construction sites. In that case, manual systems capable of storing estimation information in form of hardcopies were used to create the database. In most cases part of the database resides in the estimator's memory since results showed a good number (40%) of estimators were also the owner/managers with an appreciable number of years of experience (half of them had over ten years experience) in estimating. The overall impression was they were comfortable with the rudimental manual systems. However, manual or memory based information based systems put a considerable risk to the enterprise, for example, papers may not be traced quickly or the owner may fall sick in the midst of tendering.

In summary, though the estimation database was found adequate, most SMCEs did not tap in the advantages of using IT to reap the benefits of quick retrieval and reference of information. In addition in a significant number (81%) of SMCEs, the database depended on one person, in most cases the quantity surveyor or the owner/manager. The next section discusses the implication of findings relating to an investigation in the adequacy and competency of the human resource in the planning process and other down stream processes in the post-tender phases of the project.

6.5.2 Adequacy of competency in planning for bidding and control

Chapter 3 highlighted that for the PBFMS to be efficient and effective, it requires a competent and adequate human element as part of its infrastructure in order to efficiently perform the tasks of planning, bidding, valuation, monitoring and control. Adequacy in human numbers entails identifying the average workload of the enterprise and the needed areas of specialisation. Since it was difficult to measure the amount of work load that SMCEs have at any particular time, it was not worthwhile investigating the issue of numbers. However, it was possible to investigate the adequacy of requisite skills needed for each function in the SMCEs. Competence was viewed as made up of speciality and experience in the job.

- ***Competence of project estimation***

The results in Chapter 5 indicated that in majority (64%) of the SMCEs, a single person performs the work of project scheduling and estimation (Section 5.6.5). It is in only a few (36%) enterprises that two separate individuals or groups perform the function of estimating project time and cost. The problem of having one person carrying out both functions compromises the quality of project estimates. When two or more individuals separately perform the project scheduling and cost estimates, possible errors and mistakes are easily avoided or reduced. Moreover, when they are so many jobs, the tasks can be overwhelming for a single person leading to more errors. In addition, reliance on one person also brings in the question of reliability of the process, for example, in a situation where the estimator falls sick in the midst of tenders.

Further investigation revealed that half (50%) of the SMCEs employ qualified quantity surveyors to perform the project planning functions and the practice was more prevalent in medium sized enterprises (Section 5.6.5). Best practice (e.g. Smith, 1998) recommends the use of a quantity surveyor for project estimates or somebody with a vast amount of experience. However, in quite a good number (44%) of SMCEs, the owner performed both functions (time and cost estimates) and this was more pronounced in small sized companies. From the results, the use of outside consultants was also observed to be in use. While this may not be a bad idea if a competitive tender has to be developed, the problem arises when

the tender is won and the site personnel are not conversant with project plans developed by a consultant. This may need re-hiring the consultant during construction phase and thus incurring more costs.

The results also indicated that in a majority (82%) of the SMCEs the estimators, be it owner or quantity surveyor, had considerable estimating experience of six years and above (Section 5.6.5). Since most projects that the SMCEs implement are not very complex, it may explain why owners in some of SMCEs use their experience to carry out both functions of time and cost estimation and also the lack of separation of the two tasks. However like a consultant, the owner/manager's presence may be needed at the site if something is not well understood by site personnel during construction. Inevitably, this dual role puts a great burden on the owners causing them to pay less attention to other managerial duties, particularly regarding soliciting for work

Most of the results also indicated that firstly, as we move progressively on the enterprise size ladder (for small to medium), enterprises become more professional and separate management from functional duties, for example, of estimating (Section 5.6.4). This allows specialisation and focus thus enabling the increase in quality of both managerial and functional output. However, in case where there is an over involvement of the owner in functional duties (which often includes marketing) the enterprise is robbed of a strategic outlook and effective management. The over indulgence of the owner/manager in various functions may explain why the results for the strategic planning process, discussed earlier, indicated an inadequacy in majority (mean levels of 1.91 and 1.04 shown by the results in Table 5.4 and 5.5, Section 5.5) of the SMCEs. Being engrossed in functional detail does not provide time for strategic thinking.

- ***Competence of project adjudication personnel***

Following on to the project estimation is the tender pricing process in which a mark-up is added to the total sum of the project cost estimate. Ideally the process should be carried out by a senior management team by analysing the accuracy of the estimates and assessing the risk on the project. Therefore, team spirit and wisdom is very much viewed as the best

practice. The management team need to assess the enterprise's situation, project and market conditions in terms of the work load and competition, respectively. These factors determine the level of mark-up to add to the estimate which includes the desired profit level on the project. Results indicated that in slightly over half (51%) of the SMCEs, the owner and sometimes the quantity surveyor or consultant, individually adjudicated the estimate contrary to the notion of team effort (Section 5.6.5). It is an undesirable practice for the same person to estimate and adjudicate the tender, be it owner, quantity surveyor or consultant. In this situation not only are errors are overlooked but the project and market conditions are not analysed thoroughly leading to submitting a non-competitive bid. Literature (e.g. APM, 2005 and Charoenngam and Sriprasert, 2001) recommends team work in project pricing to provide a more accurate and workable decision due to the contributions of the various members of the management team. Thus a lack of team spirit entrenches the position of the owner/manager dominating the senior team members, if and when they exist.

- ***Competence of valuation, accounting, monitoring and control personnel***

Other functions of the PBFMS which require the intervention of the human element are accounting, valuation, monitoring and control. The functions are normally interrelated because once construction commences, there is need to record data from transactions resulting from project activities, for example, materials used or labour hours expended on the work done. Thus recording may be in physical terms or monetary terms but eventually, it facilitates the monitoring and analysing of data in order to control project activities and resources. It also facilitates tracking of payments for resources used and expenses incurred on project activities. In addition, captured data permits valuation of work done to provide a means of invoicing the client in order to get periodic payments.

Results of an investigation into these functions revealed that in most (79%) of the SMCEs, a quantity surveyor performs all the functions of project valuation, accounting, monitoring and control. This is inline with best practices (e.g. Smith, 1995, Canter, 1993) which indicates that all three functions, except accounting are best carried out by a quantity surveyor. However, the results indicated that even the accounting function, was carried out by quantity surveyors in a very significant number (79%) of SMCEs (Section 5.6.5). The results were

interesting because first of all, it was a break with the monotony of the owner being involved in every activity. Secondly, the results indicated accountant is far less useful in SMCEs, confirming that the quantity surveyor or owner/manager are at the front of most of the functions of the PBFMS. The finding could mean that employing an accountant is seen as a duplication of effort or an additional and unnecessary cost in SMCEs where both management and financial accounting functions could be carried out by the quantity surveyor. It may also be the perception that since accountants are not conversant with project estimates, it is of no point including them in down stream processes after estimating. This perception is also reinforced by the fact that the financial functions in SMCEs are not very complex and thus with the pressure to avoid hiring costs, proprietors choose to employ a quantity surveyor to perform all the tasks mentioned.

In summary, regarding the human element involved in project planning and provision of information for implementation, a few aspects are worth noting. First, in half of the SMCEs the function of producing the project estimates was conducted by the owner while in the other half it was conducted by the quantity surveyor and in some few cases consultants. Second, the team spirit recommended in the adjudication process was absent in most of the SMCEs as the owner/manager dominated the adjudication process. Finally, at the implementation stage, majority (82%) of SMCEs left the quantity surveyor to conduct the valuation, monitoring and control of the project. However, in some, the work was done by the owner who also was involved in other management duties. The next section discusses results of investigating the overall adequacy of information produced for bidding, valuation and control.

6.5.3 Adequacy of project planning information for bidding valuation and control

The major output of a PBFMS is information and the cradle of most of the information generated during pre- or post-project tender is either based on or derived from project estimates. The importance of project estimates is due to the fact that all the other project processes, including bidding, operations, accounting, valuation, monitoring and control and performance measurement processes are based on its *existence* and *quality*.

The study investigated the existence of major aspects of project estimates produced by SMCEs. Quality was tested in terms of how effectively project estimates facilitate other project processes mentioned above. Results in Chapter 5 indicated that the project estimates produced by SMCEs had the necessary ingredients expected of such information (Section 5.6.4). In other words, they were adequate in this respect and thus emulated the desired effectiveness of the proposed PBFMS.

The results obtained were not surprising because project estimates, being the basis for obtaining jobs, must be performed adequately in order to submit competitive bids to clients. SMCE would do anything therefore, to ensure that all necessary items expected by the client and any aspects which may give a competitive edge to the enterprise are included in the bids. In the construction industry, the major objective of the project estimating process is to price the bill of quantities provided by the client in the tender documents. This entails stating the 'right' price for executing each item of work indicated in the bill. However, to arrive at the item rates several other tasks are necessary to achieve this objective. These include, for example, identifying the scope work required by client as stated in the tender document and the associated specifications and standard of workmanship. Following on to the 'down loading' of scope and quality from the client tender documents is the development of a project schedule which is conducted by firstly identifying and documenting the methods of construction (method statement) for each item of work. The completion of this task leads to the identification of activities making up each item of work determining their sequence and estimating their duration. From the sequence critical activities are identified and the project duration is determined by adding up the total duration of the critical activities. The assembly of all activities in their sequence leads to the development of a project schedule. The project schedule forms a major and critical part of the project estimate because, for example, it determines how long the resources are used, on the project. The study results showed that these aspects were adequately carried out.

Following on to the project schedule is the estimation of costs of project activities by identifying, specifying and quantifying the necessary resources to execute them. In determining the cost of resources, cognisance is given to their type, specification, quantity,

quality and duration of use. The estimation process converts the basic cost of resources into all-in rates and on-site costs for pricing the bill of quantities. For the purposes of internal control the estimation process aggregates costs identified for each work package in order to develop a budget for each deliverable. The aggregation of costs for all deliverables leads to the development of the project expenditure budget. All these processes and the relevant information were found well developed in a majority (mean level of 2.37 (Section 5.6.2) of the SMCEs, implying the PBFMS were adequate in producing reliable project estimates.

However, while time and cost estimates existed (as developed from the scope and quality specifications provided by the client), results indicated that in a majority (68%) of the SMCEs, the basis on which the estimates were developed, that is, the assumptions, were lacking. In addition, majority (87%) of SMCEs did not make any assessment of the nature of risk and contractual conditions for projects. Best practice (as espoused by, e.g. Ndekugri and MacCaffer, 1988; and MacCaffer and Baldwin, 1984) asserts that a project estimate should include three statements relating to assumptions used for the assessment of risks and contractual conditions to facilitate the adjudications process conducted by senior management team.

The reasons for lack of assessment of project conditions may lie in the fact that in a considerable number (44%) of the SMCEs, the estimation process and tendering process are in many cases treated as a single process and conducted by a single person, the owner/manager. In cases where the estimator is different from management as in 50% of the SMCEs sampled, it was indicated that a verbal report was discussed between the estimator and the owner. In these two situations, a high possibility exists that the assumptions, risks and contract conditions are simply noted and incorporated in the bid during the tendering process without necessarily being documented. The nature of handling the bidding process points to the fact that the process is not a very formal process in a SMCEs.

The other reason for lack of the three statements in a project estimate may be due to the nature of projects. Firstly, projects executed by SMCEs are not very complex, with many involving not more than three storey buildings and sums of less than P8 (R9.86) million and

for the civil projects the upper limit is about P40 (R46.8) million (as according to the recent classification of enterprises by DBES (2007) and DR (2007). Secondly, the contract conditions are similar from project to project since majority (65%) of work is from almost the same clients, namely central government and local authorities. Most likely the position taken by estimators and management is that the risks on such projects are similar and well known to warrant formal and complicated documentation of risk and contractual conditions.

The second investigation on project estimates was their *quality* in terms of the manner in which they facilitate other down stream processes. The discussion of the results of investigating for this attribute follows next, beginning with their adequacy in bidding.

- ***Adequacy in bidding***

Bidding process formulates the tender price for a project. Bidding involves a three stage process, adjudication, setting of the mark-up and the actual tendering process. The latter is more of an administrative task to comply with the client's instruction than a function of the PBFMS. The first two tasks are definitely envisaged functions of the PBFMS. Much of the information used in the adjudication process is based on the submission of the estimator in form of project estimates, assumptions, project risk analysis and an assessment of contractual issues as discussed before. Therefore, the investigation focused on issues of pricing the bill of quantities after the setting of a mark-up consisting of overheads, risk and profit factors. However, as indicated earlier, part of the risk is catered for as a contingent sum provided for by the client in the tender documents.

Results showed that majority (85%) of the SMCEs do not disaggregate the mark-up into its constituent parts mentioned above (Section 5.6.4). However, they indicated that the mark-up set differs from project to project. Reasons for variation included in descending order, the level of keenness, competition, nature of project and market conditions. In essence what this meant was the profit levels expected differed on each project.

While majority (Section 5.6.4) viewed their bidding information and process as being adequate, the results indicated that their bidding success rate was lower than the level

espoused in literature (e.g. Canter, 1993 and Smith, 1995) which suggested that for sustained job acquisition, the success rate should be in the range between 10-17%. Majority (67%) of SMCEs fell below 10% range meaning if ten jobs are tendered for either one is won or nothing. This was a troubling result because failure to win jobs is not only a costly exercise but determines survival of enterprises.

Although for convenience and consistence of discussion bidding information was separated from the human element that conducts the task, in reality the separation is artificial as the two are closely interlinked. Through a cognitive process management team has to make a judgement as to what level of the mark-up should be set on each project. This judgment is normally based on experience and management's gut feeling in relation to how they view the extent of competition and the state of the market and economy. Thus the success of a bid depends on at least both management cognitive prowess and bidding information.

- ***Adequacy in valuation***

Valuation is the partial completion of the construction sales contract. Work completed within a period, normally every month, is measured and valued using the rates inserted in the bill of quantities during pricing (bidding). The actual measurement of work by both the estimator and the client's representatives is not of significance at this point but it is the implication of the application of the rates and on the final value of work when the project is completed and its relation to PBFMS. The rates are an output of the estimating and adjudication processes of the PBFMS. The result of investigating how the PBFMS facilitates the valuation process indicated that it was adequate in a majority (mean level of 2.15 shown by the results in Table 5.12, Section 5.9.1) of SMCEs. The results are not surprising given the fact that it is a straight forward process of measuring and applying already existing rates. The only snag came when an investigation into the ultimate need to reconcile progress payments with the contract sum that flaws emerge.

External valuation, which is valuing work completed in the period, getting it certified by quantity surveyor and invoicing the client, is only a part of the valuation process (Cheng *et al.*, 2002). Internal valuation relates to the need to ensure that, when everything is held

constant, the sum of progress payments plus retentions finally adds up to the contract sum stated in the bid. Results from an investigation on this aspect indicated that SMCEs did pay particular attention to reconcile actual and planned value in order to determine whether actual value adds up to planned (Section 5.6.4). In their perception, SMCEs construed valuation as the need to measure work and get it certified in order to be paid without knowing the implication it has on the ultimate final tender sum.

The major reason for the inadequacy of this aspect lay in the lack of preparation of debtors schedule, a piece of information that shows how the planned contract sum is expected to be spread over the contract period. In the open ended sections of the data collecting instrument, a few respondents provided some reasons as to why they did not prepare such information. They contended that such information may be of little value since it is not normally followed because the rate of actual progress of work most likely varies from planned amount. In addition, there are also often disputes on the value or quality of work, for example, which unfixed materials to include in the valuation.

In determining the adequacy of the valuation component of the PBFMS, it was clear that SMCEs concentrated on the progress payments part of it, and ignored its implication on the control aspect which aims at achieving the forecast contract sum.

▪ ***Monitoring, control and performance measurement***

A linear view of the project delivery processes, would tempt someone to think that last processes in the project delivery chain are monitoring, control and performance measurement. The PBFMS plays a great role in gathering and processing information for these activities. However, cognisance must be taken that these sub-systems cannot effectively function without the accuracy and availability of project estimates. In addition, both the control and performance measurement tasks depend very much on the suitability, accuracy and timely availability of monitoring reports to provide the needed mechanism for controlling projects right from inputs to outputs of activities. Moreover, information availability is one aspect but the ability to take sound decision for control is another important aspect in the control sub-system. In a study on construction enterprises conducted by Cheng *et al.*, (2002)

relating to the ranking of information required by a general contractor, monitoring and control came second after planning, emphasising the interrelatedness and importance of the two tasks.

In investigating for the control attribute of the PBFMS two attributes were tested, firstly whether the information produced was adequate to facilitate the control process. Secondly, the extent to which the control feature of the SMCEs facilitated in delivering projects on time and within cost based on the premise that a good control system enables effective delivery of projects. However, this is not to say that there is necessarily an absolute causal (one-to-one) relationship between project control and the project delivery metrics.

The results of investigation (Section 5.9) in the control sub-component of the PBFMS revealed that it is inadequate both in information provision and on its impact on project delivery, for example, results indicated that majority of projects were delivered beyond schedule (82%) and contract sum (95%). The results were similar to those of another study (Ssegawa and Ngowi, 2007) conducted to identify the causes of poor performance of public construction projects in which it was indicated that 85% of the projects studied had time overruns while 65% had cost overruns.

The problem of inadequate monitoring and control is multi-faceted. Firstly, the commonly identified cause of inadequacy of project control is the ineffective project reports. Results clearly indicated that the basic reports expected, for example, material control in form of margins, wastage and usage reports; variance in labour and plant cost and outputs rates; and overhead variances, were rarely produced for most of projects (Section 5.6.1) of SMCEs.

Secondly, there is always a general problem of inaccurately predicting, or not trying at all to predict, the rates of items of work and materials that will prevail at the time of execution of the project due to inflation. Indeed results showed that SMCEs do not have inflation indices to adjust the rates held in their estimation database (Section 5.6.2). What this means is that most of SMCEs produced tenders with rates that do not reflect future price increases. On

winning projects they find themselves with project cost overruns arising from increases in prices of resource inputs.

Another issue which may be attributed to poor project control and which was identified in the results was the issue of the adequacy of the human element. It is the human element that makes control decisions. If that aspect is lacking however, useful or accurate the reports are, project control cannot be effectively achieved. Project control requires that data is gathered, processed and analysed, most often by different staff from those performing project operations at site. Apart from fostering an element of independence in the control mechanism, site staff would be overloaded if they were to execute project activities and perform a greater part of project control functions. This scenario and the fact that the findings indicated that the owner/manager or estimator are persons who also perform the control functions in a majority (as indicated earlier) of SMCEs would reinforce the notion of work overload on these personnel. Moreover, what complicates project control, if indeed is performed by either the estimator or owner/manager, is the logistical nightmare created by the distances between the site and head office where the duo is normally based. Canter, (1993) and Ogunlana and Thorpe (1991) added another twist when they noted that there is normally data incompatibility between site and estimate information to facilitate proper comparison and hence project control.

The issue of performance measurement requires recognising that it can be done at two levels; at enterprise and project level. At the enterprise level it requires aggregating results from all the accounts of various project into a corporate financial statement. The function is best performed by the enterprise financial accounting system, a system which was outside the scope of study. Therefore, the focus of performance measurement was at the project level.

The study sought to investigate the adequacy of the PBFMS in facilitating the adequacy of performance measurement at project level. Performance at project level is measured in two ways, periodically and at the end of the project's life. The former is intertwined with project control. The desire by the project team to know how the project is performing during implementation also necessitates controlling the project. Period performance deals with the

desire to know how the project is progressing and at what cost. Inevitably if the project is not performing well, the obvious reaction is to take corrective action – which is project control. Therefore, the results of periodic performance were considered the same as project control and the PBFMS were found to be inadequate to facilitate this exercise (Section 5.6.4). The possible reasons have already been given.

Project performance evaluation also needs to be conducted at the end of the project for the purposes of organisational learning. This allows the project team and management to assess their systems, processes and effort. However, in order to accomplish this task the PBFMS must supply information relating to the review, both the forecasts and the actual. It must therefore, be configured in such a way that it can facilitate the exercise. The results (Section 5.6.2) showed that the PBFMS do not adequately facilitate the carrying out of this processes in significant number of SMCEs.

The implication of not conducting a post project performance review has the disadvantages of prohibiting organisational learning, a process which allows communication and review of challenges and problems among team members. This is particularly important for those at site and head office; between procurement and the users of the assets procured. With a project review, experienced problems are identified and innovative solutions suggested by team for deployment in the next project. However, caution must be made that the process only works if it is not a witch hunting exercise. Once a blame culture emerges, then subsequent reviews become an exercise of defence, fortification and cover-ups defeating the whole purpose of learning.

6.6 Implications of Findings- the Management Commitment Component

From a human perspective the mere possession of skills possessed by the operatives of the PBFMS in the enterprise is not enough, management behavioural disposition while conducting business forms a major part of the drive for enterprise success. The epitome of management behavioural disposition is engrained in management leadership represented by its commitment to the enterprise vision and mission through the support of activities and

systems. In other words, no matter how adequate the PBFMS may be however efficient and effective the project manager and his team are, if management are not committed to the project, it is highly probable that its performance will be hampered.

Thus one of the major hypothesis of the study, sought to investigate management's support and compliance for activities, processes, procedures and policies relating to the development, operation and usage of PBFMS in the enterprises. A number of studies (e.g. Basu *et al.*, 2002) have argued that management's commitment leads to an effective PBFMS and in turn the latter is linked to enterprise success (Kearns, 2007).

Results of testing on of the major hypothesis in Chapter 5 showed that management, in majority (mean level of 2.49 shown by the results in Table 5.16, Section 5.9.1) of SMCEs (Section 5.7.2), is adequately committed to observing the best practices expected while developing, operating and managing an effective PBFMS. As indicated in Chapter 5 commitment was made up of two constructs *support* and *compliance*. The two words in turn were represented by a number of constructs which measured the *adequacy* of commitment as a major component of a PBFMS. Support, for example, meant that management got involved and participated in issues relating to best practice in PBFMS. On the other hand involvement, for example, meant that management provided a visionary outlook, consistently charting the future direction for development of a PBFMS and at the same time constantly demonstrating to team members the link of the PBFMS contribution to the enterprise mission.

Thus according to the results management's perception and attitude was that a PBFMS was critical to the success of the enterprise. The result was not surprising since a PBFMS is at the heart of most of the important functions in the enterprise, for example, project estimating, pricing, valuation and project control. The enterprise's survival, for example, is based on winning tenders and valuing work done, both of which hinge on the estimating and bidding processes facilitated by a PBFMS.

Management's participation relates to the investment of resources, time and energy in matters pertaining to a PBFMS. Thus involvement is more of a mental state of management while

participation is a hands-on approach requiring engaging in activities that pertain to the planning development and implementation of a PBFMS. Management, through its leadership, provides the much needed direction and guidance in the development, operation and sustenance of a PBFMS. This must be evidenced in the desire for management to invest in resources for the PBFMS in order to make it efficient and effective in performing its functions and thus facilitate organisational performance. In addition, by requesting and using information, management sends a signal of the importance of a PBFMS in the enterprise decision making process. All these aspects were found to be adequately existent and practical in a majority (shown by the results in Tables 5.15-5.17, Section 5.7.2) of the SMCEs.

Another dimension investigated was compliance by management to the PBFMS controls, procedures and policies. It is not always the case that support is always followed by compliance. For a PBFMS to function properly and consistently there must be procedures and policies which in many cases manifest as financial controls to guide the behavioural attitudes and actions in the treatment and recording of transactions, for example, relating to the purchase and usage of assets belonging the enterprise. Controls ensure minimisation of abuse, wastage and misuse of assets and money by employees, including owner/manager. Thus enterprise resources are only channelled for value adding activities.

The results obtained in the study indicated that management complies with best practices relating to policies, procedures or controls of the PBFMS, seem contrary to other studies and reports (e.g. Ritchie and Richardson, 2004; BOCCIM, 2005; and Basimanebotle, 2005). The issue of management compliance with best financial practices had been of concern in smaller enterprises including SMCEs. Some studies (e.g. Ritchie and Richardson, 2004) made the observation that some of the proprietors transfer enterprise designated funds into personal bank accounts or use enterprise funds to finance a lavish lifestyle, including the purchase of expensive cars, provision of gifts to friends and the taking of personal holidays all of which are unrelated to business. Similar observations have been made in Botswana where proprietors were reported to have bought expensive cars or diverted enterprise money to other businesses. Palalani (2000) and Basimanebotle (2005), for example, cited situations where contractors use project funds for buying cattle for their so called 'cattle post' ventures (a form

of cattle rearing common in Botswana). In addition, issues of, for example, ensuring that the owner is paid a set monthly salary as opposed to making unwarranted and unexplained withdraws that are not properly accounted for were also frequently cited (Basimanebotle, 2005).

The explanation for the contradiction lies possibly with the identities of individuals who completed the data collecting instrument in the SMCEs. While it was anticipated that the instrument was to be completed by estimators or accountants in the enterprises, the results indicated that the owner/manager in a significant number of SMCEs completed the questionnaire (5.3.1). Secondly, even where there were actual estimators and accountants, it is possible that the owners could have sought to complete the questionnaire by themselves, viewing the divulging of some of the information as sensitive and confidential to leave it to employees. In a study conducted to investigate problems encountered by citizen contractors in Botswana, it was revealed that because most of the SMCEs are a one-person operation attempts to get information relating to their operations were sometimes treated with a high degree of suspicion (Sentongo, 2005). Moreover, this was exacerbated by an increasing attack on the industry by politicians and media for poor performance. Some contractors saw research studies as a further attempt to dig out their weaknesses and use them to attack and stigmatise their businesses and the industry as a whole (Sentongo, 2005). The scrutiny on the industry in Botswana has never ceased as another report on industry (Ssegawa and Ngowi, 2007) revealed two years later that the performance of contractors was one of the major causes of the poor performance of the industry. In that situation, majority of the owners of the SMCEs sought to complete the questionnaire themselves. In that case it would take a straightforward individual to say whether there is a flouting of PBFMS controls in the enterprise they own as this would implicate them in an unprofessional conduct leading to poor enterprise governance. While there is adequate support for PBFMS, there is doubt whether there is absolute compliance for best practices of operating a PBFMS. Therefore, the truthfulness of the results of this component are difficult to vouch and hence difficult to ascertain what exactly happens in the SMCEs regarding financial transactions and processes.

6.7 Adequacy of PBFMS of SMCEs and its Contribution to Performance

The foregoing sections have discussed results pertaining to the major hypothesis formulated and tested in the study relating to the existence and adequacy of the major components of a proposed PBFMS for SMCEs. The discussions indicated that the two of the major components namely the *project planning and control* and *management commitment* to PBFMS were *adequate* (illustrated in Figure 6.1). However, the *strategic management* component was found to be *inadequate*.

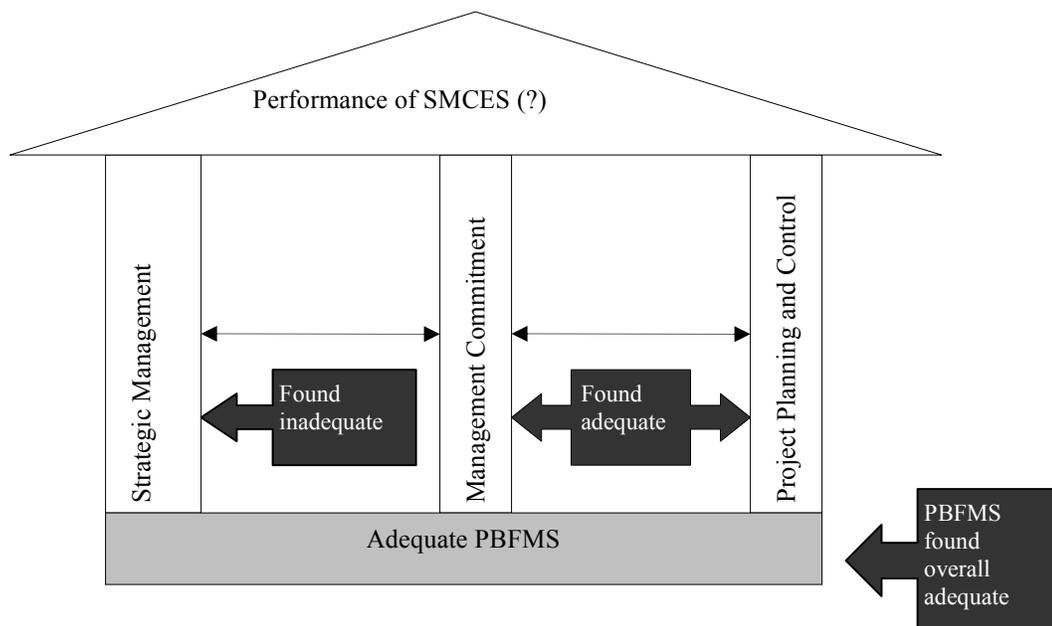


Figure 6.1: Findings of the adequacy of the major components of PBFMS of SMCEs

However, *when all components* are combined, the results in Chapter 5 indicated that that *majority (mean level of 2.1929 shown in Table 5.17 Section 5.10) of SMCEs have an adequate PBFMS to facilitate their performance (see Figure 6.1)*. This was contrary to the premise (hypothesis) of the study which suggested, that SMCEs have inadequate PBFMS which contribute to their poor performance. The basis of the study was that an adequate PBFMS would facilitate the vital areas of performance, for example, bidding to achieve above average success rates of obtaining work in order to obtain set turnover targets.

Secondly, an adequate PBFMS would facilitate the efficient and effective project implementation and control (in terms of cost, schedule and quality) to ensure planned profit is achieved. It is not enough to obtain revenue, it is important to control costs so that projects are delivered to clients in time and at agreed cost. The two aspects if achieved ensure two things, planned profitability and client satisfaction. In making these premises, it was recognised that an adequate PBFMS was not the only factor in enhancing enterprise performance but a major contributor or facilitator.

Furthermore, results in Chapter 5 indicated that while the majority (as indicates by results in Section 5.8) of SMCEs had an adequate *overall* PBFMS there were still those which had an inadequate PBFMS in the sample studied. The study was based on the premise that an adequate PBFMS facilitated good performance. It was worthy testing to determine whether there was a remarked difference in those SMCEs which had an adequate PBFMS and those which had an inadequate one, even though the overall performance was poor. The results confirmed (Section 5.10) that indeed there was a significant difference in performance between the two, with those with adequate PBFMS performing better than those which had an inadequate one.

In summary, the overall PBFMS of majority (Section 5.8) of SMCEs was adequate and in addition, though majority (Section 5.9.2) of SMCEs experienced poor performance, those with an adequate PBFMS performed better than their counterparts.

6.8 Revisiting the Proposed PBFMS Model

In Chapter 3 a PBFMS model (see Figure 3.9, Chapter 3) was proposed made of three components namely, strategic management, planning and control and management commitment for PBFMS development and management. The model was considered an essential part of the SMCEs infrastructure which if adequately configured would lead to effective project delivery, this would lead to customer satisfaction and finally good financial performance.

Best practices in each component were identified, for example, in the project planning and control, the use of tools and estimation information databases in the production of project estimates and other types of information for various decision-making processes. It thus was envisaged that if the model is implemented by SMCEs, it would provide the effectiveness needed for the most crucial areas of performance namely long-term survival, particularly relating to competition and down-turns in the industry. For the short-term tasks, it was envisaged that the model would facilitate the efficiency and effectiveness needed in maintaining above average success rates in bidding and in facilitating project control in order to achieve the forecast project profitability.

A PBFMS capable of facilitating the effectiveness for achieving long and short-term performance was considered to be adequate for an SMCE and crucial for fulfilling its mission. The actual systems of the SMCEs were tested for adequacy of which results were presented in Chapter 5 and discussed in the preceding sections of this Chapter. A review of what was anticipated and what obtained is necessary to determine if there are any adjustments to be made to the proposed model in order to make it more practical for the SMCEs application. Secondly, the revised model resulting from this research would also be considered the study's contribution to knowledge in the area of financial management in a project based environment of the in the construction industry, and in particular in Botswana.

6.8.1 A revisit of the PBFMS strategic management component

In general terms, strategic management requires going through several iterative processes including scanning and analysing the environment, formulation of goals and strategies and following up their achievement through the development and implementation of operational plans. Results indicated that in its entirety, the strategic management component was found inadequate in majority (as shown by results in Table 5.4, Chapter 5) of the SMCEs. For large enterprises strategy has been noted to be achievable in three basic and generic ways namely differentiation, focus and cost effectiveness (Ansoff, 1967). It was however pointed out that differentiation was not a practical strategy in the construction industry, especially where the traditional procurement system is used (Betts and Ofori, 1992) since the design process, where most of the innovation takes place in the project delivery chain, is not in the hands of

construction enterprises but with the project designers (architects and engineers). It was also noted that the focus strategy is difficult to implement in an industry with a narrow product and service base. In addition this is compounded by a narrow clientele base which characterises the developing countries, including Botswana. A dominant client exists in such markets namely the public client, who in case of Botswana offers 65% of the jobs (Ssegawa and Ngowi, 2007) and therefore, it is a practical reality to focus on this market. Moreover, in terms of category of work, building projects are let more in the market than civil works and are more lucrative than maintenance work.

The above situation leaves SMCEs with the traditional strategy of cost, time and quality, that is, ensuring that they are cost effective and able to deliver projects in time and within agreed specifications. The cost effectiveness strategy may be viewed as an integrated package because failure to achieve time and quality impacts directly on cost containment. This is where an adequate PBFMs facilitates the achievement of the strategy.

In view of the fact that strategic management needs not be grandeur like in large enterprises, SMCEs should concentrate on strategies that would increase their profitability by increasing their market share and cost containment effort facilitated by practices and tools of an adequate PBFMS. In construction, turnover and market share targets act as long-term goals for achievement in the planning period and thus facilitate an enterprise's movement from one registration class (and hence size) to another. Canter (1993) and Smith (1995) attested to this premise when they noted that in the construction industry turnover targets provide the overall impetus for identifying value providing markets and funding requirements. Charoenngam and Sriprasert (2001) further noted that increased market share normally translates in increased turnover which in turn translates into greater profitability if costs are contained; profitability provide greater cashflow for growth. All these, it is envisaged, should be facilitated by an adequate PBFMS.

The strategic component suggested in Chapter 3 (and illustrated in Figure 3.4) may therefore, be re-stated in view of the above understanding created from both the results and literature. Thus some adjustments are necessary as illustrated in Figure 6.2 (in grey boxes).

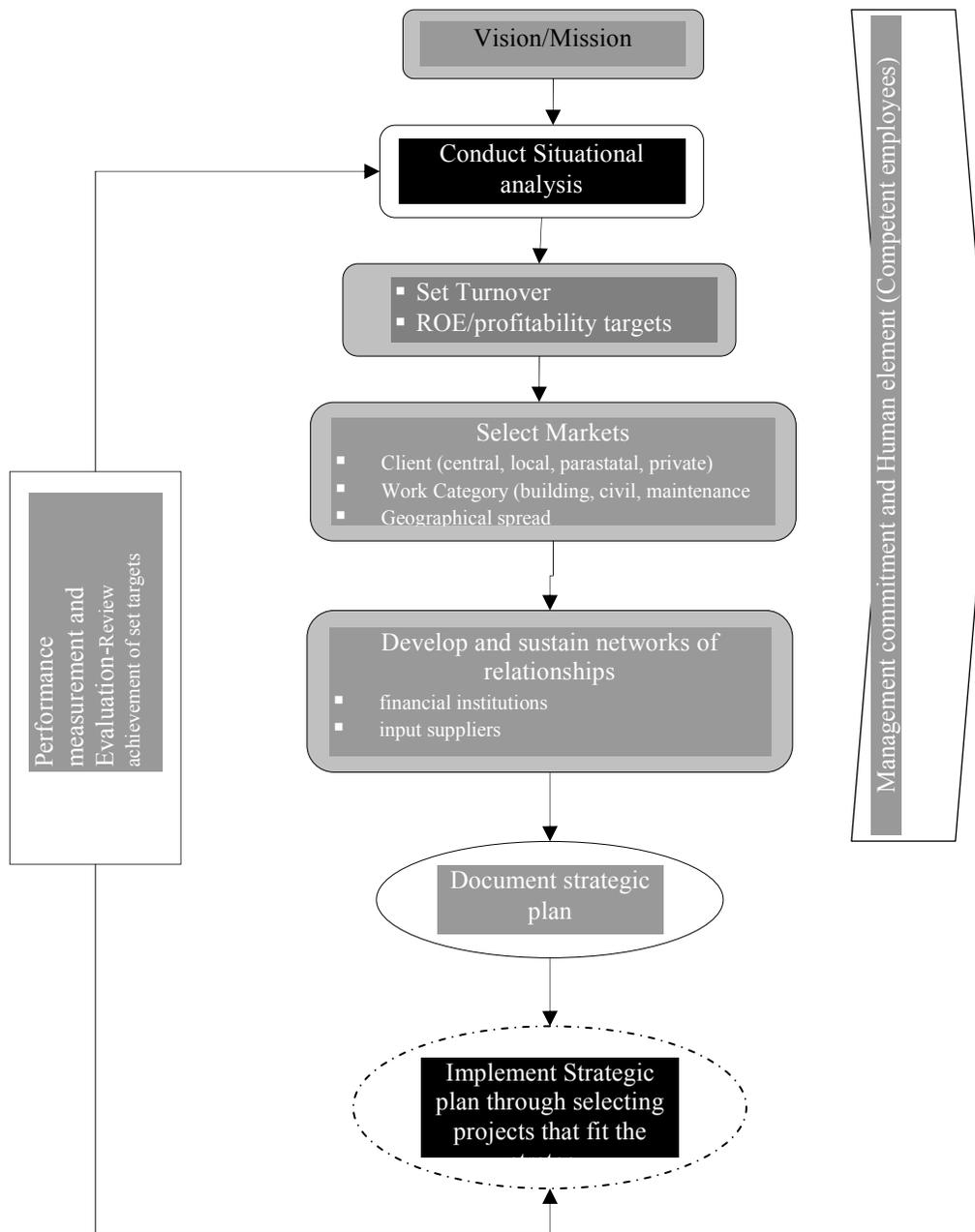


Figure 6.2: The strategic management component of the PBFMS

- i) Firstly, SMCEs must define their mission, in order to focus on what makes them exist and how they want to exist. It was noted, for example, in Chapter 2 that some proprietors may not want growth for their enterprises, preferring to stay small while others prefer growth (Stanworth and Curran, 1977). Both trends have been noted in the SMCEs studied in Botswana.

- ii) Secondly, SMCEs must have practices of conducting a situational analysis to identify and internalise threats and opportunities resulting from competition, trends in the industry and state of the economy in order to determine demand and competition. This process appeared to have been conducted by the SMCEs studied. However, the interpretation of the information obtained from the process and the consequent decision making process was found inadequate (Section 5.5.5 - 5.5.3).
- iii) Thirdly, SMCEs must set turnover and profitability targets for achievement in the planning period (for example three years). Canter (1993) suggests setting turnover targets which are based on previous planning period but taking into account the prevailing conditions as forecast from the situational analysis.
- iv) To incorporate the entrepreneurial part for going into business in the equation, SMCEs need to incorporate targets that seek to benchmark a return on capital invested. This in turn will set the profitability target for projects.
- v) Fourthly, they should develop markets in terms of clients, category of work and geographical spread that give the optimal value to achieve the set targets. Thus only projects that are within identified markets should be tendered for because they are presumed to provide the greatest value for achieving set turnover/profitability targets. This calls for tendering for work in identified market only, be it in form of type of clients, category of work geographical location or combination of all them.
- vi) Fifthly, they should create a network of supplier relationships. This will facilitate obtaining project resources at economical rates and at the required reliability and quality. This aspect includes maintaining a good relationship with financial institutions to ensure a smooth flow of funds even when the times are hard.
- vii) Sixthly, SMCEs must link the strategic plans with operational plans by developing functional and project plans to implement the strategic plan. The targets identified and set for a particular planning period are only achievable in a stepwise manner through operational plans
- viii) Lastly, there should be a mid-term and final review for the strategy to examine whether it is still on track and to the extent to which it has been achieved, respectively. If the plan is not being achieved an analysis should be conducted using a situation analysis (for internal and external factors) and a corrective action taken. The plan should be

updated to indicate the contemporary situation (hence the bi-directional arrows in Figure 6.2 show the iterative nature of the strategic management process).

It is envisaged that each step and choice made in the strategic management process logically leads to another, for example, extending the market by choosing to move into the civil work category or increasing the geographical spread requires changing the enterprise's structure and acquiring the necessary resources to support the required strategy and the changed logistics. Often construction enterprises spread themselves geographically far beyond their reach as a result of not analysing that the situation requires additional management and resources to support the increased scale of logistics. The need for more resources and the nature of the construction industry makes it mandatory to create a network of relationships with financial institutions and input suppliers to match the geographical spread of project work.

Moreover, the fact that the construction industry is an accrual based industry where payments often lag behind expenditure and made in progressive interval with a significant amount of retained funds, creates an inadequate cashflow situation project after project. Therefore, the need for creating a network of relationships with financial institutions and input suppliers cannot be over emphasised for SMCEs.

It has been added and emphasised that a competent human element (see the right hand side of Figure 6.2) is needed to conduct the process using tools and technique which efficiently provide the necessary information and which is effective in providing a strategic direction for the enterprise. Lastly, the link between strategic and operational plan are highly emphasised in form of functional and project plans because this is how strategies are implemented. This sets the tone for discussing the next aspect of review of the model namely project planning and control component.

6.8.2 Re-visiting the planning and control component of the proposed PBFMS model

Project planning entails three major processes namely the development of the project estimates, tendering and project monitoring and control. The results presented in Chapter 5

and their subsequent discussion in the preceding sections of this Chapter concluded that the planning and control component of majority (as shown by the results in Table 5.13) of the SMCEs are adequate. The discussion highlighted that some adjustments need to be made to make the model more practical for use by the SMCEs as compared to the one described in Chapter 3 and illustrated in Figure 3.6. However, it must be noted that this component, unlike the strategic component requires, only a few adjustments.

- i) The adjustments include, firstly, the linking of the strategic plan to the operational plan, particularly to project plans has been identified as the missing link, yet it is where project planning starts as illustrated in Figure 6.3 (grey colour depicts missing component or a component not adequately performed by the SMCEs). The decision to tender for a project should be made based on two interrelated issues, firstly whether the project is aligned to the strategic plan (the link) and secondly, whether the nature of the particular project is one that will create value for the enterprise (strategic fit). To answer this question a preliminary project study is conducted. This task was found well conducted in all the SMCEs perhaps because normally the client normally requests all tenders to visit the site of construction before bidding for the project.
- ii) A slight adjustment to the previous model (Chapter 3, Figure 3.6) was the scope definition which required defining the scope of work to be done in the project. However, since the scope definition is always developed by the consultants (architects and engineers) and given in the tender document from the client in a traditional procurement system, SMCEs only need to ‘down load’ the scope for understanding the work requirements. This task is a precursor to the development of project estimates in form of schedule, budget, cashflow forecast and risk plan.
- iii) The budgeting process of the project was found wanting and proposed model is suggesting that it should be done after the pricing to allow a double sided view. This would consist of an expenditure and revenue schedule to provide the timing of flow of funds out of and into the enterprise during the construction phase. It is noteworthy that revenue schedule cannot be completed before the pricing of the tender and perhaps that why it is neglected.

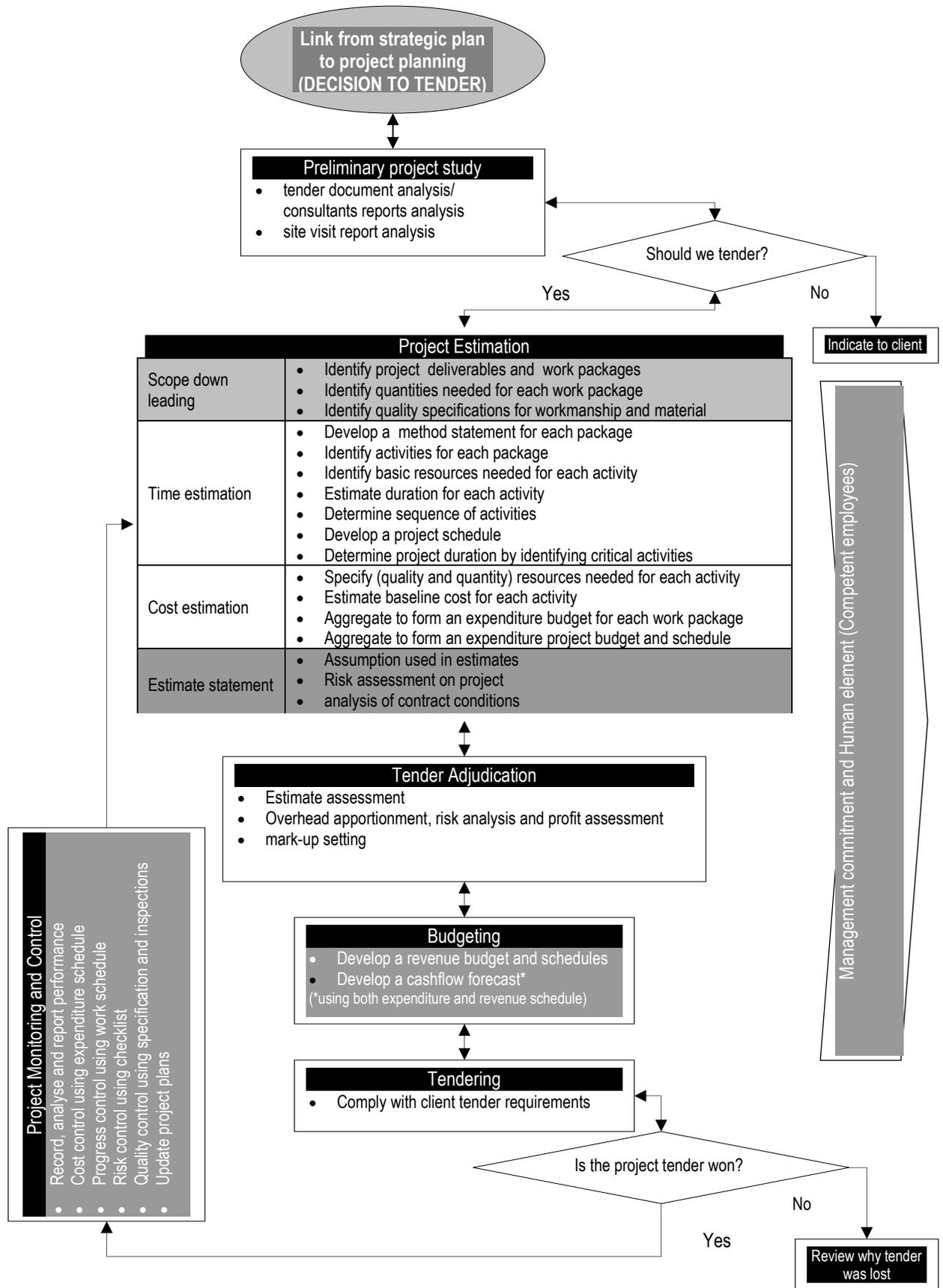


Figure 6.3 Project planning and control component

Thus production of an expenditure and revenue schedules facilitates the development of a project cashflow statement with a view to ascertaining and planning for financing requirements.

- iii) The model emphasises that once a tender is won and project work commences, project monitoring and control must begin and if there is any change to the plan, an updated plan must be produced. This also emphasises the iterative nature of the plan-monitor-control cycle. The aspect was found wanting in a majority of SMCEs and needs to be strengthened in SMCEs.
- iv) Like the strategic model the human element in conducting the project and control processes is emphasised (see Figure, 6.3 on the left). The emphasis is on the need for skills, experience and adequate numbers.

Like in the strategic component, the need for a competent human element is needed to conduct the planning and control process using tools and techniques that provide the necessary efficiency in order to provide information which is necessary and effective.

6.8.3 Re-visiting the management commitment component

Management commitment was mentioned as an important ingredient in the success of any activity in the enterprise. Though the aspect was discussed in Chapter 3, it was not included in the model illustrated by Figures 3.4 and 3.6. Due to its importance the component has been visually added in the updated model as shown in Figure 6.1 and 6.2. The point being made is that management must get involved and participate in decisions and activities that support the development and operation of the PBFMS and moreover exhibit behaviours and action that comply with best practices in financial management.

Figure 6.1 has purposely shown management commitment as a triangle embracing the other two components in rectangles to emphasise the requirement for management commitment and leadership for the two processes. The triangle indicates the hierarchy of management levels (top, middle and lower), although in SMCEs these levels tend to merge into almost one that of the owner/manager.

6.9 Contribution to Knowledge by the Study

In pursuit of Phillips and Pugh (2000) observation that a doctoral thesis should contribute to knowledge (Section 1.7.1), this section discusses what has been achieved in the study in regards to this aspect. This however, has to be digested in tandem with the introductory discourse to the issue given in Section 1.7. Four observations are being put forward.

- i) Firstly, and as already stated before, strategic management has been widely studied for large enterprises and mainly in non-construction sectors of the economy (e.g. Porter, 1991; Robin and Pierce, 1983; Newkirk and Lederer, 2006). In addition, when an attempt to study the strategic management process has been done in the construction industry, it has been studied in isolation from operational issues. In other words strategic management studies have conducted in a manner that divorces it from operational issues as if there is no link between the two (e.g. APM, 2005; PMI, 1996 and 2000; Betts and Ofori, 1992; Junnonen, 1998). The thesis has combined both strategic management process and operational aspects and proposed a model on how the two should be *conducted* and *linked*.
- ii) Secondly, the steps provided for in each component of the proposes model are considered practical in nature as opposed to the generic frameworks provided for in the project management books of knowledge developed by the various project management associations (e.g. PMI 2004 and APM, 2005).
- iii) Thirdly, there has been very little empirical research work carried out firstly, in the construction industry of Botswana and secondly, in a manner that combines and examines how financial management is interlaced with project management.
- iv) Fourthly the thesis has empirically uncovered the practices of the construction enterprises in Botswana regarding various facets of their major operations, right from the strategic view, operations and management practices.

It is envisaged that the study has provides an understanding of how SMCEs operate with a view to improving their performance. This will certainly benefit contractors, the client and

policy makers. In Botswana, the last two are almost intertwined and would be keen to identify areas where they can facilitate contractors in order raise their level of performance.

6.10 Study Limitations

Leedy and Ormond (2005) noted that there is hardly any study without limiting factors, especially when carried out in a natural setting as compared to a controlled environment akin to experiments. This premise underscores the importance of interpreting the results of any study in context of the study limitations. Therefore, a couple of aspects need mentioning regarding the circumstances in which the study was conducted and their possible implications. These are namely the state of industry at the time of conducting the study, the identity of majority of respondents and scope of study.

6.10.1 State of industry during study

It is a normal trend for the construction industry to experience cycles of booms and downturns depicting periods of high and low demand, respectively for construction services (Smith,1998). Both states of the industry affect enterprises differently. In boom times, new enterprises enter the industry with little experience, resources and business connections (Kale and Arditi, 1998). The older ones become complacent and inefficient in their operations and outlook. During a down turn, most inefficient enterprises are weeded including those with thin resource reserves. Those which survive are normally efficient but in addition make a number of drastic decisions which in most cases affect investment in resources, including those relating PBFMS, for example, the natural reaction is to reduce human resource.

Reports (e.g. Basimanebotle, 2005 and Ssegawa, 2007) relating to the construction industry in Botswana at the time of conducting the study indicated that the industry was in a downturn. As already argued at the beginning of this Chapter, it therefore would seem that the inefficient enterprises were weeded out and the efficient ones left. It is therefore most probably that those which were left constituted the sample studied. It would be argued that the PBFMS which were studied were therefore those belonging to the efficient and above average SMCEs. If this premise is correct, and which is strongly argued, the result would

reflect the PBFMS of only those enterprises that withered the down-turn storm and it would necessitate conducting the study in the boom time as well. This would provide a more holistic view of the nature of the PBFMS in both states of the construction industry. In other words a longitudinal study would be most appropriate as opposed to a cross sectional study of which this research has characterised. However, given the doctoral time frame, this may not have been possible.

6.10.2 Identity of respondents

The identity of the respondents may have contributed to the nature of responses obtained particularly those relating to management commitment to PBFMS. As noted already, this is a behavioural aspect and any questions being asked are most likely seen as a self assessment. The concern is that the results obtained in this section seem to contradict earlier studies (e.g. Sentongo, 2005 and BOCCIM, 2005) and local media reports (e.g. Basimanebotle, 2005) especially relating to the issue of compliance with best practices in financial management.

While the questionnaires were meant to be completed by estimators or accountants, who were thought to be different from owner/managers, it turned out that in a significant number (60%) of enterprises, they were one and the same thing. Therefore, there is a high suspicion that this part of the result was not given the due truthfulness it deserved.

6.10.3 Exclusion of quality in the scope of study

Construction project performance is normally defined and measured using four major parameters namely time, cost, quality and functionality. The latter encapsulates the manner in which the project design captures the essential elements of a client brief. In other words the failure for a project to be functional may be blamed on the miscommunication between the client and designer and to the very least the contractor. However, for the other three elements (time, cost and quality), the contractor shares a greater blame if the project is not delivered within the agreed confines of the contract, especially if the aspects are traceable in the construction phase of the project.

The study focussed on issues relating to cost and time because of the objective nature of their measurement. It is quite easy for a respondent to ascertain whether project were delivered within agreed time and cost. Issues of quality on the other hand are subjective and very detailed to obtain an assessment of the overall picture of the project. Moreover, a number of quality issues may have their origins at the design stage. This is the reason why the quality aspect was not included in the study. However, an inclusion of how the PBFMS of SMCEs facilitates in achieving the quality aspect of project, would have made the study more revealing and encompassing. Thus the exclusion of quality parameter, especially in performance measurement may be considered one of the limitations of the study.

On the other hand it must be borne in mind that issues of quality normally surface as extended time to correct the defect and increased costs of re-work which in turn leads to decreased project profit. Therefore, an argument may be made that if quality problems are encountered on a project, the contractors are penalised in form of the need to extend the project duration to correct the defects. Obviously the time expended on the need to rework has an increasing effect on the cost of project, from the contractor's side and which in turn diminishes the forecast profit. In other words, the quality element is included by proxy in the study and the results may not be far from reality.

6.10.4 Extension of the study to another country

Another aspect worth considering in a bid to gain a deeper understanding of the subject investigated is to replicate the study in another country with a similar industry and economic profile, for example, Namibia. Such a study if conducted would perhaps provide a comparative of the PBFMS in the two industries. The fact that reports came out which showed that the SMCEs were not performing well in terms of project delivery and financial management and yet the findings of the study indicate that their PBFMS are adequate requires a comparison of the two aspects in various industries. Moreover, if the quality aspect is included, such a study would quite enriching.

In summary, despite the limitations the study has revealed a number of insights in the world of PBFMS in SMCEs and improvements in subsequent studies may be done to address some of the aspects as suggested in the recommendations in the next Chapter.

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7.1 Introduction

This Chapter provides conclusions relating to the findings arising out of the study which set out to investigate the nature of financial management systems used in SMCEs operating in Botswana. The study was motivated by the frequent media and research reports that have for over the past decades indicated that the construction industry has two major problems namely poor project delivery and frequent business failures. The construction industry was defined as made up of several players including consultants, contractors and inputs suppliers. However, in many of the reports construction enterprises were singled out for failing to deliver projects within agreed project parameters of cost, time and quality. Literature (e.g. Kgabo *et al.*, 1999; Dun Bradstreet, 1987) also indicated that they have the highest business failure rates of all enterprises in most economies.

Prior to focusing on the problem of investigation, a holistic picture describing the nature of the construction industry was provided. Its uniqueness as compared to other sectors of the economy was articulated to illustrate the challenges that SMCEs face in the construction industry environment. The description highlighted the fact that there are several factors which when combined influence the performance of SMCEs in terms of project delivery and profitability. However, while this is always appreciated, a number of accusations levelled against construction enterprises centred on self inflicted aspects like lack of effective financial management systems and fiscal practices as being one of the major contributors to the problem. The systems fail to provide management with effective information for making decisions regarding long and short term planning and control. They thus fail to provide the efficiency and effectiveness needed in achieving strategic management, project planning, monitoring and control processes. This assertion was the major premise on which the study was based.

Pursuant to that premise and through a literature search and review of theory and practice, a financial management model was proposed aimed at contributing in solving the identified

two problems. The model was developed with a full realisation of the uniqueness of the construction industry and thus took cognisance of the notion that generic financial models are not suitable for construction enterprises which perform their work in a project based environment. Generic project management models from various books of knowledge of the various professional institutions (e.g. PMI, 2004; and APM, 2005) were also found inadequate to address the needs of the construction enterprises. Construction management models were also examined and were found lacking especially in the strategic process and how it is linked to operational aspects. Within that context the motivation arose to develop combining theory and best practices from various sources of knowledge including financial, construction and project management. An adaptation of the generic models was thus conducted to develop a more practical and appropriate model for use by construction enterprises and the product was the project based financial management system (PBFMS).

The PBFMS is a synthesis of theory and best practices for the major processes carried out in a typical construction enterprise relating to strategic and operational aspects. The model thus describes the best practices for each of the sub-processes that an enterprise needs to perform to ensure long-term and short-term planning. The former emphasises the strategic planning processes while the latter emphasises the project planning and implementation process.

A third component, that of management commitment, was considered a vital link to the effective management of a PBFMS. Like any enterprise activity or process, commitment by management provides leadership and support. Furthermore through involvement in processes and participating in, showing interest and endorsing activities relating to PBFMS management underpins its purpose time and time again.

Using an appropriate research Strategy namely the survey and questionnaire methodology the study investigated the extent to which the actual financial management systems used in SMCEs in Botswana conform to the proposed PBFMS. Arising from a few studies and media reports which often cite poor performance in the areas relating to project delivery and financial management, the investigation took the position that the PBFMS of SMCEs are inadequate to facilitate long and short-term planning and control processes. This Chapter

therefore, presents conclusions resulting from the findings of an investigation in the problem already discussed in Chapter 6. In addition, some recommendations are proposed on how the model may be effectively utilised and how further investigations may be pursued to understand the subject more deeply.

7.2 Conclusions

The conclusions presented here arise from the findings and associated synthesis relating to the proposition posited at the beginning of the study namely that the PBFMS of most SMCEs are inadequate to facilitate efficient and effective delivery of projects within required time, quality and cost as agreed with clients and hence good foster financial performance. This position was made at a strategic level of investigation but to get a deeper understanding of the subject, the proposition was broken down into three parts representing the components of the PBFMS as espoused in the model. It is against this background that the conclusions are presented in the next sections.

7.2.1 Strategic management

The proposed PBFMS is expected to effectively facilitate the strategic management process in SMCEs. The study investigated whether the actual systems of the SMCEs were adequate to facilitate the strategic management process by possessing or emulating the attributes of the envisaged PBFMS model. To test for the actual adequacy of this component among SMCEs a hypothesis was stated as follows.

H_{01.1}: The PBFMS of SMCEs do facilitate the strategic management process

The results of the study indicated that the hypothesis was not supported and the alternative hypothesis was considered. **Thus majority of SMCEs did not have adequate strategic management processes.** This situation is caused by a number of aspects including the fact that over half (52%) of the SMCEs did not have documented plans and those which had plans they were either prepared by the owner or by consultants. The former meant that there was no reference point due to lack of documentation. The latter meant that there was no team spirit in most of SMCEs as the owner dominated most of the proceedings. Secondly, there was lack of

internalising the plans from the enterprise team if the plans were made by one person be it the owner or consultant.

The second finding was the **strategic plans were not linked to operational processes for enabling SMCEs chart a sound and systematic future direction**. The finding was a natural progression from the first because in the absence of strategic plans in most of the SMCEs, it was inconceivable whether there could be any link. The finding highlighted the fact that most of the SMCEs carry out their activities on an ad-hoc basis with little appreciation of their future implication. They are hence not able to foresee trends both in the economy and industry which might adversely affect their businesses particularly changes in construction demand and supply of input resources. Thus lack of plans and their linkage to operational plans makes SMCEs highly vulnerable to the industry's cyclic trends especially in the downturns.

In addition, though enterprises were able to identify current threats, they were not able to demonstrate an understanding of their implication, in particular being able to forecast and anticipate their impact. Secondly, though there was a desire to grow in a majority of the SMCEs, there were no indications that logical and systematic strategies were put in place to cater for the growth and expansion. Lack of adequate strategic management process linked to the short term plans, meant that there was no mechanism in place for systematic growth.

7.2.2 Planning and control processes

The heart of a construction enterprise is firstly, being able to plan and price a project prior to award. Planning entails the processes of understanding and documenting client requirements and developing project estimates in terms of a project schedule and cost and pricing the tender. Secondly, and on winning the tender the enterprise needs to monitor and control project resources and activities and periodically value work completed in order to make claims for progressive payments.

The proposed PBFMS is expected to efficiently and effectively facilitate the carrying out of the project planning and control processes. The proposition made at the beginning of the

study was, when compared to the proposed PBFMS the SMCEs systems were inadequate in facilitating project planning and control. A hypothesis was formulated to guide investigating this aspect and was stated as follows:

H₀1.2 The PBFMS of SMCEs do facilitate the project planning and control processes.

The results of the study indicated that the hypothesis was supported implying that **majority of SMCEs have adequate systems to support project planning and control**. The results were somehow surprising after a number of accusations have been levelled against construction enterprises in Botswana, which centre on not being able to deliver projects in time and at agreed cost. As already noted in the previous chapters, planning and control consists of several sub-processes which were investigated to provide an overall picture of the planning and control component of the PBFMS.

In the majority of the SMCEs studied, the processes of producing project estimates, bidding and valuing work completed were found to be adequately carried out. A plausible explanation for the adequacy of the sub-processes lay in the fact that bidding and valuation processes are a derivation of the project estimates. Secondly, they are considered very important functions because they provide the basis for firstly, obtaining work and secondly, obtaining revenue through progressive claims.

SMCEs were however, found inadequately using project planning tools just as there was lack of provision of a project analysis report to accompany the project estimate. What was most significant and serious was the lack of project control. Just as important as planning is, control is at the centre of the project process because it ensures that the project will be delivered within agreed parameters to satisfy the client and achieve forecast profit. The inadequacy of lack of project control was highly correlated with the results that indicated that SMCEs performed poorly in project delivery, in terms of time and cost, in the past three years. In turn the lack of cost and time control could have resulted in the decreased profitability, which was also indicated by the results.

7.2.3 Management commitment

Like any other enterprise endeavour, the commitment of management to the policies, processes and activities is of utmost importance for the successful achievement of its functions and goals. Commitment was viewed in terms of support and compliance. The premise of the study which was also reinforced by media and research reports was management in SMCEs are not committed to the development and operation of the PBFMS. If this were true, it was considered to be detrimental to their effectiveness. To guide the investigation a hypothesis was formulated and was stated as follows:

H_{01.3} Proprietors of SMCEs are committed to the development and operation of a PBFMS.

The results supported the hypothesis which implied that in the majority of SMCEs, management were committed to development and operation of the PBFMS.

Commitment was made up of two major constructs namely support and compliance. The support function was fully understandable since the PBFMS processes facilitate enterprises to obtain jobs, value work to get payments and control projects to achieve profit. Compliance to the procedures and policies of the PBFMS was also found adequate contrary to media and research reports which indicated that management of SMCEs do not comply with best practices relating to financial management.

7.2.4 Overall Adequacy of PBFMS

After investigating each component of the PBFMS of the SMCEs, the final phase of the study determined the overall adequacy of the systems to test the main proposition of the study. The study was premised on the proposition that the PBFMS of SMCEs are inadequate to facilitate strategic management and operational processes in order achieve better performance; and in addition, management were not committed to the development and operation of the PBFMS. A hypothesis was formulated to guide the investigation and was stated as follows:

H₀₁: The PBFMS of SMCEs are adequate to facilitate the delivery of projects

Using a statistical procedure the results of the three components were combined to investigate the overall adequacy of the PBFMS. **The results indicated that the hypothesis was supported, that is, in a majority of SMCEs operating in Botswana the PBFMS were found to be adequate in facilitating the delivery of projects.** The results therefore did not

support the basic premise made at the commencement of the study. In view of the finding, it would suggest that SMCEs in Botswana have adequate systems to support the efficient and effective project planning and control. Secondly, management is committed to the 'welfare' of the PBFMS in terms of complying and supporting their development and operation. However, like any human endeavour, there were weaknesses in the PBFMS, for example, they were found inadequate in facilitating the strategic management process, including lack of linking the process to the operational process. They were also found weak in the most crucial process of project management; that of project control.

7.2.5 PBFMS and SMCEs performance

Despite the study not assuming a highly correlated relationship between an adequate PBFMS and enterprise performance, an assumption was made that strongly linked an adequate PBFMS with good performance of SMCEs. Essentially the premise was that an adequate PBFMS will facilitate the efficient and effective achievement of the strategic and operational processes, which in turn would lead to excellent performance. Though majority the SMCEs performed poorly, there were some who performed better than average. Therefore, in order to investigate the view that SMCEs with adequate PBFMS perform better than their counterparts, SMCEs were divided into two groups based on that attribute (adequate/inadequate).

Performance was measured as hybrid construct consisting of a project being delivered within cost and time and increased profitability in the past three years. A hypothesis was formulated to guide the investigation and was stated as follows:

H₀₂ The adequacy of the PBFMS is positively correlated with the performance of SMCEs

Though the findings showed a weak relationship between having an adequate PBFMS and good performance, they indicated that the SMCEs which had an adequate PBFMS performed better than their counterparts. Put it in another way the results indicated that an SMCEs with adequate PBFMS posted a better performance than their counterpart with inadequate system.

7.3 Recommendations

In view of the findings obtained from the study two major recommendations are proposed relating to the application of the model and how a greater understanding of the subject may be advanced in future studies.

7.3.1 Application of the model

There are basically three major recommendations proposed in relation with the PBFMS namely, the need to reinforce the strategic management and control processes.

- ***Strategic management process***

The findings suggested that SMCEs were weak in issues relating to strategic management. This suggests that SMCEs should pay more attention to matters pertaining to strategic management. This will ensure that a long term view of their enterprises is developed which takes cognisance of the trends in the economy and industry. The attritions rates of enterprises that occurred between 2005 and 2007 could have been a result of the ad-hoc manner in the way SMCEs conduct their businesses which never included forecasting trends in the industry and economy. Moreover, the nature of the construction with its cyclic booms and downturns makes it imperative to adopt such a strategic view of business.

Secondly, when a strategic plan is developed, it must be implemented through operational plans. This means that the choice of projects selected for tendering must be guided by the strategic choices made. This is essentially what links a strategic plan to an operational plan. It is also important to set targets to act a motivators as well as milestones in the achievement of the strategic plans. In this way not only do strategic plans provide means of gaining a competitive advantage but also provide ways of anticipating the cyclic trends prone to the construction industry. A systematic charting of the future ensures enterprise growth which manifests itself as a movement in registration class, changes in category of work, increase in geographical spread, horizontal or vertical integration.

- ***Control of projects***

Results of the study have indicated that the project control process is inadequate in SMCEs. This calls for a concerted effort in ensuring that the projects are controlled as the only way to ensure sustained profitability and satisfied customers. The results indicated a great lack of project control which could have contributed to poor performance both at project delivery and profitability levels. Enterprises thus need to develop a culture of using effective control techniques as prescribed in the model. If the skills are not available in the enterprises, training is then much recommended as a way of bridging the skills deficit. Secondly, they need to ensure the function is well resourced in terms of personnel who are adequate, motivated and skilled to make prudent decisions based on effective control reports. Thirdly, for effectiveness to be achieved in the project control process, team work is required between the estimators and site staff.

7.3.2 Issues relating to further studies

The limitations of study mentioned in Chapter 6 require a considerable attention when studies relating to the subject of PBFMS are initiated in the future. A longitudinal study would yield a more encompassing investigation than a cross sectional study which captures only one business cycle of the industry (either boom or down turn). Secondly, it would be a more enriching study if the entire size range of enterprises was investigated, that is, to include large enterprises in addition to the SMCEs studied in this thesis. It is possible that the assumption that large enterprises have well developed PBFMS may not be very true and may not reflect reality. Studying both groups would in addition provide means of comparing the level of advancement of the PBFMS as one moves up the size ladder. Thirdly, the other contributing arms of the problem need to be investigated namely the client/representative decisions and actions and the business environment. Lastly, a deeper understanding of the subject investigated would be achieved if the study could be replicated in another industry with a similar profile like the construction industry in Botswana, for example, Namibia.

- ***Training***

Results have indicated that SMCEs are weak in strategic management and project control. This presents a serious picture, because the long-term survival of SMCEs and their profitability is jeopardised. For SMCEs to falter on the two facets of the PBFMS means they

could be wiped out or will find it hard to achieve desired growth (results have also indicated the existence of both). In view of this, it is highly recommended that some of form of skill needs assessment should be conducted in order to identify what is lacking in the two areas. Since the government is biggest client, in the Botswana context, it would be in its interest to invest in the investigation and where need arises to offer mechanisms of training the contractors.

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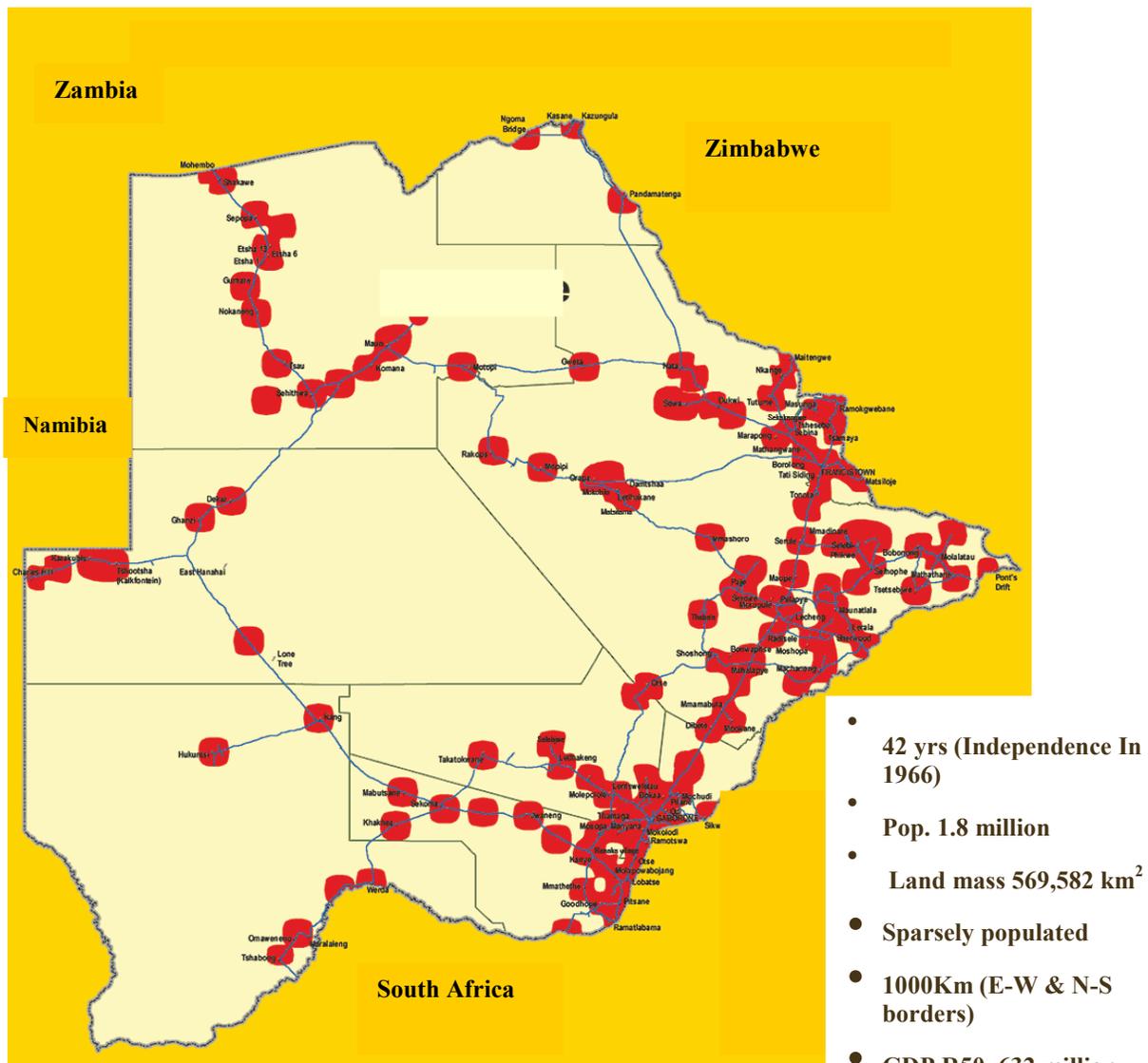
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APPENDIX 1: Map of Botswana and a few aspects about Botswana



Source: with kind permission from Mascom

APPENDIX 2: SAMPLE SIZE SELECTION CHART

Recommended sample sizes for two different precision levels					
Population size N	Sample Size (n)		Population size N	Sample Size	
	+5	10		+5%	10%
10	10		275	163	74
15	14		300	172	76
20	19		325	180	77
25	24		350	187	78
30	28		375	194	80
35	32		400	201	81
40	36		425	207	82
45	40		450	212	82
50	44		475	218	83
55	48		500	222	83
60	52		1000	286	91
65	56		2000	333	95
70	59		3000	353	97
75	63		4000	364	98
80	66		5000	370	98
85	70		6000	375	98
90	73		7000	378	99
95	76		8000	381	99
100	81	51	9000	383	99
125	96	56	10000	385	99
150	110	61	15000	390	99
175	122	64	20000	392	100
200	134	67	25000	394	100
225	144	70	50000	397	100
250	154	72	100000		

Source: Krejcie and Morgan (1970); Isaac and Michael (1981)

APPENDIX 3: INTRODUCTORY LETTER

<my address>

<address of respondent>:

<date>

Dear Sir/Madam

RE: Request to participate in a study by completing the attached questionnaire

The purpose of this letter is to introduce myself and the above mentioned subject.

My name is J K Ssegawa and I am undertaking a study in current practices in the areas of planning, financial management and control of projects in construction enterprises in Botswana. This is in partial fulfilment of my doctoral degree with the School of Business Leadership, University of South Africa.

Your company has been randomly selected for participation in the study from a list of enterprises operating in the industry in Botswana. I would therefore, kindly request you on behalf of your company to spend some 20-25 minutes of your time to complete the questionnaire to best of your ability and on behalf of your firm. The questionnaire is very easy to complete as many of the questions have multi-choice responses.

The information that you may provide will remain confidential in the sense that you and your enterprise will remain anonymous. However, when the study is completed, a seminal paper will be written where the results of the study will be contained. It is hoped that they will provide future direction in the areas of planning and control of projects and also enhance the delivery of projects in the industry. **If you are interested** in the findings and recommendations please indicate on the questionnaire so that I could supply the paper when completed.

I will be grateful if after completing, the questionnaire is posted using the self addressed and stamped envelope enclosed.

I am looking forward to your cooperation in the study.

Yours faithfully

Ssegawa J K

Doctoral student, School of Business Leadership, University of South Africa.

APPENDIX 4: MEASURING INSTRUMENT -QUESTIONNAIRE
(To be completed by an estimator, quantity surveyor or accountant in the company)

1. This questionnaire is to be completed by an estimator, quantity surveyor or accountant in the company.
2. It seeks to investigate the nature and practises of planning, control and financial systems in project based companies and associated challenges and problems.
3. For multi choice questions, please tick (✓) the option that best describes your company situation. In case you want to add an extra comment to the question, please use the attached blank page.

SECTION 1: Demographic profile

1.0 Person completing the questionnaire is : estimator Internal QS accountant Company owner
 QS-quantity surveyor

1.1 The *nature* of work done by my company is: 1 Civil 2 Building Both (1 &2) maintenance

1.2 The company is *now* registered with PPADB in class OC A B C D E

1.3 The company was *first* registered in class OC A B C D E

1.4 In which *year* did your company start operating? 19__ ...or 200__

1.5 In *five years* time I expect the company to be in class A B C D E

1.6 If you expect to register your company in a *higher class*, provide *one* major reasons for the expectation
 I have invested in more assets and personnel Company is moving in both civil and building markets
 I have developed a network of job connections Other reasons (specify)

.....

1.7 From your head office, what is *furthest distance*, that your company has ever executed a project?
 Under 100 Km 100-299 Km 300-499 Km Over 500 Km

1.8 What *was* the number of full-time employees in the *first year* of your company's operation?
 Less than 5 5-9 10-14 15-19 20 and above

1.9 What is the number of full-time employees working for the company *now*?
 Less than 5 5-9 10-14 15-19 20 and above

1.10 *How much work* do you obtain from following job sources (e.g. 40% Govt., 30% Councils, 30% private companies- please ensure they add up to 100%)?

-----Government -----Councils* -----Parastatals** -----Private companies -----Individuals

(*City/town/district) (e.g. **BHC, Water utilities, BPC, BDC, BTC, etc)

1.11 The amount of work you normally perform as a *sub-contractor* (the rest being as a main-contractor) in a year is:
 0-24% 25-49% 50-74% 75-100%

SECTION 2: Business and operational plan (definition - a business or strategic plan for an enterprise contains objectives and strategies for proving future direction and achievement while operational or project plans guide the company in shorter term particularly, in execution of projects)

2.1 Does the company always have a *business plan*? Always Sometimes Rarely Never

If the answer to question 2.1 is Never, please go to Section 3

2.2 What *period*, in years, does the business plan cover? Less than 1 over 1-2 3-5 Over 5

2.3 The business plan is normally *produced* by?

Company owner Senior Management Consultant Plan is not in written form

2.4 Does the business plan have specific goals set for achieving in the future?

Not that I know Moving to another class Increasing operational capacity Increasing turnover
 Other (specify).....

2.5 Business plan *exists* as A document Minutes of meeting Consultant report Owner talk

2.6 Is the business plan *adhered to* after it is made? Always Sometimes Rarely Never

2.7 If your answer to 2.6 is *never* what is the *reason*?-----

2.8 *Who normally reviews* the business plan to see if the business plan (set of goals) has been *achieved*?

Company owner Senior Management Consultant Never reviewed

2.9 What one *major* factor has made the company *better than* its competitors – the major competitive advantage?

<input type="checkbox"/> My company has superior assets and work force	<input type="checkbox"/> My network of job connections
<input type="checkbox"/> I take advantage of citizen empowerment policies	<input type="checkbox"/> My company offers superior service (cost and time)
<input type="checkbox"/> Superior Management	<input type="checkbox"/> Productive permanent workforce
<input type="checkbox"/> Other (specify).....	

2.10 What one *major* aspect in business environment poses the greatest *threat* to the existence of your company?

<input type="checkbox"/> Lack of jobs	<input type="checkbox"/> Too much competition
<input type="checkbox"/> Lack of access to finance	<input type="checkbox"/> Increasing lack of transparency in tendering
<input type="checkbox"/> Other (specify).....	

2.11 When does your company perform financial analysis (e.g. accounting ratios) to determine the *financial performance*?

Every three months Every six months Every year Never done

2.12 Describe the level of the *financial performance using profitability* of your enterprise in the last three years?

Highly increased Fairly increased Remained same Declined Highly Declined

2.13 Are your operational plans always derived from your business plans?

Always Sometimes Rarely Never

2.14 Describe the nature of your success rate at bidding for project tenders (consider you bid for 10 projects, how many would you normally win? – say 3 or 5 choose the rate that fits your profile)

0 sometimes I don't get At least 1 to 2 3-4 Over 4

2.15 What *major* opportunity do you foresee (expect) in the business environment?

.....
.....

2.16 Who conducts a market analysis to find out the needs, opportunities and business threats

Company owner Senior Management Consultant Marketing department Other (specify).....

SECTION 3 : Planning tools

For questions 3.1 to 3.9, please tick (√) the option that *best describes* your company situation. How often do you use the following tools for *planning projects* in your company?
 (Use the scale: **3**: For all projects; **2**: For a number of projects; **1**: For very few projects; **0**: Tool is never used).

- 3.1 Project work break down structure (WBS)
- 3.2 Project bar chart (or Gantt chart) for project programme
- 3.3 Project network diagram for project programme
- 3.4 Construction method statement for major construction activities
- 3.5 Work package (or activity) codes for uniquely identifying project activities
- 3.6 Project overheads checklist
- 3.7 Project risk checklist for producing risk plan (or any other plan)
- 3.8 Inflation adjuster for prices (price index)
- 3.9 Do you use earned value analysis or management (EVA or EVM)

3	2	1	0

- 3.10 Please indicate the major reason for *not* using the tools
- | | |
|--|--|
| <input type="checkbox"/> Projects are too small to warrant the use of the tool | <input type="checkbox"/> No body in the company knows how to use the tools |
| <input type="checkbox"/> We are always under work pressure | <input type="checkbox"/> Other reasons (specify) |

SECTION 4 : Estimation information database

For questions 4.1 to 4.12, please tick (√) the option that *best describes* your company situation. When you *bid for project or win a project tender* do you *update or change* the following information?
 (Use the scale: **3**: For all projects; **2**: For a number of projects; **1**: For very few projects; **0**: Information is never used).

- 4.1 Company overall work load
- 4.2 Company cashflow
- 4.3 Company budget
- 4.4 Company plant register
- 4.5 Employee details (database or list)
- 4.6 Company employee work load
- 4.7 Subcontractor contacts (database or list)
- 4.8 Supplier contacts (database or list)
- 4.9 Cost data for resources (material, plant and labour)
- 4.10 Labour and plant output data
- 4.11 Material wastage and usage rates
- 4.12 Unit or standard rates for common construction activities

3	2	1	0

- 4.13 If you have all or some of the above information, in what *form* is it stored?
- | | | | |
|---|---|--|--------------------------|
| <input type="checkbox"/> Computer form only | <input type="checkbox"/> Paper records only | <input type="checkbox"/> Some in computer and some in paper form | <input type="checkbox"/> |
|---|---|--|--------------------------|

- 4.14 Generally do you *update* your information in the company? YES NO

If the answer to 4.14 is NO please go to 4.15; if YES please go to Section 5

SECTION 6 Accounting work

6.1 Accounting work in your company is done by

Business owner Accountant Relative Estimator Outsider (specify).....

6.2 The *profession* of the person who does the accounting is: Chartered accountant Accounting technician
 Accounting Degree Holder Other qualification (specify).....

6.3 What is the *experience* of the accountant?

1 year or below 2-5 years 6-9 years 10 and over years

6.4 The company *accounting system* is: Computerised Simple using cash book, bank statement
 Full accounting system, with double entries in ledgers

6.5 Personal transactions are separated from business transactions: Two separate accounts are used
 Two separate accounts used but transactions mixed One account is used for personal and business transactions

6.6 The company *owner* is paid a *salary* every

week month Every time she/he needs money Never paid

SECTION 7: Control information output

(For questions 7.1 to 7.9, please tick (√) the option that *best describes* your company situation. At what level is the following information produced during project work?

(Use the scale **3**:Only at project level; **2**: Only at work package level; **1**: At both levels (1 & 2); **0**: Information is never produced)

7.1 Labour and plant time sheets

7.2 Material and plant usage report

7.3 Material buying margins report

7.4 Sub-contractor margins report

7.5 Project schedule report

7.6 Project cost statement

7.7 Schedule and cost variance analysis

7.8 Project cost forecasts

7.9 Project schedule forecasts

3	2	1	0

7.10 The quality of the above information when used for controlling projects is:

Excellent Very good Good Poor

7.11 Do you ever produce post-contract audits? Always Sometimes Rarely Never

7.12 If the answer to 7.11 above is Never what is the reason for not producing post-contract audits

There is no use doing post audits since the project is over Too much work
 It is difficult to get past information when the project is complete Other reasons (specify)

SECTION 8: Overall Nature of information

(For questions 8.1 to 8.6, please tick (√) the option that *best describes* your company situation. Describe the nature of the characteristics of information produced and used for planning, bidding and control in your company.

(Use the scale: **3**: Always; **2**: Sometimes; **1**: Rarely; **0**: Never).

- 8.1 The information is accurate
- 8.2 The information is timely produced
- 8.3 The information is complete
- 8.4 The information is up-to-date
- 8.5 The information is accessible when it is needed
- 8.6 The information is in the format that users need it

3	2	1	0

8.7 Is overall nature of the information produced and used in your company satisfactory?

- Excellent Very good Good Poor

8.8 If your answer is 8.7 is poor, please provide a major reason why the information is not satisfactory

- There are no qualified people to produce and manage information Too much work to keep track of all things
 It is difficult to organise information from construction sites Not enough people
 Other (specify)

8.9 In terms of profitability, describe the overall performance of the company in the last three - five years

- Excellent Very good Good Poor

8.10 Have you ever completed a project late?

- Always Sometimes Rarely Never

8.11 Have you ever completed a project above the tendered contract sum?

- Always Sometimes Rarely Never

8.12 What *one major* factor would you attribute as the cause of the above in 8.11

- Client related problems (e.g. paying late) Consultant problems (e.g. not responding to project issues quickly)
 My own problems Business environment (e.g. lack of specified materials)

SECTION 9: (For questions 9.1 to 9.9, please tick (√) the option that *best describes your* company situation using the scale: **3**: Always; **2**: Sometimes; **1**: Rarely; **0**: Never).

What is the nature of support, involvement and participation provided by management in the development of the company's financial system?

- 9.1 Management invests in assets (e.g. computers) for processing information
- 9.2 Management is interested in getting and using information
- 9.3 Management requests reports to evaluate project performance
- 9.4 Management ensures that controls are working

3	2	1	0

9.5 Management hires enough and qualified people

9.6 Management requests for reports to see and make decisions financial performance

9.7 Management works within financial procedures and controls

9.8 Management makes sure money for projects is used for project purposes

9.9 Management appreciates the decisions of the accountant/QS on financial matters

9.10 What was the highest level of education of the owner of the firm?

Never went to school
 Primary certificate
 Secondary certificate

Diploma and above

9.11 What type of training does the owner have?

Technical
 Management
 both
 None

SECTION 10

10.1 Please indicate whether you would like to receive a copy of the findings (results) of the study.

YES
 NO

I wish to thank you for spending your time to complete the questionnaire and please place it in the enclosed self addressed envelope and post it to me.

You could also fax it on: 3952-309 or phone me on 355-4292 or 7149 8140 to collect it .

SECTION 11: Please you may add your additional comments here resulting from your experience or something important or unique you feel was not covered the questions

SECTION 1

SECTION 2

SECTION 3

SECTION 4

SECTION 5

SECTION 6

SECTION 6

SECTION 8

SECTION 9

APPENDIX 5: EXCERPT OF THE RESEARCH PERMIT

TELEPHONE: 3958500
TELEGRAMS: WORKCOM
FAX: 3913303/3902922
REFERENCE:



MINISTRY OF WORKS AND TRANSPORT
P/BAG 007
GABORONE
BOTSWANA

REPUBLIC OF BOTSWANA

REF: WC 4/37 VI POIII

10th January 2007

Mr J.K.Ssegawa
University of Botswana
Private Bag 0061
Gaborone

Attention: Mr J.K. Ssegawa

Dear Sir,

RE: GRANT OF A RESEARCH PERMIT: MR J.K. SSEGAWA

Your application for a research permit refers.

You are herewith granted permission to conduct a study entitled "Causes of poor Performance of Public Construction Projects in Botswana."

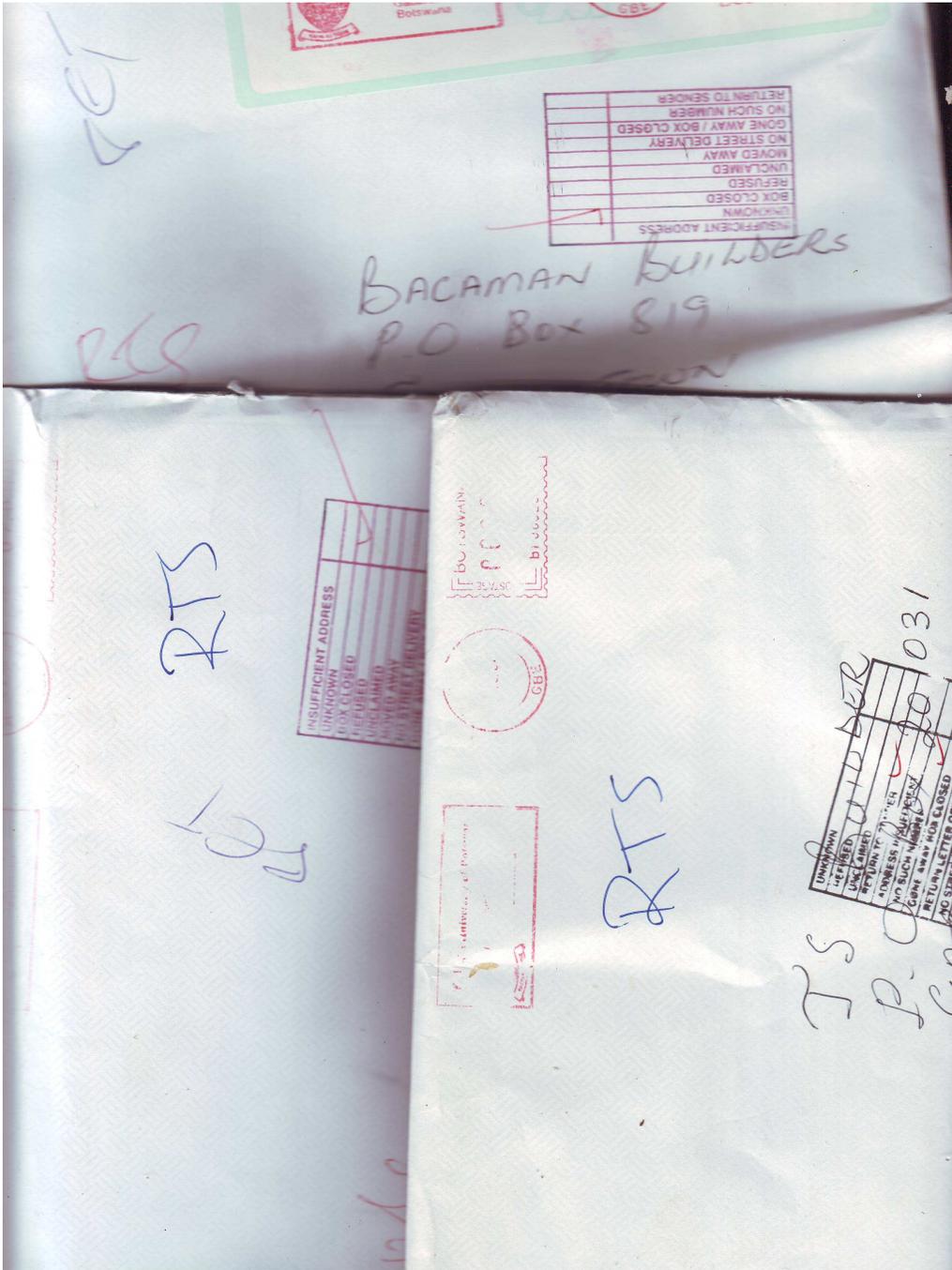
The permit is valid for a period of 6 months.

The permit is granted subject to the following conditions:

1. You conduct the study according to the particulars furnished in the application.
2. Any changes to the approved proposal should be resubmitted to this office for review. A copy of the permit should be attached to all correspondence relating to the said permit.
3. Copies of the final report should be directly deposited with the Office of the President, Ministry of Works and Transport, National Assembly, National Archives, National Library Service, Department of Building and Engineering Services, Institute of Research and

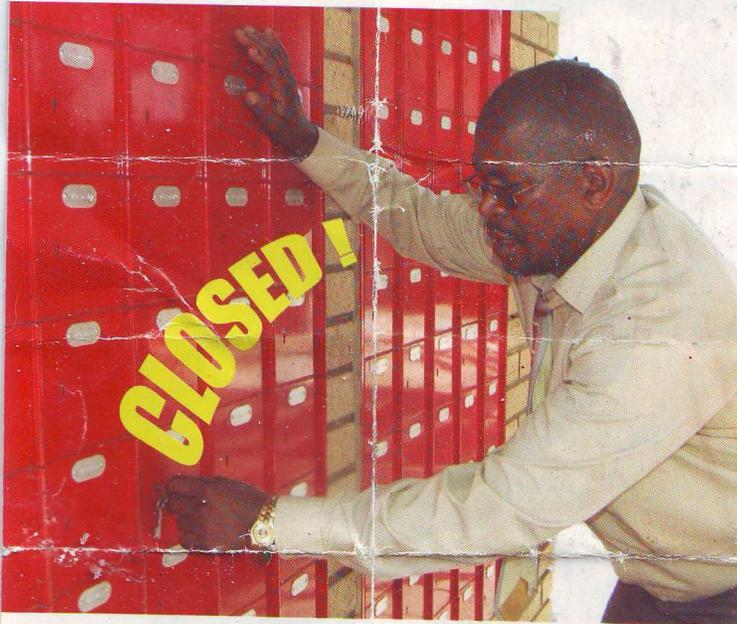
VISION - We, the Ministry of Works and Transport will have safe, reliable and sustainable Public Works and Transport infrastructure, and related services that will contribute significantly to a high quality of life for Botswana.

APPENDIX 6: A SAMPLE OF THE RTS LETTERS RECEIVED



APPENDIX 7: BOTSWANA POST OFFICE ULTIMATUM TO CLIENTS

ADVICE OF POST BOX & PRIVATE BAG RENTAL FOR 2008



Kindly note that your Post Box / Private Bag is due for renewal by 31 December 2007 for the period 1 January - 31 December 2008. Failure to renew will also result in a penalty fee until 31 January 2008, after which your Post Box / Private Bag may be forfeited.

BotswanaPost 

We will deliver

Customer Information Manager
P.O. Box 100 Gaborone
Tel: 3913870, Email: enquiries@botspost.co.bw

Appendix 8: AGGREGATED RESPONSES FROM STUDY PARTICIPANTS

Number for 0	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10	1.11	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	2.10	2.11	2.12	
Number for 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	24	
Number for 2	15	48	55	69	5	14	37	9	25	25	28	63	11	33	49	43	56	0	60	3	38	12	38	49	
Number for 3	21	0	46	16	36	35	24	12	26	19	37	7	37	47	23	18	43	0	31	15	24	12	26	21	
Number for 4	5	42	0	16	26	50	5	18	23	8	8	12	52	15	22	10	2	0	4	18	4	68	2	7	
Number for 5	60	11	0	0	21	0	35	61	10	20	25	15	0	4	7	30	0	0	6	56	29	9	0	0	
Number for 5	0	0	0	0	13	0	0	0	15	29	3	0	0	0	0	0	0	0	0	9	6	0	0	0	
Average		2.48	1.46	1.48	3.01	2.38	2.38	3.31	2.64	3.09	27.92	1.78	2.42	1.92	1.87	2.27	1.47	-	1.56	3.52	2.42	2.73	1.40	1.11	
STD		0.502	0.500	0.756	1.136	0.719	1.295	0.997	1.353	1.594	27.787	1.166	0.682	0.808	0.987	1.288	0.540	0.000	0.830	0.955	1.395	0.786	1.919	0.847	
Total	101	101	101	101	101	99	101	100	99	101	101	97	100	99	101	101	101	101	101	101	101	96	101	101	
Number for 0	2.13	2.14	2.15	2.16	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	3.10	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	4.10	4.11	4.12
Number for 1	51	0	0	0	9	51	17	26	14	31	30	101	0	3	0	3	8	5	3	8	5	9	8	13	8
Number for 2	47	67	0	44	12	24	9	26	25	18	38	0	3	10	18	19	19	17	22	28	14	14	18	36	26
Number for 3	2	27	0	21	13	17	23	18	8	14	26	0	10	37	23	27	23	23	29	35	37	31	31	14	20
Number for 4	1	5	0	30	67	9	52	31	54	38	2	0	37	51	60	52	51	56	47	26	45	47	44	38	47
Number for 5	0	1	0	0	0	0	0	0	0	0	0	0	51	0	0	0	0	0	0	0	0	0	0	0	0
Number for 5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average	1.09	1.400	0	2.5	2.37	2.08	2.09	1.53	2.01	1.58	1.40	-	2.35	2.35	2.42	2.27	2.16	2.29	2.19	1.81	2.21	2.15	2.10	1.76	2.05
STD	0.751	0.485	0	1.87	1.007	1.129	1.132	1.180	1.162	1.275	1.919	-	0.780	0.780	0.778	0.871	0.997	0.920	0.880	0.928	0.864	0.974	0.964	1.097	1.023
Total	101	100	0	98	101	101	101	101	101	101	96	101	101	101	101	101	101	101	101	97	101	101	101	101	101
Number for 0	4.13	4.14	4.15	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	5.1	5.11	5.12	5.13	5.14	5.15	5.16	5.17	5.18	5.19	5.2	5.21	5.22
Number for 1	0	0	0	0	0	0	0	0	10	14	4	4	6	6	3	14	10	15	2	12	27	41	37	0	0
Number for 2	94	5	27	44	0	2	65	51	6	12	10	20	19	10	21	15	8	12	20	15	9	21	26	16	0
Number for 3	7	5	29	51	13	16	34	27	8	23	24	27	35	26	22	27	33	27	25	20	19	11	13	65	24
Number for 4	0	0	25	3	0	30	0	8	77	52	63	50	41	59	55	45	50	47	54	54	46	28	25	20	50
Number for 5	0	3	20	0	6	53	2	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	
Number for 5	0	88	0	3	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average	1.07	4.62	2.37	1.68	4.55	3.33	1.40	1.85	2.50	2.12	2.45	2.22	2.10	2.37	2.28	2.02	2.22	2.05	2.30	2.15	1.83	1.26	1.26	2.03	3.03
STD	0.255	1.066	1.2999	0.799	1.015	0.814	0.601	1.27	0.986	1.089	0.830	0.901	0.911	0.891	0.896	1.077	0.965	1.090	0.855	1.071	1.265	1.254	1.197	0.989	0.714
Total	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
Number for 0	6.1	6.2	6.3	6.4	6.5	6.6	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	7.10	7.11	7.12							
Number for 1	0	0	0	0	0	0	7	7	21	17	5	9	14	11	9	0	0	0							
Number for 2	10	36	5	44	51	17	25	27	30	30	34	30	39	33	45	28	17	0							
Number for 3	78	36	15	45	29	75	18	30	16	13	15	28	15	22	16	38	17	12							
Number for 4	2	19	24	12	21	5	51	37	34	41	47	34	33	35	31	30	32	8							
Number for 5	2	10	57	0	0	4	0	0	0	0	0	0	0	0	0	5	35	0							
Number for 5	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
Average	2.17	2.03	3.32	1.68	1.70	1.96	2.12	1.96	1.62	1.77	2.03	1.86	1.66	1.80	1.68	2.12	1.84	2.40							
STD	0.904	0.974	0.905	0.677	0.794	0.615	1.013	0.958	1.156	1.157	1.005	0.990	1.080	1.039	1.009	0.875	1.084	2.656							
Total	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101							
Number for 0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	8.10	8.11	8.12		9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9			
Number for 1	0	3	5	7	3	3	6	0	0	5	0	0		6	0	7	0	6	3	3	0	0			
Number for 2	7	14	21	8	24	11	17	3	37	63	47	30		7	13	0	9	9	10	8	9	5			
Number for 3	40	54	29	38	19	26	41	0	37	12	7	15		24	27	39	38	34	37	26	17	24			
Number for 4	54	30	46	48	55	61	22	0	27	18	2	30		62	61	55	54	52	51	64	75	70			
Number for 5	0	0	0	0	0	0	5	0	0	0	23	16		0	0	0	0	0	0	0	0	0	0		
Number for 5	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0		
Average	2.47	2.10	2.15	2.26	2.25	2.44	2.03	-	1.90	1.44	2.01	2.350		2.43	2.48	2.41	2.45	2.31	2.35	2.50	2.65	2.66			
STD	0.626	0.742	0.921	0.879	0.921	0.805	0.960	-	0.794	0.850	1.344	1.223		0.871	0.715	0.815	0.655	0.869	0.780	0.770	0.639	0.574			
Total	101	101	101	101	101	91	3	101	98	79	91			99	101	101	101	101	101	101	101	99			

Note:
Count 0-5 means the number of responses relating to the choices made in the question. Some questions had four or five choices and hence some of the numbers (count) are not applicable e.g. Questions 1.1 required the identity of the respondent and therefore there were four choices numbered 1 to 4. Most of the questions in sections 3,4,5,6,7,8 and 9 had the scale 0,1,2,3