

Diffusion of Management Accounting Practices in Bangladesh: Practitioners' Satisfaction towards Sophistication

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CERTIFICATE

This is hereby certified that Nikhil Chandra Shil, Registration No. 33, Session: 2011-12 is a PhD student under the Department of Accounting and Information Systems and has prepared this thesis titled '*Diffusion of Management Accounting Practices in Bangladesh: Practitioners' Satisfaction towards Sophistication*' under my supervision. This work is original and has not been published or submitted for the purpose of publication elsewhere.

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Abstract

Management accounting research has attained some behavioral dimensions in recent years. Today's management accountants are entrusted with embedding different value dimensions in products and services offered by companies which made them more practical. Some contingent factors become very much operative to guide and lead management accountants in practical field. The extent of success of management accountants to integrate the value dimensions in establishing management accounting practices is an important area and necessitates an exploratory form of research. In Balanced Scorecard (BSC), the researchers have already linked internal business processes with profitability (Kaplan and Norton, 1992). Thus, management accountants should consider the satisfier of the end users that will ultimately bring their own satisfaction and the practices established by them will accommodate all requirements leading to goal congruence. The essence of the study is that employee satisfaction in general and management accountants' satisfaction in particular will ensure demanded value in products and services if the satisfying factors are rightly identified and addressed. Management accountants' satisfaction is also important to achieve sophistication in management accounting practices. Satisfaction of management accountants contributes towards the development of sophisticated management accounting practices. This research employs an exploratory form of research under contingency framework to explore contingent factors (both internal and external) that affect the satisfaction level of management accountants. How management accountants' satisfaction may lead to sophisticated management accounting practices is the central focus of the research.

The transition in Bangladesh from a state-owned industrial sector to a market-led industrial sector added extra momentum to the study of management accounting practices. These changes put immediate pressure on accounting practice to meet the demands of the new business environment. Strategic target of the country to bring it to the status of a developed country by 2041 refined the economic structure and political philosophy significantly. Bangladesh immediately needs a highly responsive and competitive manufacturing sector where the application of advanced management accounting tools becomes a priority. Thus, the research area is timely; however, it will work as a benchmark study. Institutions are developing as most of the companies are first generation companies demanding strong level of regulatory support. Thus, the current study failed to provide any promising results rather revealed different market inefficiencies like low level of diffusion, wide gap in theory and practices, different types of gaps, abundance of less sophisticated management accounting practices, sophistication-satisfaction mismatch, sophistication of firms having no relationship with contingent constructs etc. Still, there are hopes as demonstrated in different interview outcomes.

Based on the findings of a semi-structured questionnaire-based survey, supplemented by 16 selected in-depth interview data, this study explores the diffusion of different management accounting practices (MAPs) in 113 manufacturing companies from different sectors. In addition, drawing off the existing literature on new institutional sociology and innovation diffusion theories, a model is developed to form the basis for investigating and evaluating the factors that influence the development and change of MAPs in Bangladeshi firms. This investigation is underlined with thorough statistical inference resulting from applying factor analysis and simple and multiple regression to the survey data as appropriate. The data collected from in depth interviews are codified and analyzed to provide more insight into MAPs in the responding firms.

Although the responding companies have reported using most of the MAPs surveyed, the adoption rates of these practices are noticeably lower than the adoption rates of MAPs usually found in the management accounting literature in other countries. The findings also seem to confirm those of recent studies in other countries about the popularity of traditional practices over the much acclaimed advanced ones. However, respondents not only claim to derive higher benefits from traditional MAPs than from advanced MAPs, but they also express their intention to place greater emphasis on the former in the future. Thus, this study questions the exaggeration in the criticism of traditional MAPs that characterized the obsolescence campaign initially led by Kaplan (1986) and Johnson and Kaplan (1987) and the acclaimed superiority of the so-called advanced MAPs.

This research concludes that the demand side perspective, which dominates the literature on innovation diffusion, is not adequate on its own and, therefore, the supply side and the institutional environment are also important factors in explaining the diffusion of MAPs. Institutional factors, especially those related to the fashion perspective (e.g. use of consultants) and the fad perspective (e.g. being in a joint venture with a foreign partner) appear to be essential in facilitating diffusion. Finally the main limitations of this study are outlined and opportunities for future research are discussed, particularly in relation to this study's findings about the need to reconsider the usefulness of traditional MAPs and also the need for a multiple perspective approach for studying the diffusion of MAPs.

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List of Abbreviations

AAA	American Accounting Association
ABC	Activity Based Costing
ABM	Activity Based Management
AHP	Analytic Hierarchy Process
AMAT	Advanced Management Accounting Techniques
APL	Action Profit Linkage
BCAS	Bangladesh Cost Accounting Standards
BDT	Bangladeshi Taka
BIIA	Bangladesh Institute of Industrial Accountants
BPDB	Bangladesh Power Development Board
BSC	Balanced Scorecard
CBK	Common Body of Knowledge
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CVP	Cost Volume Profit
DDI	Development Dimensions International
DGDA	Directorate General of Drug Administration
DL	Direct Labor
DM	Direct Material
DOI	Diffusion of Innovation
EDUN	Education
EFA	Exploratory Factor Analysis
ERP	Enterprise Resource Planning
FMCG	Fast Moving Consumer Goods
FMOH	Fixed Manufacturing Overhead
FRA	Financial Reporting Act
GNI	Gross National Income
GP	Gross Profit
ICAP	Institute of Chartered Accountants of Pakistan
ICMA	Institute of Cost and Management Accountants
ICMAB	Institute of Cost and Management Accountants of Bangladesh
IFAC	Internal Federation of Accountants
IMA	Institute of Management Accountants
IRR	Internal Rate of Return
JIT	Just in Time
MAI	Management Accounting Innovation
MAPs	Management Accounting Practices
MBA	Master of Business Administration
MDG	Millennium Development Goals
MNC	Multinational Corporation
MRP	Maximum Retail Price
NAO	National Audit Office
NBR	National Board of Revenue
NGO	Non Government Organizations

NIE	New Institutional Economics
NIS	New Institutional Sociology
NP	Net Profit
NPV	Net Present Value
OIE	Old Institutional Economics
PBP	Payback Period
PDQL	Pool Driver Quantitative
PDQN	Pool Driver Quantitative
PESTEL	Political, Economic, Social, Technological, Legal and Environmental
ROSC	Report on Observance of Standards and Codes
S&AOH	Selling and Administrative Overhead
SCD	Single Cost Driver
SMA	Strategic Management Accounting
SME	Small and Medium Enterprises
SOEs	State Owned Enterprises
SPC	Service Profit Chain
SWOT	Strength, Weakness, Opportunity and Threat
SRO	Statutory Regulatory Order
TCO	Total Cost of Ownership
TOC	Theory of Constraint
TP	Trade Price
TQM	Total Quality Management
TSD	Technical Service Department
UK	United Kingdom
UN	United Nations
USA	United States of America
VAT	Value Added Tax
VBM	Value Based Management
VfM	Value for Money
VMOH	Variable Manufacturing Overhead

Chapter 1

Introduction

This chapter extends discussion covering following main points –

- 1.1 Preamble
- 1.2 Background
- 1.3 Research Rationale and Significance
- 1.4 Theoretical Considerations
- 1.5 Research Aims and Objectives
- 1.6 Research Methodology
- 1.7 Limitations of the Study
- 1.8 Structure of the Thesis

1.1 Preamble

This chapter presents a brief introduction to the thesis for a quick reference to the readers. It starts with a simple background in section 1.2 followed by a discussion in section 1.3 on motivating factors for conducting a research in this area. The related theories as applied in this thesis are summarized in section 1.4, followed in section 1.5 by the research goals and objectives. The overall research methodology is presented in section 1.6 in brief followed by the identification of few limitations of the research in section 1.7 so that the research findings can be read keeping the limitations under consideration. The chapter ends with outlining a general structure of the thesis in section 1.8.

1.2 Background

Research conducted in the field of management accounting and practices thereof has undergone significant changes in recent years due to increase in competition, change in production technology, huge investment in research and development, shortening product life cycle and change in customer tastes and requirements. In twentieth century, significant devotions were made by the management accounting practitioners and researchers to develop advanced tools in fulfilling the decision making needs of internal users. Strong arguments have already been established in literature that if management accounting is to maintain its relevance, it requires meeting the changes in management information needs corresponding to these significant changes.

Traditional cost and management accounting practices have been under substantial criticism for their lack of efficiency and capability in coping with the requirements of a changing environment during the last two decades (Askarany & Smith, 2004; Beng et al., 1994; Bork & Morgan, 1993; Chenhall, 2003; Gosselin, 1997; Hartnett & Lowry, 1994; Lefebvre & Lefebvre, 1993; Spicer, 1992). Such criticisms relate to the failure of traditional cost and management accounting practices to provide detailed information on activities important for organizations. Lawrence & Ratcliffe (1990) support this argument by providing survey evidence of levels of dissatisfaction among both management accountants and managers with the cost and management accounting techniques then being used in industry. Bork & Morgan (1993) echo this observation, suggesting that traditional cost and management accounting systems have failed to keep up with the increasing demands imposed on them by technological change in manufacturing environments. Kaplan (1984) has argued that there has been no development of management accounting techniques during the period from 1925 to the 1980s. Atkinson (1987) confirmed a crisis of management accounting profession that had lost relevance and that one of the solutions was to define a set of relevant and practical management accounting skills.

Other writers recognize the existence of a 'gap' between theoretical models, which suggest how management accounting should be done, and management accounting practices (MAPs) (Scapens, 1985; Edwards and Emmanuel, 1990; Drury et al., 1993; Ashton et al., 1995; Drury, 1996). Anthony (1989) criticized the claims by researchers that a specific management accounting technique is widely (or not) used where there is no statistical evidence to prove that. He further argued that there was a need for survey information concerning the use of MAPs, as information about MAPs is very poor and that almost all related information is anecdotal. Also Drury (1998) claimed, further empirical studies are required to provide a detailed description and evaluation of these new systems and factors that influence change.

Management accounting researchers have responded to these concerns with survey based studies of MAPs. Examples include studies from the UK (Drury et al., 1993 and Abdel-Kader and Luther, 2006), USA (Green and Amenkhienan, 1992), Australia (Chenhall and Langfield-Smith, 1998a), New Zealand (Waldron, 2005), and Finland (Hyvonen, 2005). Moreover, some researchers have been interested in comparing MAPs between countries. Examples include a study by Wijewardena and Zoysa (1999) comparing MAPs in

Australia and Japan and a study by Luther and Longden (2001) who compared MAPs between South Africa and the UK.

Unsurprisingly, therefore, the management accounting literature has witnessed a growing interest into the study of the diffusion of cost and management accounting innovations (Anderson & Young, 1999; Askarany, 2003; Askarany & Smith, 2001, 2003; Booth & Giacobbe, 1998; Chenhall & Langfield-Smith, 1998; Cooper & Kaplan, 1991; Gosselin, 1997; Johnson, 1992; Johnson & Kaplan 1987; Hartnett & Lowry, 1994; Maiga & Jacobs, 2003; Malmi, 1999). A number of internal and external factors aggregately pushed management accounting throughout the last century to reach to its current shape. Boer (2000) acknowledges that there is a change in management accounting practices. Management accountants do more management activity and less accounting dealing with costs (Burns et al., 2004). Thus, innovations and changes for betterment are the most important requirements that call for sophistication. The research focuses on the identification of the level of sophistication and the factors that affect the level of sophistication from a developing country's perspective like Bangladesh. Furthermore, the "gap" between theory and practice in management accounting seems to arise from comparing between MAPs and optimal models – usually based on neoclassical economic theory – in simple production settings that do not relate to problems faced by practitioners; hence the view that research should focus more closely on studying observed practice by drawing off organization, social and economic theory (Scapens, 1991; Scapens, 1994; Drury and Tayles, 1995; Burns and Scapens, 2000).

1.3 Research Rationale and Significance

Although much attention has been paid to the relevance of MAPs (Drury et al., 1993), there still exists a lack of knowledge concerning the current state of MAPs, especially in less developed countries (Joshi, 2001; Lin and Yu, 2002; Waweru et al., 2004; Van Triest and Elshahat, 2007). In a market economy under construction as is now the case in Bangladesh, the importance of studying management accounting cannot be emphasized enough. Firms in these countries offer a unique opportunity for researchers to study the evolution of MAPs in a relatively short period of time (Anderson and Lanen, 1999).

Currently, there is a growing interest in management accounting in emerging and transitional economies whether in Europe (Haldma and Laats, 2002; Szychta, 2002), Asia (Joshi, 2001, O'Connor et al., 2004) or Africa (Lather and Langden, 2000; Waweru et al., 2004; Van Triest and Elshahat, 2007). These studies indicate that, despite the tremendous

social, political and economic changes affecting businesses in these countries, traditional MAPs remain the most common.

Moreover, there are certain differences in the adoption of and the benefits from MAPs between the industrialized world and the less-developed countries. For instance, Luther and Longden (2001) concluded that the benefits derived from MAPs in South Africa differ from the UK equivalents and the factors that influence management accounting change in South Africa are different from those which influence it in the UK. They also found support for Hopper's (2000) argument that MAPs are not universally uniform and cannot be understood without reference to the importance of political, cultural and economic factors in countries. They noted that despite the influence of widely selling textbooks and other quick diffusion agents, management accounting practice is not universally uniform (Luther and Longden, 2001, p. 315).

Similarly, Hopper et al. (2004) argued that management accounting in less developed countries cannot be understood without referring to broader socioeconomic factors such as poverty, an incomplete set of state institutions, and weak markets. Moreover, Luther and Longden (2001), Haldma and Laats (2002) identify new factors that are more related to transitional and emerging economies such as the legal accounting environment and shortage of qualified accountants.

Other researchers argued that despite the fact that economic shock (such as the deregulation of governmental control and the increase in market pressures) in emerging and transitional economies is a necessary condition to stimulus for the diffusion of Western MAPs in these countries, they are not sufficient. They indicate that the mimetic institutional isomorphism and the diffusion of innovation literature, particularly the performance gap argument, are appropriate for explaining the diffusion of accounting innovations in developing countries (Firth, 1996; Lin and Yu, 2002; Wu et al., 2007). This leads to questions about the factors (both impetus and impediment) that affect the diffusion of MAPs in developing countries, whether Western MAPs have been adopted in less developed countries, and the feasibility of advanced MAPs diffusion to less developed countries.

In Bangladeshi case, the transition from a planned economy to a market economy, which commenced in the late 1990s, has resulted in fundamental changes such as the restructuring and privatizing of state-owned enterprises, a noticeable growth in foreign direct investment, and an emerging private sector. Prior to the transition period companies were predominantly owned, controlled and supervised by government institutions. These

changes put immediate pressure on accounting practice to change for meeting the demands of the new business environment.

The accounting profession in Bangladesh is still in its infancy and its main emphasis is on preparing external financial reports and external auditing which is mainly imposed by the laws rather than driven by the desire to provide useful information to potential users. Despite the environmental factors in Bangladesh which is significantly different from those in the UK and the US, the Bangladeshi accounting education system and accounting profession have been developed towards the accounting environment and the private sector of the UK and US. In this respect, it has been argued that the factors which have influenced the adoption of accounting practices (including MAPs) in Bangladesh are multinational companies, especially in the pharmaceutical and garments sector, international accounting firms (mainly from the UK and the US), the accounting education system which relies on British and American texts, the accountants from other countries, and the Bangladeshi accountants educated overseas. Thus, the diffusion of Western accounting practices in Bangladesh can be linked to two key mechanisms: foreign companies operating in Bangladesh and the Bangladeshi accounting education system.

The rapid developments and changes in the Bangladeshi economy and its increasing integration with the global economy make it an excellent area for the investigation of the important aspects of the Western MAPs diffusion and the responsiveness (or not) of management accounting to its environment. Therefore, this is a good opportunity to undertake research on MAPs in Bangladeshi companies in the context described above. The study is restricted to manufacturing companies; service sector companies raise their own particular issues and require separate in-depth studies.

1.4 Theoretical Considerations

In trying to understand MAPs, researchers of management accounting change have used a variety of explanatory frameworks, including contingency theory, agency theory and, more recently, the two related theories of innovation diffusion and institutionalization. Much of the empirical work in the area of management accounting follows a contingency approach (Langfield-Smith, 1997; Chenhall, 2003). Such approach assumes that nothing is certain and every action depends on some internal and external contingent factors. Contingency approach, consisting of some internal and external factors, is driving management accounting practices forward giving it a behavioral shape. For example,

satisfaction is a behavioral issue that depends on lots of contingent factors within and outside the firm. Identification of factors that may influence the level of satisfaction of management accounting practitioners has received considerable attention. Satisfying employees in general and management accountants in particular, is the key to success. Addressing the requirements of management accountants become a prime issue and, in management accounting area, this is done through the establishment of sophisticated management accounting practices to the satisfaction of the practitioners. The research targets to address the issue of satisfaction of management accountants, sophistication achieved in management accounting practices, and possible influence of satisfaction on sophistication as given in **Figure 1.1** below.

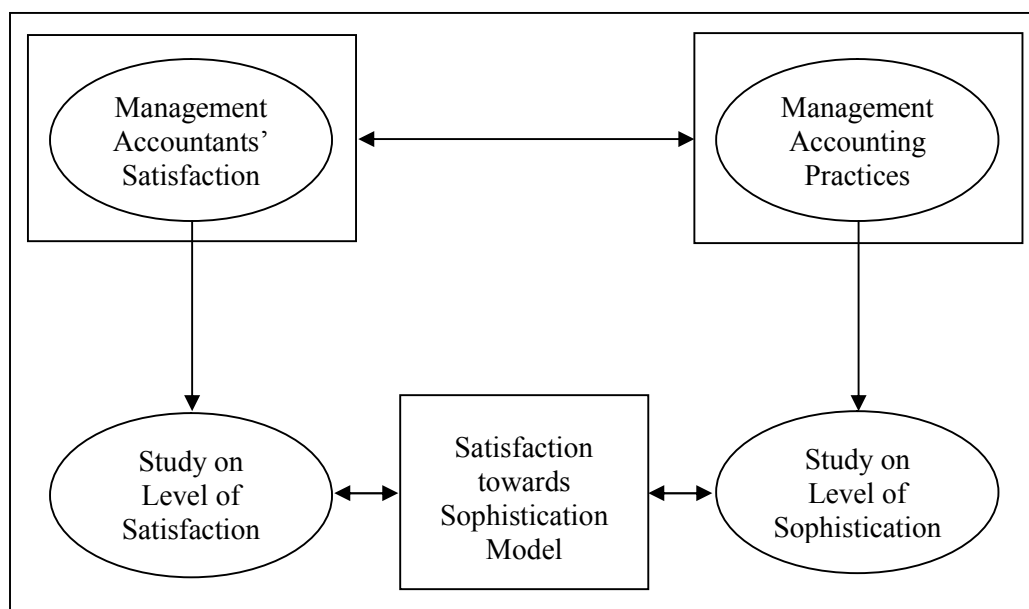


Figure 1.1: Relationship between satisfaction and sophistication

The study also puts significant attention to innovation diffusion and institutional theories which are seen as very promising for understanding organizational change and the diffusion of innovation in emerging environments (see Tolbert and Zucker, 1983; Abrahamson, 1991; Scapens, 1994; Scott, 1995; Haunschild and Miner, 1997; Chua and Petty, 1999; Hage, 1999; Davis and Marquis, 2005).

According to Bjornenak (1997), diffusion is the process whereby the innovation is spread or disseminated. The common criterion accepted for the idea and practice to be considered as an innovation is that the idea or the practice is perceived as new by the unit of adoption (Hage and Aiken, 1970; Zaltman et al., 1973; Daft and Becker, 1978; Hage, 1980; Damanpour, 1991; Zammuto and O'Connor, 1992).

Researchers have attempted to investigate the factors that influence the diffusion of innovation by trying to answer questions on what the attributes are for early and late adopters and why some innovations are being widely adopted more than others. Many attempts have been made to classify the factors which influence the diffusion of innovation through the literature (e.g. Kwon and Zmud, 1987; Anderson, 1995; Rogers, 1995, 2003; Askarany, 2003). For instance, Rogers (1995, 2003) classified these factors into: attribute of innovations, the type of innovation decision, the nature of communication channels, the nature of social systems, and the extent of change agents' promotion efforts. Building on Rogers (1995, 2003), Askarany (2003) developed a model that classified the factors influencing the diffusion of innovation into: attributes of innovation, attributes of adopters and attributes of social systems which include all the influential factors that could not be related to the other two groups of factors. He also supports the claim made by Rogers (1995, 2003) that the characteristics of innovation are the most important influencing factors on innovation diffusion.

However, some have argued that most of the studies on the diffusion of innovation are based on a pro-innovation perspective, which assumes that innovations are adopted as a result of an organization's demand where the adoption of innovation decision is guided only by rational decision-making (Zaltman et al., 1973; Downs and Mohr, 1976; Kimberly, 1981; Van de Ven, 1986; Nicholson, 1990; Abrahamson, 1991, 1996; Rogers, 1995, 2003). However, this perspective underestimates the effect of the suppliers of innovations in its diffusion (Brown, 1981; Clark, 1984).

Various researchers have paid attention to diffusion of innovation in connection with a new institutional sociology theory (e.g. Scott, 1995; Haunschild and Miner, 1997; Chua and Petty, 1999; Howorth et al., 2002). The new institutional sociology theory suggests that firms within a "field" adapt their management practices (including MAPs) to gain legitimacy and ensure survival. Organizations must be responsive to external demands/pressures and expectations in order to survive (DiMaggio and Powell, 1983; Oliver, 1991). This theory seeks to explain why organizations in the same field look similar and the pressures that shape organizations.

Central to the new institutional sociology perspective is the notion of "isomorphism" or the process that forces organizational similarity. Institutional isomorphism takes three forms: coercive, normative and mimetic (DiMaggio and Powell, 1983). Examples of coercive isomorphism (or pressures) are governmental mandates and financial reporting

requirements. Normative pressures are associated with professionalization and derived primarily from education and professional networks.

Mimetic pressures arise from standard responses to uncertainty which is a powerful force that encourages companies to imitate the most successful or the leaders in their field. Organizations may model themselves on others when organizations' technologies are poorly understood or when goals are ambiguous. Thus as a result of institutional operations and pressures, MAPs will diffuse across organizations when they operate in the same environment. It will bring homogeneity across organizations in terms of their applications of MAPs.

In this context, Granlund and Lukka (1998) argue that MAPs tend towards homogenization within the industrialized world, although there are still notable differences in MAPs at micro level among countries, due to cultural or government regulations. Building on new institutional sociology theory, they identify the factors directing MAPs towards convergence or divergence to include both economic (e.g. market competition) and institutional perspectives (coercive pressures, normative pressures, and mimetic). In addition, an interesting alternative perspective in explaining diffusion of innovation that seems close to new institutional sociology theory is offered by Abrahamson (1991) who developed three additional perspectives to the efficient-choice perspective; they are the forced selection perspective, the fad perspective, and the fashion perspective. These alternative models will be discussed in detail in the next chapter.

1.5 Research Aims and Objectives

The main aim of this research is to investigate the state of sophistication of management accounting practices in Bangladesh. To achieve this, the research has the following four objectives:

1. To explore the factors affecting the level of satisfaction of management accountants.
2. To explore the current state of management accounting practices in Bangladeshi manufacturing companies.
3. To describe the level of sophistication attained by Bangladeshi manufacturing companies in applying different management accounting techniques.
4. To explain the gaps that exist in management accounting practices with a proposed method of quantifying the gap.

1.6 Research Methodology

For the design of this research it is decided to adopt a pragmatic approach, using both positivistic and phenomenological paradigms. Each paradigm has strengths and weaknesses and using both paradigms would maximize the advantages and minimize the disadvantages of each one. However, it should be noted that these two paradigms are near the extremities of the continuum; each methodology can be moved some way along the continuum according to the individual researcher's assumptions (Hussey and Hussey, 1997). In addition, consistent with this choice, the research objectives and, based on the recommendation of using a triangulation of methods (e.g. Collis and Hussey, 2003; Bryman and Bell, 2007; Saunders et al., 2007), this research adopts a mixed method approach. The dominant method is quantitative; it relies on data collection using a self-administered questionnaire to a sample of Bangladeshi manufacturing companies. This is supplemented by a qualitative method in the form of selective in-depth interviews.

Surveys are often conducted simply because it is the only way to get the information needed. Individuals or organizations usually sponsor surveys for one of three basic reasons (Alreck and Settle, 1995):

- a) They want to influence or persuade some audience;
- b) They want to create or modify a product or service they provide for a particular public;
- c) They want to understand or predict human behavior or conditions because it is the focus of their academic or professional work.

Hussey and Hussey (1997) pointed out that “a survey is a positivistic methodology whereby a sample of subjects is drawn from a population and studied to make inferences about the population. Having decided on a sample, it is necessary to decide on how to ask the survey questions. The alternatives are face-to-face or telephone interviews or questionnaires.”

Questionnaires are associated with both positivistic and phenomenological methodologies. Under a positivistic paradigm questionnaires can be used for large scale surveys. A positivistic approach suggests that closed questions should be used, whereas a phenomenological approach suggests open-ended questions. Consequently, open-ended questions do not lend themselves to large-scale surveys (Hussey and Hussey, 1997).

A pilot study was done prior to the distribution of the final version of the questionnaire. The final version was developed after several drafts which were benefited from constructive feedback received as a result of different procedures of pre-testing. To bring

more objectivity in research methodology, a sample frame is thought of the manufacturing companies where professional management accountants are working. This is done through the scrutiny of membership directory of ICMAB¹ for the year 2012. Such scrutiny results 200 companies as given in **Table 1.1** below where the members of ICMAB were working. The study doesn't consider any service industry and companies operating outside Dhaka. Out of the 200 companies, management accountants from 47 companies expressed their reluctance to participate in the survey. Other 153 companies are considered as the sample for the study. However, questionnaires are not received from 28 companies though they have been given remainder in time and 12 of the received questionnaires are rejected due to the missing data. Finally a total of 113 questionnaires are used for data analysis based on which the thesis draws major conclusions. The reliability of a measure in terms of its stability and consistency was tested through the parallel test and Cronbach's coefficient alpha and all the scales in the questionnaire were considered as reliable. Also an external and an internal validity were established in this research.

SL	Industry	Number of Members Worked	Number of Firms	Usable Questionnaires Received
1	Cement	10	8	4
2	Chemicals/ Fertilizer	15	13	8
3	Garments & Textiles	83	74	46
4	Jute	2	2	1
5	Oil, Gas, Fuel & Power	33	20	8
6	Paper, Printing & Publication	6	4	2
7	Pharmaceuticals	34	30	16
8	Sugar, Food & Allied	15	13	5
9	Tannery/Leather	4	4	2
10	Tobacco	4	3	2
11	Others	180	29	19
	Total	386	200	113

Table 1.1: Distribution of participating firms in the study

Based on its stated objectives, this research can be described as exploratory, descriptive, and explanatory type of research. The part of the research related to the first two

¹ ICMAB is the Institute of Cost and Management Accountants of Bangladesh, the only national level institute in the country, to conduct research and impart accounting education in the field of cost and management accounting in Bangladesh.

objectives, which is to explore factors affecting the level of satisfaction of management accountants and to explore the state of current MAPs in Bangladeshi manufacturing companies, can be classified as exploratory. The part of the research that deals with third objective, which is to describe the level of sophistication attained by manufacturing firms in Bangladesh, can be classified as descriptive. And the last objective, which is to explain the gaps that exist in management accounting practices, can be classified as explanatory. Descriptive statistics in terms of means and frequency were mainly used to meet the descriptive objectives. Factor analysis as well as simple and multiple regression were used to test the research hypotheses and meet the exploratory and explanatory objectives. In addition, the qualitative data gained from interviews were analyzed using qualitative research methods like Grounded Theory and the quoted statements where appropriate were used to support the data analysis.

1.6.1 Respondents' profile

The quality of research output seriously depends on the quality of respondents who are participating in the survey. A clear understanding between the researcher and the respondents on research agenda is also important to keep the survey free from any misunderstanding at either side.

Considering the significance of the topic, the study is conducted based on a very rich respondents' profile. As already mentioned in research methodology section, respondents are identified from 113 manufacturing firms where initial contact point in each case was a professional cost and management accountant working in respective firms. However, when they are approached for the survey, good percentages (about 59%) of them have let it to be done by subordinates and have requested to keep their identity undisclosed. Due to the nature of the research, one respondent represents one firm which result a total of 113 respondents from 113 firms. Respondents' demographic biography in terms of their educational background, experience (in years), intention to switch, number of jobs worked so far and designations is presented below (**Table 1.2**):

Demographic Profile of Respondents	Frequency	Percentage
a) Educational Background		
Professional Certifications	46	41
Master's Degree	57	50
Bachelor Degree	10	9
b) Years of Experience		

Demographic Profile of Respondents	Frequency	Percentage
Less than 5 years	25	22
5 – 10 Years	44	39
More than 10 years	44	39
c) Intention to Switch		
Yes	20	18
No	93	82
d) Number of Jobs		
Less than 3	56	50
3-5	50	44
More than 5	7	6
e) Organizational Designation		
i) Top Level Management		
Managing Director	2	
Director	7	
Chief Financial Officer	5	
Country Manager	2	
Group CFO	3	
Finance Controller	6	
VP Finance and Company Secretary	3	
Total	28	25
ii) Mid Level Management		
Production Supervisor	2	
General Manager	7	
Manager	25	
Assistant Manager	11	
Chief Accountant	3	
Assistant General Manager	2	
Deputy General Manager	2	
Assistant Finance Controller	3	
Head of Accounts	5	
Total	60	53
iii) Lower Level Management		
Executive	18	
Accounts Officer	7	
Total	25	22

Table 1.2: Respondents' Profile

As already mentioned, a good percentage of the respondents are affiliated with professional accounting institutes, some of them are already qualified members and others are senior student members who are very close to their certification. In terms of years of experience, a good percentage of respondents (78%) are having more than 5 years of

experience. It reflects the required maturity of the respondents to address a questionnaire related to satisfaction, its antecedents and precedents. In another case, it reveals that only 18% of the respondents have an intention to switch current job. It signifies that the accounting practitioners are not severely job hopper which may be driven by their satisfaction with the existing job. Satisfaction with the job is a very important criterion for loyalty and commitment which will lead high level of customer satisfaction through ensuring product and service quality at a commendable rate. In terms of managerial hierarchy, only 22% respondents are holding lower level management position. And these respondents come from highly decentralized organization where there are independent departments taking care of cost and management accounting related issues. Due to the structured questionnaire, these executives are referred by top level management and thus it is expected that there will be no asymmetry of feedback given by them. It is also good to observe that in most of the participating firms, management accountants hold either top level or mid level management positions which is important to undertake customer pleasing initiatives in their respective firms.

1.6.2 Corporate Profile

This section presents the profiles of companies (**Table 1.3**) participated in the survey in terms of different firm specific parameters like years in operation, number of employees, annual turnover and net assets. These parameters are important to have a general understanding on the firms taken part in the study.

Corporate Profile	Frequency	Percentage
a) Years in Operation		
0-10	20	18
11-20	56	50
21-30	11	10
31-40	13	12
41-50	4	3
More than 50	9	7
	113	100
b) Number of Employees		
0-1000	65	58
1001-2000	18	16
2001-3000	14	12
3001-4000	7	6

Corporate Profile	Frequency	Percentage
4001-5000	2	2
More than 5000	7	6
	113	100
c) Annual Turnover (in BDT)		
Less than 100 million	36	32
101 – 1000 million	31	27
1001-10,000 million	34	30
More than 10,000 million	12	11
	113	100
d) Net Assets (in BDT)		
Less than 100 million	25	22
101 – 1000 million	47	42
1001-10,000 million	30	27
More than 10,000 million	11	9
	113	100

Table 1.3: Corporate Profile

Like respondents' profile, corporate profile of the responding firms is also very rich. More than 80% of the firms are in operation for more than 10 years. More than 40% of the firms are having more than 1,000 employees. Around 40% of the firms have annual turnover of more than BDT 1,000 million. It gives some idea regarding the maturity, stages of life cycle, value of the firms, and target market size of the responding firms all of which are important for surveys relating to satisfaction.

1.7 Limitations of the Study

While conducting the research, the researcher faced couple of problems that may limit the applicability of the research findings. Some of such limitations are mentioned below on which readers' discretion is expected:

- a) The researcher considers all whose job definitions fall within the broader spectrum of accountants as 'practitioners' irrespective of their possession of professional certification. This is a major limitation of this research.
- b) The study of diffusion covers only one time period. Due to the absence of any baseline survey in the field of diffusion of management accounting practices in Bangladesh, the study fails to cover two different time periods for studying any potential developments/changes in the area.

- c) Convenient sampling (based on the membership directory of ICMAB for the year 2012) is applied for selecting sample companies for the survey. However, for selecting interviewees in case of in-depth interview, snowball sampling is used.
- d) The survey is based on manufacturing companies from Dhaka region only.
- e) Abundance of missing figure and respondents' unwillingness to provide some information limits the sample size.
- f) Sample size (113 respondents from 113 firms) is small.
- g) Data collection period stretches a long period of more than one year.

The findings of the study should be read keeping all these limitations under consideration.

1.8 Structure of the Thesis

In addition to this chapter, the thesis comprises eight more chapters. A structure of the thesis is given in **Figure 1.2**. **Chapter Two** provides a brief overview on Bangladesh economy, management accounting profession in Bangladesh and a literature on different theoretical foundation used in the study. It also provides insights into the diffusion of MAPs through the lens of the theory of innovation diffusion. The chapter discusses the alternative perspectives in explaining the diffusion of innovation, such as the supply side of diffusion and the new institutional sociology theory. It also presents the Contingency Theory and its application in the field of management accounting.

Chapter Three brings the study of management accountants' satisfaction relating to the system they use and jobs they do. Different antecedents of satisfaction are considered and value dimensions are brought to identify any relationship between satisfaction and value dimensions. It establishes the premise that satisfaction is very important for the development of sound management accounting practice environment. This chapter attempts to make a linkage between satisfaction and profitability via different value dimensions.

Chapter Four presents the study of diffusion of management accounting practices in Bangladesh. It provides existing literature on management accounting practices, current study results mostly in descriptive forms with a critical note on the diffusion of innovation from Bangladesh perspective.

Chapter Five presents selective examples on management accounting practices in Bangladesh which is the outcome of selective in-depth interviews. It highlights some best practice examples as demonstrated by different manufacturing firms which confirm the existence of innovative management accounting techniques in practice.

Chapter Six brings the study of sophistication in management accounting practices. Initially the chapter identifies different studies relating to sophistication, and then it provides a new definition to study sophistication as a response to the call for widening the area of studying sophistication.

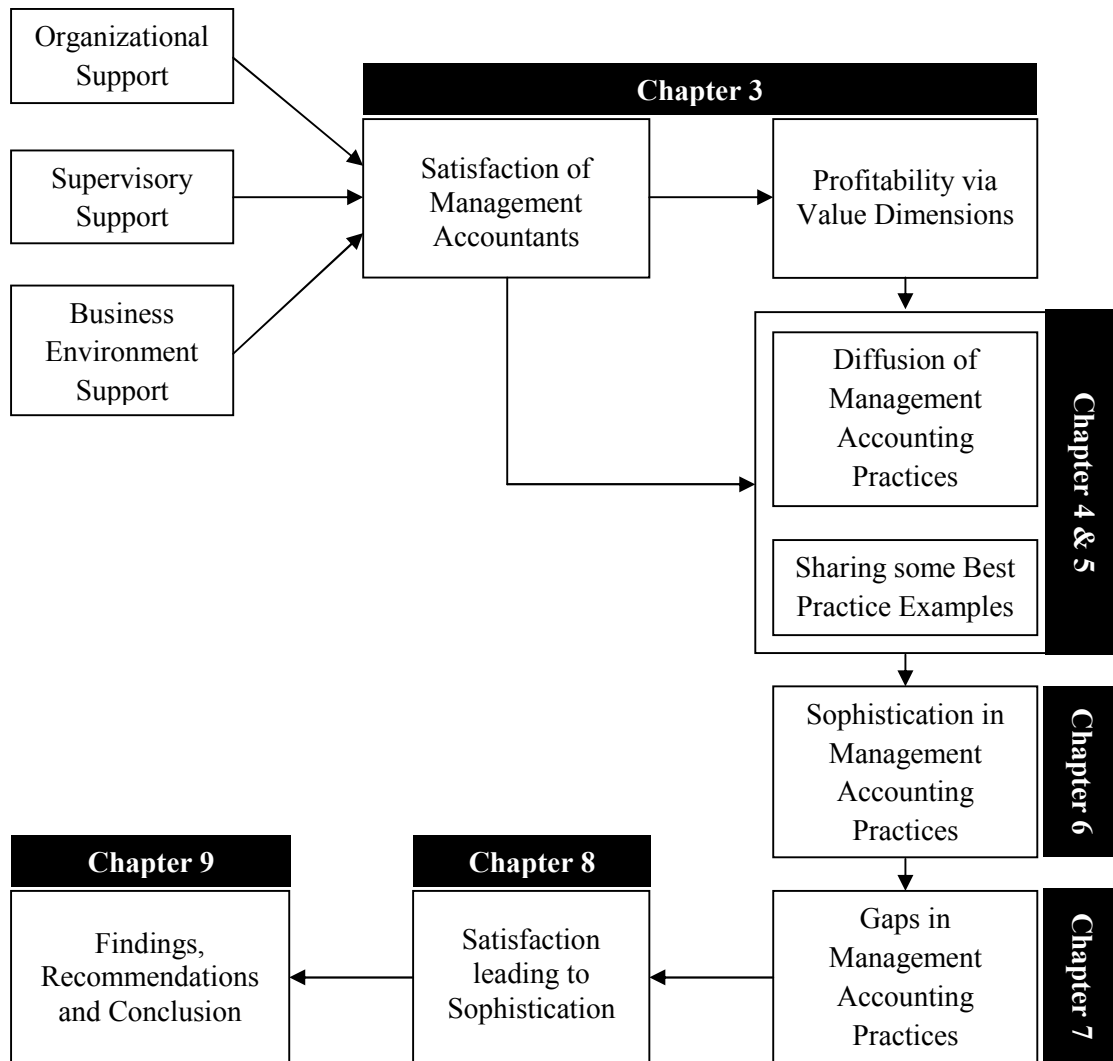


Figure 1.2: Structure of the thesis

Chapter Seven presents existing literature on gaps that exist between theory and practice in the field of management accounting. Then it proposes a generic model to study the gaps in a more holistic way which is the outcome of in-depth interviews. At the same time, this chapter also presents a quantitative methodology of quantifying gaps, particularly the gap between perception and level of application of different management accounting techniques.

Chapter Eight presents the ultimate goals of the study. It identifies different contingent factors influencing the level of sophistication achieved by different management accounting firms in Bangladesh. It also addresses the issue whether practitioners' satisfaction leads to sophistication.

Finally, **Chapter Nine** brings an end to the thesis with a general conclusion. It highlights some major findings and policy recommendations coming out of this study. These recommendations open few interventions targeting extra attention towards the development of management accounting environment in Bangladesh. Only then, management accounting can generate the maximum benefits to different stakeholder groups through increasing firms' competitiveness via confirming governance. It also discusses the contributions of this research to current state of knowledge and offers some areas for further research.

Chapter 2

A Review of the Contextual and Theoretical Considerations

This chapter extends discussion covering following main points –

- 2.1 Introduction
- 2.2 Bangladesh Economy and the Need for Management Accounting Profession
- 2.3 Management Accounting Profession in Bangladesh
- 2.4 Contingency Theory
- 2.5 Diffusion Theory
- 2.6 Conclusion

2.1 Introduction

There are differences between management accounting and financial accounting research. Researches in the field of financial accounting are driven by some common concepts like harmonization of accounting standards, application of agency theory, expectation gap and expectancy theory, audit independence, transparency and accountability, stewardship theory etc. These are mainly focused on ensuring transparency and accountability through disclosing information in general purpose financial statements under common standards irrespective of jurisdictions. However, management accounting researches address a completely different perspective due to its nature which bypasses the common requirements of financial accounting.

The development of management accounting can be theoretically aligned with that of natural sciences. It has been tested in laboratory to understand the construct and then applied in practice to fulfill the demand of certain closed groups like the management in broader sense. However, the financial accounting is a social science taking care of societal perspective particularly. Due to this gap, management accounting is driven by the intuition of management and the management accountants need to apply the professional wisdom to fulfill those information needs which are mostly discretionary in nature.

The style of management accounting research, thus, is not a generalized one and the application of contingency theory becomes customary in management accounting. Management accounting techniques developed in academia have been modified by the

time they come to practice and similarly techniques applied in practice have been customized while they come to academia. Due to the application of contingency theory and diffusion theory of innovation, management accounting becomes so rich and comes very close to the practitioners. Innovativeness in management accounting makes it an evolving discipline from the very beginning. On the way of its proud journey, it accommodates different concepts from sociology and other behavioral sciences to bring the discipline very close to human psychology and gives it a societal perspective. However, the adoption of innovations takes different fashion in different parts of the world which attracts a good number of researchers in the area and enriches management accounting innovation research and its diffusion. This chapter targets to present different theoretical foundation of the thesis like contingency theory and diffusion of innovation theories in the field of management accounting. This chapter also presents a brief discussion on Bangladesh economy and management accounting profession in Bangladesh which is very pertinent to the thesis.

2.2 Bangladesh Economy and the Need for Management Accounting Profession

Management accounting and economic development are intertwined. Management accounting is developed to address the particular needs of firms due to economic refinements triggered by great industrial revolution. Since then, it is strongly visualized that innovative management accounting practices are diffused mostly in developed part of the world to cater the specific needs of the practitioners. And the remaining part of the world is struggling to absorb different management accounting practices that mostly suited their local characteristics. Asian economy is now experiencing a rapid growth which becomes the talk of the time, may be this century will be the Asian century led by India and China. As a neighboring country, Bangladesh is also trying to join the newly defined economic belt by improving its different economic parameters during last couple of years. In September 2000, 189 countries attending the UN Millennium Summit, signed the UN Millennium Declaration, a manifesto to eradicate extreme poverty, hunger and disease among the one billion people in the world who subsist on barely anything (UN, 2000). The project set a deadline of 2015 to achieve eight goals, called Millennium Development Goals (MDGs). As a part of its routine achievement of different milestones under MDG, Bangladesh is dreaming to be a middle income country by 2021 and developed country by 2041. The World Bank's latest estimates of Gross National Income

per capita (GNI) continue to show improved economic performance in many low-income countries, with Bangladesh, Kenya, Myanmar, and Tajikistan now becoming lower-middle income countries, joining those with annual incomes of \$1,046 to \$4,125. To expedite its economic strength through improving different macro-economic parameters, Bangladesh needs a highly responsive industrial sector. A retrospective sketch of industrial sector along with political philosophy is presented below in brief.

On her independence in 1971, Bangladesh inherited an economy led by private sector. However, the then government has nationalized all the properties¹ left by Non-Bangalee owners as a philosophy driven by socialism. These properties are brought under the state ownership based on state intervention and central planning (Government of Bangladesh, 1972). By 1974, the public sector controlled about 350 state owned enterprises (SOEs) responsible for over 92% of total fixed assets of the industrial sector. However, their inefficiency adversely affected public investment and their losses consumed 30% of annual project aid. Not surprisingly, this strengthened the hand of adversaries of the public sector (Ghafur, 1976).

Public sector control problems had created a response of privatization policies in Bangladesh. A common research finding is that accounting controls become irrelevant in SOEs because political influences over decisions outweigh commercial considerations and bypass formal accountability systems (Jones & Sefianc, 1992). Several studies on Bangladesh SOEs found bureaucratic rule-bound controls were maintained but largely ignored because decisions were politicized (Uddin & Hopper, 2001; Hoque & Hopper, 1997; Alam, 1997). Technically sound accounting systems operated within centralized state planning but were irrelevant for managers as they bore little semblance to operational realities. Accounting appeared to exist to legitimate state activities to external aid agencies by demonstrating the appearance, rather than the substance, of financial accountability and rational economic planning. Not surprisingly, there was widespread managerial dissatisfaction with controls, which was reflected in poor enterprise performance.

¹ All properties left the non-Bangalee owners are placed under three corporations: 78 industrial enterprises are placed under Bangladesh Jute Industries (which is substituted for Mills in 1974) Corporation as per First Schedule; 73 industrial enterprises are placed under Bangladesh Textile Industries (which is substituted for Mills in 1974) Corporation as per Second Schedule and 18 industrial enterprises are placed under Bangladesh Sugar Mills Corporation as per Third Schedule of The Bangladesh Industrial Enterprises (Nationalization) Order 1972.

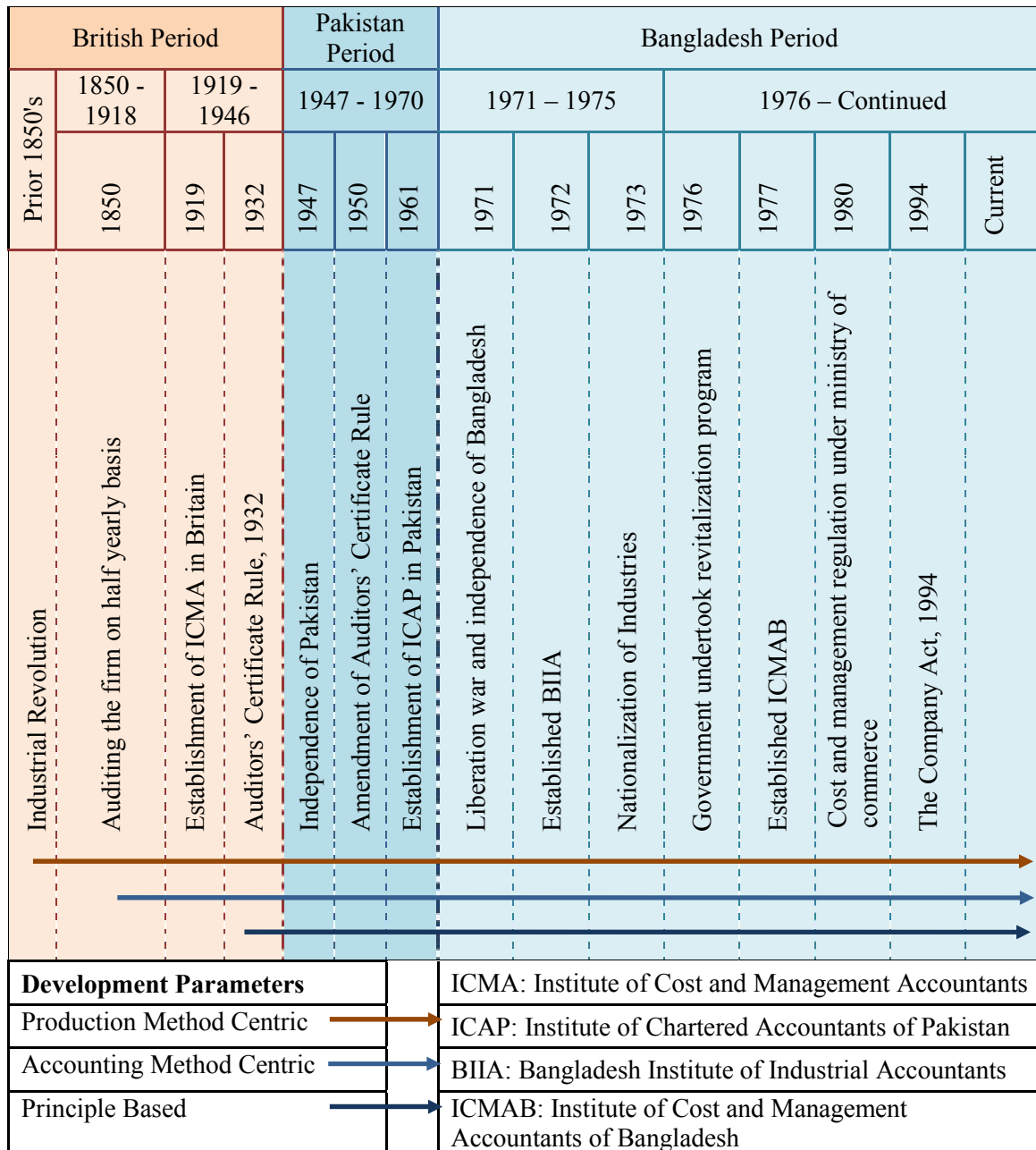


Figure 2.1: Development of Management Accounting in Bangladesh

In late 1975s a new government came to power, assuming full control in 1977. This government initiated liberal economic policies leading to some small companies being returned to their owners at nominal prices and on easy terms. A disinvestments board was established resulting in 255 SOEs, including “abandoned” and vested properties, being divested or privatized between 1975 and 1981 (World Bank Reports, 1995). Advocates of privatization presume that ownership changes will induce superior management controls, and hence greater productive and allocative efficiency (Vickers & Yarrow, 1988). World Bank reports (1995) justifying privatization emphasize the lack of financial accountability

and transparency in SOEs, and their immunity from market disciplines and the scrutiny of legal institutions. World Bank reports (1995) and the IMF emphasize the importance of creating an “Enabling Environment” in Bangladesh to promote accountability, transparency and efficiency in companies.

As Bangladesh moves from nationalization to privatization of business enterprise to realize efficiency, government interference has been restrained and the government’s sphere of actions and decision-making authority are limited mostly to the macro economy. The adoption of the scientific management system by the privatized organizations to ensure efficiency has created an environment to motivate and facilitate the use of management accounting. The growth and change of decision-making authority and level from the government to the enterprise has been the most important factor that has created the demand for practicing management accountants in Bangladesh. Some notable developments as mentioned in the timeline (**Figure 2.1**) bring the management accounting practices in its current shape and the refinement will be continued as new requirements and demands will come in due time. In the figure, the development of management accounting is shown in line with three development parameters. Production method centric starts with the industrial revolution whereas accounting method centric begins with the requirement of audit on a half yearly basis in 1850. And the third development parameter is based on principle with the enactment of Auditors Certificate Rule, 1932.

2.3 Management Accounting Profession in Bangladesh

Management accounting as a profession remains still in its infancy in Bangladesh. After her independence in 1971, Bangladesh has faced lots of problems and difficulties because of small number of Bengali professional accountants. Realizing the difficulties and importance of accountants, the Government of Bangladesh formed an ad hoc committee which appoints 18 chartered accountants to solve the problems. On 6th January 1972, the Government of Bangladesh passed a law ‘The Bangladesh Chartered Accountants Order’ and then established the Institute of Chartered Accountants of Bangladesh. The institute is solely responsible for producing chartered accountants within the jurisdiction of Bangladesh. In addition, the institute sets accounting standards as guidelines for the professional accountants and practitioners and control the financial accounting and reporting environment.

However, establishment of this institute has less impact on the development of management accounting profession rather sometimes it works as unwelcoming to the way of flourishing another parallel profession considering it as a professional challenge for existence and plug in coercive isomorphism. In a single geographic territory, two different professions enjoying the right of statutory audit seems to be in confliction though the scope of such audit is completely different. However, economies led by manufacturing sector cannot run without the services of management accountants.

Globally management accounting profession was not accepted as independent profession before 1919. The profession achieves organizational foundation after establishing “*the Institute of Cost and Management Accountants*” in Britain in 1919. In the same year, “*Institute of Management Accountants*” has been established in America to develop the profession. These institutes represent the premier in management accounting profession worldwide. The parallel institute that represents the profession in Bangladesh is named as the Institute of Cost and Management Accountants of Bangladesh (ICMAB) which was established in 1977 based on the ordinance known as Cost and Management Accountants Ordinance 1977. The institute was a branch of “Pakistan Institute of Industrial Accountants” set up in Dhaka in 1961. After the independence it was renamed as “Bangladesh Institute of Industrial Accountants” in 1972. Activities of the institute are regulated by the “Cost and Management Accountants Regulations, 1980”. It is an autonomous body under the Ministry of Commerce, Government of the People’s Republic of Bangladesh. This is the only institute in the country dedicated to cost and management accounting education and research. The cost and management accounting profession in Bangladesh is mainly controlled by this body whose structures are modeled on “the United Kingdom system” (Parry & Grooves, 1990). ICMAB also prides itself in advising the government on various issues relating to national budget, company law, VAT, taxation, privatization etc. on its own initiative and through representation in different committees formed by the government. In Bangladesh until 1994 there was no statutory enactment as to maintenance of cost accounting records of any sort and audit thereof by manufacturing companies. Two sections have been inserted in the Companies Act, 1994 requiring certain companies to maintain specific cost accounting records and audit of the same as and when desired by the government. So long, as there is no statutory mandatory obligation regarding maintenance of specific cost accounting records and audit of the same; companies, particularly manufacturing companies, are maintaining their cost

accounting records to suit the purposes and requirements of their internal management and the requirements of their external financial audit done by chartered accountants (Sharkar et al., 2006).

2.4 Contingency Theory

The contingency theory approach to the study of organizations developed at the beginning of 1950's as a response to prior theories of management that, despite their diversity, commonly emphasized “one best way” to organize. This approach is summarized by Szilagy and Wallace (Szilagy & Wallace, 80) from the original work (Kast & Rosenzweig, 73):

“The contingency approach attempts to understand the interrelationships within and among organizational subsystems as well as between the organizational system as an entity and its environments. It emphasizes the multivariate nature of organizations and attempts to interpret and understand how they operate under varying conditions ...”

Contingency theory is an approach to the study of organizational behavior in which explanations are given as to how contingent factors such as technology, culture and the external environment influence the design and function of organizations. The assumption underlying contingency theory is that no single type of organizational structure is equally applicable to all organizations. Rather, organizational effectiveness is dependent on a fit or match between the type of technology, environmental volatility, the size of the organization, the features of the organizational structure and its information system.

Contingency theories were developed from the sociological functionalist theories of organization structure such as the structural approaches to organizational studies by Reid and Smith (2000), Chenhall, (2003) and Woods (2009). These studies postulated that organizational structure was contingent on contextual factors such as technology, dimensions of task environment and organizational size. In some other literature, contingency theory was still regarded as a dominant paradigm in management accounting research (Fisher, 1995; Cadez and Guilding, 2008). This section presents a brief review of existing literature on the application of contingency theory in the field of management accounting research.

2.4.1 Alternative approaches in contingency theory

Contingency theory studies postulate that organizational outcomes are the consequences of a fit or match between two or more factors. The concept of fit has been defined by Van de Ven and Drazin (1985) in three approaches - selection, interaction and systems approaches. First, in the selection approach, the interpretation of fit was that, if an organization wants to survive or be effective, it must adapt to the characterizations of its organizational context. In this view, organizational design is caused by organizational context. Most of the early contingency research studies adopted this approach to examine links between organizational context and design but did not analyze organizational performance. Using this approach, both task and technology were defined in two dimensions (Dewar and Hage, 1978). Other researchers such as Freeman (1973) investigated technology as a contingent factor. These researchers found that there was a strong relationship between various characteristics of technology and structure in the organization (Marsh and Manari, 1981). However, these studies did not provide evidence on whether different types of structures in different tasks or technological conditions were effective.

Second, fit is interpreted as an interaction effect of organizational structure and context on performance (Khandwalla, 1977; Van de Ven and Ferry, 1980). Khandwalla (1977), for example, found that for effective firms the correlations between technology, structural dimensions of vertical integration, delegation, authority and sophistication of control systems were more significant than for ineffective firms. However, in these studies, the differences in the correlation between context and design in the high and low performing organizations were not significant. Furthermore these studies did not show if the interactions between context and design were effective.

Third, another approach in the contingency theory literature with regard to fit is the systems approach. According to the systems approach, one can understand organizational design only by simultaneously investigating the contingencies, structural alternatives and performance criteria existing in an organization. There is also another view of fit in the systems approach. It is called equifinality (Van de Ven and Drazin, 1985) which advocates that there is not a best way in the selection, interaction and pattern approaches to fit. Multiple and equally effective alternatives may exist. Van de Ven and Drazin (1985) suggested that contingency studies should be designed. Hence, the comparative evaluation of various forms of fit is possible and the design of organizational sub-

divisions should be taken into consideration. There are a number of important assumptions in the contingency approach, some are explicitly stated and others are implicit. Some of the important assumptions are listed below:

- a) Fit - The better the fit among contingency variables (e.g., between technology and organizational structure) the better the performance of the organization. Performance is generally defined as a function of financial variables such as return on investment, profit or net wealth.
- b) Rationality - Organizational actors perform in ways that are always in concert with the super-ordinate goal of organizational effectiveness. As a consequence, there is always goal consensus among decision makers within an organization.
- c) Situational determinism - For example, the environment is given and managers and thus organizations cannot influence it.
- d) Deterministic models - Clear causal inference is often made.
- e) Cross-sectional and non-historical empirical methods.
- f) Linear model of contingency variables - Most contingency studies rely on statistical methods which are based on the general linear model, e.g., regression.

2.4.2 Application of Contingency Theory in Management Accounting Research

One of the earlier works in management accounting research adopting a contingency perspective was Hofstede's (1967) classic field work. Hofstede (1967) found that, economic, technological and sociological considerations had a significant impact on the functioning of budgeting systems. In addition, cultural effects on management control systems have been studied (Hofstede, 1983; Brownell, 1982; Brownell and Hirst, 1986). This has become an important area of research (Harrison, 1992, 1993; O'Connor, 1995; Taylor, 1996; Chenhall, 2006).

Contingency theory has also been applied to the subunit level of organizational behavior. Hayes (1977) examined the appropriateness of management accounting in order to measure the effectiveness of different departments in large organizations and found that contingency factors or contingencies were the major predictors of effectiveness for production departments. Hayes (1977) also advocated the use of contingency theory in studies of organizational assessment and subunit evaluation. Hayes' study hypothesized three major contingencies affecting sub-unit performance: internal factors, interdependency factors and environmental factors. The results of the study suggest that

the underlying causal variables should be studied rather than just narrowly examining surrogates. The results also implied that a contingency approach should be taken to managerial accounting and the relevant assessment methods should be determined by sub-unit type, sub-unit inter-relationships and the extent of environmental influence on the performance of sub-units.

Flamholtz et al. (1985) reviewed the contingency literature concerned with the issue of control. In this aspect of the contingency literature, the issue of control is studied along three main traditions: the sociological, the administrative and the psychological perspectives. The sociological perspective focuses on the entire organization and the larger groups within it. In this view, structural mechanisms of rules, policies, hierarchy of authority or coordinative units obtain control (Flamholtz et al., 1985). The administrative perspective focuses on the individuals or departments within an organization. The control mechanisms employed by the administrative theorists are plans, measurement, supervision, evaluation and feedback. The psychological perspective emphasizes goal and standard setting, extrinsic and intrinsic rewards, feedback or interpersonal influence (Flamholtz, 1979).

Shank (1989) applied contingency principles in investigating the use of managerial accounting systems and information in a strategic way. Banker et al. (1991) looked at the impact of structural factors and found that firms which implemented just-in-time (JIT) or other team-work programs were more likely to provide information regarding performance to shop-floor workers.

Research studies such as Govindarajan and Gupta (1985) have investigated the relationship between firms' strategies and the design of their control systems. Merchant (1985) uncovered contingent relationships between corporate contextual factors, such as size of the firm, product diversity, extent of decentralization and the use of budgetary information. Additionally, some studies have investigated the influence of external factors such as impact of environmental uncertainty. Environmental uncertainty was found to be a major explanatory variable as to whether accounting data was appropriate in evaluating the performance of business units (Fisher, 1995; Hartmann, 2000; Chenhall, 2003).

From review of management accounting research using contingency theory, the usage of contingency theory is summarized. Contingency theory has been applied in management accounting research in order to address three types of questions. These questions are about: first, the fit between organizational control and structure; second, the impact of

such fits on performance; third, investigation of multiple contingencies and their impact on organizational design.

Contingency theorists attempted to identify the important variables assumed to influence organizational performance. They then attempted to operationalize and measure these variables and determine their effects on performance. Seminal studies were done by researchers such as Lawrence and Lorsch (Lawrence & Lorsch, 67) (influence of the environment on organizational integration and differentiation), Burns and Stalker (Burns & Stalker, 61) (influence of environment on organization structure), and Woodward (Woodward, 65) (influence of the technology on organizational structure).

2.5 Diffusion Theory

The Diffusion of Innovation Theory was first discussed historically in 1903 by the French sociologist Gabriel Tarde (Toews, 2003) who plotted the original S-shaped diffusion curve, followed by Ryan and Gross (1943) who introduced the adopter categories that were later used in the current theory popularized by Everett Rogers. Katz (1957) is also credited for first introducing the notion of opinion leaders, opinion followers and how the media interacts to influence these two groups. The Diffusion of Innovation theory is often regarded as a valuable change model for guiding technological innovation where the innovation itself is modified and presented in ways that meet the needs across all levels of adopters. It also stresses the importance of communication and peer networking within the adoption process.

In simple terms, the diffusion of innovation refers to the process that occurs as people adopt a new idea, product, practice, philosophy, and so on. Rogers mapped out this process, stressing that in most cases, an initial few are open to the new idea and adopt its use. As these early innovators 'spread the word' more and more people become open to it which leads to the development of a critical mass. Over time, the innovative idea or product becomes diffused amongst the population until a saturation point is achieved. Rogers distinguished five categories of adopters of an innovation: innovators, early adopters, early majority, late majority, and laggards. Sometimes, a sixth group is added: non-adopters. Rogers estimated the percentage of each category, which in fact, is very similar to the proportions found in a normal bell-curve.

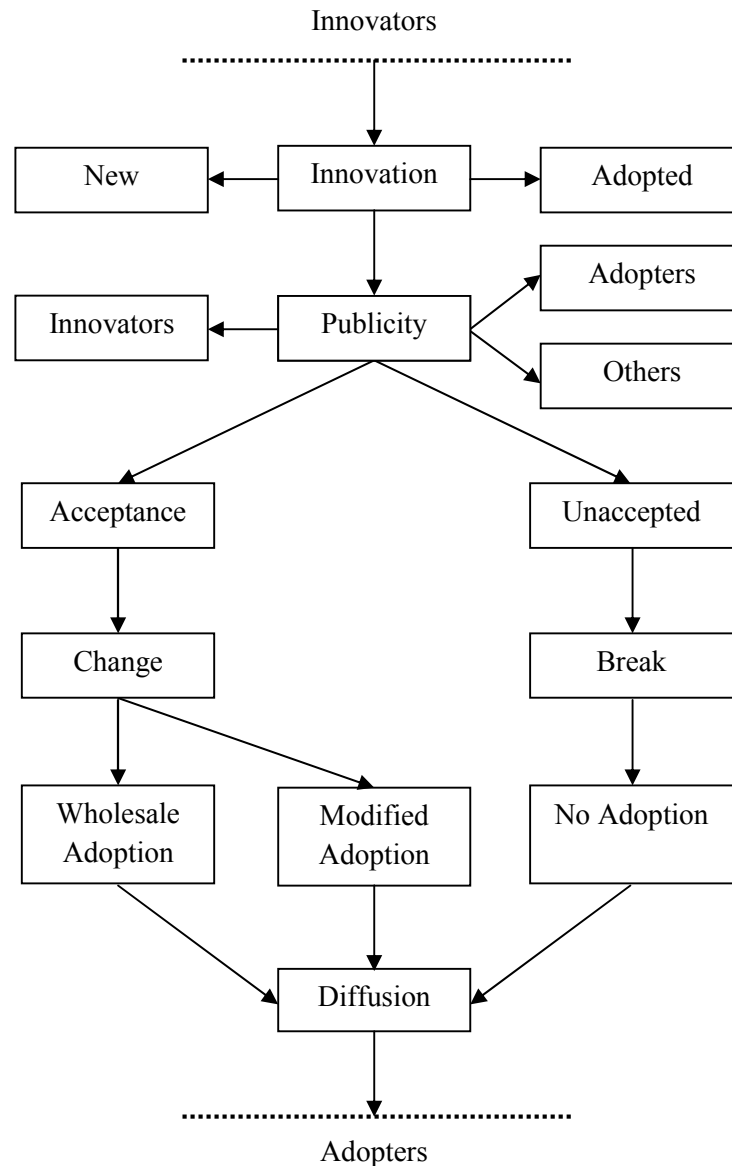


Figure 2.2: Innovators vs. Adopters in a diffusion process

Wide diffusion of management accounting tools brings a sort of harmonization in management accounting practices. This harmonized practice in the field of management accounting, unlike financial accounting, is essentially characterized by different motivators. The harmonization of management accounting practice is a result of a number of different diffusion processes that are attracting increasing attention in management accounting research (Bjørnenak, 1997; Clarke et al., 1999; Gosselin, 1997; Malmi, 1999). Innovation is an inherent drive of human endeavor to contribute some beauty for the benefit of mankind at any capacity. This desire is the motivation behind the innovative efforts in any discipline. However, there is no guarantee that all the innovation will

receive the same attention of the community. The main problem is that most of the innovations demand 'change' which people doesn't like to accept so easily. Thus every innovation needs some confirmation from the society before its wide diffusion. This confirmation comes through a process like consensus which may take good amount of time. Thus, it may take a long journey from innovation to diffusion process which needs to pass across different milestones as identified in the above figure (**Figure 2.2**). A close relationship between innovators and adopters helps to diffuse any innovation smoothly.

Rogers (1995) points out that all innovations should not be automatically regarded as equivalent units of analysis, and argues that the different characteristics of innovations help to explain their different rates of adoption. A management accounting innovation is often referred to as a management accounting model, indicating a general scheme of how the management accounting system is designed (Arwidi and Samuelson, 1993). All models consist of certain characteristics. In the case of management accounting models, the characteristics can assume one of at least two forms, namely design characteristics and rhetorical elements.

Bjørnenak and Olson (1999) introduced the term design characteristics to describe the technical specification of management accounting models, indicating a general scheme of how management accounting systems are designed. Viewed in this way, it is the set of design characteristics that define the technical specification of a management accounting innovation (MAI). Examples of design characteristics in the case of ABC are cost objects, activity hierarchy and cost drivers, and in the case of the BSC strategy maps, scorecard perspectives and cause-effect linkages.

Rhetorical elements represent the alleged benefits of a MAI. Rhetorical elements are used to persuade an audience about the value of an innovation. Thus, the rhetorical elements used shape the beliefs about a MAI. Rhetoric can focus on various aspects of an innovation, for example, benefits (often compared to existing techniques), areas of use, problems it can solve, and stories about companies that successfully use the innovation. The rhetoric presented not only aims at persuading an audience about the more technical merits of an innovation, but also that the innovation is the most rational and modern approach to manage contemporary organizations. In this respect Ruling (2005) means the rhetoric typically consists of "an ensemble of assumptions and claims about the functioning of organizations, the economy and society that are related to a set of more or less precise suggestions and rules about how to manage organizations".

Diffusion is the process whereby an innovation is communicated through certain channels over time among the members of a social system (Rogers, 1995). Three important social phenomena describe the speed and range of a diffusion process (Bjørnenak, 1997). Initially, the idea may meet *resistance*, for example in the form of an unwillingness to make organizational changes or of theoretical objections from academics. *Barriers* to diffusion are another factor. These can assume the shape of lack of resources or cultural/linguistic obstacles. Barriers are also related to the final factor, namely the *information field* of potential adopters, that is to say the extent of contacts a potential adopter has made at a given time. The information field affects the rate of diffusion.

By focusing on the information field we direct attention to the supply side of the diffusion process. Diffusion studies have traditionally focused on organization's demand for innovations and emphasized the role of potential adopters of innovations in driving the communication process. However, more recent studies have seen the supply side as actively seeking to control the information field of potential adopters (Abrahamson, 1991, 1996; Abrahamson and Fairchild, 1999). This modern perspective has also inspired studies of the diffusion of management accounting innovations (Bjørnenak, 1997; Gosselin, 1997; Malmi, 1999). In a study of Norwegian manufacturing firms Bjørnenak (1997) suggested that potential adopters' contacts with the propagators of ABC explained the rate of adoption better than efficient-choice variables. This is consistent with the findings presented in a study of diffusion of ABC among Finnish manufacturing firms (Malmi, 1999). Malmi's study showed that fashion-setting organizations exert considerable influence in the take-off stage of the diffusion process (i.e. during the period with high rates of adoption). Both studies take the innovation (i.e. ABC) as given, and do not discuss the possibility of different "ABC packages". Clarke et al. (1999) explains the low adoption rates of ABC in Ireland by referring to the absence of compulsory further professional education in management accounting, the lack of practitioner journals devoted specifically to management accounting, and the absence of executive MBA programmes, i.e. supply side factors.

Alvarez (1998) and Mazza and Alvarez (2000) stress the importance of making innovations compatible with the societies to which they are transmitted (diffused). They also argue that cultural discourses and legitimization are the main resources needed to enable the popularization of an innovation. One way in which the supply side can popularize an innovation in a specific location is by matching the design characteristics

and rhetorical elements of the innovation (i.e. the bundling) to the preferences and knowledge of the potential adopters. A certain degree of ambiguity about the content of fashionable concepts which opens the concepts to different interpretations and uses, will potentially increase the supply side effect in the diffusion process, for example by including elements in the bundling process that reduce barriers and resistance to change. The degree of ambiguity regarding its content endows the innovation with its interpretative viability. Thus, a high level of interpretative viability may make the innovation more compatible with new social settings (Benders and van Veen, 2001). Early fashion-setting adopters, consulting firms and others can be described as supply side drivers in the diffusion process, since they either actively impel the spread or are passively imitated (Abrahamson, 1991). The supply side may use interpretative viability to impose imitative behavior as a means of spreading innovations, e.g. by linking the innovation to success stories from practice.

2.5.1 Demand vs. Supply Side of the Diffusion of Innovation

Some researchers (e.g. Brown, 1981; Clark, 1984; Clark and Staunton, 1989; Bjornenak, 1997) advocate the use of both the demand and supply sides in the explanation of innovation diffusion. The demand approach, which dominates the diffusion of innovation literature, assumes that different adopters demand different innovations according to some features such as organizational, environmental and adopter characteristics. In addition, in explaining differences in times of adoption, it is assuming the availability of the innovation to everyone.

In contrast, the supply approach deals with cases where the innovation is not universally available due to the fact that the supply is under control, as it focuses on the process by which innovations and the conditions for adoption are made available to organizations, and thus it pays attention to the characteristics of diffusion agent (Brown, 1981; Clark, 1984). Clark and Staunton (1989) stated that as a result of the activities of supply side agencies, organizations do not have equal access to information and innovations by controlling the process of spread of information and innovation through time and space.

In a similar manner, Clark (1984) pointed out that the demand approach can only be an adequate explanation if the supply of the innovation was not universal. In such cases it is essential to discover and explain the rationale behind the strategy for making the innovation available. He argued that, when every potential adopter of an innovation did

not have equal access to an innovation, supply side factors might be considered as an important influencing factor in the diffusion process of that innovation. In addition, Griliches (1957) pointed out that it did not make sense to blame potential adopters for being non-adopters or slower in adoption than others, if particular innovations were not available to them or were being made available to them at a later date in contrast to adopters.

The widest analysis of diffusion using a supply approach was developed by Brown (1981). He explained that the supply side of diffusion consisted of market and infrastructure factors which influence the rate and patterning diffusion. He focused on how innovations could be diffused (i.e. marketed) by considering the marketing strategies used by diffusion agencies (i.e. propagators) which supply innovations. It is through these agencies that the innovation is made available to potential adopters.

Therefore, each potential adopter may or may not know the innovation. In addition, the innovation may require some pre-existing infrastructure such as financial resources, information, and appropriate skills. In other words, knowledge about the innovation and the availability of needed infrastructure largely shape the diffusion of innovation. Bjornrak (1997) emphasizes the important role of institutions in defining the organization's information field. He points out that the innovator, the first organization to adopt an innovation and, where applicable, a diffusion agent such as a consultant, could play important roles in the diffusion process as propagators. In addition, the role of infrastructure such as books and articles make the potential adopters aware of available innovation and convince them to adopt it. In this respect, it should be noted that propagators are not free agents able to control the availability of the innovation to their best advantage. Just as potential customers are subject to constraints of knowledge, conservatism or poverty, so organizations too are limited in what they can do.

To summarize, the supply side of diffusion seems to play a key role in explaining the diffusion of innovation. The supply side sheds lights on the marketing strategies used by diffusion agencies (propagators), which supply innovations to potential adopters. In addition, this perspective appears to be more important when potential adopters do not have equal access to an innovation in terms of the knowledge about the innovation and provision of necessary infrastructure such as financial resources, information, and appropriate skills.

2.5.2 Dynamic Perspective on the Diffusion of MAIs

The dynamic perspective on the diffusion of MAIs proposed here divides along two dimensions: components of MAIs, i.e. design characteristics and rhetorical elements, and objects of dynamics. Combination of the two dimensions provides seven types of forms of which a MAI may disseminate to new locations, as shown in **Table 2.1**.

Object of the dynamics	Design characteristics	Rhetorical elements
Elements of the innovation	Design selecting	Rhetorical selecting
The complete innovation	Changing	Reframing
The innovation and other innovations or existing ideas	Design bundling	Rhetorical bundling
The innovation as a component of a meta innovation	Housing	

Table 2.1: A Framework of a Dynamic Perspective on the Diffusion of Management Accounting Innovations

Design selecting occurs when only one or more design characteristics of a MAI are singled out for use. Thus, design selecting denotes a partial diffusion of a MAI.

Rhetorical selecting is a partial diffusion of an innovation where an innovation's name, parts of its rhetoric or one or more of the innovation's key concepts are selected for use.

Changing denotes a partial modification of a MAI's set of design characteristics, leaving the foundation of the innovation unaffected. The original conceptualization of a MAI is transformed through the introduction of new or removal of existing design characteristics.

Reframing takes place when a MAI is introduced into new contexts, for example new industries or new organizational functions, or is applied to new organizational problems.

Design bundling is the practice of combining design characteristics of a MAI with design characteristics from one or more other MAIs or existing ideas for the purpose of presenting the new set of design characteristics as a single management accounting idea. The name of the MAI and/or the other MAI(s) or existing idea(-s) or an entirely new name might be used to label the new package of design characteristics.

Rhetorical bundling occurs when rhetorical elements of a MAI are combined with rhetorical elements from one or more other MAIs or existing ideas. The new set of elements is presented as a single management accounting idea or as two or more

separately treated management accounting ideas. The name of the MAI and/or the other MAI(s) or existing idea(-s) or an entirely new name might be used to label the bundled product.

Housing denotes that a MAI is diffused as a component/part of another MAI. In recent years we have witnessed the introduction of a new type of MAI, in which the content of the innovation is more ambiguous. Strategic management accounting (SMA) and value-based management (VBM) are examples of this type of innovation. They can be characterized as umbrella concepts covering a combination of other MAIs and existing ideas. We call this form of MAI diffusion housing. In contrast to the other six forms of MAI diffusion, housing does not necessarily involve a transformation of the innovation. In fact, the design characteristics of the MAIs involved are often not explicitly discussed. Instead, the rhetorical elements, particularly rhetoric focusing on the use of MAIs, are usually more important than the design characteristics in this type of diffusion.

2.5.3 Alternative Perspectives in Explaining the Diffusion of Innovation

The classic literature of the diffusion of innovation has been criticized due to the fact that it has been dominated by a demand perspective which assumes that rational adopters make technically efficient choices (Rogers, 1995, 2003). However, this perspective underestimates the role of suppliers of innovations in providing the information to potential adopters (Brown, 1981; Clark 1984). Furthermore, it fails to address sufficiently the institutional mechanisms which can lead organizations to adopt technically inefficient innovations (DiMaggio and Powell, 1983, 1991; Abrahamson, 1991). Thus, the next three subsections will deal with possible alternative explanations of the diffusion of innovation that have been found in the literature.

2.5.3.1 Institutional Theory

Various researchers have paid attention to the diffusion of innovation in connection with new institutional sociology theory (e.g. Scott, 1995; Haunschild and Miner, 1997; Chua and Petty, 1999; Howorth et al., 2002). Institutional theory researchers have pointed to the influence of institutional factors such as the government role and the organizational network in the diffusion of innovation. For instance, Tolbert and Zucker (1983) investigated the diffusion and institutionalization of civil service reforms by cities. In their study they distinguished between two different cases of diffusion. The first one

found that when the civil service procedures are required by the State, they diffuse rapidly and directly from the State to each city. In the second one, when the procedures are not required by the State, they are not deemed legitimated, they diffuse gradually over time and largely through social influence. In this case, early adoption of the procedures by cities occurs as a result of internal organizational factors as organizations require these procedures. But later, when number of organizations adopting the procedures increase, they become institutionalized leading to legitimacy. Once that happens, the legitimacy of procedures facilitates the later diffusion; so organization factors no longer predict the adoption decision.

In this context, it is worthwhile to discuss briefly the various types of institutional theory that have been used in understanding organizational/ management accounting change. According to Hussain and Hoque (2002) and Scapens (2006) there are three different versions of institutional theory to study organizational/ management accounting change, namely: New Institutional Economics (NIE), Old Institutional Economics (OIE) and New Institutional Sociology (NIS).

NIE adopts a rational economic approach, which mainly focuses on making optimal choice by organizational actors to maximize the economic outcomes (Spicer and Ballew, 1983; Spicer, 1988). This type of institutional theory illustrates the economic factors which are thought to shape the structure of organizations and their MAPs; this perspective heavily influences conventional management accounting theory and research (Burns and Scapens, 2000; Hussain and Hoque, 2002).

In contrast, OIE starts from a rejection of the rational economic approach. The central core of this version is the important role of organizational routines and institutions in shaping organizational change. Based on this perspective, the changes in organizational and accounting routines should be recognized, these changes in routines may (or may not) be embedded in organizational institutions. Organizational institutions are regarded as imposing forms and social coherence upon the activities of human thought and action (Burns and Scapens, 2000).

NIS, which is largely attributed to DiMaggio and Powell (1983, 1991), suggests that within a high degree of environmental uncertainty, organizations will develop homogeneously. In NIS, however, the main question is why organizations in the same field look similar and what the pressures and processes are in shaping an organization. This version is concerned with the effect of the wider social environment, where an

organization is located on organization structure. It is believed that the survival of an organization depends not only on achieving production efficiency but also on its conformity to societal norms of acceptable practice (Meyer and Rowen 1977; DiMaggio and Powell, 1983, 1991). To illustrate conformity, DiMaggio and Powell (1983, 1991) identify three types of isomorphism: coercive, normative, and mimetic.

While OIE looks closely at institutions and the pressures within the organization that shape the MAPs, NIE and NIS look to institutions that put pressures from outside the organization (Scapens, 2006).

Based on the discussion above, it seems that there is an overlap between diffusion of innovation theory and institutional theory, especially NIS. The central interest in diffusion theory is how and why (or why not) some firms adopt new ideas or practices. In this respect, NIS seems to provide an answer to these questions as it gives an explanation as to why and how some practices may diffuse through the population. Thus, this theory needs some elaborative discussions which is attempted below.

NIS theory puts emphasis on the organization in its institutional environment, not organization's task environment as usually prescribed by contingency theory, which has received much attention in management accounting research (Covaleski et al., 1996; Hussain and Gunasekaran, 2002). These environments, which include an organization's networks such as customers, suppliers, and other organizations that influence input and output of the organization, include also the culture and social systems such as rules, beliefs and norms. Thus, in order to survive, organizations do not just need to achieve production efficiency, but they also need to adopt the practices and procedures that are acceptable in their institutional environment, and they do that to ensure continuance of support from their institutional environment and to gain legitimacy. Scott (1987) states that -

Until the introduction of institutional conceptualizations, organizations were viewed primarily as production systems and/or exchange systems, and their structures were viewed as being shaped largely by their technologies, their transactions, or the power dependency relations growing out of such interdependencies. Environments were conceived of as task environments: as stocks of resources, sources of information, or loci of competitors and exchange partners. While such views are not wrong, they are clearly incomplete.

Institutional theorists have directed attention to importance of symbolic aspects of organizations and their environments. They reflect and advance a growing awareness that no organization is just a technical system and that many organizations are not primarily technical systems. All social systems, hence all organizations, exist in an institutional environment that defines and delimits social reality.

Therefore, according to NIS theory, organizational forms, practices and procedures will diffuse within organizational fields in a similar setting. Meyer and Rowan (1977) and DiMaggio and Powell (1983) both tried to answer the same question: what makes organizations so similar? They concluded that organizations become homogeneous in the same field, not only because they need to increase efficiency but they also confirm social rules. DiMaggio and Powell (1983) defined an organizational field as

Those organizations that, in the aggregate, constitute a recognized area of institutional life: key suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services or products.

They state that the concept that best captures the process of homogenization is isomorphism; they define organizational isomorphism as the resemblance of a local organization to other organizations in its environment or field. They distinguish between competitive and institutional isomorphism. Competitive isomorphism is more concerned with efficiency and market competition; hence it assumes that the adoption of practices and forms is based on a rational assessment of their benefits. This makes this type of isomorphism as the most relevant to an organization that exists in free and open market competition, particularly for an early adoption of innovation. For a fuller picture of the diffusion of innovation, however, DiMaggio and Powell suggest that an additional insight using institutional isomorphism is necessary. Institutional isomorphism occurs when an organization is subject to pressure from other organizations or institutions operating in its environment. DiMaggio and Powell (1983, 1991) identify three types of institutional isomorphism/pressures:

- a) Coercive pressure concerns the external pressures (both formal and informal) that are exerted on an organization from other organizations upon which they are dependent, and from society to conform to culture expectations. Such pressures may be felt as force, as persuasion, or as invitation to join in collusion. For

instance, organizations adopt new techniques as a result of government regulations, or large manufacturing companies may force their suppliers to standardize their shipping operations.

- b) Mimetic pressure emphasizes uncertainty as a powerful force for imitation. In the situation when organizations are uncertain about their environment, goals, and technology efficiency, organizations tend to copy certain practices from other organization, that are considered being legitimate or successful, in their field. In this context, John and Meyer (1981) in DiMaggio and Powel (1983) claim that It is easy to predict the organization of a newly emerging nation's administration without knowing anything about the nation itself, since "peripheral nations are far more isomorphic - in administrative form and economic pattern - than any theory of the world system of economic division of labor would lead one to expect".
- c) Normative pressure focuses on the pressures for change that occur when organizations seek institutional legitimacy for their activities (DiMaggio and Powel, 1983, 1991). DiMaggio and Powel (1983, 1991) state that this kind of pressures stems primarily from professionalization. They identify two aspects of professionalization that are important sources of isomorphism. First, the formal education produced by universities and professional training institutions, as they play a central role in developing organizational norms among managers and their staff. Second, the growth of professional networks that span organization and across which new techniques diffuse, for instance, individuals who occupy similar positions in many organizations, or who are hired from other organization.

One of the criticisms of NIS theory is that it often dichotomizes between the public and the private sector organizations, arguing that institutional and market pressures are mutually exclusive and each set of pressures is confined to a particular class of organizations. It is assumed that the former are subject to institutional pressure, whereas the latter are shaped by competitive market pressures. Researchers using this theory have emphasized mostly on non-profit organizations and public agencies such as schools, universities, hospitals and voluntary associations. Thus, the effects of economic pressure have been neglected (Meyer and Rowan, 1977; Powell, 1991; Scott, 2001).

However, the validity of dichotomizing between efficiency and legitimacy has been questioned, as economic and institutional pressures can exist in either private or public

organizations (Powell, 1991; Scott, 2001). In this context, Major and Hopper, (2003) state that Private firms too can be subject to coercive, mimetic and normative isomorphism, for example regarding practices of governance. Moreover, technical means of achieving efficiency are not given but are socially constructed. Thus businesses may mimetically copy practices of apparently successful firms, often following normative advice from outside experts.

To summarize, NIS suggests that within a high degree of environmental uncertainty, organizations will develop homogeneously. With respect to the diffusion of innovation which would make inter-organization diffusion of practices, the implications of this theory are that potential adopters may base their decisions to adopt or reject an innovation on one or more of the following forces:

- a) They may mimic other organizations within their sector that they perceive to be successful (mimetic force);
- b) They may experience pressure from other organizations or institutions upon which they are dependent on to adopt a particular innovation (coercive force);
- c) The norms established by professionals and professional associations may exert pressure on them to adopt a particular innovation in order to gain legitimacy in their field (normative force).

2.5.3.2 Roger's Diffusion of Innovation Theory

Diffusion of Innovation (DOI) Theory (**Figure 2.3**), developed by E.M. Rogers in 1962, is one of the oldest social science theories. It originated in communication to explain how, over time, an idea or product gains momentum and diffuses (or spreads) through a specific population or social system. Communication is a process in which participants create and share information with one another to reach a mutual understanding (Rogers, 1995). Diffusion is the process by which an innovation is communicated through certain channels over a period of time among the members of a social system. An innovation is an idea, practice, or object that is perceived to be new by an individual or other unit of adoption. The end result of this diffusion is that people, as part of a social system, adopt a new idea, behavior, or product. Adoption means that a person does something differently than what they had previously (i.e., purchase or use a new product, acquire and perform a new behavior, etc.). The key to adoption is that the person must perceive the idea, behavior, or product as new or innovative. It is through this that diffusion is possible.

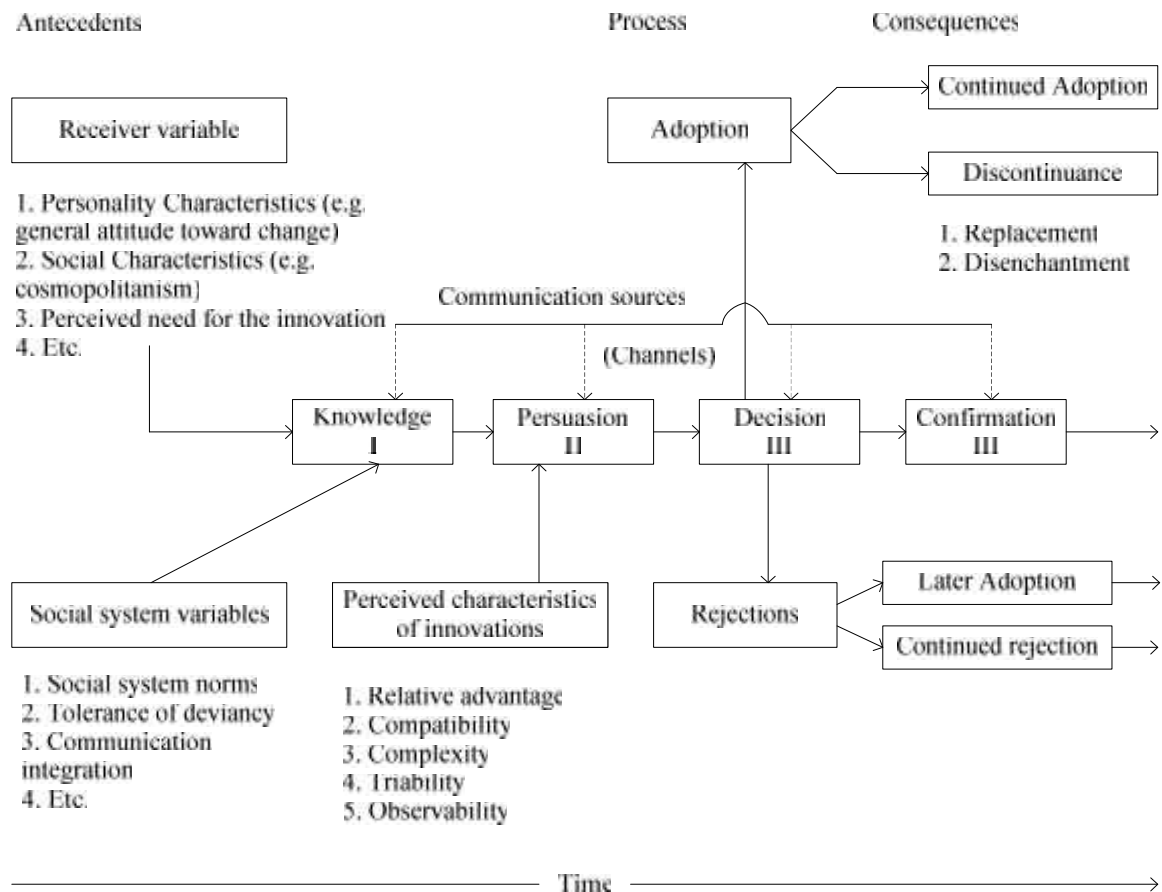


Figure 2.3: Diffusion of innovation model (Source: Rogers, 1995)

Adoption of a new idea, behavior, or product (i.e., "innovation") does not happen simultaneously in a social system; rather it is a process whereby some people are more apt to adopt the innovation than others. Researchers have found that people who adopt an innovation early have different characteristics than people who adopt an innovation later. When promoting an innovation to a target population, it is important to understand the characteristics of the target population that will help or hinder adoption of the innovation. There are five established adopter categories (**Figure 2.4**), and while the majority of the general population tends to fall in the middle categories, it is still necessary to understand the characteristics of the target population. When promoting an innovation, there are different strategies used to appeal to the different adopter categories.

- a) **Innovators** - These are people who want to be the first to try the innovation. They are venturesome and interested in new ideas. These people are very willing to take

risks, and are often the first to develop new ideas. Very little, if anything, needs to be done to appeal to this population.

- b) **Early Adopters** - These are people who represent opinion leaders. They enjoy leadership roles, and embrace change opportunities. They are already aware of the need to change and so are very comfortable adopting new ideas. Strategies to appeal to this population include how-to manuals and information sheets on implementation. They do not need information to convince them to change.
- c) **Early Majority** - These people are rarely leaders, but they do adopt new ideas before the average person. That said, they typically need to see evidence that the innovation works before they are willing to adopt it. Strategies to appeal to this population include success stories and evidence of the innovation's effectiveness.
- d) **Late Majority** - These people are skeptical of change, and will only adopt an innovation after it has been tried by the majority. Strategies to appeal to this population include information on how many other people have tried the innovation and have adopted it successfully.
- e) **Laggards** - These people are bound by tradition and very conservative. They are very skeptical of change and are the hardest group to bring on board. Strategies to appeal to this population include statistics, fear appeals, and pressure from people in the other adopter groups.

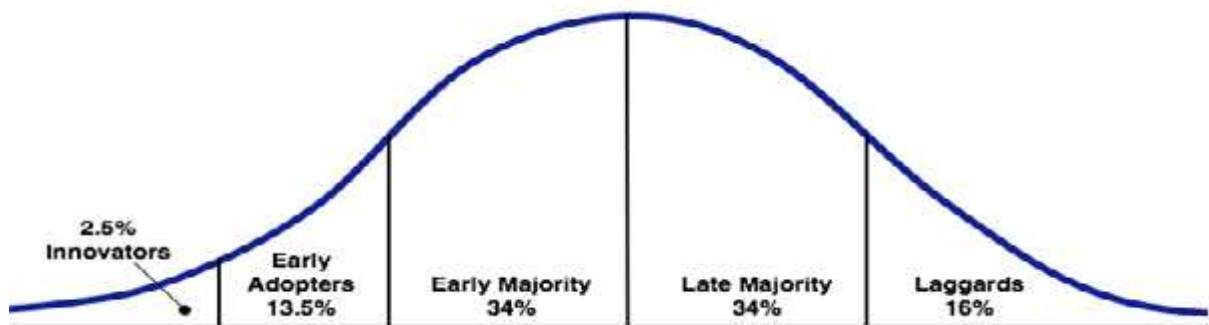


Figure 2.4: Categories of Innovativeness

The stages, by which a person adopts an innovation, and whereby diffusion is accomplished, include awareness of the need for an innovation, decision to adopt (or reject) the innovation, initial use of the innovation to test it, and continued use of the innovation. There are five main factors that influence adoption of an innovation, and each of these factors is at play to a different extent in the five adopter categories.

- a) Relative Advantage - The degree to which an innovation is seen as better than the idea, program, or product it replaces.
- b) Compatibility - How consistent the innovation is with the values, experiences, and needs of the potential adopters.
- c) Complexity - How difficult the innovation is to understand and/or use.
- d) Trialability - The extent to which the innovation can be tested or experimented with before a commitment to adopt is made.
- e) Observability - The extent to which the innovation provides tangible results.

2.5.3.3 Abrahamson's Framework

An interesting alternative perspective in explaining diffusion of innovation that seems close to NIS theory is offered by Abrahamson in 1991 who argued that as a result of the domination of pro-innovation biases in the diffusion of innovation literature, it is difficult to answer questions such as when and why inefficient innovations do diffuse, and when and why efficient innovations are rejected. To answer these questions, he suggests counter assumptions of pro-innovation bias which would underline less dominant perspectives that do not reinforce pro-innovation bias.

The efficient-choice perspective is based on two major assumptions (March, 1978), organizations within a group can freely and independently choose to adopt an administrative technology and organizations are relatively certain about their goals and their assessment of how official technologies will be in attaining these goals. In order to overcome the limitations of efficient choice perspectives which reinforce pro-innovation bias, he argued that organizations may also imitate or be affected by other organizations' decisions, or forced to adopt or reject the administrative innovation. Therefore, he developed three additional perspectives based on a contrary assumption, namely the forced selection, the fad, and the fashion perspectives (**Table 2.2**).

a) The Efficient Choice Perspective

This perspective, which reinforces pro-innovation bias, assumes that organizations have little uncertainty about certain core issues like goals or preferences; ways to maximize profit, growth of market share, complete advantage or any other strategic choices etc. Also these organizations can measure the efficiency of administrative innovation

(Grandori, 1987). Therefore, organizations rationally choose the most efficient innovations that are useful for attaining their goals.

Based on this perspective, environmental uncertainty creates similar performance gaps across organizations (Grandori, 1987). Organizations that have similar goals tend to adopt the same efficient administrative innovation in order to close performance gaps. In contrast, organizations that either do not experience these environmental changes or have different goals will reject these innovations.

Furthermore, the innovation could be rejected as a result of the supply side, when organizations outside the group such as consulting organizations, introduce new techniques to close an old performance gap or disclose a new one. This introduction of the new will consider the old technique as inefficient in closing these organizations' performance gap, which rationally will lead to adopting the new one and widespread rejection of the old technique.

		Imitation–Focus Dimension	
		Imitation processes do not impel the diffusion or rejection	Imitation processes impel the diffusion and rejection
Outside–Influence Dimension	Organizations within a group determine the diffusion and rejection within this group	Efficient choice	Fad
	Organizations outside a group determine the diffusion and rejection within this group	Forced selection	Fashion

Table 2.2: Theoretical Perspectives Explaining the Diffusion and Rejection of Administrative Technologies (Source: Abrahamson, 1991)

b) The Forced-Selection Perspective

This perspective assumes that organizations outside a group, such as governmental bodies or labor unions, which control sufficient power, can decide which administrative innovation should diffuse and which should be rejected by organizations. These organizations may be interested in either forcing the diffusion/rejection of inefficient administrative innovations or the rejection/diffusion of efficient ones. In addition, these powerful organizations may have conflicting views in their preferences as to which administrative innovation should be diffused or rejected. In this case organizations that

have greater power will force others to adopt or reject the innovations that they support. So if the organizations that have greater power have an interest to reject the innovation, they will do so.

c) The Fashion Perspective

Organizations will tend to imitate other organizations under conditions of uncertainty concerning environmental force, goals, and technical efficiency (DiMaggio and Powel, 1983, 1991). Accordingly, the fashion perspective assumes that organizations in a group under conditions of uncertainty imitate administrative models promoted by “fashion-setting organizations” outside this group such as consulting firms, business mass media, and business schools. These fashion setter organizations do not have the coercive power necessary to force organizations to imitate innovation that for example a government organization or a labor union has, but they do have another power which is their capacity to encourage/induce organizations to trust and imitate innovations they promote (DiMaggio and Powell, 1983, 1991; Ginsberg and Abrahamson, 1991).

Moreover, fashion-setting organizations may not only promote efficient administrative technologies, but also may select administrative techniques that would be more profitable for them, regardless of whether these techniques are efficient or not for other organizations. In addition, organizations tend to reject old efficient innovations when fashion-setting organizations introduce new ones which could be mutually replaced. Therefore, the diffusion of inefficient techniques or the rejection of efficient ones may be facilitated by fashion-setting organizations.

d) The Fad Perspective

Although the fad perspective corresponds with the fashion perspective in that under conditions of uncertainty an organization imitates another organization’s adoption decision, the fad perspective differs because it assumes that organizations within a group imitate each other within that group. Explanations as to why this might happen include the need for organizations to a) reduce ambiguity about innovation (Rogers, 1995, 2003), b) appear legitimate by conforming to emergent norms that sanction this innovation (DiMaggio and Powel, 1983, 1991), or c) avoid the risk of letting competitors gain competitive advantage by using this innovation (Abrahamson and Rosenkopf, 1993).

Organizations' degree of imitating each other would vary with immunization of organizations to imitate. Organizations that are not linked to others in a communication network or have differences in certain attributes, should learn less from adopters and should be more immune to imitating the adopters' decision.

Moreover, the pressures on an organization to imitate could increase according to the number of adopters. Also organizations' reputation may increase the pressure, such that higher reputation organizations have a greater effect in triggering imitation. It must be noted that these pressures and immunities to adopt could also vary for the rejection of the innovation. For instance, an organization that adopts an innovation to distinguish itself from organizations with a lower reputation will face greater pressure to reject that innovation as more organizations with lower reputation adopt it.

Similarly, in the context of management accounting, Granlund and Lukka (1998) observed that there was a growing global tendency for homogenization of MAPs over the entire industrialized world. They argued that as the drivers of convergence had started to dominate those of divergence, the world of MAPs seemed to be setting smaller. However, the usage of MAPs is still different from one country to another due to cultural factors or government regulation.

Granlund and Lukka (1998) also believe that the drivers of global homogenization emerge from the search for legitimacy (social fitness) and efficiency (economic fitness). To identify and analyze the factors directing MAPs towards convergence or divergence, they developed a framework which includes both economic and institutional perspectives. They believe that both the economic and institutional pressures have an important role to play in analyzing modern organizations, and simultaneously affect MAPs; however, they are theoretically separate categories. In terms of economic pressure, advances in information technology intensified the globalization of markets and the increase of competition may encourage global value chains, foreign investments, and international joint ventures, which lead to global management accounting homogenization. They used the NIS theory to classify the explanatory variables of global homogenization of MAPs into: coercive pressures, normative pressures, and mimetic processes.

2.6 Conclusion

Management accounting profession in Bangladesh is still in its infancy. It is progressing through its revolutionary process. The present study reviewed the contingent literature in relation to management accounting and management accounting practices. First of all, a brief review on Bangladesh economy, need for management accounting and current state of management accounting practices are presented. As Bangladesh is in the verge of economic correction and modification (from service led to industry led), the demand for sound management accounting practices for a responsive and competitive manufacturing sector is of high demand. However, such demand is characterized by specific internal and external factors where the contingency theory becomes operative. Thus, contingency theory was summarized as an approach to the study of organizational behavior in which explanations are given as to how contingent factors influence the design and function of organizations. Consequently, this study reviewed management accounting research using contingency theory. One result of the present study is that contingency theory has been applied in management accounting research in order to address questions about: first, the fit between organizational control and structure; second, the impact of such fits on performance; third, investigation of multiple contingencies and their impact on organizational design. Last but not least, the present study reviewed contingent literature on management accounting system.

Based on the literature review, another result of the present study is that the main problem in contingency based modeling in management accounting is the operation of fit. Specifically, although many different forms of fit have been deployed in the literature, very few researchers have acknowledged the problems of relating them to one another (Gerdin and Greve, 2004; Cadez and Guilding, 2008). Thus, a conclusion that emerges from the above literature review on MAS research is that researchers should discuss explicitly how and whether the particular form of fit can be relevant to study that has adopted other forms for further studies. It is also necessary to extend traditional boundaries of the MAS by investigating MAS design characteristics and MAS information adequacy. Different theories on diffusion have addressed these types of fits relating to the choice of management accounting practices which have been brought under the purview of this thesis.

Chapter 3

Study of Management Accountants' Satisfaction and Profitability

This chapter extends discussion covering following main points –

- 3.1 Introduction
- 3.2 Literature Review and Hypothesis Development
- 3.3 Research Methodology
- 3.4 Analysis and Findings
- 3.5 Conclusion

3.1 Introduction

Satisfaction of management accountants with the system they work and the jobs they undertake is a very important parameter for corporate success. Most of the roles that the management accountants play in corporate life target towards value generation in different forms to improve the bottom line causing long term sustainability. On the other hand, literature gives the testimony that high profitability is being driven by the active participation of management accountants in organizational development process from various respects. Such impact is studied by different researchers in different industries. Some models like balanced scorecard, action profit linkage model, service profit chain, employee profit model echo the same concept underlying the relationship between satisfaction and profitability. Management accountants play a compromised role being intermediary between customers and management. This research is an extension to the current models where management accountants' satisfaction is aligned with profitability assuming that they really add values in corporate strategic goal which is measurable. Another specialty of the research is that it brings the role of management accounting within production and operation management research agenda. The researcher has deployed an earnest effort to relate management accountants' satisfaction with the commitment of adding value to products and services which ultimately leads to profitability. Management accountants facilitate the internal management to provide quality goods at affordable prices. This research attempts to establish the link between management accountants' satisfaction and profitability. Additionally, the research also

confirms that management accountants add values as they find this as a part of their core job definition.

This chapter presents a summary of existing literatures on employee satisfaction, employee-profit models and form related hypotheses for testing. It also identifies the antecedents of satisfaction and divides the analysis section into three different modules. Module one covers the satisfaction of management accountants, module two addresses different value dimensions as being driven by satisfaction and finally, module three searches for any relationship between management accountants' satisfaction and profitability. The analysis is based on a semi-structured questionnaire survey as introduced in chapter 1 in research methodology section. Findings of the chapter bring some interesting issues relating to satisfaction and profitability where satisfaction of management accountants are characterized by some job related parameters. Management accountants' satisfaction has a good reasoning on their commitment and performance which is important for adding any value. However, level of satisfaction doesn't show any commendable result with profitability. It is believed that the findings of this study will bring new insights on management accounting research in coming days. Previous researches didn't consider the satisfaction of management accountants explicitly rather it was embedded in overall employee satisfaction. This research identifies the gap and brings the study of management accountants' satisfaction as a new research agenda.

3.2 Literature Review and Hypothesis Development

This section presents existing literatures on employee satisfaction, satisfaction-profitability, and employee profitability models relating to current research interests. It also develops relevant hypotheses for testing.

3.2.1 Employee Satisfaction

Employee satisfaction receives considerable attention to both academic researchers and professionals due to perceived behavioral impact on workplace performance. Employees are the first recipient of the value offered by a company. Berry (1981) considers employees as customers. Thus, the employees of the business can be viewed as customers as well as the internal suppliers (Voss et al., 2005). Businesses now-a-days are continuously putting a greater emphasis on the two important aspects relating to its employees, namely employees as internal customers of the business, and the motivation and retention of employees over the long term (Gupta et al., 2005; Van Eeden and

Koekemoer, 2000). External customers cannot be made happy until internal customers are. The study of Palmatier et al. (2006) echoes the same concept where they conclude that the logic of satisfying the needs of internal customers, places the business in a better position to deliver the quality desired to satisfy external customers.

On part of management, it is always important to know what satisfies employees if management is committed to employee satisfaction. Different motivational theories like Affect theory (Edwin A. Locke, 1976), Dispositional Theory (Judge et al., 1997), Two-Factor (Motivator-Hygiene) Theory (Frederick Herzberg, 1959), Need Theory (Abraham Maslow, 1943), Job Characteristics Model (Hackman & Oldham, 1976) etc. identify different satisfiers considering the respective research framework. Further, some other studies concentrate on the identification of the main antecedents of satisfaction which is very much relevant to the underlying research questions. Such a study proposes three antecedents of employee satisfaction, viz., perceived organizational support, perceived supervisory support and customer participation (Yoon et al., 2004). Perceived organizational support is the extent to which employees perceive that the organization values their contributions and cares about their well-being, whereas, perceived supervisory support is the extent to which supervisors develop a climate of trust, helpfulness, and friendliness. And, customer participation is the extent to which a customer is physically, mentally, and emotionally involved in the delivery of a service/product. A representation of this model is given below (**Figure 3.1**):

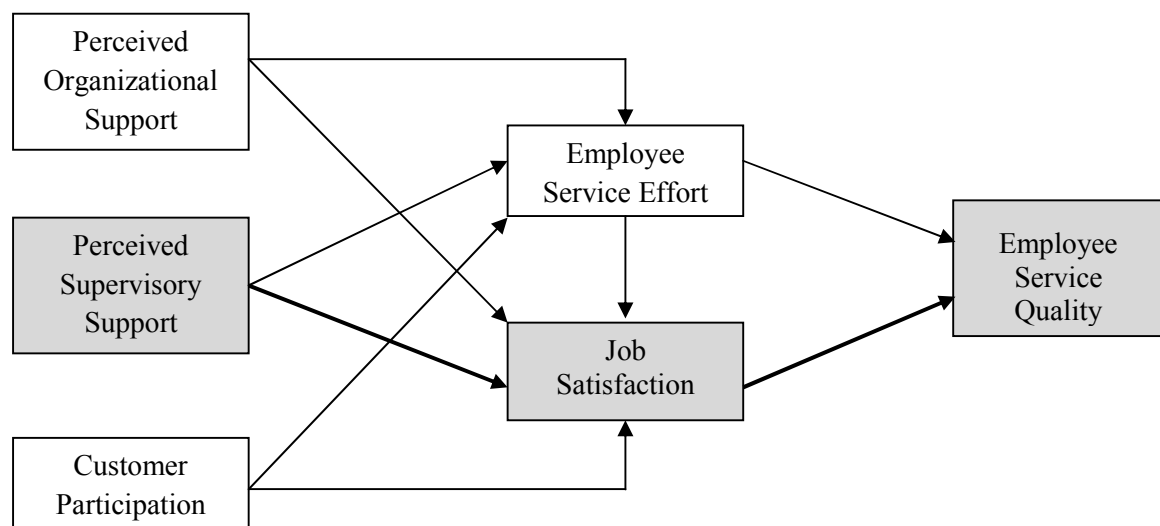


Figure 3.1: Antecedents of employee satisfaction and employee customer service

As the model indicates, all three antecedents affect employee service quality through employee service effort and perceived job satisfaction. Empirical findings suggest that out of the three antecedents, perceived supervisory support is the single most powerful predictor of job satisfaction and employee service effort. At the same time, job satisfaction is a more important predictor of employee service quality than employee service effort. Another model (Yoon et al., 2001) presents two antecedents of job satisfaction and employee service quality, viz., supportive management, and service climate. Supportive management is the extent to which management is supportive and shows concern for employees and service climate is employees' shared perceptions of how much the organization values service. A representation of this model is shown below (Figure 3.2):

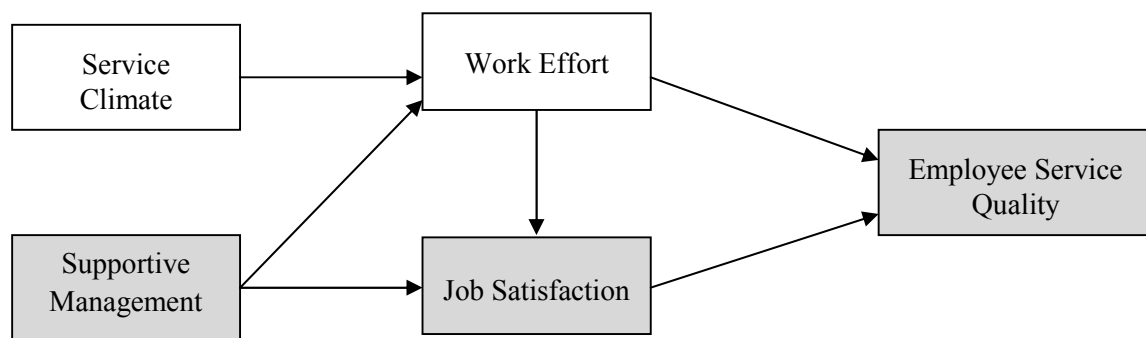


Figure 3.2: Antecedents of job satisfaction and employee service quality

As illustrated in the model, service climate affects work effort but not job satisfaction. However, supportive management has an effect on both work effort and job satisfaction. Work effort influences employee service quality directly as well as through job satisfaction. An empirical test of the model showed that, relative to work effort, job satisfaction was a better predictor of employee service quality. Both of the models on the study of antecedents of satisfaction prescribe a common conclusion. Supports of management have important impact on employee service quality through job satisfaction. Some other studies have identified remote level satisfiers rather than the mere grouping constructs. It is important to know what includes the major grouping constructs of employee satisfaction like organizational support, supervisory support, customers' participation, service construct etc. A summary of a number of previous studies indicating the various antecedents of employee satisfaction is produced below in **Table 3.1**.

Author's name (year)	Antecedents studied
Edwin Theory, 1976; Hackman & Oldham, 1976; Coleman, 1976; Alexandros-Stamatios et al., 2003; Lincoln and Kalleberg, 1990	Intrinsic reward (Autonomy, achievement in work, recognition, promotion opportunities, skill variety, task identity, task significance, and feedback)
Hackman & Oldham, 1976; Adams, 2000; Lincoln and Kalleberg, 1990	Extrinsic rewards (Hygiene factors include aspects of the working environment such as company policies, supervisory practices, pay and fringe benefits, promotion or advancement opportunities and other working conditions)
Wheeless et al., 1984; Winska, 2010; Heather et al., 2005; Luthans & Larsen, 1986; Whitely, 1984; Wheeless et al., 1984	Superior-subordinate communication and relation
Beehr, 1995; Cooper et al., 1989; Cushway et al., 1996; Hinshaw, et al., 1983; Lucas et al., 1993; Dolan, 1987; Devereux, 1981; Nolan, 1995	Work load and stress
James and Jones, 1974; Locke, 1976; Payne and Pugh, 1976; Payne et al., 1976; Hellrigell and Slocum, 1974; Bowen & Ostroff, 2004; Wright et al, 2001; Wright et al., 2005	Organizational Climate
Arabi, 2000; Jandaghi, 2011; Preussand Lautsch, 2002 and Al-Najjar, 1996	Job security

Table 3.1: Antecedents of employee satisfaction (**Source:** Kumari, L. 2012)

From the above discussions, we may easily derive a model to explain the antecedents (factors) that affect management accountants' satisfaction. Management accountants represent employees themselves and their satisfaction also depends on same parameters that satisfy other employees. Considering the underlying contingency theory, management accountants' satisfaction depends on some internal and external parameters; where internal means within the organization and external means outside the organization. Management accountants are the professionals and thus the professionalism of management accountants have a significant reciprocity with the external environment where they act.

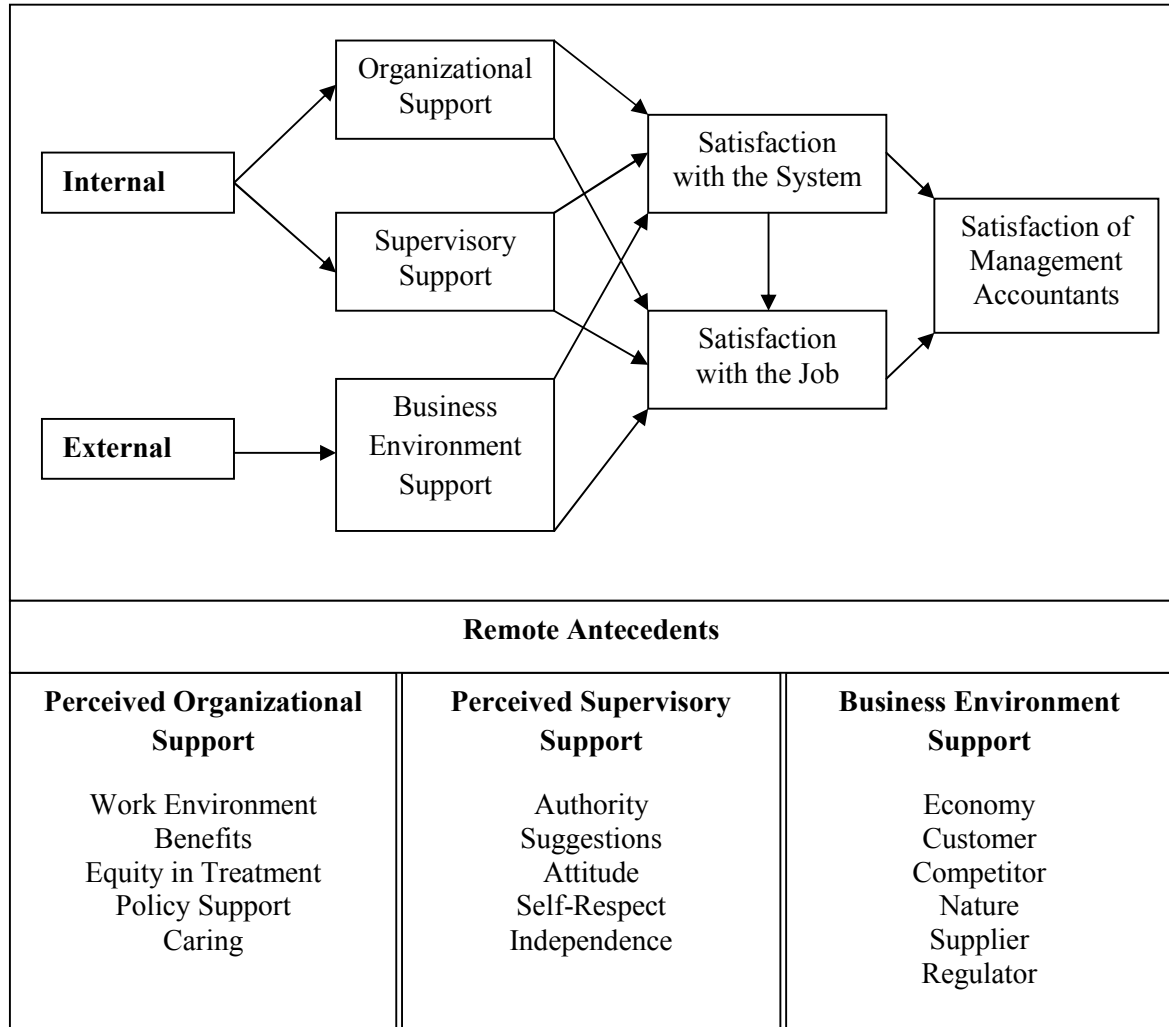


Figure 3.3: Antecedents of management accountants’ satisfaction

As per the above diagram (**Figure 3.3**), management accountants’ satisfaction has two dimensions; satisfaction with the system and satisfaction with the job. Organizational support, supervisory support and support from the business environment affect both of the dimensions positively. At the same time, satisfaction with the system affects the job satisfaction of management accountants. Organizational support is the extent to which organization cares the requirement of management accountants and values their contribution. Supervisory support is the level of suggestions, empowerment and independence offered by the supervisor relating to making optimal decision and in disseminating information. Business environment support comes from external business environment where the activities of management accountants are closely integrated with, like support from customers, competitors, suppliers, regulators, nature and overall macro

economic scenarios. In line with the discussion, we can take the following hypotheses for testing:

H1a: Management accountants' satisfaction with the system doesn't depend on organizational support, supervisory support and business environment support.

H1b: Management accountants' satisfaction with the job doesn't depend on organizational support, supervisory support, business environment support and management accountants' satisfaction with the system.

H1c: Satisfaction of management accountants doesn't depend on Management accountants' satisfaction with the job and Management accountants' satisfaction with the system.

3.2.2 Employee Satisfaction and Perceived Value

There exists a strong positive relationship between employee satisfaction and value perceived by customers. Positive changes in employee attitudes lead to positive changes in value as provided by firms in the form of products and services. Vilares and Coelho (2003) found that perceived employee satisfaction, perceived employee loyalty, and perceived employee commitment had a sizable impact on perceived product quality and on perceived service quality (**Figure 3.4**).

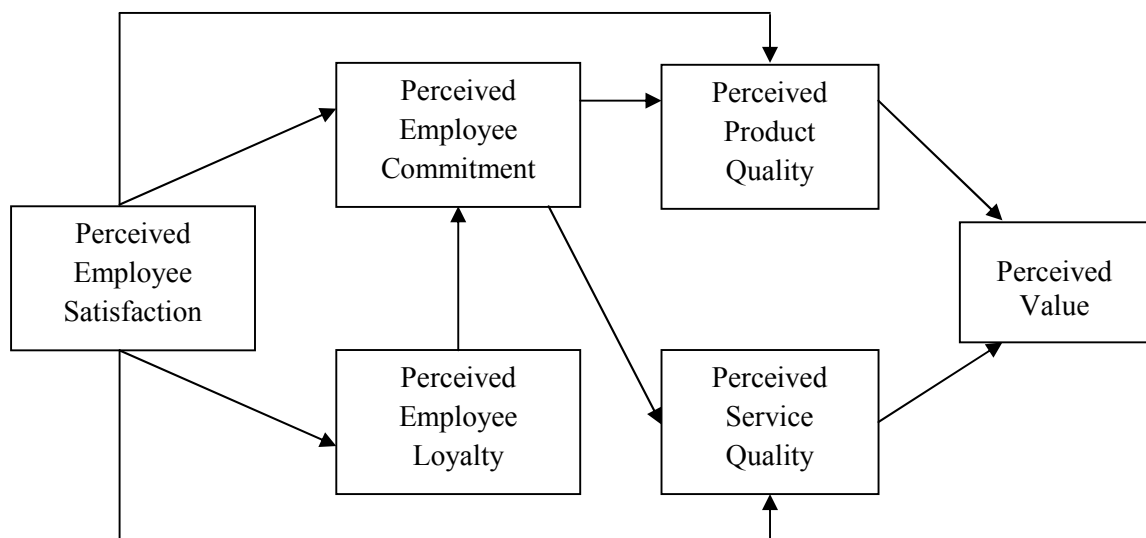


Figure 3.4: Relationship between employee satisfaction and perceived value

The model signifies that employee satisfaction not only affects employee commitment and employee loyalty, but it also has a twofold impact (i.e., direct and indirect) on critical customer satisfaction-related variables. On the other hand, employee dissatisfaction

results poor performance. Schlesinger and Heskett (1991b) claim that staff frustrations lead to high turnover, merely reinforcing the organizational approach of minimal training, poor rewards and poor customer service in a *cycle of failure* (Schlesinger & Heskett, 1991a). The mirror effect is also central to Normann and Ramirez' (1993) work on the value for designing interactive strategy and also to Liedtka et al.'s (1997) generative cycle of mutually reinforcing, self-sustaining employee and client development in professional services.

In line with the literatures and discussion above, the following hypotheses can be taken for testing:

H2a: Employee satisfaction doesn't affect employee loyalty

H2b: Employee Satisfaction doesn't affect employee commitment

H2c: Employee satisfaction doesn't affect product quality

H2d: Employee satisfaction doesn't affect service quality

H2e: Employee loyalty doesn't affect employee commitment

H2f: Employee commitment doesn't affect product quality

H2g: Employee commitment doesn't affect service quality

H2h: Product quality doesn't affect value

H2i: Service quality doesn't affect value

3.2.3 Satisfaction and Profitability

Research aimed at quantifying the links between satisfaction, productivity, and financial performance began in 1980 with Benjamin Schneider's survey of satisfaction levels of bank customers and employees (Tobias, 2000). Studies such as Frederick Reichheld's "The Loyalty Effect," (1996) and James L. Heskett, W. Earl Sasser Jr., and Leonard A. Schlesinger's "The Service Profit Chain" (1997) produced the first sets of hard data quantifying these links. Both studies conclude that there are direct and quantifiable links between customer service variables, employee variables, and financial results (Sweetman, 2001; Brooks, 2000).

In "The Service Profit Chain", the authors proposed a model that workforce capability, satisfaction, and loyalty would lead to perceptions of value. The study found that employees' perceptions of their capabilities, satisfaction, and length-of-service were correlated with customer satisfaction (Koys, 2001). The service-profit chain (Heskett et al., 1997) is a research framework that comprises the linkages of employee variables, customer variables and organizational performance as given below (**Figure 3.5**):

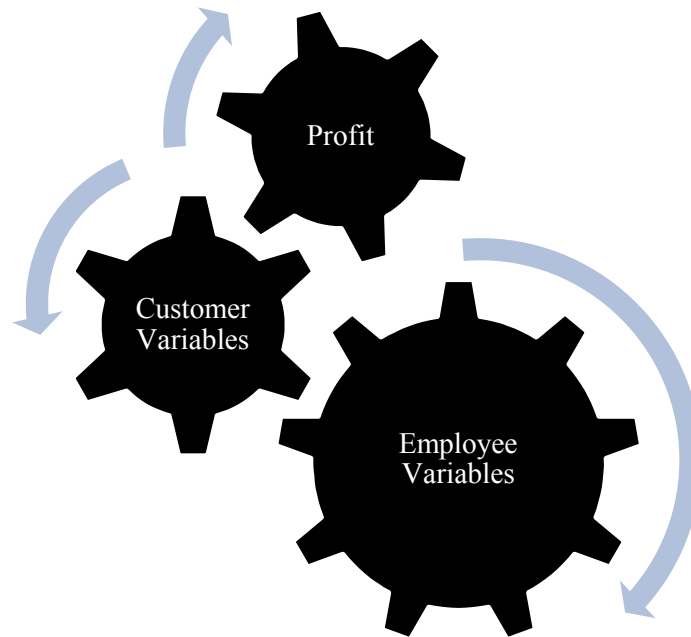


Figure 3.5: Service-Profit Chain

Employee variables consist of employee perception of internal service quality which organization provides to its employees, employee satisfaction and employee loyalty. Customer variables comprise the customer's perception of the quality of the service delivered by employees, customer satisfaction, and customer loyalty. Causal relationships run from employee variables to customer variables and corporate profitability. The model provides an integrative framework for understanding how employee variables are related to customer variables regarding the perception of the service and intended behavior, and how these ultimately translate into profit. The argument of the service-profit chain (Heskett et al., 1997) proceeds as follows:

“Profit and growth are stimulated primarily by customer loyalty. Loyalty is a direct result of customer satisfaction. Satisfaction is largely influenced by the value of the services provided to customers. Value is created by satisfied, loyal and productive employees. Employee satisfaction results primarily from high-quality support service and policies that enable employees to deliver results to customers.”

Another model, the Action-Profit Linkage (APL) model (**Figure 3.6**), was proposed by two academics of Rice University, Marc Epstein and Robert Westbrook (Epstein and

Westbrook, 2001). According to the authors, APL permits managers to “identify and measure key drivers of business success and profit, develop causal links among them and estimate the impact of actions taken to bring them about” (Epstein and Westbrook, 2001).

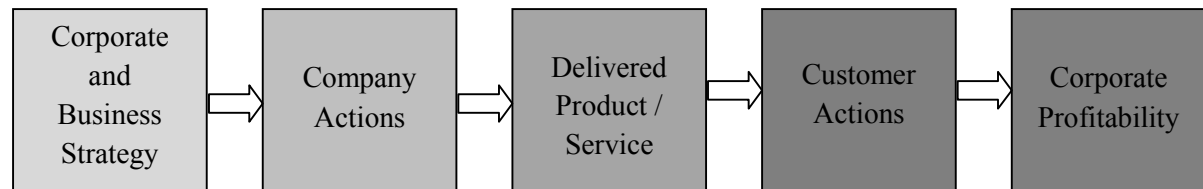


Figure 3.6: Action-Profit linkage model

It starts with the premise that strategy is a set of diverse activities companies choose to perform. Actions may be originated in different company domains, such as Operations, IT, Human Resources, Marketing and Sales, Finance and Accounting, External relationships. Actions affect the products or services delivered by companies, including product attributes, brand, customer-service activities. Delivered products or/and services influence customer behavior manifesting in customers’ perceptions, attitudes and reactions. Customer behavior is reflected in the corporate profitability representing the sum of the revenues set against the cost of undertaking strategic actions. Managers are encouraged to set-up the metrics for the relevant links across this chain, collecting the data and tracing the most important links for corporate profitability through statistical analysis. “Developing and testing their customized models, companies begin to limit their investments to those that improve profitability; the model’s output discourages investment in unprofitable areas” (Epstein and Westbrook, 2001).

On the other hand, Service-Profit Chain (SPC) asserts that employee satisfaction is related to profitability and growth. However, the SPC construct omits drivers other than those of employee satisfaction (**Figure 3.7**). However, SPC assumes the link between satisfaction and company profitability. The current research has assumed the theme from this research outcome where employee satisfaction is aligned with profitability.

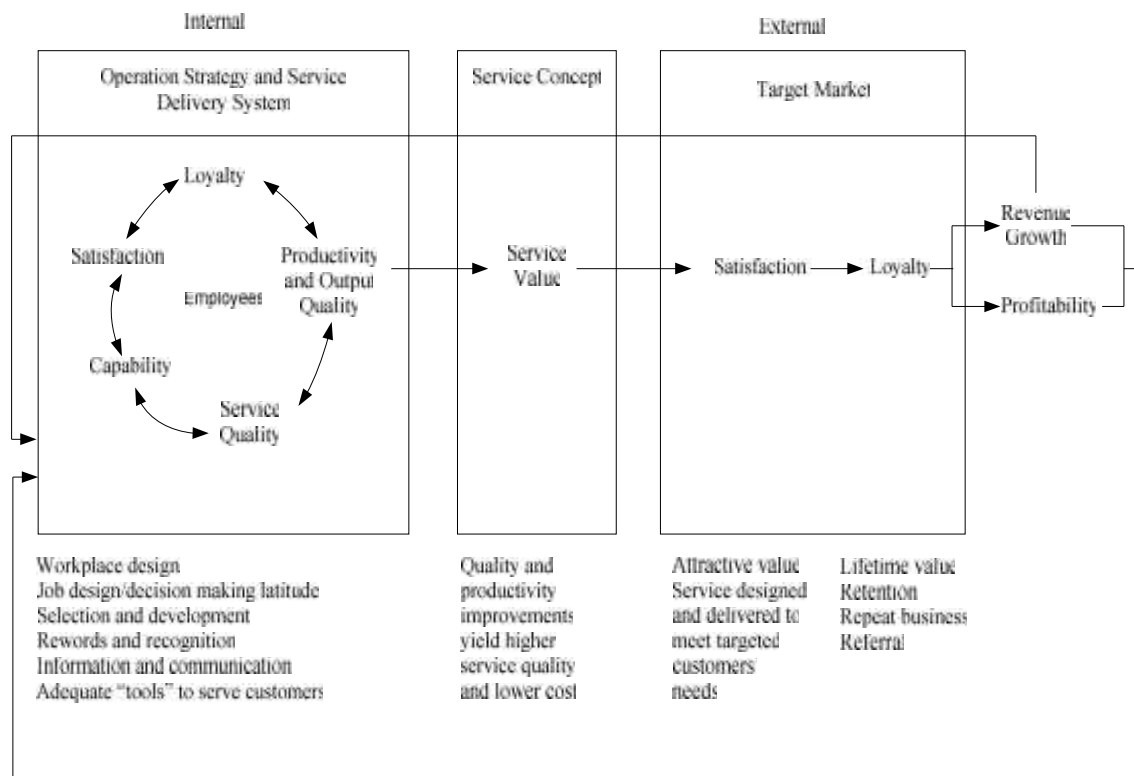


Figure 3.7: Service – Profit Chain (Source: Heskett, Sasser and Schlesinger 1997)

3.2.4 Employee-Profit Model

The employee-profit model is presented in the **Figure 3.8** below. The employee variables are related to attitudes that reside at the level of customers. The strongest argument here is in the case of employee satisfaction, which is directly determined by job characteristics. As the perception of what makes the job attractive may be co-influenced by how others (colleagues, customers) evaluate it, it is likely that the level of appreciation by customers – especially if they are in a position to communicate their satisfaction directly to the employee – is instrumental in the satisfaction of the employee.

The empirical test of the employee-profit model indicates that the internal service quality perceived by employees is a significant determinant of employee satisfaction. Five dimensions (work environment, work resources, cooperation, leadership and rewards) define the internal service quality in the model. The results suggest that employee satisfaction has a strong influence on employee turnover intention, and a somewhat less strong influence on tenure. Tenure appears to be a less important determinant of profitability.

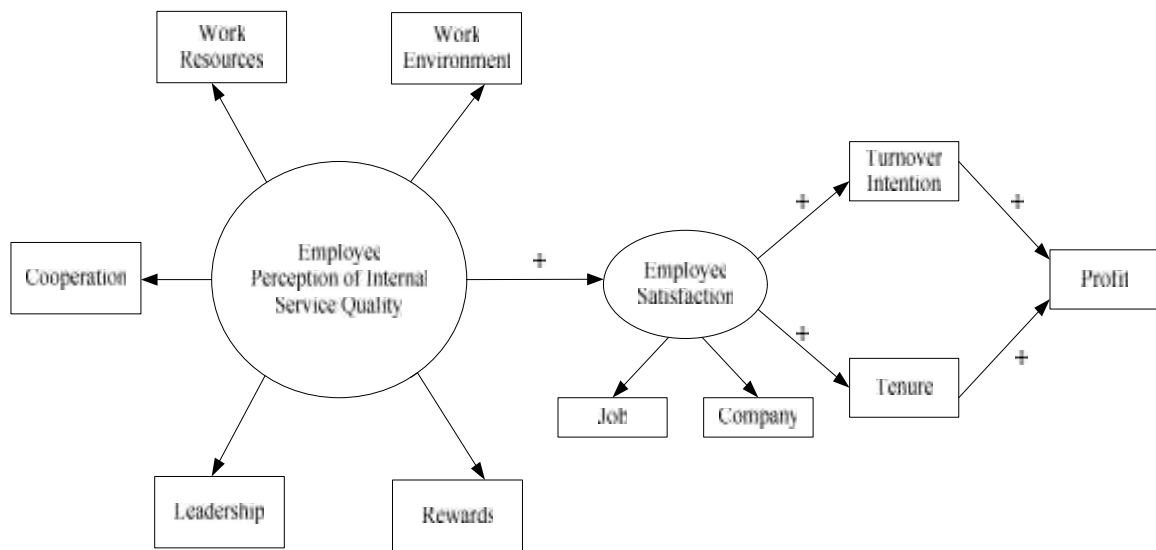


Figure 3.8: Employee-profit model (Xu and Goedegebuure, 2005)

In 1997, Development Dimensions International (DDI) conducted focus groups, customer interviews, literature reviews, and surveys to determine drivers of an effective service environment. DDI found evidence of a circular relationship between employee satisfaction and retention, and customer satisfaction and loyalty, and increases in company profitability. In addition, employee satisfaction was strongly related to employee commitment and loyalty, and both measures have proven relationships to retention and productivity. Dr. Thomas Rollins of the Hay Group developed a model linking employee opinion survey results directly with business performance metrics while excluding customer satisfaction measures. Main findings include the following:

- This model holds that company-wide employee satisfaction results affect business unit employee satisfaction results, which affect business unit financial results, which in turn affect company-wide financial metrics.
- However, the model also holds that the company-wide financial metrics may also affect company-wide employee satisfaction results, allowing the model to demonstrate correlation, but not causation between the different areas considered (CLC, 1998).

Gallup reports that highly satisfied groups of employees often exhibit above-average levels of the following characteristics:

- Customer loyalty (56 percent)
- Productivity (50 percent)

- Employee retention (50 percent)
- Safety records (50 percent)
- Profitability (33 percent)

A *Watson Wyatt Worldwide* study found that the practice of maintaining a collegial, flexible workplace is associated with the second-largest increase in shareholder value (nine percent), suggesting that employee satisfaction is directly related to financial gain. Over 40 percent of the companies listed in the top 100 of *Fortune* magazine's "America's Best Companies to Work For" also appear on the *Fortune 500*. While it is possible that employees enjoy working at these organizations because they are successful, the *Watson Wyatt Worldwide* Human Capital Index study suggests that effective human resources practices lead to positive financial outcomes more often than positive financial outcomes lead to good practices (Bruce and Kay, 2002).

The issue of causation—did the increases in employee satisfaction cause the increase in customer satisfaction, productivity or profitability, or vice versa—is not often addressed in research. However, a 2001 study published in *Personnel Psychology* examined whether positive employee behaviors and attitudes influence business outcomes or if the opposite, that positive business outcomes influence employee behavior, is true. Study findings include the following:

1. The study broke down employee attitudes and satisfaction into five measurable employee behaviors: conscientiousness, altruism, civic virtue, sportsmanship, and courtesy. The study measured participants in the five categories, reviewed turnover rates within the participant population, and compared this data with the organizations' financial performance for the following year.
2. Findings support the idea that employee satisfaction, behavior, and turnover predict the following year's profitability, and that these aspects have an even stronger correlation with customer satisfaction (Koys, 2001).

Price Waterhouse Coopers reported in April of 2002 that 47 percent of surveyed executives from multinational companies cite employee satisfaction and decreased employee turnover as major contributors to long-term shareholder return. Other studies indicate that companies found the following from their efforts to study the links between employee satisfaction, customer satisfaction, productivity, and financial performance:

1. Unhappy employees are less productive and more likely to have higher absence rates

2. Satisfied employees are more productive, innovative, and loyal
3. Increases in job satisfaction lead to increases in employee morale, which lead to increased employee productivity
4. Employee satisfaction leads to customer retention (Graham, 1996; Lucas, 2001; Davidhizar and Shearer, 1998; Devlin, 1999).

ACNielsen utilizes a similar model and states that it finds that when employee satisfaction rises, financial results soon improve. However, the company goes further to tie managers' bonuses to employee satisfaction scores within their business units (Shellenbarger, 1999). Based on the analysis of these research findings, the following hypothesis has been tested.

H3: Management accountants' satisfaction does not have any relationship with profitability.

How employees feel about their job has an impact on their work experience, and also on business outcomes such as sales and profit. Employees can strongly contribute to an organization's success by having a customer-centric approach in their work and in their work-related interactions. However, recent research indicates that employee satisfaction does not necessarily contribute directly to productivity. Satisfaction may be viewed as a passive attribute, while more proactive measures such as motivation levels and brand engagement are viewed as more closely linked to behavioral change, performance, and, ultimately, to bottom line performance.

Employee productivity depends on the amount of time an individual is physically present at a job and also the degree to which he or she is "mentally present" or efficiently functioning while present at a job. Companies must address both of these issues in order to maintain high worker productivity, and this may occur through a variety of strategies that focus on employee satisfaction, health, and morale (Goetzel and Ozminkowski, unknown). The question is then: "What should organizations do to ensure high job satisfaction among their employees?" As found in the practices of Fortune 100 companies, employee satisfaction is the result of a holistic approach that involves strategic steps such as:

1. Identify root causes of dissatisfaction among employees
2. Conduct benchmark studies of best practices in selected other companies

3. Develop employee satisfaction measurement systems that can be used corporate wide and worldwide
4. Monitor employee satisfaction on a regular basis
5. View employees as the primary source of competitive advantage
6. Show concern for total employee well-being
7. Develop meaningful employee involvement and effective communication channels
8. Introduce managerial accountability for people management

In this study, a careful attention has been deployed to confirm any link between employee satisfaction and bottom line performance. The model presented below refers to some important drivers of this relationship. A schematic presentation considered in this study is given in **Figure 3.9** below.

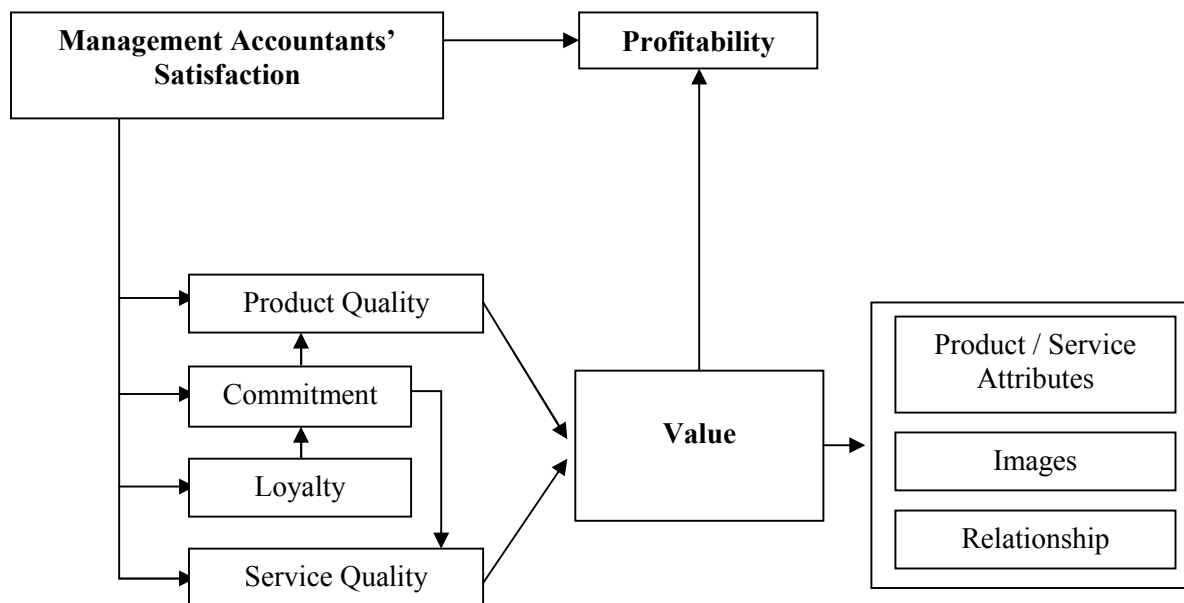


Figure 3.9: Management Accountants Satisfaction and Profitability

3.3 Research Methodology

This research is based on the questionnaire survey as referred in research methodology section of chapter 1 of the thesis. Different descriptive and inferential statistical tools are used to analyze the survey data and to test the hypotheses as identified in literature review section. Operational definitions of different major constructs used in this chapter are given below in **Table 3.2**.

Constructs	Operational Definitions
Organizational Support	<p>Perceived Organizational Support is the degree to which employees believe that their organization values their contributions and cares about their well-being and fulfills employees' socio-emotional needs (Eisenberger et al., 1986; Rhoades & Eisenberger, 2002). It has been measured by (Yoon et al, 2001; 2004) –</p> <ul style="list-style-type: none"> • Work environment – favorable and congenial working • Benefits – monetary and non-monetary • Equity in treatment • Policy Support – paper work, written guidelines etc • Caring – opinions and well being
Supervisory Support	<p>Supervisory support is the extent to which leaders value their employees' contributions and care about their well-being. A leader with high supervisory support is one that makes employees feel heard, valued, and cared about. It has been measured by (Yoon et al., 2004) –</p> <ul style="list-style-type: none"> • Authority – power to carry out the required duties • Suggestions – advise and share of professional wisdom • Attitude – professional dealing • Self-respect – sense of honor and dignity • Independence – mental state of doing job freely
Business Environment Support	<p>The business environment is defined as a complex of policy, legal, institutional, and regulatory conditions that govern business activities. It is a sub-set of the investment climate and includes the administration and enforcement mechanisms established to implement government policy, as well as the institutional arrangements that influence the way key actors operate (DCED, 2008). It has been measured by –</p> <ul style="list-style-type: none"> • Economy – impact of macroeconomic parameters on business • Customer – support from customers and their involvement • Competitor – healthy competition and fair play • Nature – geographic location and its impact on cost of doing business • Supplier – availability • Regulator – constructive support
Satisfaction with the Job	<p>Job satisfaction can simply be defined as the feelings people have about their jobs (Stahl, 2004). It has been specifically defined as a pleasurable (or un-pleasurable) emotional state resulting from the appraisal of one's job (Locke, 1976), an affective reaction to one's job (Cranny, Smith & Stone, 1992), and an attitude towards one's job (Brief, 1998). It has been measured by the factors grouped in –</p> <ul style="list-style-type: none"> • Organizational Support • Supervisory Support

	<ul style="list-style-type: none"> • Business Environment Support • Satisfaction with the System
Satisfaction with the System	<p>Satisfaction with the system refers to the level of satisfaction of management accountants with the product costing system, how accurately the products are getting priced to ensure right value for money. It has been measured by the factors grouped in –</p> <ul style="list-style-type: none"> • Organizational Support • Supervisory Support • Business Environment Support
Satisfaction of Management Accountants	<p>As a sub-set of employee, satisfaction of management accountants is very close to the overall satisfaction of every employee with the activities they do. It has been measured by –</p> <ul style="list-style-type: none"> • Satisfaction with the Job • Satisfaction with the System
Value	<p>Zeithaml and Mary (2003) have identified through their research that consumers view value in many different ways. They observe that what constitutes value is highly personal and idiosyncratic. Their view of value is very much connected to price and to what the customer gets for his or her money. In fact, they observe that consumers define value in four ways: (1) value is low price; (2) value is whatever I want in a product or service; (3) value is the quality I get for the price I pay, and (4) value is what I get for what I give. Here, value is measured by customer value proposition as proposed by Kaplan and Norton (1996) through generic model consisting three ingredients:</p> <ul style="list-style-type: none"> • Product/Service Attributes which includes functionality, quality, price, time • Image • Relationship

Table 3.2: Operational definitions of the major constructs

Based on the research objectives, constructs and relationships to be tested, a theoretical framework of the research is presented in **Figure 3.10** below. The questionnaire has separate sections to cover management accountants' satisfaction across 16 different categories 5 of which are defined as perceived organizational support, 5 others as perceived supervisory support leaving other 6 to be classified as business environment support. Responding management accountants have expressed their personal opinion while addressing these questions in a 7 point Likert scale. The opinions so collected are analyzed using regression analysis through SPSS under inductive methodology.

Another section of the questionnaire deals with the factors which covers two important issues relating to the research objectives. Firstly, it shows the impact of management accountants' satisfaction on some pre-fixed parameters like loyalty, commitment, product and service quality etc followed by some value dimensions like attributes, image, relationship etc on a 7 point Likert scale as it is a type of behavioral feedback collected from respondents. Finally the research ends with the search for any potential relationship between management accountants' satisfaction and profitability. Regression analysis is used to test the hypotheses formed in literature review section.

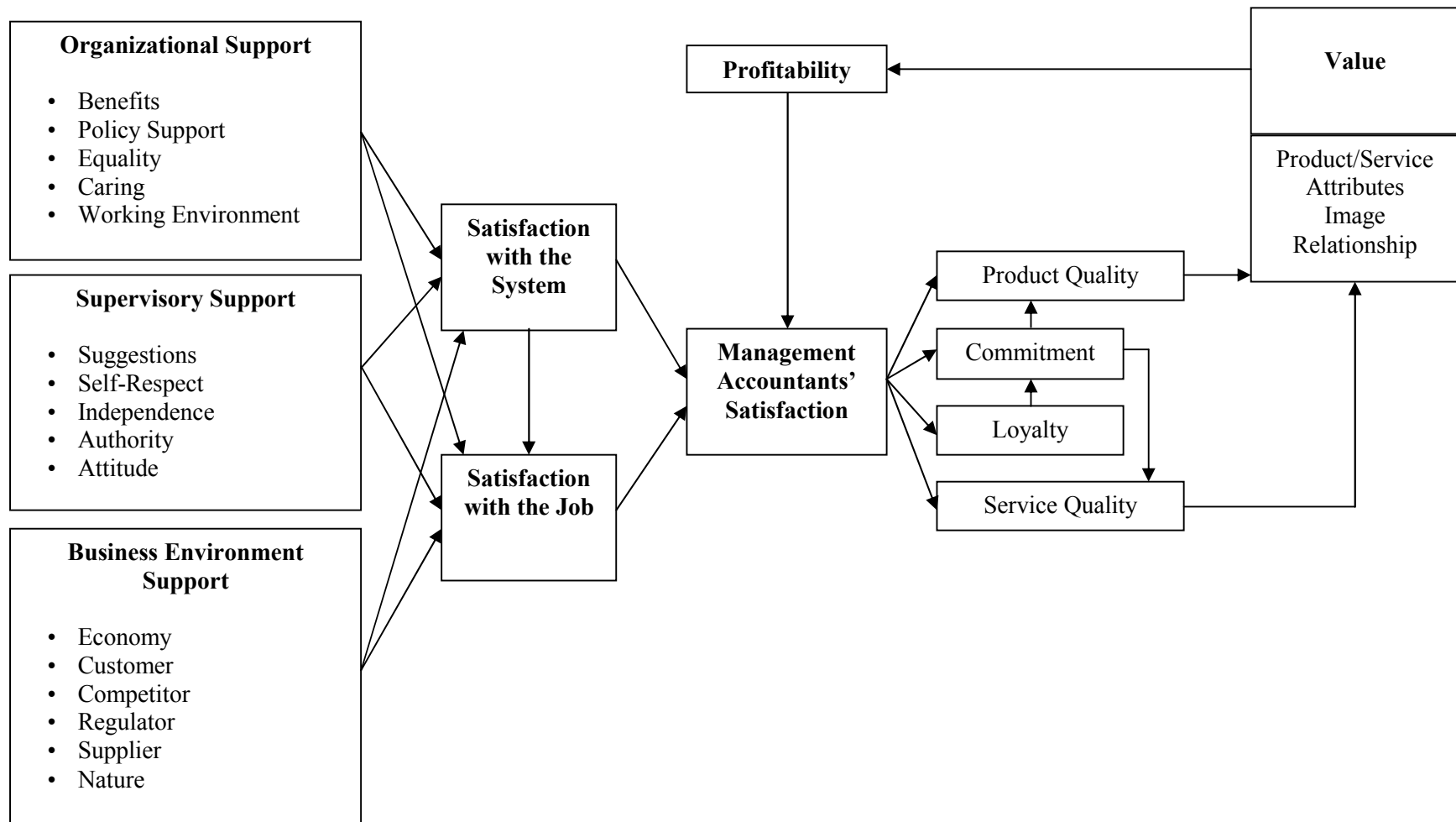


Figure 3.10: Theoretical framework of the research

3.4 Analysis and Findings

This section presents the analysis and major findings of the study. The analysis follows modular presentation. First module presents the analysis relating to management accountants' satisfaction. Second module deals with the analysis relating to value dimensions. And finally, the analysis finds out any relationship between satisfactions and profitability. The respective findings are embedded with the analysis followed by the result of tested hypotheses.

3.4.1 Management Accountants' Satisfaction

This section presents analysis of the level of satisfaction of management accountants with the system they are involved and with the job they perform as reflected in their own opinion across 16 different antecedents. As explained in research methodology section, these 16 antecedents have been grouped into three main construct, i.e., organizational support, supervisory support and business environment support. Average score out of 7 is shown in **Table 3.3** below.

1	Organizational Support	
(a)	You are happy with the benefits you receive for the job you are responsible	5.52
(b)	Working guidelines or policy is supportive to carry out your duties smoothly	5.67
(c)	Employer treats every employee equitably	5.36
(d)	Your employer takes proper care of your personal requirements (problems)	5.26
(e)	You are happy with the work environment your employer ensures	5.59
	Average	5.48
2	Supervisory Support	
(a)	Supervisor always have constructive suggestions to perform better	5.64
(b)	Your supervisor believes and practices self respect and honor	5.74
(c)	You enjoy sufficient independence from your supervisor in performing your duties	5.76
(d)	You enjoy sufficient authority to perform the duties you are responsible for	5.57
(e)	Attitude of your supervisor is positive	5.58
	Average	5.69
3	Business Environment Support	
(a)	The economic scenario (e.g., inflation, interest rate) has positive impact on your performance (demand of your product, product cost, price etc.)	5.09
(b)	You are happy with the level of involvement of customers and their support	5.19
(c)	You believe that the competition you face in the market is healthy and fair	5.07
(d)	Regulatory supports like tax, customs, company act etc. are positive and constructive	5.29
(e)	You are happy with the availability and performance of your prime suppliers	5.42
(f)	You have less natural uncertainty (natural calamities, seasonal fluctuations etc.) that	4.08

	help us to manage risk easily and smoothly	
	Average	5.02

Table 3.3: Average score across different satisfaction construct

As per the opinion of management accountants, they put more weight on supervisory support (5.69) followed by organizational support (5.48) with the least weight given for business environment support (5.02). In supervisory support construct, the most important satisfiers are independence, self-respect and constructive suggestions which are very important requirements to work responsively towards corporate goals. On the other hand, the most important satisfier from organizational support construct is working guidelines and policy without which smooth work performance and productivity at any level of the organization is very difficult. Professional management accountants like other employees require clear guidelines from management to reduce possible work-conflicts and non-conformance. In business environment support construct highest priority goes for suppliers, regulatory issues and customers' involvement.

Based on the hypotheses identified, six different regression models are run taking different variables as dependent and independent. A summary of the results of all the regression is produced in **Table 3.4**. The analyses of respective results are given below.

Model 1: Perceived organizational support with five ingredients

This model is run to identify whether different ingredients like benefits, working policy, equitability, caring and working environment can explain changes in perceived organization support aggregately or individually. The model becomes significant ($p < .001$) with a R^2 value of .438 meaning 44% of the changes in organizational support is explained by the ingredients. However, out of five ingredients, only equitability becomes statistically significant ($p < .01$).

Model 2: Perceived supervisory support with five ingredients

This model is run to identify whether different ingredients like suggestions, self-respect, independence, authority and attitude can explain changes in perceived supervisory support aggregately or individually. The model becomes significant ($p < .001$) with a R^2 value of .450 meaning 45% of the changes in supervisory support is explained by the ingredients. However, out of five ingredients, only attitude becomes statistically significant ($p < .01$).

Models	Dependent Variable	Independent Variable	Model Significance	Beta-Coefficient (Significant)	Beta	Sig
1	Perceived Organizational Support	Benefits	R = .662	Benefits	.248	.012
		Working Policy	R ² = .438	Working Policy	.174	.064
		Equitably	Sig = .000	Equitably	.288	.004
		Care		Care	-.010	.902
		Work Environment		Work Environment	.122	.199
2	Perceived Supervisory Support	Suggestions	R = .671	Suggestions	.098	.362
		Self-respect	R ² = .450	Self-respect	.108	.313
		Independence	Sig = .000	Independence	.150	.113
		Authority		Authority	.117	.254
		Attitude		Attitude	.329	.003
3	Business Environment Support	Economic Scenario	R = .694	Economic Scenario	-.136	.083
		Customers' Involvement	R ² = .482	Customers' Involvement	.300	.001
		Competition	Sig = .000	Competition	.154	.058
		Regulatory Support		Regulatory Support	.231	.021
		Suppliers		Suppliers	.234	.007
		Natural Uncertainty		Natural Uncertainty	.119	.101
4	Satisfaction with the System	Organizational Support	R = .428	Organizational Support	-.069	.549
		Supervisory Support	R ² = .183	Supervisory Support	.234	.028
		Business Environment	Sig = .000	Business Environment	.333	.001
5	Satisfaction with the Job	Organizational Support	R = .736	Organizational Support	.417	.000
		Supervisory Support	R ² = .542	Supervisory Support	.208	.011
		Business Environment	Sig = .000	Business Environment	.045	.571
		Satisfaction with the System		Satisfaction with the System	.302	.000
6	Management Accountants' Satisfaction	Satisfaction with the System	R = .777	Satisfaction with the System	.106	.123
		Satisfaction with the Job	R ² = .604	Satisfaction with the Job	.720	.000
			Sig = .000			

Table 3.4: A summary of regression analysis considering management accountants' satisfaction

Model 3: Business environment support with six ingredients

This model is run to identify whether different ingredients like economic scenario, customers' involvement, competition, regulatory supports, suppliers' power, and natural uncertainty can explain changes in business environment support aggregately or individually. The model becomes significant ($p < .001$) with a R^2 value of .482 meaning 48% of the changes in business environment support is explained by the ingredients. However, out of six ingredients, only customers' involvement and suppliers' power becomes statistically significant ($p < .01$).

Model 4: Satisfaction with the system with three major constructs

This model is run to identify whether changes in satisfaction with the system is explained by three major constructs, i.e., organizational support, supervisory support and business environment support. The model becomes statistically significant ($p < .001$) though only 18% of the changes is explained by the constructs. And out of three major constructs, only business environment support becomes statistically significant ($p < .01$).

Model 5: Satisfaction with the job with four constructs

This model is run to identify whether changes in satisfaction with the job is explained by four constructs, i.e., organizational support, supervisory support, business environment support, and satisfaction with the system. The model becomes statistically significant ($p < .001$) with a R^2 value of .542 meaning 54% of the changes in satisfaction with the job is explained by the constructs. And out of four constructs, organizational support and satisfaction with the system becomes statistically significant ($p < .001$).

Model 6: Management Accountants' Satisfaction with satisfaction with the system and job

This model is run to identify whether changes in management accountants' satisfaction is explained by his satisfaction with the system and with the job. The model becomes statistically significant ($p < .001$) with a R^2 value of .604 meaning 60% of the changes in

management accountants' satisfaction is explained by the constructs collectively. And out of two constructs, only satisfaction with the job becomes statistically significant ($p < .001$).

Considering the findings of all the six regression models as analyzed above, we can set the rules for accepting the hypotheses as given in **Table 3.5** below.

	Hypotheses	Expected Sign	Accepted/ Rejected
<i>H1a</i>	Management accountants' satisfaction with the system doesn't depend on organizational support, supervisory support and business environment support.	+	Rejected
<i>H1b</i>	Management accountants' satisfaction with the job doesn't depend on organizational support, supervisory support, business environment support and management accountants' satisfaction with the system.	+	Rejected
<i>H1c</i>	Satisfaction of management accountants doesn't depend on Management accountants' satisfaction with the job and Management accountants' satisfaction with the system.	+	Rejected

Table 3.5: Test of hypotheses on management accountants' satisfaction

In all the three cases, the null hypotheses have been rejected and alternate hypotheses are accepted. Thus management accountants' satisfaction with the system and job depends on the identified constructs. At the same time, management accountants' overall satisfaction mostly depends on their satisfaction with the job, not with the system. These results are very important here. Management accountants and other employees in Bangladesh demonstrate same scenario whose satisfaction is driven by job related parameters, may be they are not playing strong role in designing system so far. Due to this reason, the regression coefficients produce some poor result which was different in standalone analysis as given in **Table 3.3**. For example, independence out of five ingredients from supervisory support construct received the highest attention which becomes insignificant in Model 2. Thus we need to study both the descriptive statistics and results of regression analysis together to understand the scenario properly.

3.4.2 Management accountants' Satisfaction and value dimensions

This is the second module of the analysis where management accountants' satisfaction has been aligned with the different value dimensions. This module is an extension of the previous module which tries to identify whether there exists any relationship between management accountants' satisfaction with different value dimensions. Initially the precedents of management accountants' satisfaction are identified as commitment, loyalty, product quality and service quality. Collectively these precedents act positively to ensure value to the deliverables. Respondents' feedbacks on these issues in a 7 point Likert scale are summarized below in **Table 3.6**.

1	Precedents of Management Accountants' Satisfaction	
(a)	You are loyal to your organization	6.51
(b)	Your level of commitment towards achieving corporate goal is very high	6.20
(c)	You are actively involved to ensure product quality to the satisfaction of customers	5.80
(d)	You are actively involved to ensure service quality (after sale) to the satisfaction of customers	5.79
	Average	6.08
2	Value Dimensions	
(a)	You believe that your customers are happy with the functionality of your product	6.10
(b)	Customers are happy with the quality of your product	6.24
(c)	You provide products at affordable price that your customers always solicit	5.88
(d)	You are always in time in terms of new product/feature development	5.75
(e)	Image of your company always attracts customers to belong to your company	6.12
(f)	Your company always maintain good relationship with your customers	6.19
	Average	6.05

Table 3.6: Average score across different value dimension construct

As per the above table (**Table 3.6**), satisfaction of management accountants results a good degree of loyalty and commitment towards the job. Out of six value dimensions, quality receives the highest priority followed by relationship and image. Price and time receives the least attention.

Based on the responses, 10 different regression models are run in line with the different hypotheses taken for test. Summary of all the regression results is provided below in **Table 3.7** followed by a discussion.

Models	Dependent Variable	Independent Variable	Model Significance	Beta-Coefficient (Significant)	Beta	Sig
1	Loyalty	Satisfaction of Management Accountants	R = .315 R ² =.099 Sig = .001	Satisfaction of Management Accountants	.315	.001
2	Commitment	Satisfaction of Management Accountants	R = .136 R ² =.019 Sig = .150	Satisfaction of Management Accountants	.136	.150
3	Product Quality	Satisfaction of Management Accountants	R = .320 R ² =.102 Sig = .001	Satisfaction of Management Accountants	.320	.001
4	Service Quality	Satisfaction of Management Accountants	R = .408 R ² =.166 Sig = .000	Satisfaction of Management Accountants	.408	.000
5	Employee Commitment	Employee Loyalty	R = .447 R ² =.200 Sig = .000	Employee Loyalty	.447	.000
6	Product Quality	Employee Commitment	R = .264 R ² =.070 Sig = .005	Employee Commitment	.264	.005
7	Service Quality	Employee Commitment	R = .271 R ² =.073 Sig = .004	Employee Commitment	.271	.004
8	Value	Functionality	R = .644 R ² =.415 Sig = .000	Functionality	.087	.346
		Quality		Quality	-.052	.577
		Price		Price	.255	.004
		Time		Time	.082	.402
		Image		Image	-.039	.680
		Relationship		Relationship	.499	.000
9	Value	Product Quality	R = .206 R ² =.043 Sig = .028	Product Quality	.206	.028
10	Value	Service Quality	R = .313 R ² =.098 Sig = .001	Service Quality	.313	.001

Table 3.7: A summary of regression analysis considering different value dimensions

Model 1: Loyalty as explained by management accountants' satisfaction

This model targets to find out a potential development of loyalty driven by the management accountants' satisfaction. This model becomes significant ($p < .01$) with R^2 of .099 which means that only 10% of changes in loyalty is explained by management accountants' satisfaction.

Model 2: Commitment as explained by management accountants' satisfaction

This model targets to find out a potential development of commitment driven by the management accountants' satisfaction. This model is insignificant resulting no bearing on level of commitment due to management accountants' satisfaction.

Model 3: Product quality as explained by management accountants' satisfaction

This model targets to find out a potential improvement in product quality driven by the management accountants' satisfaction. This model becomes significant ($p < .01$) with R^2 of .102 which means that only 10% of changes in product quality is explained by management accountants' satisfaction.

Model 4: Service quality as explained by management accountants' satisfaction

This model targets to find out a potential improvement in service quality driven by the management accountants' satisfaction. This model becomes significant ($p < .001$) with R^2 of .166 which means that 17% of changes in service quality is explained by management accountants' satisfaction.

Model 5: Employee commitment as explained by employee loyalty

This model targets to find out a potential development in employee commitment driven by employee loyalty. This model becomes significant ($p < .001$) with R^2 of .200 which means that 20% of changes in employee commitment is explained by employee loyalty.

Model 6: Product quality as explained by employee commitment

This model targets to find out a potential development in product quality driven by employee commitment. This model becomes significant ($p < .01$) with R^2 of .070 which means that only 7% of changes in product quality is explained by employee commitment.

Model 7: Service quality as explained by employee commitment

This model targets to find out a potential development in service quality driven by employee commitment. This model becomes significant ($p < .01$) with R^2 of .073 which means that only 7% of changes in service quality is explained by employee commitment.

Model 8: Value as explained by different value dimensions

This model targets to find out a potential relationship between value and six different value dimensions like functionality, quality, price, time, image and relationship. This model becomes statistically significant ($p < .001$) with R^2 of .415 which means that 42% of changes in value is explained by different value dimensions. However, out of six value dimensions only price ($p < .01$) and relationship ($p < .001$) are statistically significant.

Model 9: Value as explained by product quality

This model targets to find out a potential relationship between value and product quality. This model becomes insignificant which is very close to the findings in model 8 above where quality with relation to value becomes insignificant. In Bangladesh, customers are not that much concerned with quality.

Model 10: Value as explained by service quality

This model targets to find out a potential relationship between value and service quality. This model becomes statistically significant ($p < .01$) with R^2 of .098 which means that only 10% of changes in value is explained by service quality. It means that customers are not concerned with product quality but they are concerned with after sales services.

Considering the findings of all the ten regression models as analyzed above, we can set the rules for accepting the hypotheses as given in **Table 3.8** below.

	Hypotheses	Expected Sign	Accepted/ Rejected
H2a	Employee satisfaction doesn't affect employee loyalty	+	Rejected
H2b	Satisfaction doesn't affect employee commitment	+	Accepted
H2c	Employee satisfaction doesn't affect product quality	+	Rejected
H2d	Employee satisfaction doesn't affect service quality	+	Rejected
H2e	Employee loyalty doesn't affect employee commitment	+	Rejected
H2f	Employee commitment doesn't affect product quality	+	Rejected

	Hypotheses	Expected Sign	Accepted/ Rejected
H2g	Employee commitment doesn't affect service quality	+	Rejected
H2h	Product quality doesn't affect value	+	Accepted
H2i	Service quality doesn't affect value	+	Rejected

Table 3.8: Test of hypotheses on value dimensions

In all the cases as mentioned above, the null hypotheses have been rejected and alternate hypotheses are accepted except two cases. Employee satisfaction doesn't affect employee commitment and product quality doesn't affect value. In all other cases, alternate hypotheses are accepted. Management accountants' satisfaction develops loyalty and ensures product quality and service quality. Satisfaction may not develop employee commitment; however, employee loyalty helps to build employee commitment. And employee commitment affects both product and service quality. Very important finding is that product quality doesn't affect value, but service quality does.

3.4.3 Satisfaction and Profitability

The final module of the analysis deals with the relationship between satisfaction and profitability. The essence is that management accountants' satisfaction should be materialized through improving the bottom line. In line with this conceptualization, this study targets to identify possible relationship between satisfaction and profitability. For the purpose, a regression model has been developed which results the following (**Table 3.9**):

Models	Dependent Variable	Independent Variable	Model Significance	Beta-Coefficient (Significant)	Beta	Sig
1	Profitability	Employee Satisfaction	R = .012 R ² =.000 Sig = .897	Employee Satisfaction	.012	.897

Table 3.9: A summary of regression analysis considering profitability and satisfaction

However, the regression model as presented above result worrying picture regarding the relationship. Management accountants' satisfaction doesn't have any relationship with profitability. The firms fail to operationalize its satisfaction effort to raise profitability. Thus the null hypothesis is accepted which is given in **Table 3.10** below.

	Hypotheses	Expected Sign	Accepted/ Rejected
H3	Management accountants' satisfaction does not have any relationship with profitability.	+	Accepted

Table 3.10: Test of hypothesis on profitability

3.4.4 Management Accountants' Satisfaction and Intention to Switch

It is established that low level of job satisfaction results high level of employee turnover. This study also searches for this behavior whether the management accountants reflect any different motive behind the relationship between satisfaction and switch. Considering 'intention to switch' as dependant and 'satisfaction of management accountants' as independent variable, a linear regression model is formed which becomes statistically significant ($p < .001$) with R^2 of .239 meaning 24% of the changes in 'intention to switch' parameter is explained by changes in management accountants' satisfaction. However, the negative beta coefficient (-.489, $p < .001$) confirms that 'intention to switch' and 'satisfaction of management accountants' are inversely correlated. High level of satisfaction results less possibility of intention to switch and vice versa.

3.5 Conclusion

Employee satisfaction, profitability and their interrelationships are very common research agenda. However, addressing satisfaction of management accountants who are playing very critical role in organization to attain strategic goals has not been researched. This chapter addresses employee satisfaction, particularly management accountants' satisfaction, to enrich the literature of employee satisfaction. It identifies three major constructs of management accountants' satisfaction, viz., organizational support, supervisory support and business environment support. And it concludes that management accountants' satisfaction largely depends on all these major constructs.

The research also identifies some precedents of satisfaction like loyalty, commitment, product quality and service quality. It is widely accepted and believed that to demonstrate innovation and creativity in workplace, the management accountants need to be contented with the job environment. In fact, management accountants have a crucial role to play in rebuilding customer satisfaction (Helmi, 1998) via ensuring different value dimensions in offered products and services. They must link increased value with improved financial

results. Some employers even believe that satisfying or delighting employees is a prerequisite to satisfying or delighting customers, thus protecting the “bottom line” (Brown, 1973; Levine, 1995). In line with this, this study considers the interrelationship between management accountants’ satisfaction, value dimensions and profitability. And the research through a semi-structured questionnaire survey concludes that management accountants’ satisfaction has relationship with different value dimensions. However, it fails to prove that satisfaction is related to profitability.

The research intends to fill up the current gap in management accounting research in the field of satisfaction of management accountants. Management accounting practices are the services offered by management accountants directly influencing customers due to demanded value in products and services. Thus, it is important to conduct a study to find whether there exists any relationship between the satisfaction level of management accountants, value dimensions and profitability. This is the motivation of this study.

Chapter 4

Diffusion of Management Accounting Practices in Bangladesh

This chapter extends discussion covering following main points –

- 4.1 Introduction
- 4.2 Literature Review
- 4.3 Research Methodology
- 4.4 Analysis and Findings
- 4.5 Conclusion

4.1 Introduction

An interesting feature in the development of management accounting practices (MAPs) is that they seem to converge within the industrialized areas of the world (Granlund and Lukka, 1998). This seems to apply, particularly, to new and innovative ideas in management accounting. The relevance lost debate, initiated by a set of articles (e.g. Kaplan, 1983, 1984) and the best-selling book by Johnson and Kaplan (1987), that management accounting research, practice and teaching had failed to keep pace with changes in the business environment and that as a result management accounting had lost its relevance for planning, decision making and control, has ushered a new dimension in management accounting research. Such critical observation has solid empirical foundation that this development had weakened the competitive position of US corporations. Thus the debate requested management accounting practitioners to involve into more research on management accounting practice, including survey and field studies, and for academia and researchers to act as communication channels for the diffusion of management accounting innovations (MAIs). This call brings extra momentum to develop innovative management accounting techniques followed by the study of diffusion of such techniques.

Based on the concern as raised above, this research deploys a motivated effort on studying the diffusion in Bangladesh which is characterized as late adopter of innovative tools. Bangladesh economy was initially explained as an economy led by agricultural sector. However, from 90s it has been changed due to the wide scale privatization effort undertaken by the then government encouraging private investment. As Bangladesh is

observing a steady growth in major economic parameters, she perceives to have a strong manufacturing sector to ensure a balanced economic growth. It is in line with the millennium development goals (MDGs) which are properly manifested in 2021 vision of becoming a middle income country within that time. Bangladesh has recently observed huge investment in education sector; enrichment of professional accounting education; opening the border for easy flow of man, machine and resources; all of which shows the high commitment of the regulators to confirm a highly productive manufacturing sector. Still most of the manufacturing firms in Bangladesh are first generation firms enjoying some policy support from the local regulators. It is really interesting to survey the competitiveness of these firms via the application of different innovative management accounting techniques. This is the main motivating factor of the study.

Diffusion is the process whereby an innovation is communicated through certain channels over time among the members of a social system (Rogers, 1995). Three important social phenomena describe the speed and range of a diffusion process (Bjørnenak, 1997). Initially, the idea may meet *resistance*, for example in the form of an unwillingness to make organizational changes or of theoretical objections from academics. *Barriers* to diffusion are another factor. These can assume the shape of lack of resources or cultural/linguistic obstacles. Barriers are also related to the final factor, namely the *information* field of potential adopters, that is to say the extent of contacts a potential adopter has made at a given time. The information field affects the rate of diffusion.

By focusing on the information field we direct attention to the supply side of the diffusion process. Diffusion studies have traditionally focused on organization's demand for innovations and emphasized the role of potential adopters of innovations in driving the communication process. These studies have regarded the information field as a passive factor in the diffusion process. However, more recent studies have seen the supply side as actively seeking to control the information field of potential adopters (Abrahamson, 1991, 1996; Abrahamson and Fairchild, 1999). This modern perspective has also inspired studies of the diffusion of management accounting innovations (Bjørnenak, 1997; Gosselin, 1997; Malmi, 1999). In a study of Norwegian manufacturing firms Bjørnenak (1997) suggested that potential adopters' contacts with the propagators of ABC explained the rate of adoption better than efficient-choice variables. This is consistent with the findings presented in a study of diffusion of ABC among Finnish manufacturing firms (Malmi, 1999). Malmi's study showed that fashion-setting organizations exert

considerable influence in the take-off stage of the diffusion process (i.e. during the period with high rates of adoption). Clarke et al. (1999) explains the low adoption rates of ABC in Ireland by referring to the absence of compulsory further professional education in management accounting, the lack of practitioner journals devoted specifically to management accounting, and the absence of executive MBA programmes, i.e. supply side factors. Bangladesh enjoys a strong supply side, however, demonstrates a weak demand side which is properly demonstrated in this paper showing a very poor relationship between level of diffusion and different firm specific factors. It is expected that the research will explore the level of diffusion along with the causal factors for providing policy support to the researchers, practitioners, academia and regulators for corrective actions.

Alvarez (1998) and Mazza and Alvarez (2000) stress the importance of making innovations compatible with the societies to which they are transmitted (diffused). They also argue that cultural discourses and legitimization are the main resources needed to enable the popularization of an innovation. One way in which the supply side can popularize an innovation in a specific location is by matching the design characteristics and rhetorical elements of the innovation (i.e. the bundling) to the preferences and knowledge of the potential adopters. A certain degree of ambiguity about the content of fashionable concepts which opens the concepts to different interpretations and uses, will potentially increase the supply side effect in the diffusion process, for example by including elements in the bundling process that reduce barriers and resistance to change. The degree of ambiguity regarding its content endows the innovation with its interpretative viability. Thus, a high level of interpretative viability may make the innovation more compatible with new social settings (Benders and van Veen, 2001). Early fashion-setting adopters, consulting firms and others can be described as supply side drivers in the diffusion process, since they either actively impel the spread or are passively imitated (Abrahamson, 1991). The supply side may use interpretative viability to impose imitative behavior as a means of spreading innovations, e.g. by linking the innovation to success stories from practice.

This research particularly focuses on the level of diffusion of different management accounting innovations. At the same time, it focuses on the drivers of such diffusion. A presumption of weak diffusion really exists which brings new research agenda in the form of studying the impact of different demand side and supply side factors. In a society

offering strong supply side, weak diffusion is being caused by poor demand side which has been uncovered in this paper considering different factors like accuracy, profitability, turnover, net assets as proxy to demand side factors. The analysis is based on a structured questionnaire survey where the data is analyzed through different descriptive and inferential statistics. This study will bring some insights regarding the applicability of different management accounting techniques and plays certain role to converse in academia so that the strong reciprocity between practitioners and academia may be established.

The discussions have been divided into five sections. Section one has introduced the paper followed by a detail literature review in section two. Section three presents the research methodology which is followed by findings and analysis in section four. Finally the paper concludes the discussion in section five.

4.2 Literature Review

This section presents a brief literature review on key terms relating to the diffusion of management accounting practices.

4.2.1 Diffusion

New beliefs, ideas, knowledge, programs, practices and technologies can be communicated between members of a social system over time through a process known as diffusion (Rogers, 2003). Diffusion theory fits well with the practical exigencies of moving research to practice as evidenced by its use in quite diverse disciplines including sociology, medicine, psychotherapy, education, communication, and public health. As such this theory assists in outlining and offers explanations for patterns of innovation promulgation that takes place across different and distinct communities of practice (Green et al., 2009). As described by Brownson et al. (2006), the diffusion of research to a practice context involves negotiating four potential barriers that may prevent academic research from more effectively engaging with practice. These barriers; discovery, translation, dissemination and change, are depicted in **Figure 4.1**.

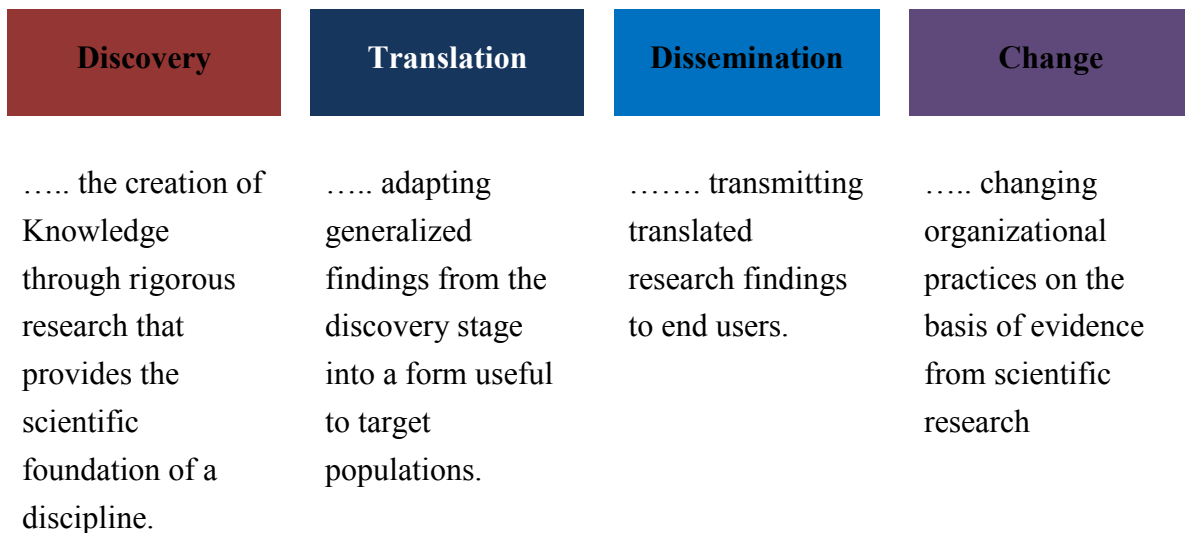


Figure 4.1: Barriers to research diffusion (**Source:** Gautam, 2008)

Figure 4.1 maintains that diffusion is not an instantaneous act, but rather, is dependent upon successfully addressing four mutually related, yet independent potential barriers to harvesting knowledge generated by academic research for application to practice. Discovery, “the creation of knowledge through rigorous research that provides the scientific foundation of a discipline” (Gautam, 2008), can represent an important impediment to the closer integration of research and practice. Often represented as a “knowledge production” problem (Van de Ven and Johnson, 2006), the discovery barrier often manifests as a failure to pose questions of interest to management (Rynes et al., 2001; Vermeulen, 2005), ignoring basic questions about the purpose of scholarly work (Pettigrew, 2005), or knowledge “lost before translation” (Shapiro et al., 2007). An underlying explanation offered for this knowledge production problem is that a research-practice divide transpires due to practitioners facing daily pressures that are disconnected from research questions posed by academics. The need for management accounting researchers to therefore, “ask the right questions” in the first place, is a fundamental prerequisite if our research efforts are not to become isolated from practice.

Overcoming the translation barrier requires academic research be presented in a form that is coherent and digestible for practitioners. In the management accounting literature, academic research has been regularly cited as a major obstacle to bridging the research-practice gap. In a paper, Mautz (1978) concluded that researchers are incompetent in

communicating research matters to practitioners, and in another paper, Werner (1978) argued that practitioners will only give research a 'Fair Chance' for study if it is offered to them in a interesting, readable and understandable way. Failure in translation has been attributed as being a primary cause of the increasing and contended, irreversible gap between research and practice (Baxter, 1988). This observation has been repeated consistently in subsequent decades, for example, van Helden and Northcott (2010) argue that the understandability of research findings are often hindered by poor presentation, such as excessive attention to methodology and theory, or by ignoring any research implications of potential relevance and interest to practitioners.

Dissemination involves exposing practitioners to research findings via appropriate media, distribution or communication channels (Gautam, 2008). Concern that management accounting research does not engage with practice often focuses on this barrier. A number of causes have been attributed. They include, a focus upon communicating with academic colleagues, in preference to practitioners (Malmi and Granlund, 2009); the time lags involved in academic publishing versus the practitioners short-term decision requirements (Inanga and Schneider, 2005); the general reluctance of practitioners to attempt reading management accounting research journals (Scapens, 2008; Inanga and Schneider, 2005) and, their disinterest in research outputs employing other presentation modes (Mitchell, 2002).

Change is the goal of applied academic research. It involves implementing practices triggered by research based evidence (Gautam, 2008). This particular barrier is arguably independent of the diffusion process (Green et al., 2009), being largely related to the management of change. The area of change management has been extensively researched in the organizational, strategic and general management literatures, and a summary of these findings is far beyond the scope of this research. Nevertheless, as Brownson et al. (2006) observe, common to much of this literature is the recognition that parties to the change need to be "ready, willing, and able" to embrace new ways of operating if the adoption of the change is to be successful and sustainable. If meaning is, to a large extent, derived from context (Laughlin, 2011), consequential and convincing connection of research with specific organizational settings is important. Thus, this barrier to the diffusion of academic research to practice is in effect, about contextualizing research to demonstrate to practitioners, its amenability to adoption.

4.2.2 Innovation

While diffusion has consistently been defined as the process whereby the innovation is spread or disseminated (Bjornenak, 1997), the definition of innovation is not straight forward. On its own, the word innovation may be understood to be an idea, practice, or object that is perceived to be new to its adopters (Zaltman et al., 1973; Rogers, 1995; 2003). Likewise, organizational innovation is consistently defined as the adoption of an idea or behavior that is perceived as new by an organization (Hage and Aiken, 1970; Zaltman et al., 1973; Daft and Becker, 1978; Hage, 1980; Damanpour, 1988, 1991; Zammuto and O. Connor, 1992). The innovation can be a new product, a new service, a new technology, or a new administrative practice. The common criterion accepted for the idea to be considered as an innovation is perceived newness. According to Rogers (1995, 2003), newness might be determined in terms of new knowledge regarding the idea, and also in terms of a first decision to adopt this idea by the relevant adoption unit. In this context, Evan and Black (1967) and Van de Ven (1986) pointed out that innovations could be either old or new ideas adopted in new settings. Firth (1996) stated that using a new idea or even the adoption of an old idea in a new context, where this idea is regarded as new, may be viewed as an innovation. Also according to Ax and Bjornenak (2005), innovation may be old ideas applied to new settings or even old ideas being reintroduced into the same setting at a later point in time. Newness of an idea or practice should also be considered in terms of its adoption by the unit of adoption such as organization, rather than the first use ever or its newness to a population of organizations (Zaltman et al., 1973; Pierce and Delbecq, 1977). In addition, Damanpour and Evan (1984) and Slappendel (1996) indicated that it is the perception of newness by the adoption unit that matters, not the idea or object being new to the world, to other different environments, or to the organizational populations, as adoption of new ideas in an organization is expected to affect organizational performance regardless of the time of its adoption by other organizations in the population. The newness element is also important to differentiate innovation from change. Zaltman et al. (1973) argued that, while all innovation implies change, not all change involves innovation as not everything that an organization adopts is perceived as new. In the context of management accounting innovation, Sulaiman and Mitchell (2005) distinguish between various types of changes as follows:

- Addition: introduction of a new technique as extension to an existing management accounting system, such as the introduction of quality costing system or budgeting system.
- Replacement: introduction of a new technique as replacement for an existing part of a management accounting system such as the replacement of traditional costing with ABC, or of a fixed budgeting system with flexible budgeting.
- Output modification: modification of the information output of the management accounting system such as the preparation of weekly as opposed to monthly variance reports or the re-presentation of numerical information in graphical form.
- Operational modification: modification of the technical operation of the management accounting system such as the use of a pre-determined as opposed to an actual overhead rate in an existing costing system or the use of regression analysis as opposed to an inspection basis for separating fixed and variable costs.
- Reduction: the removal of a management accounting technique with no replacement such as the abandonment of budgeting or the cessation of breakeven analysis.

Thus, the addition, replacement, output modification, operational modification changes, and reduction can be regarded as innovation as long as they are perceived as new by the organizations. Another important distinction found in the literature is that between administrative and technical types of innovation (e.g. Damanpour, 1991; Utterback, 1994). Technical innovation belongs to product, services and production process technology. It is related directly to basic work activities and production process technology, such as new product or services, whereas administrative innovation affects organizational structure and procedures and, therefore, is related to organizational management such as an introduction of a new management accounting technique (Daft, 1978; Damanpour and Evan, 1984).

4.2.3 Adoption of Management Accounting Practices

Any practice is an organized, open-ended spatial-temporal manifold of actions (Schatzki, 2005). The set of actions that composes a practice is organized by three phenomena: understandings of how to do things, rules, and teleoaffective structure. Rules mean explicit formulations that prescribe, require, or instruct that such and such things to be done, said, or the case; a teleoaffective structure is an array of ends, projects, uses (of

things), and even emotions that are acceptable or prescribed for participants in the practice (Schatzki, 2005). Similarly, in management accounting, practice includes a set of actions based on some rules that lead towards an end. More specifically, MAPs deal with the application of different types of accounting data to supplement operational, tactical, and strategic management decision making process.

During the 1980s, Kaplan, in his review of *The Evolution of Management Accounting* (1984) and with Johnson in the *Relevance Lost* book, leveled strong criticism at the management accounting practices of the day. Virtually all of the (management accounting) practices employed by firms today and explicated in leading cost accounting textbooks had been developed by 1925 ... there has been little innovation in the design and implementation of cost accounting and management accounting control systems (Kaplan, 1984). As a response to the wide criticisms that management accounting faced such as its lag behind production techniques and the gap between theory and practice, many surveys have been conducted in different countries around the world concerning the diffusion of MAPs. Activity-based costing (ABC) is considered to be one of the most written and talked about innovations in management accounting (Johnson, 1990; Shields, 1995; Booth and Giacobbe, 1998; Clarke et al., 1999; Brown et al., 2004). Despite the argument regarding the benefits of ABC; surveys have reported considerable variations in its adoption (Baird et al., 2004; Drury, 2004). In this context, Drury (2004) states that ‘Significant variations in the usage of ABC both within the same country and across different countries have been reported. These differences may arise from the difficulty in precisely defining the difference between traditional costing systems and ABC systems and the specific time period the surveys were actually undertaken.’ In the UK many surveys have been conducted on the adoption rate of ABC, **Table 4.1** gives a summary of some of these surveys.

	Innes and Mitchell (1991)	Drury and Tayles (1994)	Innes and Mitchell (1995)	Innes et al. (2000)
ABC currently used	6	4	21	17.5
ABC currently under consideration	33	37	29.6	20.3
ABC considered then rejected	9	5	13.3	15.3

ABC not considered	52	44	36.1	46.9
Intended to introduce ABC	*	9	*	*

Table 4.1: ABC adoption in UK companies (%)

* This information was not gathered in the study.

As can be seen from **Table 4.1**, at the beginning of the 1990s there was a growing interest in ABC by UK companies although the adoption rates were low. Innes and Mitchell's (1991) research on the implementation and use of ABC systems reveals that only 6% of surveyed UK firms had begun to implement ABC by 1990. A higher rate of adoption was found by Bright et al. (1992) who reported a 32% adoption rate, although they were doubtful about its correctness. Drury and Tayles (1994) reported that 4% of UK manufacturing firms had adopted ABC by 1991, with 9% intending to use it. Moreover, they reported a growth in companies considering the usage of ABC. Innes and Mitchell (1995) reported a continuing trend in the adoption of ABC, as 21% of the top 1,000 firms in the UK had adopted it. However, there was a decline in companies considering ABC with an increasing number of companies rejecting it. In 1999, Innes and Mitchell repeated their survey; they reported a decrease in both the use and the number of companies considering ABC. On the other hand they indicated an increase in the number of companies rejecting and not considering ABC. They concluded that the popularity of ABC declined over the period of investigation between 1994 and 1999. Similar results were reported in another research by Drury and Tayles (2000) indicating that only 15% of the organizations surveyed had implemented full ABC, 5% indicated partial implementation and a further 3% were in the process of implementing it.

Ghosh and Chan (1997) surveyed 109 companies in different industries in Singapore; they reported that 13% of the respondents use ABC, although it was ranked the last in the adoption rate out of 12 MAPs surveyed. In India the adoption rates of ABC and ABM in 60 large and medium companies were 20% and 13% respectively (Joshi, 2001).

In Greece, an early survey by Ballas and Venieris (1996) revealed that Greek companies did not adopt ABC at all, while a more recent study by Venieris et al. (2000) in manufacturing companies reported a 12.7% adoption rate. In Belgium, the adoption rate was 19% (Bruggeman et al., 1996). In the Netherlands, Groot (1999) found that 12% of the firms had implemented ABC, and in France it was 20% (Bescos et al., 2001). Finland seemed to have had an increase in the adoption rates during the 1990s, as can be seen

from the adoption rates; 6% in 1992, 11% in 1993, and 24% in 1995 (Virtanen et al., 1996). In Norway, Bjonenak (1997) indicated a high adoption rate, with 40% of the companies surveyed having implemented ABC or planned to do so. No evidence of ABC adoption was found in Italy (Barbato et al., 1996) or Spain (Saez-Torrecilla et al., 1996).

In the USA several surveys have examined the adoption of ABC in companies and reported a range of results, although they recorded higher rates compared with other countries. For example, Green and Amenkhienan (1992) state that 45% of responding manufacturing firms in their study using advanced technologies have implemented ABC to some degree. A study conducted by the Cost Management Group of the Institute of Management Accountants (1993) found that 36% of responding US firms had implemented ABC, and a later survey in 1996 by the same group showed that the adoption rate had increased to 41%. Another study by Shim and Sudit (1995) indicated that 27% of the manufacturing firms surveyed had fully or partially implemented ABC, while a study by Hrisak (1996) reported a higher adoption rate of 53%. More recent surveys show a relatively low adoption rate. For example, Shim and Stagliano (1997) reported the usage rate being 27%, Groot (1999) found that 17.7% of the companies investigated had adopted ABC, and Frey and Gordon (1999) identified a higher rate of 24.4%. Australia's findings present a mixed picture regarding ABC diffusion. Booth and Giacobbe (1998) found a low adoption rate of 12%. Chenhall and Langfield-Smith (1998) recorded a much higher adoption rate of 56% for ABC and 68% for ABM.

Firth (1996) reported a lower adoption rate of ABC in China: 1% in State-owned enterprises and 2% in Chinese partner firms in joint ventures. Sulaiman et al. (2004), who reviewed the literature on the adoption of MAPs in four Asian countries, concluded that 'it would seem that the use of ABC has not caught on in the four countries surveyed. Consequently, an interesting area to address in the future research is the obstacles to ABC implementation in Asian firms.'

Since its introduction in the early 1990s, the balanced scorecard (BSC) has attracted a great deal of interest as a new management accounting technique for integrating financial and non-financial performance measures (Lipe and Salterio, 2000). Thus, several studies surveyed the implementation of this technique. For example, a survey conducted in US estimates that 60% of the 1,000 firms studied have experimented with the BSC (Silk, 1998). Moreover, Frigo and Krumwiede (1999) report that about 37% use BSC, with 16%

planning to implement it in the future, while 14% are still considering implementing it, and only 2% are reported rejecting or abandoning BSC.

Studies in Europe indicate the current and future popularity of the BSC approach. For instance, Pere (1999) indicated that BSC is widely used in Finland, as 31% of the respondents indicated that they use it and 30% were in the process of implementing it. A study on Swedish companies reported that 27% have already implemented the BSC, and if the companies that state they expect to have the BSC within 2 years are included, the adoption rate rises to 61% (Kald and Nilsson, 2000). Regarding BSC use, a survey conducted by Joshi (2001) indicates that 40% of the Indian companies surveyed used BSC. In Malaysia, Sulaiman et al. (2004) found only 13% of the 61 companies surveyed actually used a BSC.

In the UK, Francis and Minchington (2000) reported that 24% in all sectors and 21% of manufacturing sector use BSC. A comparative study conducted by Gehrke and Horvath (2002) on some of European countries showed that companies in Germany, the United Kingdom, Italy and France are familiar with the BSC, as 98%, 83%, 72% and 41% of the responding companies have knowledge of it, respectively. Moreover, the study revealed that approximately 20% of the companies in Germany, the United Kingdom and Italy intended to implement the BSC. Another comparative study was undertaken by Speckbacher et al. (2003) in German-speaking countries (Germany, Austria and Switzerland). The results of the study showed that 26% of 201 companies surveyed have implemented the BSC.

Little research has been undertaken on the extent to which companies use strategic MAPs, such as target costing, life cycle costing and quality costing (Drury, 2004). An earlier study by Tani et al. (1994) found that 60.6% of their sample of 180 listed Japanese manufacturing firms used some form of target costing. Wijewardena and Zoysa (1999) found in their study of 209 Japanese manufacturing companies and 225 Australian manufacturing, that target costing was perceived as the most important practice used in Japan, while it ranked only tenth in importance of the 11 MAPs studied in Australia. Chenhall and Langfield-Smith (1998) found that of 78 respondents of large Australian manufacturing firms, 38% confirmed the use of target costing, although this adoption rate was relatively low compared to the adoption of other accounting practices and was ranked 27 as the least adoption rate among all the 42 MAPs surveyed. Moreover, their findings

reveal that the target costing provided a low benefit in the past (ranked 30) and expected to have a lower emphasis in the future (ranked 40).

In India, although only 35% of the companies surveyed reported the usage of target costing, it was ranked the fourth in terms of the extent of its benefits. In Malaysia, Tho et al. (1998) reported that about 41% of the 214 companies surveyed use target costing and another 4% said that they would implement target costing in the next five years (quoted in Sulaiman et al., 2004).

In respect of the diffusion of quality cost reporting, a comparative study by Wijewardena and Zoysa (1999) of MAPs in Australia and Japan found that quality cost reporting ranked similarly in importance by the respondents in large manufacturing companies in both countries, 9 in Australia, 7 in Japan. Adler et al. (2000) reported that 19.4% of 165 New Zealand manufacturing companies currently use quality cost reporting, while 6% used it in the past. In addition, 4% of respondents indicated that the technique is being installed, another 7% were investigating its potential and only 3% of the respondents had not heard of it before.

Guilding et al. (2000) carried out a study about the extent of using strategic MAPs across three countries: New Zealand, The United Kingdom, and the United States. The adoption rate of quality costing was relatively moderate among the sample and for each of these three countries. However, it was ranked the third most adopted techniques for the full sample and the second in New Zealand, the third in the UK, and the fifth in the USA. Recently in the UK, Abdel-Kader and Luther (2006) reported that the cost of quality was regarded to be not important by 41%, moderately important by 44%, and important by 14% of the respondents in British food and drink companies. Moreover, their study reveals that 54% of the companies surveyed use the cost of quality (24% use it rarely, 18% sometimes, 10% often and 4% use it very often). Wijewardena and Zoysa (1999) conducted a survey of MAPs in large manufacturing companies in Australia and Japan. Their study findings indicate that only 5% of the respondents use life cycle costing in Australia, whereas 13% of them use it in Japan. Similarly, Guilding et al. (2000) carried out a survey of strategic MAPs across three countries: New Zealand, UK, and USA. Life cycle costing was the second least adopted practice among the full sample and for each country of seven practices surveyed.

Diffusion is a process which takes a long time to diffuse successfully in organizational unit. However, most of the studies conducted in the field of diffusion consider only one

time period due to research limitations. Without a baseline survey, it is not possible to conduct such study again keeping the same construct and sample frame to conclude any potential improvement in diffusion process. Very few studies have undertaken the same study with reference to different time periods (Innes and Mitchell, 1991, 1995). As there is no such studies conducted before in Bangladesh, this study is done with reference to one time period (2012-13) only and left the opportunity of observing any improvement in diffusion status at a later time period considering this study as a baseline study.

The above findings indicate a mixed picture regarding MAPs diffusion in different countries. Despite the long period of emergence of these techniques and the claims of their high benefits in the literature, the adoption rates of MAPs are still low. The reported adoption rates of MAPs in these countries range between 3% and 30%, except for target costing, which seems to have relatively a higher adoption rate (the adoption rates range between 35% and 60%). Also ABC is the most advanced MAPs studied in these countries, while other advanced MAPs, such as target costing, life cycle costing and quality costing have received less attention.

For many years there has been a concern that accounting research is separate from and largely irrelevant to, practice which is also reflected in the findings of above studies. Baxter (1988) summarizes this concern well when he says 'I fear that a great gap separates much research from practice'. This concern about a 'gap' has echoes in much of the recent literature on this important topic (see, for example, Tilt, 2010; Parker et al., 2011; Tucker, 2011) even though this literature has recognized that there is not a simple solution to such a complex problem. A literature on researches conducted so far on management accounting practices in Bangladesh has been presented below which clearly identified the adoption status of different MAPs with some detailing on purposes.

Sarkar & Yeshmin (2005) has focused on the application of responsibility accounting as one of the management accounting techniques in 30 organizations. The authors have focused on four responsibility centre as cost center, revenue center, profit center and investment center to show the accountability of the organization. This study has also revealed that the most common technique - budget is being used to evaluate the performance. It puts a selective focus on responsibility accounting in few organizations which needs to be extended.

Sharkar et al. (2006) has given an overview of the management accounting practices in the listed manufacturing companies of Bangladesh. The analysis of this study has

revealed that all sectors fail to practice some newly developed techniques. They have suggested improving and fastening the management accounting practices. This study itself calls for new research. Considering only listed company has narrowed the focus of the study as listed companies are primarily concerned with financial accounting, not with management accounting.

Mazumder (2007) has examined the status of use of management accounting techniques in the manufacturing enterprises of Bangladesh. It has been discovered that modern techniques like Activity-Based Costing, Target Costing, Just-in-Time (JIT), Total Quality Management (TQM), Process Reengineering and The Theory of Constraints (TOC) were not used in public and private sector manufacturing enterprises but a few Multinational Corporations (MNC) are using some of techniques like JIT and TQM. Also traditional techniques like financial statement Analysis, Cash Flow Analysis, budgetary control, management reporting were found widely used followed by CVP Analysis, Marginal Costing, and Fund Flow Analysis etc. This study mainly focuses on the level of application of different management accounting techniques but doesn't cover the reasons of such choice which may be driven by different firm specific factors.

Yeshmin and Das (2009) have conducted a study on financial institutions in Bangladesh. It revealed that managers of the financial institutions are very much satisfied with the application of budgetary control analysis and variance analysis to measure their performance among the fourteen management accounting techniques. At the same time managers were very much dissatisfied with the application of segment reporting. This study considers service sector for studying the level of application of different management accounting techniques and thus highly innovative techniques like Activity Based Costing, Target Costing, Lean Manufacturing, etc. remains outside the scope.

A recent study (Yeshmin and Fowzia, 2010) aimed to examine the use of the management accounting techniques in manufacturing and service industries of Bangladesh for discharging managerial functions. To achieve this objective, 151 organizations from manufacturing and service industries had been surveyed. By identifying 14 management accounting techniques, three factors had been identified to determine the variability of the usage level in managerial functions. The findings revealed that management accounting techniques such as financial statement analysis, budgetary control, CVP analysis, variance analysis, and fund flow analysis were common in both the industries and were

used frequently in managerial decision making. This study considers both service and manufacturing sectors together which evoked some analytical problems.

The study conducted by Yeshmin & Hossan (2011) has emphasized on the level of usage of twenty-three management accounting techniques in making effective decisions by the different manufacturing organizations in Bangladesh. This study would be of particular relevance to Bangladesh, because it would help to assess the significant influence of management accounting techniques in decision-making by manufacturing organizations of Bangladesh. **Table 4.2** below identifies different management accounting techniques used in different researches conducted in Bangladesh from time to time.

SL	Management Accounting Tools	Yeshmin & Hossan (2011)	Yeshmin and Fowzia (2010)	Mazumder (2007)
1	Cash flow Statement Analysis	√		√
2	Ratio Analysis	√	√	√
3	Budgetary Control	√	√	√
4	Cost Volume Profit Analysis	√	√	√
5	Variance Analysis	√	√	
6	Fund Flow Analysis	√	√	√
7	Standard costing	√		√
8	Variable Costing	√	√	√
9	Target Costing	√	√	√
10	Absorption Costing	√		√
11	Inter-firm Comparison	√		√
12	Activity Based Costing	√	√	√
13	Differential costing	√		√
14	Just in Time	√		√
15	Opportunity Costing	√		√
16	Responsibility Accounting	√	√	
17	Segment Reporting	√	√	
18	Total Quality Management	√	√	√
19	Theory of Constraint	√	√	√
20	Management by	√	√	

SL	Management Accounting Tools	Yeshmin & Hossan (2011)	Yeshmin and Fowzia (2010)	Mazumder (2007)
	Exception			
21	Process Reengineering	√		√
22	Kaizen Costing	√		
23	Balance Scorecard	√	√	
24	Management Reporting			√

Table 4.2: Management Accounting Tools used by Bangladeshi firms (Authors' compilation from relevant literature)

The study (Yeshmin & Hossan, 2011) reveals that cash flow statement analysis, ratio analysis, budgetary control, CVP analysis, variance analysis, fund flow analysis, TQM, and TOC are widely used management accounting techniques. The study also applies factor analysis to identify any hidden relationship resulting five factors considering the variability of the responses given by the respondents. Finally, the authors have tried to find out the level of significance of different managerial accounting techniques in decision making. Out of 23 techniques, only eight techniques namely, budgetary control, fund flow analysis, absorption costing, balanced scorecard, TOC, ABC, segment reporting and inter firm comparison become statistically significant. At the same time, the study concludes that only 25.6% of the variation in decision making of manufacturing organizations is explained by 23 management accounting techniques used in the study.

In another study (Shil & Pramanik, 2012), a survey is conducted across 25 manufacturing companies to put comments on the adoption and implementation status of Activity Based Costing. The study reveals that a good number of companies surveyed (64%) apply ABC for product costing and other purposes, however, the quality of ABC is not up to standard, even costing system with only one cost driver is also referred to as ABC. Thus the diffusion rate is not satisfactory. At the same time, the sample size was so small and it may not reflect the actual scenario of the market.

Another study (Kabir et al., 2013) aims at exploring the extent to which the listed pharmaceutical companies in Bangladesh are practicing management accounting tools in making managerial decisions and revealed that management accountants use a number of tools, on average 35, across a wide range of operational, managerial and strategic functions.

Based on the above literature, a total of 21 management accounting practices have been identified to study the level of diffusion in sample firms. The analysis has tried to maintain proper alignment of three keywords (diffusion, innovation and management accounting practices) with their respective gravity. Some of the 21 management accounting techniques as used in this survey may seem to be traditional; however, as per the definition of 'innovation', they are new in the context of Bangladesh and Bangladeshi firms. Most of the studies conducted so far lack to bring innovation and diffusion in studying management accounting techniques. These studies mainly analyze the level of application of different management accounting techniques on a structured questionnaire designed on the basis of Likert's 5 point scale. This study widens the analysis by extending the sample size considering both listed and unlisted manufacturing firms. It has also searched the reason of diffusions of different management accounting techniques by collating the level of application with different factors like size, profitability, net assets etc.

4.3 Research Methodology

The study is based on the result of a semi-structured questionnaire survey as mentioned in chapter 1. Different descriptive and inferential statistical tools are used in line with the objectives of the study. Descriptive tools like mean, standard deviations are applied to identify the highly used techniques. Exploratory factor analysis (EFA) is used as a data reduction tool to identify any hidden relationship among the techniques. Regression analysis is used to identify any potential causal relationship between the level of diffusion and different parameters like level of accuracy, profitability, turnover, net assets etc.

4.4 Analysis and Findings

This section presents the analysis and major findings of the study. It starts with a general discussion on management accounting practices from different perspectives. Next section presents regression analysis in two different modules. In first module, exploratory factor analysis identified major groupings among the management accounting techniques which have been regressed with other variables to identify any relationship. And in next module, the grouping is done based on the average score out of 5 which is regressed again with other variables to identify any possible relationship. The respective findings are embedded with the analysis.

4.4.1 Number of Cost Pools

The questionnaire provides a very precise definition of cost pool which is read as ‘the typical procedure for assigning indirect costs (i.e. overheads) to products (or services) involves a two-stage process. In the first stage indirect costs are allocated to cost centres (also known as cost pools)’. Then it asks the number of cost pools used by the respective firms to assign indirect costs to products/services. Studying the results of all the 113 respondents, a frequency distribution is developed below (**Table 4.3**) regarding the number of cost pools used by the selective firms:

Number of Cost Pools	Number of Cases	Percentage	Range
(1) 1 Cost Pool	15	13	1 – 356
(2) 2 Cost Pools	12	12	
(3) 3 – 5 Cost Pools	32	28	
(4) 6 – 10 Cost Pools	10	9	
(5) 11 – 20 Cost Pools	23	20	
(6) 21 – 30 Cost Pools	5	4	
(7) 31 – 50 Cost Pools	5	4	
(8) Over 50 Cost Pools	11	10	
Total	113	100%	

Table 4.3: Distribution of Cost pool

The above table presents the use of cost pools by Bangladeshi firms. And it is very surprising that one multinational company operating in FMCG markets uses as more as 356 different cost pools. In justification of using so many cost pools, one of the important reasons of using cost pools comes out. Cost pools are used to classify, trace and control costs properly. It is not possible if the costs are not properly aligned with the responsible cost centres. The responding organization justifies that it leaves no ambiguity on the identification of costs centres for every class of costs it incurs.

4.4.2 Number of Cost Allocation Bases

The analysis puts special emphasis on cost allocation bases due to the significance on identification and use of allocation bases to ensure accuracy in product costing. The questionnaire puts a very much straight forward purposive definition of cost allocation bases which is read as ‘in the second stage of the two-stage process, indirect cost/overhead allocation rates are established for each cost centre to assign overheads to products/services’. And the questionnaire seeks the respondents to mention the number of indirect cost/overhead allocation recovery methods they use for assigning indirect costs to products/services. The frequency count results the following picture (**Table 4.4**):

Number of Different Types of Cost Allocation Bases	Number of Cases	Percentage	Range
(1) 1	13	12	1 – 50
(2) 2	23	20	
(3) 3	32	28	
(4) 4	18	16	
(5) 5	11	10	
(6) 6	1	1	
(7) 7 – 10	10	9	
(8) Above 10	5	4	
Total	113	100	

Table 4.4: Distribution of Cost Allocation Bases

Only 12% of the respondents use 1 cost allocation bases and 20% uses 2 cost drivers. It means remaining 68% respondents use multiple cost drivers. And one of the respondents uses as more as 50 different cost drivers that operates in tobacco manufacturing industry. This pattern of cost driver usage results a good scenario of cost analysis.

4.4.3 Types of Cost Driver

Both number and types of cost drivers are important to understand the complexity of costing system that a firm applies. The questionnaire had a section where the respondents are requested to write the name of the cost drivers they use. In some cases (about 10% of the respondents), this question was not attempted; however, other respondents have identified good number of cost drives which can be presented below (**Table 4.5**):

SL	Types of the Drivers	Frequency	Category
1	Machine Hours	33	Time Based
2	Direct Labor Hours / Man Hour	24	Time Based
3	Physical Output / Volume	15	Volume Based
4	Area of Occupation / Floor Space /Square Feet	10	Volume Based
5	Sales Quantity	7	Volume Based
6	Production Quantity	7	Volume Based
7	Sales/Production Value	6	Volume Based
8	Direct Material Cost	4	Volume Based
9	KW Power Usage / Power Consumption	3	Volume Based
10	Direct Labor Cost	3	Volume Based
11	Number of Employees	2	Volume Based
12	Number of Machine Setup	2	Volume Based
13	Number of Products	2	Volume Based
14	Kilowatt Hour	2	Time Based
15	Stock Value	2	Volume Based
16	Material Input	2	Volume Based
17	Number of Batch	2	Volume Based
18	Number of Procedures	2	Volume Based
19	Setup Time	1	Time Based
20	Material Handling Time	1	Time Based
21	Units of Raw Material Required	1	Volume Based
22	Number of Customers Called	1	Volume Based
23	Number of Customers Attained	1	Intensity Based
24	Number of Transfers Sent or Received	1	Volume Based
25	Number of Checks Processed and Sent	1	Volume Based
26	Per Metric Ton Cold Rolled (CR) Coil	1	Volume Based
27	Per Metric Ton Corrugated Iron (CI) Sheet	1	Volume Based
28	Number of Meals	1	Volume Based
29	Number of Purchase Order	1	Volume Based
30	Number of Inspection	1	Volume Based
31	Number of Parts	1	Volume Based
32	Number of Components Tested	1	Volume Based
33	Number of Production Runs	1	Volume Based
34	Machine Hour per Minute	1	Time Based

SL	Types of the Drivers	Frequency	Category
35	Labor Shift	1	Volume Based
36	Packing Unit	1	Volume Based
37	Preservation	1	Volume Based
38	Material Output	1	Volume Based
39	QC Hours	1	Time Based
40	Number of Shipments	1	Volume Based
41	Material Weight	1	Volume Based
42	Number of Change Order	1	Volume Based
43	Number of Product Lines and Plants	1	Volume Based
44	Production Hour	1	Time Based
45	Running Meter	1	Volume Based
45	Number of Coil	1	Volume Based
47	Number of Meter	1	Volume Based
48	Number of Department per head Staff	1	Volume Based
49	Number of Products	1	Volume Based
50	Number of Product Group	1	Volume Based
51	Number of Category	1	Volume Based

Table 4.5: Types of Cost Allocation Bases

The above table classifies cost allocation bases into different categories. Most of the bases are categorized as volume based driver. Bangladeshi manufacturing firms rarely use intensity driver which demonstrates a simple costing system. However, it's a good sign that around 51 different natures of cost allocation bases are in use.

4.4.4 Number of Professional Accountants

As already mentioned, mostly all the participating firms have professional management accountants which is reflected in the table below (Table 4.6). Only eight of the participating firms don't have any professional management accountant. This happens due to the time gap between the selection of sample and actual survey. At the time of selection of sample, professional management accountants have been working in all the sampled firms. However, actual survey has taken place at a later period when few of the sampled firms don't have any professional management accountants. Number of professional accountants working in the sampled firms have been presented below which reflects that many firms (around 75%) employ more than one professional accountants.

Number of Professional Accountants	Number of Cases	Percentage
0	8	7
1	20	17
Number of Professional Accountants	Number of Cases	Percentage
2	30	27
3-5	32	28
6-10	15	13
11-20	4	4
More than 20	4	4
	113	100

Table 4.6: Distribution of Professional Accountants

4.4.5 Cost Structure

Manufacturing firms in Bangladesh are highly dominated by variable costs (around 88%). And, they are running material intensive production process incurring more than 60% costs in direct material category (**Table 4.7**). This may be a possible reason of low value addition, low profitability and low diffusion of different management accounting practices. However, it provides a good foundation for adoption of different management accounting techniques to revise the cost structure for making the firms more cost effective. On the other hand, firms equitably share non-manufacturing costs into administrative and marketing categories.

Manufacturing Cost	Percentage	Non-Manufacturing Costs	Percentage
Direct Material	61.22	Administrative Expenses	50.65
Direct Labor	16.22	Marketing Expenses	49.35
Variable Manufacturing Overhead	10.43		
Fixed Manufacturing Overhead	12.13		
Total Manufacturing Costs	100%	Total Non-Manufacturing Costs	100%

Table 4.7: Cost Structure of Firms

4.4.6 Structure of Production Process

About 31% of the responding firms are engaged with producing homogeneous product for mass market whereas 29% of them are producing heterogeneous product for mass market (**Table 4.8**). 29% of the other firms are engaged with unit production leaving remaining 20% for serial unit production. This distribution shows a healthy sharing of different structure of production process.

Production Process	Frequency	Percentage
Homogeneous mass production	35	31
Heterogeneous mass production	29	26
Serial unit production	20	18
Unit production	29	25
Total	113	100

Table 4.8: Structure of Production Process

4.4.7 Production Lines and Number of Products

The surveyed firms demonstrate good varieties of product lines and stock keeping units which pave a strong foundation for adopting different management accounting practices. Only 20% of the responding firms have less than 3 production lines and 22% of the firms have upto 5 stock keeping units. On the other hand, 22% of the responding firms maintain above 50 stock keeping units which demands a complex costing system (**Table 4.9**).

Number of Production Lines	Firms	Percentage	Number of Products	Firms	Percentage
1	11	10	1-5	25	22
2	11	10	6-10	23	20
3-5	45	40	11-20	12	11
6-10	26	23	21-30	15	13
11-20	14	12	31-50	13	12
Above 21	6	5	Above 50	25	22
Total	113	100	Total	113	100

Table 4.9: Number of Products and Production Lines

4.4.8 Variation in Products

The questionnaire asks the respondents regarding the variation in production process based on three important parameters like physical size, complexity and batch size on a Likert 5 point scale when 1 refers to ‘not at all’ and 5 refers to ‘a very great extent’ (**Table 4.10**). In terms of physical size, it scored the highest one (3.73 out of 5). However, all of these values reflect a moderate status.

Nature of Variation	Average Scale Value
Physical Size	3.73
Complexity	3.02
Batch Size	3.52

Table 4.10: Nature of Variation

4.4.9 Use of cost data

Level of adoption of different management accounting practices largely depends on the use of cost data for different types of decision making. The questionnaire offers four different perspectives (**Table 4.11**) of the application of cost data and seeks responses on a 7 point Likert scale. The most important use of cost data as advocated by the respondents is for making product/pricing service decisions (6.12 out of 7). Other use of cost data like ensuring reliability, cost reduction efforts, introducing new product, redesigning, product mix decision, dropping product lines also carries significant importance to the practitioners.

a) The cost of products or services must be highly reliable to compete in our markets	5.73
b) Cost data is extremely important because of our cost reduction efforts	5.89
c) Cost information is the most important factor when making product/pricing service decisions	6.12
d) The business unit performs many special studies relating to product/service introduction, redesign, mix, discontinuation, or cost reduction decisions	5.72

Table 4.11: Use of Cost Data

4.4.10 Information Technology

This question specifically caters the need for information technology and the nature of information technology in terms of its compatibility of real time processing of information, responding to queries, integration and array of data (**Table 4.12**). In all cases, the respondents are convinced that information system owned by manufacturing firms should address all the requirements properly to survive and remain competitive in the market.

a) The organisation's information systems (i.e. sales, purchasing, manufacturing etc) are highly integrated with (i.e. accessible by) each other.	5.43
b) The information system offers user friendly query capabilities to various users	5.38
c) A wide array of cost and performance data is available within the system	5.35
d) Manufacturing (or service) provision and other operating data in the information system are updated 'real time' rather than periodically	5.18

Table 4.12: Compatibility of Information Technology

4.4.11 Extent of Competition

On an average, Bangladeshi firms face good level of competition across all the three categories (**Table 4.13**). On a Likert 7 point scale price competition scored 5.38, product competition 5.57 and marketing competition 5.73. These levels of competition are important for the demand of different management accounting practices.

Types of Competition	Average Scale Value
a) Price competition	5.38
b) Product competition	5.57
c) Marketing competition	5.73

Table 4.13: Extent of Competition

4.4.12 Adoption of Different Management Accounting Techniques

This study caters to provide diffusion status of different management accounting techniques in practice. For that purpose, a total of 21 techniques have been identified and a survey was conducted to identify the level of application of those techniques to understand the market of management accounting in Bangladesh. Based on the feedback

of the respondents in 5 point Likert scale, a descriptive statistics may be presented with mean, standard deviation, maximum and minimum data values as follows:

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Cash Flow Statement Analysis	113	.00	5.00	4.1947	1.17912
Budgetary Control	113	.00	5.00	4.0619	1.31124
Ratio Analysis	113	.00	5.00	3.8496	1.24801
Variable Costing	113	.00	5.00	3.6726	1.30550
Total Quality Management	113	.00	5.00	3.6195	1.45356
Fund Flow Analysis	113	.00	5.00	3.5044	1.37011
Variance Analysis	112	.00	5.00	3.3482	1.46865
Standard Costing	113	.00	5.00	3.2920	1.44964
Absorption Costing	111	.00	5.00	3.2793	1.47815
Segment Reporting	113	.00	5.00	3.1681	1.44483
Responsibility Accounting	113	.00	5.00	3.0973	1.44522
Balanced Scorecard	113	.00	5.00	2.9912	1.52066
Target Costing	113	.00	5.00	2.9646	1.58638
Activity Based Costing	113	.00	5.00	2.9558	1.53756
Process Re-engineering	113	.00	5.00	2.9115	1.37294
CVP Analysis	113	.00	5.00	2.9027	1.48784
Inter-firm Comparison	113	.00	5.00	2.8584	1.41968
Lean Manufacturing	113	.00	5.00	2.4956	1.52435
Theory of Constraints	113	.00	5.00	2.4071	1.41823
Kaizen Costing	113	.00	5.00	2.1593	1.42407
Back-flush Costing	113	.00	5.00	2.1327	1.27828

Table 4.14: Descriptive measurement of different Management Accounting Techniques

Out of 21 techniques, 2 have average values more than 4, 9 have average values more than 3 but less than 4 and other 10 have values less than 3. The analysis highlights that out of 21 management accounting techniques, cash flow statement analysis and budgetary control are highly used followed by ratio analysis, variable costing and other tools as specified in **Table 4.14** above. In a separate section, the author has tried to identify

whether this level of diffusion is being driven by any firm specific factors like profitability, turnover, net assets etc.

4.4.13 Exploratory Factor Analysis

As already mentioned, this study uses 21 management accounting techniques to understand the level of diffusion of different management accounting techniques. However, using these 21 techniques separately for inferential analysis is operationally difficult and will not bring any merit in analysis. Thus, categorizing these techniques into smaller groups is important for making the analysis worthy and manageable. Exploratory factor analysis is done as a data reduction technique to identify whether any grouping among them is possible or not. A summary of the factor analysis is presented below (**Table 4.15**):

	Measures	Values
1.	Measure of Sampling Adequacy	.817
2.	Level of Significance	.000
3.	Number of Factors Extracted	6
4.	Cumulative Percentage	67.985
6.	Reliability – Cronbach’s Alpha	.863

Table 4.15: Summary of factor analysis

Interpretive adjectives for the Kaiser-Meyer-Olkin Measure of Sampling Adequacy are: in the 0.90 as marvelous, in the 0.80's as meritorious, in the 0.70's as middling, in the 0.60's as mediocre, in the 0.50's as miserable, and below 0.50 as unacceptable. The value of the KMO Measure of Sampling Adequacy for this set of variables is .817, which would be labeled as 'meritorious'. Bartlett's test of sphericity tests the hypothesis that the correlation matrix is an identity matrix; i.e. all diagonal elements are 1 and all off-diagonal elements are 0, implying that all of the variables are uncorrelated. If the Sig value for this test is less than our alpha level, we reject the null hypothesis that the population matrix is an identity matrix. The Sig. value for this analysis leads us to reject the null hypothesis and conclude that there are correlations in the data set that are appropriate for factor analysis. This analysis meets this requirement. A total of 6 factors have been extracted having more than 1 eigenvalues with a cumulative percentage of

about 68 which is within the accepted range. Finally alpha value of .863 ensures the reliability ($\alpha=.863>.70$). The six factors as per the rotated component matrix are presented below (**Table 4.16**) with different management accounting techniques in each factor:

Factors	Management Accounting Techniques
Group 1	Standard Costing, Responsibility Accounting, Segment Reporting, Theory of Constraints, Activity Based Costing
Group 2	Back-flush Costing, Target Costing, Lean Manufacturing
Group 3	CVP Analysis, Variable Costing, Absorption Costing, Total Quality Management
Group 4	Variance Analysis, Fund Flow Analysis, Inter-firm Comparison
Group 5	Cash Flow Statement Analysis, Ratio Analysis, Budgetary Control, Balanced Scorecard
Group 6	Process Re-engineering, Kaizen Costing

Table 4.16: Grouping of management accounting techniques as per factor analysis

4.4.14 Regression Analysis

This section presents the results of regression analysis. The purpose of this analysis is to identify any relationship between diffusion of management accounting techniques and other variables like accuracy, profitability, turnover and net assets. In two different modules, four models are run considering four different variables.

Module 1: In this module, 6 factors as identified by exploratory factor analysis are considered as independent variables where accuracy, profitability, turnover and net assets are considered as dependent variables in four different models. Based on the grouping, the dataset is manipulated to bring average value of all the 21 techniques into six categories. The regression runs result the following summary:

Dependent Variables	Model 1: Accuracy		Model 2: Profitability		Model 3: Turnover		Model 4: Net Assets	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
Group 1	.244	.074	.061	.668	-.081	.577	-.190	.195
Group 2	.006	.959	.014	.912	-.090	.484	-.074	.563
Group 3	.256	.038	-.293	.024	.038	.770	.213	.119
Group 4	.028	.813	.047	.696	.239	.066	.298	.018

Group 5	-.100	.368	.021	.859	.035	.765	-.061	.601
Group 6	-.233	.048	-.059	.631	.046	.706	.142	.255
ANOVA								
F	2.463	1.188	1.109	2.650				
Sig.	.029	.319	.363	.020				
Model Summary								
R	.353	.256	.250	.382				
R Square	.124	.065	.062	.146				

Table 4.17: Summary of Regression Analysis

Values of R^2 in all the four models are poor in terms of the explanatory power of the variables. However, model 1 (with accuracy as dependent variable) and model 4 (with net assets as dependent variable) becomes significant at $p < .050$. From this, an inference could be drawn that the level of diffusion has some connectivity with the level of accuracy and net assets. It is highly established in management accounting literature that the very purpose of management accounting is to supplement accurate decision making process. And the research puts a very important conclusion that the level of application of different management accounting techniques will be guided by the size variable which is the value of net assets. It has confirmed a very important purpose of management accounting which is resource utilization. Thus, when a company invests significantly in its fixed assets base, it is more concerned on the efficient utilization of the recourses which exerts a form of compulsion of implementing different management accounting techniques to achieve the target.

A close look at the beta values in different models also results some interesting findings. Out of six groups, only four groups become significant at different level which can be reproduced as under:

Groups	Dependent Variables	Significance	Relationship
Group 1	Accuracy	$P < .100$	Positive
Group 3	Accuracy	$P < .050$	Positive
	Profitability	$P < .050$	Negative
Group 4	Turnover	$P < .100$	Positive
	Net Assets	$P < .050$	Positive
Group 6	Accuracy	$P < .050$	Negative

Table 4.18: Significance of relationships

Tools grouped in 1 and 3 show a positive significant relationship with accuracy whereas tools in group 6 become significant but negative. It may mean that high level of diffusion in tools from group 6 results low level of accuracy as prevalent in current study. Tools in group 3 show a negative relationship with profitability, which may be due to the disparity of financial accounting and management accounting. And finally both turnover and net assets (size variable) show a positive relationship with tools listed in group 4.

Module 2: In this module, management accounting techniques are grouped by following different criteria. To bring further merit to diffusion study, 21 management accounting tools have been regrouped into three based on their average score out of 5. The following rules are applied for such grouping:

Groups	Rules	Tools
Highly Diffused Tools	Average score above 4.00	Cash Flow Statement Analysis, Budgetary Control
Moderately Diffused Tools	Average score above 3.00 but less than 4.00	Ratio Analysis, Variable Costing, Total Quality Management, Fund Flow Analysis, Variance Analysis, Standard Costing, Absorption Costing, Segment Reporting, Responsibility Accounting
Lowly Diffused Tools	Average score less than 3.00	Balanced Scorecard, Target Costing, Activity Based Costing, Process Re-engineering, CVP Analysis, Inter-firm Comparison, Lean Manufacturing, Theory of Constraints, Kaizen Costing, Back-flush Costing

Table 4.19: Grouping of management accounting techniques as per average score

Based on these 3 revised groupings, four different models are formulated again considering the four variables (accuracy, profitability, turnover and net assets) as dependent in each model with the following summary results.

Dependent Variables	Model 1: Accuracy		Model 2: Profitability		Model 3: Turnover		Model 4: Net Assets	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
Highly Diffused Tools	-.270	.020	-.065	.595	.078	.524	-.065	.609
Moderately Diffused Tools	.567	.000	-.170	.299	.155	.329	.191	.266
Lowly Diffused Tools	-.162	.193	.043	.756	-.069	.610	.088	.544
ANOVA								
F	5.724		1.328		1.078		1.813	
Sig.	.001		.269		.362		.150	
Model Summary								
R	.372		.191		.174		.232	
R Square	.138		.037		.030		.054	

Table 4.20: Result of Regression Analysis

It is very interesting to note that, as per this analysis, only model 1 (with accuracy as dependent variable) becomes significant where around 14% of variation in accuracy is explained by different management accounting tools. Highly diffused tools become significant individually ($p < .050$) though it shows a negative relationship with accuracy. However, moderately diffused tools become significant ($p < .010$) and shows positive relationship. Lowly diffused tools are not significant.

4.5 Conclusion

Application of different management accounting techniques largely depends on the demand on such techniques by the practitioners for their decision making needs. At the same time, the reciprocity of knowledge between the academia and the practitioners also plays an important role in smooth diffusion process. Finally the characteristics of the markets in terms of competition, maturity, life cycle, customer base etc. are also active parameters for the diffusion process. Considering all the prerequisites, Bangladeshi firms are exposed to less risk and criticality in terms of doing business which results a low diffusion of different management accounting techniques.

Out of twenty one techniques used in the study, cash flow statement analysis and budgetary control techniques received the highest score (more than four out of five) which are traditional management accounting techniques in a global set up. Innovative

techniques like balanced scorecard, activity based costing, target costing, lean manufacturing, theory of constraints, process reengineering etc. received a very low status in terms of diffusion. It echoes the definition as given by Firth (1996) that using a new idea or even the adoption of an old idea in a new context, where this idea is regarded as new, may be viewed as an innovation. Thus, Bangladeshi firms are very slow in accommodating globally diffused innovative tools in a similar pace rather there is a tendency of absorbing old tools in new settings.

To give a different dimension in the study of diffusion, the paper has tried to identify any causal relationship between management accounting techniques with some other variables. The interesting finding is that management accounting techniques have some relationship with accuracy and one size variable, net assets. This justifies some major roles that management accounting plays to ensure accuracy in decision making and to support the top level management in taking investment decisions. However, other variables considered in the study like profitability, turnover don't show any commendable relationship with the diffusion which may be further researched. This study only considers manufacturing firms which may also be extended by covering service sectors for wider perspectives. Further studies may also be conducted on the significance of management accounting curriculum in different universities. It may be a very strong reason for weak diffusion of management accounting techniques. Report on Observance of Standards and Codes (ROSC) of World Bank (2003) echoes the same observation where the World Bank team expressed their concern that most of the Universities in Bangladesh are not offering majoring in accounting degree and professional accounting courses are being taught by non-professionals. However, this study brings a new dimension in studying level of diffusion of different management accounting techniques with different classifications through factor analysis and based on the scores like highly, moderately and lowly diffused tools which is absent in prior researches. At the same time it has collated the level of diffusion with different factors to bring some policy issues which is the contribution of this study.

Chapter 5

Field Study: Some Best Practice Examples

This chapter extends discussion covering following main points –

- 5.1 Introduction
- 5.2 Literature Review
- 5.3 Management Accounting Practices – Learning from the Field
- 5.4 Best Practice Examples
- 5.5 General Comments regarding the Management Accounting Practices
- 5.6 Conclusion

5.1 Introduction

To bring management accounting practices into common body of knowledge for future references and use, researches take different forms. It may be conceptual, theoretical or empirical. Empirical research in management accounting is concerned with developing and testing theories, and applying research findings to policy formulation. The vast majority of such research has been conducted using field, laboratory and survey methods. Kaplan (1986) has advocated the use of one particular research method (field research) while Merchant and Simons (1986) have noted that specific research methods have been most commonly associated with certain areas of study. They suggest that the most appropriate research method is a function of the issues being addressed.

This research targets to capture the management accounting practices through in-depth interview technique. Research methodology is exploratory in nature. The questionnaire is not structured rather the respondents were free to speak within some broader perspective which has brought some new dimensions in the outcome. Sixteen of such interviews have been conducted which has been captured in this chapter. It is believed that the interview result has put light on management accounting practices from a practitioner's view-point in a more descriptive form. In addition to the statistical form of outcome which usually generates from structured questionnaire survey, in-depth interview can reveal the beauty of research in respondents' own words which is sometimes important for building theory. The design and conduct of field studies in accounting has elements of both art and science (Ahrens and Dent, 1998). There is an art to construct interesting and probing stories

about real organizational functioning and linking these stories to the theoretical basis of accounting. This chapter is mainly based on this premise. An important motivation for field research is to depart from the rigors of scientific method to capture with greater realism of the phenomena we study. When we address complex behavioral issues in organizations such as the drivers of managerial choice, the influence of particular kinds of information, the role of accounting in facilitating or hindering organizational adaptation and learning, and the management control of transactions that cross organizational boundaries, the science of strict construct definition, clearly defined measurement scales and robust hypothesis tests becomes problematic. The application of pure science may significantly compromise our capacity to represent with any sense of realism of the phenomena under study. However, it is not true to assume that field studies are all art and no science. Field study researchers have the same obligations like any other researchers who have to be rigorous and unbiased in the execution of their research (Ahrens and Dent, 1998). This chapter presents the findings of interview in descriptive form giving a reflection of management accounting practices in Bangladesh.

5.2 Literature Review

Application of field study in studying management accounting practices is not new. It is also important to specify the epistemological domain of a chapter relating to field studies. There are significant debates in the literature that challenge the role of theory, the objective observability of accounting practice in organizational settings and the broad role of field study research (Chua, 1996; Scapens, 1990; 1992; Llewellyn, 1992). By challenging the underlying principles of scientific method, the role of the researcher and the notion of data as something other than a social construction, researchers within a social constructionist paradigm would challenge the assumptions that underpin many of the discussions regarding validity and reliability. This chapter takes a perspective that is predominantly aligned with positivism. It is assumed that accounting practices are realities that can be observed and studied by researchers, albeit within a social context that is an integral part of that reality. Theory is treated as both informing and being informed by observation (Humphrey and Scapens, 1996), and the researcher is assumed to be capable of relatively objective observation and analysis of accounting and organizational phenomena. It would also apply to some interpretive or critical research, as the social and political context of accounting may be legitimate subjects of study within

this framework. It is however less applicable to strong forms of social constructionist research.

By a field study we mean a research design that embraces a relatively small number of companies, as opposed to a wide-ranging survey or intensive case enquiries in two or three companies (Kaplan, 1986; Scapens, 1990; Ryan et al., 1992). Developing and administering a questionnaire was rejected as unlikely to produce the necessary level of detail or depth of insight required about developments involving management accountants. Intensive case research focusing on two or three companies was also rejected on the grounds that, despite its demonstrated capacity to provide rich accounts of practice and provocative insights, it may not capture the range of such practices and insights. In addition, since the present study is regarded as exploratory, the opportunity to pursue either or both survey and intensive case work at a later stage is open. It is important that the 16 companies that constituted the sample of this study could be regarded as at the leading edge in their respective fields.

Researches in management accounting may be executed through three theoretical perspectives: positivist (or rational), interpretative or critical (Hopper and Powell, 1985). The positivist perspective expresses the most classic and dominant research option on management accounting (Modell, 2007) which addresses society objectively, takes individual behavior as deterministic, resorts to positivist methodology to deploy research (Hopper and Powell, 1985; Modell, 2007; Ryan *et al.*, 2002) and privileges quantitative data and result generalization (Chua, 1986; Ryan *et al.*, 2002). The interpretative perspective assumes that social practice, including management accounting, are not a natural phenomenon, but a social constructed phenomenon (Covaleski *et al.*, 1996; Ryan *et al.*, 2002). The interpretative researchers develop their research using social theories, as for example, the institutional theory and actor-network theory (Wickramasinghe and Alawattage, 2007). The researchers use these theories for, by one hand, explaining management accounting and control practice and, on the other, explaining and modifying existing theory. The critical perspective emerges as a reply to the limitations of the positivist perspective simultaneously trying to cover some shortcomings of the interpretative perspective (Chua, 1986; Wickramasinghe and Alawattage, 2007). The proponents of this perspective look into the relationship between the organization and the social, economic and historical context, using other social sciences such as sociology, history, political science, anthropology, and others.

The case study is an empirical study that investigates a contemporary phenomenon, within real life context, and in which the frontiers between the phenomenon and the context are not clearly evident (Yin, 2003). The option for the case study is justified with the following three conditions (1) the research questions are of *how* and *why* type; (2) the phenomenon being analyzed is contemporary; (3) the researcher assumes the visitor role not holding any control over the phenomenon under study nor over the behavior of the main actors. Yin's definition of a case study remains one of the most descriptive and commonly used definitions which is read as -

'.. an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and context are not clearly evident' (Yin, 2003, 13)

The case study has been presented as a good research method of management accounting and control since it provides a better understanding and content theorization of the processes and the context in which the practice of management accounting and control takes place (Adams *et al.*, 2006; Berry and Otley, 2004; Berry *et al.*, 2009).

Depending on the research objectives, the case studies on management accounting and control may take several forms (Scapens, 2004), not being always possible, to clearly identify, the boundaries between each one of them. Case studies may assume the following configurations:

Descriptive: aim to describe the management accounting and control practices adopted by a group of entities.

Illustrative: describe the successful use of management accounting and control practices and try to identify the extension in which the several tools are adopted by corporations.

Experimental: consist on testing techniques and tools of management accounting and control with the objective of analyzing its impact.

Exploratory: seek to identify the reason for use of certain management accounting and control practices and generate hypothesis for further investigation.

Explanatory: intend to study the use of management accounting and control practices based on the existing theory to explain the observed practices.

Ferreira and Merchant (1992) elaborate on the distinguishing features of field studies in following words:

In field research studies:

1. *The researcher has direct, in-depth contact with organizational participants, particularly in interviews and direct observations of activities, and these contacts provide a primary source of research data.*
2. *The study focuses on real tasks or processes, not situations artificially created by the researcher.*
3. *The research design is not totally structured. It evolves along with the field observations.*
4. *The presentation of data includes relatively rich (detailed) descriptions of company context and practices.*
5. *The resulting publications are written to the academic community.*

Ferreira and Merchant's (1992) extensions are designed to exclude pilot studies, ex-post clarifications of statistically-analyzed data, archival studies, and case studies not aimed at the research community. A notable attribute of these definitions is that they blur the distinction between case studies and field studies and focus on the substantive aims of the method. If there is a natural distinction between case studies and field studies, it is in the definition of a unit of analysis. The term 'case study' implies a single unit of analysis that focuses on the organization or organizational subunit (Spicer, 1992). The term field study is broader and almost certainly embraces case studies within it (Lillis and Mundy, 2005). More importantly, the distinction is unimportant in consideration of method attributes such as validity and reliability, as the data are qualitatively similar. In this chapter, the term field study is used as a generic term which captures the type of studies described by Yin (2003) and Ferreira and Merchant (1992).

The approach taken here favors field research in management accounting. While field study research in financial accounting and auditing is not deliberately excluded, the chapter focuses on data derived from in-depth contact with organizational participants. There is less imperative for field studies utilizing deep insights from organizational participants in financial accounting and auditing, and less history of such studies as a source of theory development. A comparison of different empirical research methods is provided in **Table 5.1** below.

	Field Research	Laboratory Experiment	Surveys
Research Application:			
Primary Purpose	Exploration	Test (Causal) Theories	Exploration
Secondary Purpose	Description		Test cross-sectional theories
Validity:			
Statistical Conclusion	Low	High	Medium
Internal	Low	High	Low to Medium
Construct	Low to High	Low to High	Low to High
External	Low to High	Low to Medium	Medium
Control	Low	High	Low to Medium
Researcher:			
Demand Effects	Low to High	Low to High	Low to High
Researcher Expectancy Effects	Low to High	Low to High	Low to High
Actors:			
Volunteers	Volunteers, or draftees via a request from a superior	Volunteers, or draftees from classes or business	Volunteers, or draftees via a request from another
Incentive to participate	Desire to help	Class requirement	Desire to help
	Request from a superior	Class credit	Request from another
	Result feedback	Fixed financial compensation	Result feedback
		Performance contingent financial compensation	Nominal fixed compensation
Sampling Method	Convenience or Random Sample	Convenience or Random Sample	Convenience or Random Sample
	Typically small sample size	Sample size varies	Typically large sample size
Evaluation Apprehension	Low to High	Low to High	Low
Observing and Recording of Behavior:			

	Field Research	Laboratory Experiment	Surveys
Methods	Subjective self report	Subjective self report	Subjective self report
	Visible Observer	Visible Observer	
	Hidden Observer	Hidden Observer	
	Archival Report		
	Public record		
	Trace		
Reactivity effects	Low to High	Low to High	Low to High
Context:			
Artificial vs. Natural	Complete natural setting	Artificial	Incomplete natural setting
	Incomplete natural setting	Stimulated firm or market	
	Natural setting disturbed by researcher		
Experimental realism	Low to High	Low to High	Low to High
Mundane Realism	High	Low to Medium	Medium

Table 5.1: Comparison of Empirical Research Methods (Source: Runkel and McGrath, 1972)

5.3 Management Accounting Practices – Learning from the Field

It is really interesting to observe the corporate lifestyle of management accountants through in-depth interview technique. This section presents some of such learning from the field that is of significant importance to management accounting researchers. For example, one of the respondents who takes care of both treasury and management accounting accepts the motive of **profit maximization** candidly in his own words which is a very primitive role that management accountants play –

In business, whatever may be the philosophy we believe or take our ultimate purpose is maximizing the value for our owners via flapping profit – the bottom line. Every time we are busy with that ultimate goal starting with a healthy top line (revenue) to result a handsome bottom line (profit).

A management accountant is found busy with the robust budgeting process. Target setting is the important task to make budget worthy. Practice of 'rolling budget' system in firms (budgeting for one extra month ahead as one month is elapsed) is widely used so that budget period is not going to be time-barred. The respondent justifies the beauty of using the rolling budget system in his wording as 'at the same time, I can evaluate the budgeted figure as I learn from the experience (taking advantage of positive happening and getting cautioned with the negative)'.

Accuracy in product costing is sometimes embedded with budgeting. Because in production budget, the management accountants need to calculate standard cost for each product the firm is producing. Products are priced on the basis of standard cost which comes from the budget specifications. And obviously at the end of the period when actual results come in hand, it is compared with the budgeted one. It results either positive or negative variances for further actions. From the positive variance, the benefits are captured and tried to be carried in next periods whereas the negative consequences are tried to be eliminated forever. So, the accuracy of product costing depends on the accuracy and smartness of the standard setting process.

Product costing is merely a part of the whole management accounting process where today's management accountants have to take lot of other decisions. As already mentioned, a management accountant needs to take care of everything from the top line through bottom line. The impact of product costing will be on gross margin only. Sometimes in product costing, the management accountants have had nothing to do which is actively controlled by the market. Thus the management accounting is not confined to ensure accuracy in product costing only, more importantly it ensures accuracy in decision making.

Analysis of marketing cost is an important area of today's management accountant to result healthy top line and handsome bottom line. The responding management accountant comes from a renowned firm producing pharmaceutical products. Pharmaceutical firms have a very critical costing process with multi-brand environment. But every brand is not similarly profitable. Some of the brands are produced for focused customers whereas some other products are produced for the mass people. So, what will be the amount of promotional expenses for which brand, how significant it should be, is a question of difference. For example, it may be like that the brand that is produced for focused group generates 70% gross margin, however, the brands that is produced for

mass people only generates 30% gross margin. Still, the firm needs to allocate more promotional expense for the brands produced for mass people where gross margin is far bigger in absolute amount as calculated in the table below (**Table 5.2**).

	Focused Brand	Mass Brand	Total
Revenue	100,000	100,000,000	100,100,000
Less: Cost of Goods Sold	30,000	70,000,000	70,030,000
Gross Margin	70,000	30,000,000	30,070,000
Gross Margin Percentage	70%	30%	30%
Contribution of Focus Brand	[70,000 ÷ 30,070,000]		0.233%
Contribution of Mass Brand	[30,000,000 ÷ 30,070,000]		99.767%

Table 5.2: Comparison of Profitability between focused and mass brand

A closer look at the above example reveals that focused brand generates 70% gross margin (stand-alone analysis) which is far above than the gross margin generated by mass brand (only 30%). However, looking at the aggregated result, total gross margin is 30% mostly contributed by mass brand (99.767%). Thus to protect the bottom line, the firm needs to be more careful on the top line of mass product where the firm will not mind to spend more promotional expenses. By the by, it is known to all that, promotional expense is very significant in drug business. And as a management accountant, one cannot undermine this expense if he wants to keep operating expenses under control.

Management accountants also put sufficient focus on controlling operating expenses as reducing production cost is always challenging. In a situation, the respondent provides a very good reasoning which is –

Because, we produce life saving drugs where we cannot change the work method and where actually everything is controlled by different regulators. In our cost control drive, we always identify value added and non-value added activities and try to eliminate non-value added activities. It may be like activity based management.

A leading firm operating in Fast Moving Consumer Goods (FMCG) market does the costing and pricing in a very simple way. It follows either production cost or full costing technique for product costing. The firm has a set Gross Profit (GP) rate or Net Profit (NP) rate for product pricing. This simplicity is due to the nature of the market the firm competes which is characterized by mass production, mass market, multiple product lines, numerous stock keeping units, and less competition (few firms capturing the big market share). However, such firms have two categories of management accountants. Some are

real management accountants and some others are cost and management accountants. Respective roles that these categories of management accountants play in firms are –

- a) Real Management Accountants:** These management accountants are mainly responsible for –
- i. Product pricing decisions
 - ii. New product development – re-launching global products locally
 - iii. Different type of forecasting
 - iv. Product costing
- b) Cost and Management Accountants:** They are responsible for –
- i. Factory accounts preparation, for example, GL posting, balancing, and closing
 - ii. Forecasting
 - iii. Factory cost reporting locally and regionally
 - iv. Cost Effectiveness Program: cost reduction effort with the help of supply chain professionals

An interesting finding from the field survey results the destiny of applying Activity Based Costing (ABC). A firm having a long history of using ABC has recently moved away from the ABC regime due to the incorporation of SAP in processing data. The respondent acknowledges that –

Our SAP module doesn't permit us to go for ABC. Thus we apply traditional form of costing with 2 cost drivers only (direct labor hour and physical output). For allocation of overheads we apply plant-wide rate system. We are happy with the traditional system of product costing. As we apply standard costing, we can take care of variances and can easily control it. So far as our experience goes, we need not to worry about variances any time as this remains within the tolerable limit. At the same time, our management believes that the extra accuracy that we may avail in product costing through ABC doesn't compensate the extra cost, difficulty and complexity of implementing ABC. Thus we are not continuing with ABC anymore and very recently we do not have any intention to move there again.

Management accountants in Bangladesh also apply back-flush costing to keep right pace with the production process. SAP is used to process data under back-flush costing system. The firm uses standard costing system which makes it easy to apply back-flush for product costing. When production is confirmed after work in process, i. e., when products

are transferred to finished goods store room, automatically back-flush costing is used to compute the cost of those units.

Sometimes a new dimension in product costing arises when management accountants need to play a completely different role. In one case, the respondent brought the bidding process into focus where the performance of management accountant is being evaluated on the basis of winning a bid. The firm works for the government, produce electricity and supply it to the national grid. In power generation, the firms do have no direct attachment with the final consumer. To get the job, firms need to participate in a competitive bidding process. They need to calculate cost per kilowatt hour and keep the same as low as possible. The costing process is different due to the nature of agreement with Bangladesh Power Development Board (BPDB), the only intermediate customer of electricity. As per power supply agreement signed between BPDB and the firms who produce electricity, supply of gas is the sole responsibility of BPDB. Firm is to maintain the power plant as per the agreement and supply the generated electricity to BPDB against which the company receives rental payments. Cost of fuel (consumption of gas) as provided by BPDP is as significant as reflected in the following table:

Statement of Comprehensive Income (Extract)

Particulars	Amount (BDT)	Percentage
Sales (excluding liquidated damage)	1,351,338,311	100
Cost of Sales	244,664,909	18
Gross Profit	1,106,673,402	82
General and Administrative Expenses	85,505,687	6
Operating Profit	1,021,167,715	76
Financial Expenses	288,727,685	21
Other Income	6,620,380	-
Net Profit before Tax	739,060,410	55
Provision for Taxation	57,534,195	4
Net Profit after Tax	<u>681,526,215</u>	51
Cost of Fuel (Consumption of Gas)	526,089,903	

Table 5.3: Income Statement

A careful look at the above income statement results how significant the cost of fuel is. If firms consider both cost of sale and cost of fuel as total manufacturing cost then cost of fuel amounts to more than 68% which is born by BPDB. At the same time, a significant

portion of cost of sales goes to depreciation (around 72%). Thus, calculating cost is not that much important here because a significant portion of the cost is born by BPDB and areas of other significant cost is very minimum where firms need to consider other management accounting issues to remain competitive in the market.

Management accountants are also involved with ensuring operational efficiency. Firms who are involved in producing electricity, it is very important to be efficient operationally. The above income statement shows that a good portion of revenue is being cut by BPDB as liquidated damage. It is due to inefficiency of generating less electricity than the committed one. However, to ensure operational efficiency, the firms take care of the following issues more specifically:

- i) We prepare operating flow chart with detailing different stages and ensure wastage control at every stage.
- ii) We do our level best to keep production cycle time within control through detail scheduling
- iii) We take proper care to our machine so that they are not going to be in idle mode through breakdown or any other production evils.
- iv) We have a policy of zero tolerance and our inventory management is very strong to combat any stock-out.
- v) We always adhere to the proper utilization of our manpower and evaluate them on the basis of their efficiency and effectiveness.

A management accountant has to play strong role on all of the issues above to control cost and maximize profit as well.

Feasibility study is another important area where management accountants have to play an important role. The areas where feasibility studies are undertaken are project evaluation, financial Analysis, requirements of regulatory authorities, for example, Ministry of Environment, Fire Brigade, Tax-VAT Authority (NBR), Licensing (Export-import, specially import) Authority, Local Municipality, Specific Regulatory Body (Bangladesh Energy Regulatory Commission). The respondent particularly mentioned the role he plays in following words:

This study is usually conducted for new product development, capacity enlargement decision and for business expansion. For example, the firm has recently involved into apartment business. It usually constructs apartments on its own land. And it never sales apartments rather it loves to go for rental. The management believes that this

policy will be more beneficial to hold all assets in the name of business and so the market is not that much familiar with its apartment business. And thus the firm results high net asset value though its asset turnover ratio is low. The firm doesn't mind as it believes, in future it will generate more benefits to it.

The discussions above results a rich job profile of management accountants which gives a general understanding on management accounting practices in Bangladesh. A summary of the field study may be made as under where management accountants are involved with:

- a) Maintaining a healthy top line (revenue) and a handsome bottom line (profit)
- b) Robust budgeting system with periodic review of variances
- c) Ensuring accuracy in product costing through standard costing system
- d) Ensuring accuracy in decision making
- e) Controlling promotional expenses for focused and mass brands
- f) Controlling operating expenses by eliminating non-value added activities
- g) Product pricing decisions
- h) New product development – re-launching global products locally
- i) Different type of forecasting
- j) Factory accounts preparation, for example, GL posting, balancing, and closing
- k) Factory cost reporting locally and regionally
- l) Cost Effectiveness Program: cost reduction effort with the help of supply chain professionals
- m) Conducting product feasibility studies
- n) Ensuring operational efficiency
- o) Winning competitive bidding
- p) Fund management

5.4 Best Practice Examples

This section brings some example of management accounting practices based on the interviews. These examples demonstrate a good picture of overall management accounting practices in Bangladesh. It also reflects the respective job definition of management accountants where management shows its commitment and adherence to global practices. This favorable treatment from the management paves the foundation of adopting innovative management accounting tools in a more holistic way in coming days.

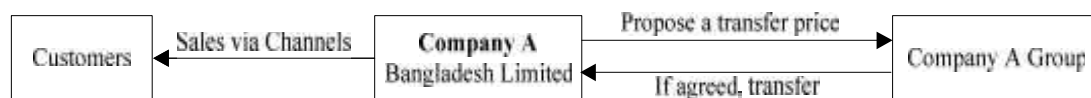
Due to the anonymity request from the interviewees, the names of the companies are kept secret.

Example 1: Transfer Pricing at Company A

Company A is the largest global pharmaceutical company in Bangladesh which has been formed through the amalgamation of three separate companies. To explain the transfer pricing policy at **Company A**, the head of financial controlling and treasury explains:

‘Transfer pricing policy as we practice in **Company A** is peculiar where we apply target costing method. When we import any life saving drugs from our group headquarter, we work as a merchandiser here. We simply offer a transfer price to the group and if the group finds it profitable, they transfer the product and we do marketing for the product here in Bangladesh.’

The whole process is presented below graphically for the readers’ easy understanding:



The step by step process of transfer pricing is given bellow followed by a graphical presentation:

- A marketing team works to conduct a survey for collecting the maximum retail price (MRP) based on market. Because marketing team will be deployed to sell that product at the price they are collecting (quoting) now.
- From the MRP as collected in step 1, chemist commission (at standard rate) is deducted and it will result the trade price excluding VAT (as there is no VAT on life saving products in Bangladesh), the price that is charged to wholesaler usually.
- From the target price, target margin is deducted. This margin should not be more than 25%. It is a regulatory requirement in Bangladesh. As per the requirement of Directorate General of Drug Administration (DGDA), maximum margin can be 25% on imported product.
- The deduction of target margin from target price results landed cost including transfer price (C & F value - the stated value of a shipment of goods includes all costs and freight involved in shipping the goods to their destination) customs, supplementary duty or any other duties. *Landed Cost is the total cost of a product once it has arrived at the buyer’s door. This list of components that are needed to determine landed costs include the original cost of the item, all brokerage and logistics fees, complete*

shipping costs, customs duties, tariffs, taxes, insurance, currency conversion, crating costs, and handling fees. Not all of these components are present in every shipment, but must be considered part of the landed cost.

- e) From the landed cost as resulted in step 4 above, we can easily calculate the transfer price considering the landed cost coefficient. As per the regulator (DGDA), the maximum coefficient is 1.61. It means for a transfer price of BDT 1, maximum cost should be charged as duty and others is 61 paisa. Thus, if the landed cost amounts to BDT 50,000 for example, the transfer price should be BDT 31,056 (BDT 50,000 ÷ 1.61).
- f) **Company A Limited** will offer the transfer price as calculated above to the group. If group finds it OK, transfer will take place, otherwise not.

A pictorial presentation of the steps as mentioned above is given below (**Figure 5.1**) for an easy idea of Transfer Pricing Technique followed at **Company A**:

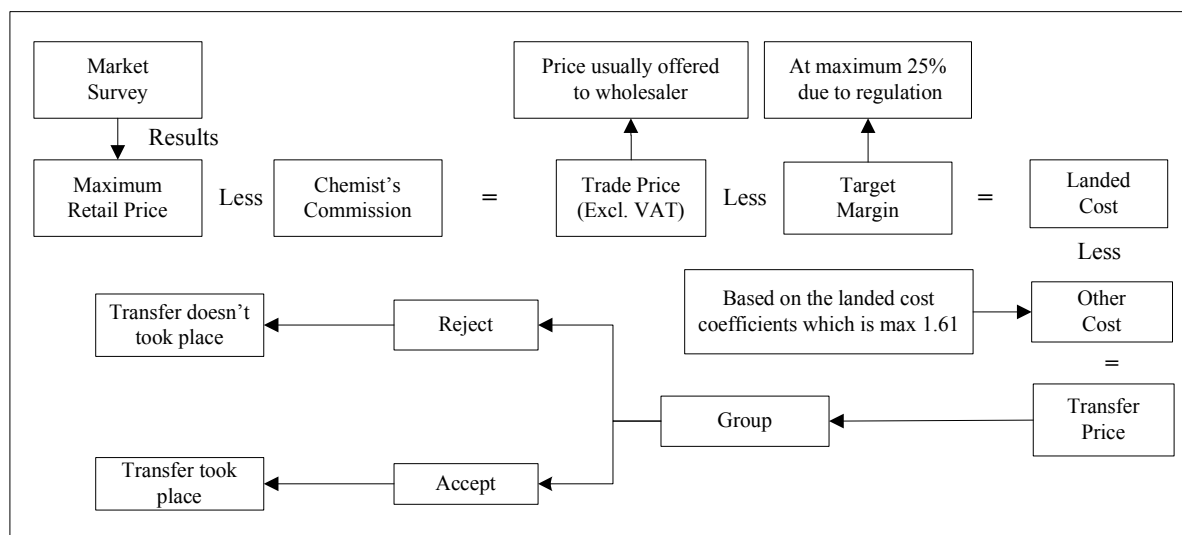
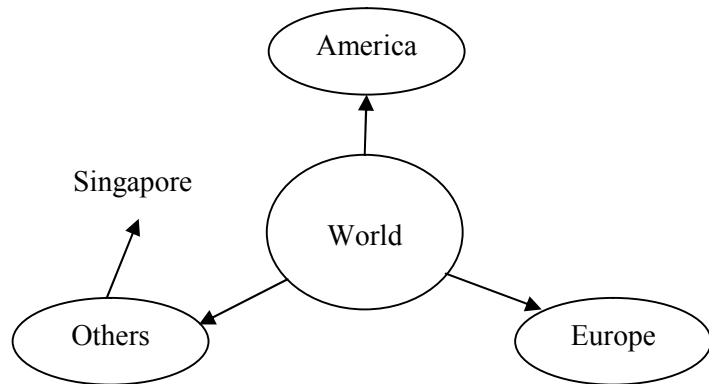


Figure 5.1: Transfer Pricing at Company A

Example 2: Product Costing at Company B

Company B is a leading Fast Moving Consumer Goods Company operating in Bangladesh from 1964. Product costing practice as followed in Company B exemplifies how decentralization can results cost cutting and quality ensuring effort of firms. Different elements of product cost are direct material and conversion cost (direct labor and manufacturing overhead). At Company B, purchase of direct material is controlled centrally. For example, Company B world is divided into three regions: America, Europe and Others. For these three regions, Company B has three different sourcing units that are

responsible for the procurement of raw material. For example, Company B Bangladesh falls in Other Region category, and any raw materials procured for Company B Bangladesh should be through the designated sourcing unit located in Singapore. Some Bangladeshi people work in Company B Bangladesh to represent Singapore to take care of raw material procurement whose salaries are paid by Company B Bangladesh, however, they report to Singapore sourcing unit. Finally, Singapore sourcing unit adjust the salary of those people against the bill.



Company B Bangladesh may acquire the raw material locally and globally. Global procurement is done through the designated sourcing unit; however, local procurement can be done independently with proper reporting to the sourcing unit via individuals who work for the sourcing units here in Bangladesh. This is done to control the procurement cost of raw materials and obviously to ensure the quality of resultant products also.

However, the sourcing unit must not transfer the raw material at cost. It must have a transfer pricing policy. Because, that sourcing unit should cover its administrative cost and at the same time must leave some profit for long-term sustainability. It is very important to note that the sourcing unit has no other ways to earn revenue. Its only job is to procure raw material for different local units based on the requisition. Based on the cost charged by the sourcing units, the landed cost will be calculated after considering some other cost as shown in the table below:

	Raw material cost	It is the C&F value as charged by the sourcing units
+	Insurance	
+	Bank charge	
+	Local freight	
+	AIT @ 3%	However, it can be adjusted later on when rebate is received, as it is rebate able
+	VAT @ 15%	However, it can be adjusted later on when rebate is received, as it is rebate able
+	RD @ 5%	Regulatory duty, if any, it depends on the nature of product

+	Import Duty	It depends on the HS Code of the material imported
+	PSI	Pre shipment inspection charge
=	Landed Cost	

Table 5.4: Computation of Landed Cost

After the calculation of landed cost, what else we need for product costing is the conversion cost. In Company B what we do is to use the conversion cost percentage of similar product. So, it's a type of standard costing what we find here is the easiest way of product costing.

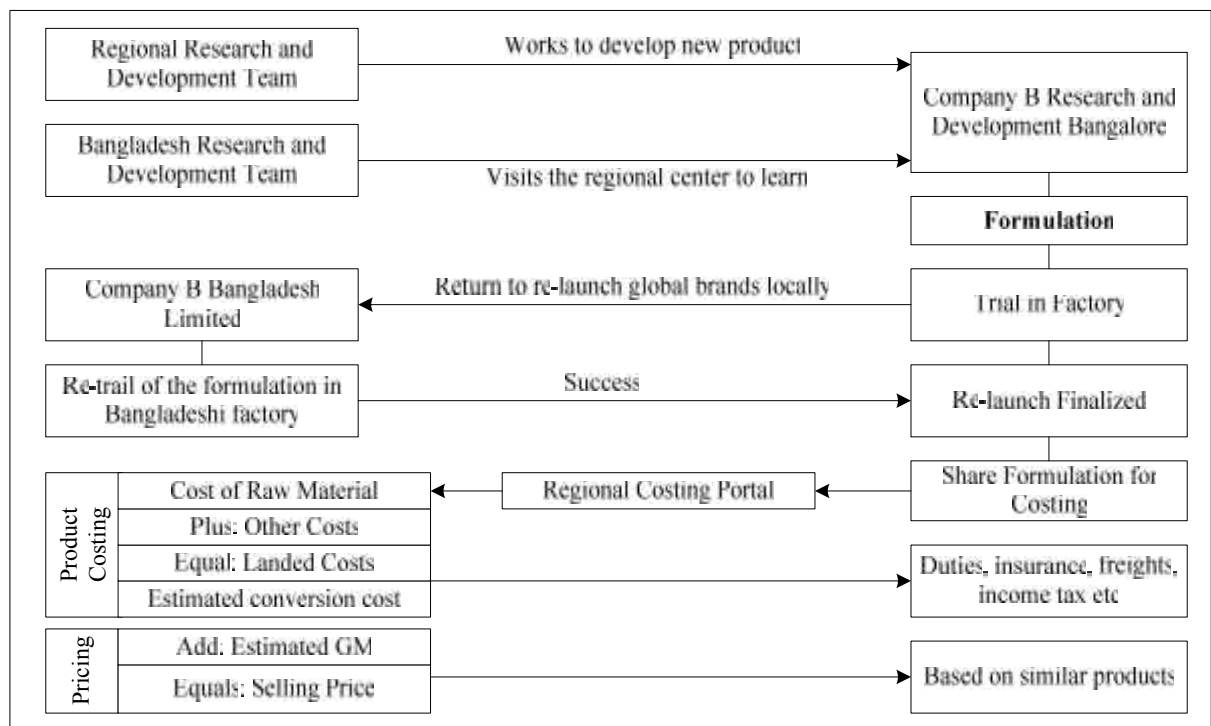


Figure 5.2: New Product Development at Company C

Example 3: New Product Development at Company C Bangladesh

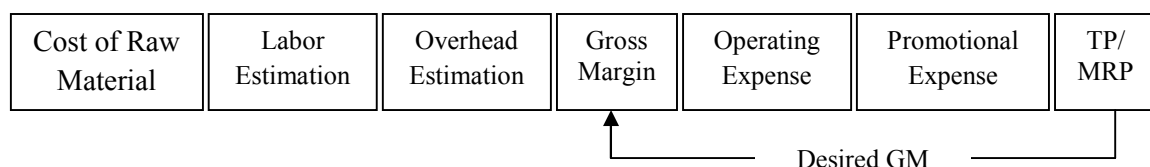
New product development process at Company C Bangladesh is very simple. Our regional research and development team plays major role in new product development process. In Bangladesh, we usually cannot go for new product development process. What we do is we re-launch global product locally. Our team visits Regional Research and Development Center located at Bangalore where they become familiar with the formulation of the product. Actually, they will undergo an extensive training program to learn the detail formulation of the specific product. The formulation will be trialed in a designated factory in Bombay. With the initial success of trial, the team come back to Bangladesh and goes for re-trial in Bangladeshi factory. If the trial is successful, there

will be no other trouble or difficulty left for the launching of the new product here. The formulation will be helpful for costing the product. Cost of different ingredients is usually posted on **Regional Costing Portal** from where material cost can be computed. **Figure 5.2** provides a diagram on the whole process of new product development, costing and pricing.

Example 4: New Product Development at Company D

Company D, a local company producing Fast Moving Consumer Goods items, started its journey in 1988 with a single product as a separate division of its Pharmaceuticals wing. In case of new product development, the process is initiated through detailed market survey by a dedicated marketing team that may result the ultimate launching of the new product. The marketing team, after the survey, will submit a proposal to accounts from where accounts will try to answer different queries like the potentiality of the product, estimated market size, untapped market share, possibility of niche marketing, solid foundation (bases) of positive forecast etc. Based on the marketing proposal and studies based on the queries, accounts recommend the launching intention of new product. Then product development department (or research and development department) involves in the process to develop the product.

The research and development team will develop the formula of the new product where identification of basic raw materials, chemistry of the raw materials (ingredients), work methods etc. receive the highest priority. After the successful completion of the formula development, the requirement is transferred to the commercial for sourcing the ingredients at competitive rate. After that, the marketing team gets involved again to settle down competitive TP/MRP (Trade Price, Maximum Retail Price) upon considering existing market competition. Actual costing is initiated now assuming that cost for raw material and TP/MRP is known. The process of costing may be diagrammed as below:



The costing may result positive or negative outcome. If it is negative, it is sent to research and development again for re-formulation so that the raw material cost may be reduced by changing the composition of different ingredients in different proportion. If, the negative

result still persists, the new product will not be commissioned for commercial production. However, if the result of costing becomes positive, it will not be accepted directly until the investment feasibility is done and such feasibility shows favorable outcome. This investment feasibility covers the lifetime of the product as significant amount of investment may not be recovered within a very small span of time. It may also happen that in initial years, the project may result losses, however, in later years, it will generate significant profit to cover-up initial losses. Lots of new departments are involved in this feasibility phase. For example, TSD (Technical Service Department), led by some mechanical engineers, is involved to evaluate the different options of capital machineries to be used in the project. Different management accounting tools like cash flows, Net Present Value (NPV), Internal Rate of Return (IRR), and Payback Period (PBP) etc. are used to evaluate the long term feasibility of the project. A diagram (Figure 5.3) is given below to depict the new product development process as applied in Company D Limited.

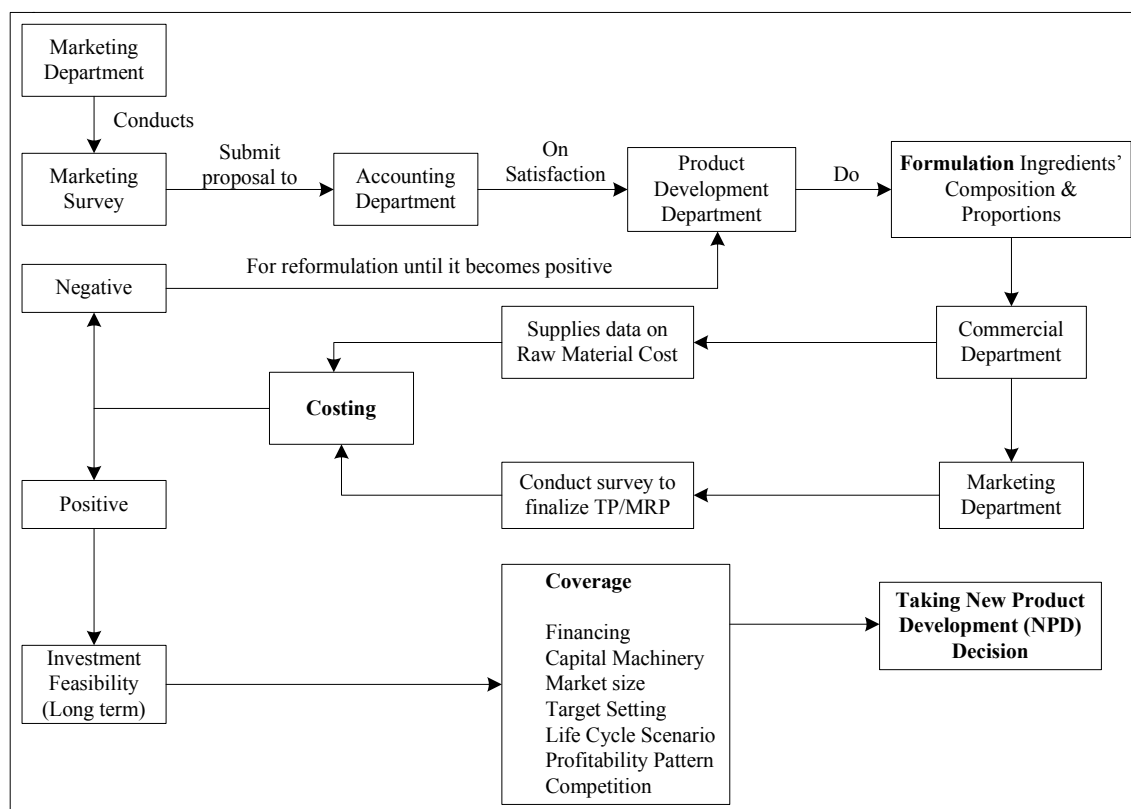


Figure 5.3: New Product Development Process in Company D Limited

Example 5: Research and Development at Company E Limited

In **Company E**, we put special emphasis on research and development. Because we believe that we do business on R&D and to remain competitive in the market, there are no other alternatives open. For example, we are facing some problems in our meter wing very recently. I hope that you are familiar with X¹ meter which has a strong brand positioning in our market. We are leading the market for long. However, recently our market share has been reduced and we find out the loopholes in our system of manufacturing and distribution of meter where our major supplier has taken the advantage of supplying meters at a lower price and thus we are losing the market. The figure below reflects the actual scenario:

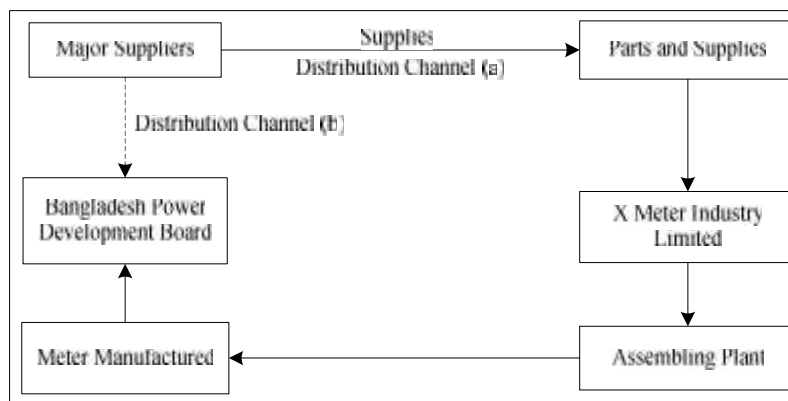


Figure 5.4: Research and Development at **Company E**

Our major supplier has taken the advantage of supplying the meters directly to our customer through competitive bidding. You must acknowledge that the cost of making a meter by our supplier must be less than that of us. As they have known the secret that we only do assembling here, they have installed the same capacity. Now what we are doing? Our product development team has brought a new solution through research and development where BPDB will enjoy an opportunity of controlling the usage of power through the installed meter. The new meters will have the quality of checking the actual load with the allocated load and if the actual load has been increased, automatically the meter will break the connection. Without the help of the BPDB, the line cannot be re-connected as it will be password protected. And we believe that we will be successful

¹ It's a very renowned electric meter used in Bangladesh whose name is kept silent due to the request of the interviewee.

with BPDB in negotiation and it will be our trade secret where we will not lose our market so rapidly.

5.5 General Comments regarding the Management Accounting Practices

Management accounting practices in general is not that much standardized. Product pricing in our market is not controlled by the manufacturer in most of the situation rather it is fixed by the market which needs to be complied by the manufacturer through a process of cost re-engineering. On the other hand, the market is not so efficient that it will penalize the manufacturers for inefficiencies in pricing, resource utilization etc. Customers in our market are not well aware regarding their rights and thus majority of customers' complains do not get publicity and remain unheard. It is found that some companies (very rare) use costly management accounting technique like balanced scorecard, activity based costing; however, others believe that the application of costly management accounting tools fails to outweigh the benefits and thus it is very unusual that the board will like to go for such techniques. Apart from the best practice examples, the overall scenario is not that much good. Thus, the management accounting practice still lies in its infancy which offers enough scope for improvement. In a question relating to the level of sophistication in management accounting practices in Bangladesh, a very influential professional management accountant in board holding the position of Group CFO gives a disappointing answer that is the reality. His answer is captured below in his own words:

Bangladesh by the time has become an industrial country characterized by good varieties of manufacturing units with huge investment. Thus, a typical type of management accounting system is in operation undoubtedly. However, if you ask about the sophistication, it's very difficult to answer. As a professional management accountant, I must say that our system is not that much sophisticated as you are thinking at the time of making the question. Let me point out some reasons below:

- 1. Our market is not competitive. It is characterized by so many irregularities and loopholes where the market players may regulate the market bypassing the norm of a fully competitive market.*
- 2. We enjoy enough opportunity in dogging the customers by charging them illogically keeping them completely ignorant about the issue. This may be due to*

the incapacity of our customers who are not aware enough to understand their rights.

3. Our market is not matured enough. Market never penalize us for inefficiencies or irregularities, rather it seems to me that market patronize us to be inefficient.

4. There exists a gap between the Board and practitioners like us. When any cost management issues is brought in Board level, it is very unlikely that the board will agree if the issue requires a handsome amount of investment.

5. It is very disappointing but real that our market always prefers simple and easy methods in product costing and other related areas; however, we never witnessed any notable failure in this regard. In such a situation, will you prefer any lengthy, complex and costly costing system? For example, in our cost of quality reporting, external failure cost is very significant that is around 85% of total cost of quality, Still we are doing good business. So look at the behavior of customers, academically you find something that is exactly opposite to the practice.

However, I believe that the level of sophistication in management accounting practices may be worrying now. It will change very soon. For example, in our group, we use SAP that provides a complete set of accounting data; we have introduced balanced scorecard for performance evaluation with an investment of approximately BDT 20 to 30 million when Norton visited our group. Thus, we are moving towards sophisticated tools depending on the requirements.

5.6 Conclusion

Management accounting profession is accepted worldwide after the industrial revolution due to the demand of new sets of accounting information that the conventional financial accounting fails to provide. Global competition, advent of advanced manufacturing systems and modern information technology added extra impetus for the development of this profession in 20th and 21st centuries. Bangladesh, as a representative of third world country, is not an exception to that drive. Rather, it is still considered as a target of safe investment by the international community due to cheap labor, favorable regulatory environment, less natural calamities and low cost of doing business in some parameters. Thus the demand for management accounting increases day by day.

As the only institute responsible for looking after the profession, the Institute of Cost and Management Accountants of Bangladesh is trying to establish professionalism in practice. It is trying to reduce the observed gaps in the market though the efforts may not be enough. One successful attempt taken by the institute is the incorporation of the requirement of cost audit in Company Act 1994. Though it is observed that the compliance of such requirement is very relaxed, however, it is believed that such requirement will bring the cost accounting record rules in practice based on which the audit will be conducted.

After independence, the decision of nationalization of industries might be appropriate for the time being; however, it was not in line with the development of management accounting profession. Due to the requirement of compliance to accounting standards, the development of accounting profession was concentrated to financial or public accounting. However, the inefficiency of the public sector along with the different political philosophy and prescription of donor agencies, the government had established a privatization board to facilitate the private sector led industrialization process by transferring the SOEs to their former Bangladeshi owners and sale/transfer of shares to the investors and buyers. This creates an enabling environment for young entrepreneurship development and balanced industrialization through fair competition, infrastructural development and policy up-gradation. The development of management accounting profession is closely related to this movement from nationalization to privatization.

Currently, the ICMAB has more than 1,300 qualified members who are directly or indirectly working for the development of the profession. The interview gives an important conclusion that the benefits of current management accounting practices mostly go to the firms. More specifically, the professional management accountants take care of the benefits of their respective firms. Some of these benefits are also enjoyed by the other players in the market like customers; however, the practices that directly favor the customers are not practiced that much in our market. The reasons are twofold: one is positive and another one is negative. It is positive in a sense that most of the firms are first generation firms struggling to survive in that market. During this time, firms should prioritize such techniques that will help them to ensure long time sustainability and then they could take over the societal perspective. And the negative resonance is the misuse of the ignorance of the market via customers. The inefficiency of the market regarding the

absorption of information for the sake of maturity and growth is responsible for such slow diffusion of customer oriented management accounting practices.

Amid of these limitations, the high quality management accounting information is demanded. Big manufacturing firms have already started to use Enterprise Resource Planning (ERP) modules in highly sophisticated information processing environment which reflects the interest of the firms to spend money for information. Even it is found that some corporate houses use balanced scorecard, activity based costing etc. in pure form by investing huge amount of money. Though the overall situation of the market is not good, the existence of some best practice examples surely creates an enabling environment for the sound practice of management accounting in future. Though most of our corporate houses fall in small and medium sized enterprises (SME) category, it will be a challenge to tailor different management accounting techniques in line with the needs of the corporate.

Chapter 6

Sophistication: Designing Management Accounting System

This chapter extends discussion covering following main points –

- 6.1 Introduction
- 6.2 Study Design and Rationale
- 6.3 Product Costing Systems
- 6.4 Sophistication in Product Costing Systems
- 6.5 Goals of Sophisticated Costing Systems
- 6.6 A Proposed Framework of Measuring Sophistication
- 6.8 A Hypothetical Example
- 6.9 Scope of Further Research
- 6.10 Conclusion

6.1 Introduction

Cost system design mainly targets to install an ideal mechanism where products/services are rationally charged for organizational resources consumed in the due process of producing the products or generating the services. ‘The resources used by a firm are destined to either producing products or generating services’ – is the main rationale of charging products/services for the resources owned by a firm. Thus, making a fair relationship between the products/services offered and resources owned by a firm is an important prerequisite of product costing system. Generally product costing system comprises two stages: resources are logically grouped into cost pools and cost of each cost pools is fairly allocated to individual products. Both of these two stages address lot of subjectivity and assumptions which make it risky of generating distorted cost data at every step. The accuracy of calculated product cost, thus, depends on the way of rationalizing these two stage processes. A system designer should provide enough scope to rationalize the steps at the time of designing the system. Starting from the identification and quantification of resources; numbers and types of cost pools; numbers, nature and types of cost drivers and other pertinent issues should be resolved objectively to rationalize the costing process that necessitates robust design of product costing system.

The system designer should list and address all potential problems to ensure safeguard to the system at the design stage. Some common problems in product costing system may be like the choice of optimum number of cost pools and cost drivers, formation of cost pools (selection of different costs and fraction in respective cost pools) containing many resources with different consumption patterns, selection of cost driver for cost pools (on the basis of cause and effect, volume or non-volume) etc. Unfortunately, available literatures in the area (see, for example, Cooper, 1988; Turney, 1991) skipped a resourceful discussion and thus, offer limited help. The reasons of such reluctance on part of academicians and practitioners need further research. Some reasons may be pointed out here. Firstly, activity based costing, the most innovative tool in the area of product costing, is a development in academia. A lot of research papers are available favoring the superiority of activity based costing over traditional costing on the ground of accuracy of product costing and importance in decision making. However, most of the papers on the diffusion of activity based costing result a worrying picture. Low diffusion of activity based costing in practice is an indication of dispersed ideology that exists between academia and practitioners. Secondly, the application of contingency approach in management accounting practices exerts another difficulty. The developments in management accounting are not universal and commonly used; rather these should be adjusted with the practitioners' requirements. The empirical research in the social sciences including accounting has less "external validity" because we could not control most of influencing factors unlike the natural sciences. The adoption of the contingency approach helps us to overcome the limitation though the approach still is not a generalized one. Thirdly, the complexity and cost of installing innovative tools may not be compensating additional accuracy in product costing and thus practitioners may be happy with their current costing system. In this chapter, an effort is deployed to incorporate all of these in designing sophisticated costing systems.

Sophistication in applying management accounting tools targets to ensure the accuracy of product costing. However, we should not undermine the main goal of sophistication and that is the decision making capability of information that the system generates. In open market economy where the factors of production can move easily in a fully competitive market, accuracy in product costing becomes a norm of the marketplace. An economy which is led by service industries, where competition is absent, consumers are not well aware of their rights, inaccuracy in product costing may not be that much problematic. However, the advancement of science and technology brings innovative way of making

products, increased earning level expedites the standard of living, globalization rationalizes borderless competition and modern civilization ensures practicable knowledge. All of these forces drive us to move forward to prove something wrong today what was practiced yesterday. Traditional costing, which reigns product costing literature for centuries, becomes age-old and outdated due to its incapacity of absorbing accurate cost in products. To drive the accuracy in product costing and decision making, activity based costing has been developed with a generalized prescription of tracing indirect cost with products. However, due to the existence of contingency approach in management accounting research, a holistic approach is required to install sophisticated costing systems. This chapter proposes a scale for measuring sophistication in costing system considering different criteria relating to the multiple goals. A thorough literature review results the main theme of this research. The proposed methodology is flexible enough to accommodate any further requirements.

6.2 Study Design and Rationale

The orientation of the paper is conceptual and the study is based on reviewing available literature in the area. The study of sophistication in product costing design dates back to the year 2000 with the seminal work of Drury and Tayles (2000) where the authors have measured the level of sophistication on a continuum of 15-point ordinal scale based on number of cost drivers and cost pools. This is the very basic form of sophistication where ABC is used as a proxy to it. The contribution of Drury and Tayles (2000) is great in a sense that they provide an objective definition of sophisticated product costing system based on the basic constructs of activity based costing. Later on, the same authors have tried to bring robustness in measuring sophistication incorporating different nature and types of cost pools and drivers along with their original constructs. However, Brierly (2008), through an interview survey, brings criticism to the way how sophistication is defined. The study acknowledges the importance of the earlier definitions of sophistication and, at the same time, proposes that the way sophistication is defined, makes the scope of sophistication very narrow which is not the case actually. Due to the underlying contingency approach in management accounting research, the definition should cover all aspects to bring robustness in it. Here, the study assumes a holistic approach to propose a measurement scale of sophistication which confirms the multiple goals of sophisticated costing systems.

6.3 Product Costing Systems

One of the goals of sophisticated costing system is the accuracy of product costing, i. e., how accurately products are being charged for the resources consumed by them. Product costing is a part of overall cost accounting system used in firms. A cost accounting system consists of the techniques, forms, and accounting records used to develop timely information about the cost of manufacturing specific products and of performing specific functions. It requires five parts including an input measurement basis, an inventory valuation method, a cost accumulation method, a cost flow assumption, and a capability of recording inventory cost flows at certain interval which is depicted in **Figure 6.1** below.



Figure 6.1: Cost Accounting System

Out of the five parts, our interest is on inventory valuation or product costing methods. Different methods propose different patterns of cost absorption by cost objects at varying levels (**Figure 6.2**). Traditional/conventional view of inventory valuation significantly differs from modern view. We may highlight the differences in a more plausible manner as given in **Figure 6.2** below.

Cost Elements					Inventory Valuation Method	View
DM					Throughput	Traditional / Conventional
DM	DL	VMOH			Variable/Direct Costing	
DM	DL	VMOH	FMOH		Absorption Costing	Modern
DM	DL	VMOH	FMOH	S&AOH	Activity Based Costing	

Figure 6.2: Product cost elements at different valuation method

Throughput costing charges products only for direct material (DM) whereas direct costing charges products with direct material, direct labor (DL) and variable manufacturing overheads (VMOH). Under absorption costing, products are charged for full manufacturing cost along with fixed manufacturing overheads (FMOH). However, activity based costing, an innovative development in the area of product costing, charges products not only for manufacturing cost but also for a part of selling and administrative overheads (S&AOH) that can be traced with the products through the identification of activities and respective drivers. Thus the product costing system has been refined gradually by bringing different elements of cost within the purview of cost as a quest for deriving accurate cost of the resultant products/services from the system. It is a drive towards achieving accuracy in product costing and ensuring sustainability of the firm.

The consensus among the academe and practitioners on traditional product costing systems is that they systematically introduce serious product cost distortions which lead to inappropriate strategic decisions, and promote and encourage behavior that contradicts corporate strategies with regard to efficient resource allocation and consumption (Cokins, 1998; Drucker, 1990, 1995; Anthony, 1988; Berliner and Brimson, 1988; Howell and Soucy, 1988, 1987a, 1987b, 1987c; Kaplan, 1988; Johnson and Kaplan, 1987; Rappaport, 1986; Merchant, 1985; Kaplan, 1984, 1983). The traditional product costing system primarily revolves around a conventional costing theory which makes the following assumptions:

- a) If a cost cannot be associated with a tangible object, then that cost must be expensed.
- b) Costs which are associated and necessary for a product must be allocated to that product.

Therefore, selling and administrative costs are expensed whereas the cost of plant assets are attached to the products cost which may sometime result inaccuracy in costing product. Since depreciation of plant assets is often based on time, a decrease in the number of units produced will result in a larger amount of overhead allocated to those units. And therefore, managers will be encouraged to maintain production at capacity in order to minimize per unit costs (Peavey, 1990). This will cause a build-up of finished goods inventory (and therefore carrying costs) which is counter-productive to a JIT environment. In traditional costing, it is believed that a cost which is relevant to the whole must also be relevant to each part (Sorter et al., 1967).

The traditional accounting system justifies the capitalizing of costs based on its physical attributes and not on its underlying economic value. By expensing research, marketing, training, and other period costs, the traditional costing approach implies that those expenditures have no future benefit. Taken literally, marketing and research expenditures incurred on the last day of the fiscal year would not benefit the subsequent period. This is clearly not the case. Those that support this theory contend that any method of capitalizing such costs would be entirely arbitrary. However, the expensing of an obvious future benefit (asset) implies that cost is 0% asset and 100% expense. This immediate write-off of an asset seems to be more arbitrary than, say, capitalizing 30% and expensing 70%. In the latter case, at least some of the cost's future economic benefits are recognized (Sorter et al., 1977).

The traditional classification of direct and indirect costs no longer applies. The traditional product costing system emerges with the industrial process during the late nineteenth and early twentieth centuries. During that time, prime costs were the primary components of production costs while product line diversity was less common (Cokins, 1998; Drucker, 1990, 1988; Berliner and Brimson, 1988; Johnson and Kaplan, 1987; Miller and Vollman, 1985; Chandler, 1977). However, the situation has now been changed significantly due to technology led automation. Indirect cost has caused the true "prime cost" to become the overhead component. The increase in the relative proportion of overhead cost is distorting product costs automatically due to putting more focus on prime cost under traditional systems. The significance of direct labor cost as a component of prime cost has now been reduced which accounts for approximately 10% of a product's cost. Manufacturing overhead now accounts for a significant portion of a product's cost (Peavey, 1990). Considering the current manufacturing environment, it would seem senseless to allocate a significant portion of a product's cost (manufacturing overhead) based on an insignificant

activity such as direct labor hours. A multiproduct manufacturer who continues to use direct labor as a basis for allocating overhead will be relying on distorted information.

Traditional overhead allocation techniques aggregate this large cost component of factory overhead across product lines. They then apply the aggregated overhead to inventory on a basis not necessarily consistent with the actual resources consumed in the production of the individual product lines. The problem with most cost allocation models (i.e. those based on direct labor, direct materials, or machine hours) is that the driving force behind most overhead costs is not unit output or direct labor (Hicks, 2006; Drucker, 1990; Berliner and Brimson, 1988; Cooper and Kaplan, 1988a, 1988b; Johnson and Kaplan, 1987; Miller and Vollman, 1985; Kaplan, 1987, 1984, 1983). Also, the consumption of resources in production may differ extensively among product lines and may not be labor related.

The recent management accounting literature provides several case studies of multi-product firms whose product costs are distorted because they allocate overhead costs to products on the basis of a single volume related variable. Johnson and Kaplan (1987) report that most of the firms that they have personally studied use simple cost accounting systems that assign overhead costs to products based on the direct labor hours spend on each product. Some costs or departmental cost pools may apply to a single or a few product lines, rather than to all products. However, many indirect costs are not a function of any common variable. Instead, many of these costs are unique (or primarily attributable) to a particular product. The traditional cost accounting system pools together these costs and then allocates them to all of the company's products. Consequently, the traditional approach results in its various products being cross subsidized. Low volume specialty products consume more overhead per unit than high volume products. Therefore, the cross subsidizing of these costs frequently results in costs which are overstated for high volume products and understated for low volume products. Cooper and Kaplan (1988) hold that the product cost distortion caused by the commonly used overhead allocation methods is systematic. The result of their use is under-costing of low volume products and over-costing of high volume products (cross-subsidization of product lines). Cooper and Kaplan (1987) describe three multi-product firms with complex manufacturing processes that rely mainly on direct labor hours to allocate overhead costs to products. They document how the apportionment of (long term) variable overhead costs on the basis of a single cost driver led these firms to over-cost some high-volume products and under-cost most low-volume products.

The primary function of accounting is to provide useful information. The traditional cost accounting system has not changed in over fifty years (Haedicke and Feil, 1991) though the environment that it is supposed to support has changed dramatically. Without an accurate knowledge of a product's cost, managers will be unable to make the appropriate pricing, marketing, and product mix decisions (Cooper and Kaplan, 1988). Realizing that the traditional costing system does not accurately support the current manufacturing environment, many companies are beginning to implement other alternatives. Activity based costing (ABC) is one alternative.

The ABC approach, which is based on a relevant costing theory, emphasizes a cost's economic substance rather than its physical form. This theory states that a cost should be attached to a product if, and only if, it provides an economic benefit. In order to be considered an economic benefit, a given cost must favorably affect a company's revenues or costs. Economic benefits should be recognized as such and therefore should be classified as an asset. Those costs which do not have a positive impact on earnings should be expensed. The relevant costing approach is completely consistent with the matching principle (Sorter et al., 1977).

The ABC approach assigns direct costs to the product as they are incurred. Unlike the traditional method, ABC does not pool together a company's indirect costs and then spread them out across product lines. Rather, it recognizes that different products incur different costs. An ABC approach embodies the concept that resources are consumed by activities and that those activity costs determine a product's cost. Under this approach, costs are first evaluated to determine whether or not they add value to a product. The value added costs are then assigned to a product based on the activity that incurred the cost. The non-value added costs are segregated and targeted for elimination (Johansson, 1990).

Thus, activity based costing overcomes the limitation of traditional costing where overheads are assigned inaccurately to cost objects in most of the cases. And this is done through activity analysis, pooling resources and using the right drivers on the basis of the pattern of cost consumption by respective cost objects. One explanation for the continued use of single cost driver (SCD) system may be the high cost of switching to an ABC system that recognizes multiple cost drivers. Such costs may include personnel, consulting, training and software costs for installing an ABC system, as well as organizational costs resulting from consequent realignment of strategies espoused by managers based on information provided by SCD system.

Cooper (1987) argues that such obsolete single cost driver based system often leads to improper pricing and distort "the strategy selected by the firm....tempting management to focus incorrectly on low-volume, specialty business." Shank and Govindarajan (1988) echo this stating "Volume-based costing can seriously distort the way a firm ... assesses the profit impact of its pricing and product emphasis decision." Therefore, the overhead allocation procedure often produces unreliable product and process cost data for management to utilize in their attempts to control costs in highly competitive market.

6.4 Sophistication in Product Costing Systems

Research on sophistication in cost accounting system design attracts a wider community in recent years. Drury and Tayles (2000), for the first time, defined and measured sophistication and their work became a pioneering one for further studies in the field. Most of the works on sophistication so far gets the main idea from the mostly innovative tool in the field of management accounting, that is, activity based costing. Some papers even measured sophistication as a dichotomous variable considering ABC system as sophisticated one and Non-ABC system as unsophisticated one (Ahmadzadeh et al., 2011). However, before presenting any critical evaluation on the way how sophistication is measured, a presentation on sophistication from the literature is commendable. This section presents a literature on different version of sophistication for the readers' understanding.

The seminal work of Drury and Tayles (2000) introduces a new research agenda in management accounting. It is argued that most of the previous surveys have sought to classify costing systems by two discrete alternatives, either traditional or ABC systems. However, Drury and Tayles (2000) adopts a broader perspective and examines cost system design choices that vary along a continuum ranging from very simplistic to highly sophisticated costing systems. The study measured sophistication in 8-point ordinal scales designed on the basis of number of cost pools and the number of different types of second stage cost drivers used by the responding organizations. Number of cost pools and drivers are counted and the study measured sophistication by three subjective categories named as unsophisticated, low sophistication, and sophisticated systems. Unsophisticated systems were described as those having less than five cost pools and two drivers, or six to ten cost pools and one cost driver. Sophisticated systems were those with more than ten cost pools and five or more cost drivers. Any other combination of cost pools and cost drivers was defined as low sophistication system. Thus the study measures sophistication

combining cost pool and cost driver in a scale. As a company increases number of cost pools and cost drivers to absorb indirect costs by its product or services, it is moving towards achieving full-fledged ABC system and thereby sophisticated cost accounting system.

Abernethy et al. (2001) conducted field study in five selected sites to bring new dimension in the study of costing system design choices and brings an obvious improvement of measuring the level of sophistication. To categorize a system as sophisticated one or not, Drury and Tayles (2000) consider a combination of number of cost pools and drivers in 8 point ordinal scales whereas, Abernethy et al. (2001) brings the qualitative issues relating to drivers and pools which is more important than quantitative issues in achieving sophistication. As per the study, different dimensions determining the level of cost system sophistication are given in **Figure 6.3** below:

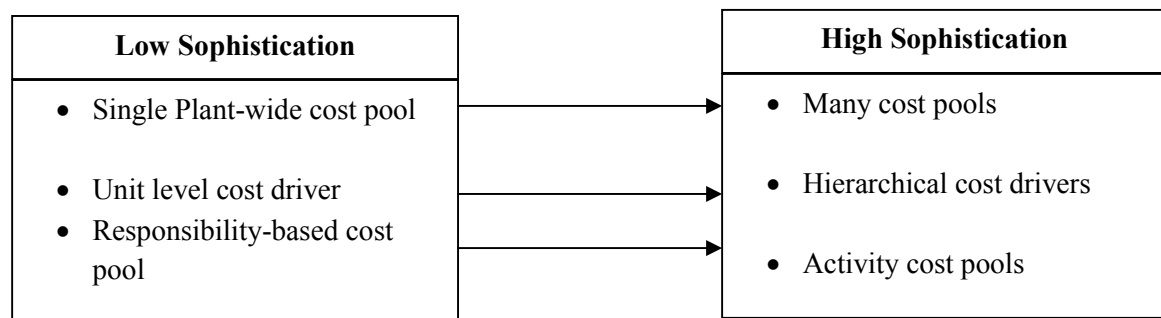


Figure 6.3: Dimensions determining the level of cost system sophistication (Abernethy et al., 2001)

This study views costing system design choices as varying along three dimensions: nature of the cost pools (i.e. activity cost pools versus responsibility cost pools), number of cost pools (single versus multiple) and type of cost drivers (whether the system had hierarchical cost drivers). Costing system's level of sophistication is evaluated based on where it is fitted on a continuum representing these three dimensions. One end of the continuum represented the simple traditional costing system (i.e. with one cost pool and a volume cost driver) and the other end represented a sophisticated costing system. This is a system where costs are grouped into a number of cost pools, there are hierarchical cost pools and there are a variety of hierarchical cost drivers. An ABC system, in its purest form would represent the end of this continuum (Cooper, 1990). Thus, this study also concludes that using ABC system means achieving sophisticated system.

In another study, Drury and Tayles (2005) define cost system sophistication as it is defined in Drury and Tayles (2000) with a slight extension that makes it a robust measure

of sophistication. They consider three factors (**Figure 6.4**) having influence on the level of cost system complexity, i. e., the number of cost pools, the number of different types of second stage cost drivers and the nature of the cost drivers (transaction, duration or intensity). Increasing the number of cost pools brings complexity in system though it captures the variability of resource consumption better. Use of cost drivers at second stage is important to apportion overhead on cost objects properly. An important attribute of a complex costing system is to ensure that cause-and-effect cost drivers are established for each cost pool so that a link is established between resource consumption and resource spending. Cause-and-effect cost drivers are more likely to be established by using many different types of cost drivers including different types of drivers within each of the volume-related, batch-related and product sustaining activities (Drury and Tayles, 2005). Finally, the level of cost system complexity is also influenced by whether transaction, duration or intensity drivers are used (Kaplan and Cooper, 1998). Transaction drivers are the least complex. Duration drivers represent an increase in the level of complexity since they represent measures based on the amount of time required to perform an activity. Intensity drivers are the most complex drivers since they are based on directly charging for the resources used each time an activity is performed. Costing system design choices varies along a continuum according to their level of complexity and measures a firm's costing system's level of complexity based on where it is located on the continuum.

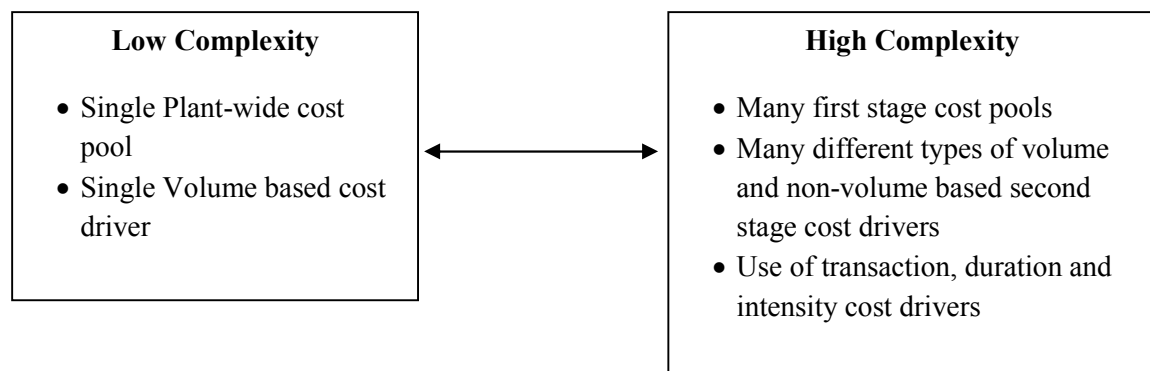


Figure 6.4: Dimensions determining varying levels of cost system complexity (Drury and Tayles, 2005)

At one end of the continuum, the lowest level of complexity (described as simplistic systems) is represented by a single cost pool and a single volume-based cost driver. Such costing systems are commonly classified as systems involving plant-wide or blanket overhead rates. Higher levels of complexity are assumed to be associated with increasing the number of cost pools in the first stage of the two-stage overhead allocation process and/or the number of different types of second stage cost drivers. Interestingly, the third

criteria of cost system complexity (nature of cost drivers) is defined theoretically, but the paper is silent regarding its use in defining cost system complexity which is based on 15 point scale as it is done in Drury and Tayles (2000).

Al-Omiri and Drury (2007) view product costing design choices as varying along four dimensions: the number of cost pools, the number of different types of cost drivers used in the second stage of the two-stage overhead assignment process, the types of second stage drivers used and the extent to which direct assignments or resource drivers are used in the first stage of the allocation process.

Costing systems are classified according to their level of sophistication based on where they fit on a continuum representing the four dimensions for assigning indirect costs (**Figure 6.5**). The most simplistic system is a direct costing system and this is located on the extreme left of the continuum. The second dimension influencing the level of sophistication relates to the number of different types of second stage cost drivers that are used. Using a greater variety of cost drivers that are the significant determinants of costs enables cause-and-effect drivers to be established for each cost pool that more accurately measure the resources consumed by cost objects.

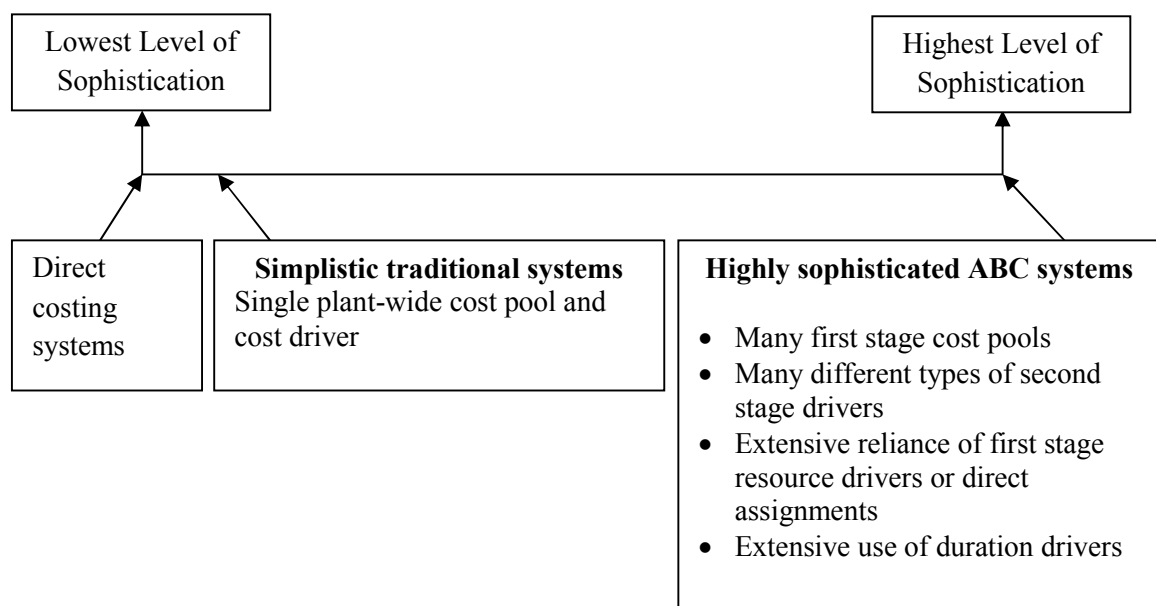


Figure 6.5: Dimensions determining the varying levels of cost system sophistication (Al-Omiri and Drury, 2007)

The level of cost system sophistication in respect of the third dimension relates to the extent to which transaction or duration drivers are used in the second stage of the allocation process (Kaplan and Cooper, 1998). Transaction drivers are less sophisticated since they assume that the same quantity of resources is required each time an activity is

performed. In contrast, duration drivers are more sophisticated since they represent measures based on the amount of time required to perform an activity. Finally, higher levels of sophistication are also achieved by relying more extensively in the first stage of the allocation process on directly assigning costs to each cost pool or using cause-and-effect first stage drivers (i.e. resource drivers).

The study uses four different measures as a proxy to the dependent variable for determining the level of cost system sophistication. First, ABC adopters and non-ABC adopters are used as a dichotomous variable. ABC adopters were categorized as having sophisticated systems and non-ABC adopters were categorized as having non-sophisticated systems. Second, the number of cost pools (centres) used is considered in an ordinal scale to measure cost system sophistication and the third measure used is the number of different types of second stage cost drivers as it was in case of Drury and Tayles (2000, 2005). Finally, another dichotomous variable represented by direct costing or absorption costing systems was used. To ascertain whether absorption or direct costing systems were used respondents were asked to indicate whether or not their costing systems assigned indirect costs to products or services.

Brierly (2008), for the first time, brings criticisms to the way of defining sophistication. He believes that prior researches have conceptualized sophistication too narrowly by imposing a definition of sophistication in terms of the assignment of indirect overhead costs to product costs. If the word 'sophistication' is not defined broadly considering the wider spectrum of product costing and its use, researchers run the risk of theoretical sterility and tunnel vision in their research methods. Even, Drury and Tayles (2006) mention that sophistication could cover other areas, though they do not discuss what this might entail. Searching for a new definition of sophistication, Brierly (2008) has initiated a qualitative research through in-depth interview method which results 16 different definitions (**Table 6.1**) of sophistication summarized into three categories: the calculation of product costs, the use of product costs, and the combination of both of these. The three most popular definitions were (1) the assignment of indirect overhead costs to product costs, (2) the inclusion of all costs in product costs, and (3) the understandability of product costs by non-accountants.

Definitions of Sophistication		N	n
Category 1: Concerned with the calculation of product costs			
1	Assignment of indirect overhead costs to product costs	12	
2	Inclusion of all costs in product costs	11	
3	Ability of directly charge overhead costs to products	2	
4	How frequently standard product costs are updated	2	
5	Whether and how non-manufacturing indirect overhead costs are assigned to product costs	1	
6	Recording a detailed bill of materials	1	
7	Production of accurate product costs	1	
8	Production of accurate actual product costs	<u>1</u>	
			31
Category 2: Concerned with the Use of Product Costs			
9	Degree to which product cost information is understandable and used by non-accountants	4	
10	Tracking costs through the production process to supply costs at each production stage	2	
11	Product costing systems that meet the business need	2	
12	Product costing systems that can be used in decision making	2	
13	Ability to provide information about product profitability and customer profitability, and for being used for financial accounting purposes and commercial decisions	1	
14	Quality of information it supplies to management, speed at which it supplies information to management and its ability to change for a different set of circumstances	1	
15	How quickly information can be obtained from the product costing system to respond to a query	<u>1</u>	
			13
Category 3: Concerned with the Calculation and Use of Product Costs			
16	Inclusion of all costs in product costs and the speed with which information is provided to users	<u>1</u>	
			<u>1</u>
			45

Table 6.1: Definitions of sophistication

Frequency count of the above 16 definitions result that most (31 out of 45) of the interviewees vote for the definitions categorized as calculation of product costs. Thus, the study also concludes that sophistication is defined mainly on the basis of how costs are absorbed by the products or services. Though the work sought for an inclusive definition of sophistication, it remains silent regarding the measurement of sophistication.

To measure sophistication, Wallace (2009) attempted to capture the number of cost pools, resource drivers, cost drivers, as well as the type of cost drivers and resource drivers used within the organization's cost accounting system. The measure employed within this study uses, refines and extends the Drury and Tayles (2005) measure of cost accounting system sophistication. It captures the components of cost accounting system which has been neglected by academic researchers (Anderson et al., 2002; Kaplan and Cooper, 1998).

The measure of cost accounting sophistication used within the analysis is a weighted composite (percentage) scale. Consistent with the Drury and Tayles (2005) measure the product of the cost drivers and cost pools were obtained. The types of cost drivers were then categorized into cost hierarchy dimensions and relevant percentages calculated for each. Only two cost hierarchy dimensions were identified i.e. unit related and batch related drivers. These dimensions were weighted: the unit-related and batch-related dimensions with a weight of 1 and 2, respectively. This allowed for the cost accounting sophistication measure to be calculated as the sum of the number of cost centers and the number of cost drivers multiplied by the relevant weighted percentage of unit-related cost drivers and batch-related cost drivers. This resulted in an applied ranking scheme within the scale for cost accounting sophistication measure to incorporate the dimensions of the cost hierarchy. That is, unit and batch related cost pools and drivers are no longer considered equal. Therefore two cost accounting systems with the same number of cost pools and cost drivers will be distinguished by their inclusion of unit and batch related activities i.e. a system that includes batch related activities will have a higher ranking than a unit only system. Given only two hierarchy levels therefore the potential range of this measure is 2 to 32. In reviewing the variability in the sophistication of the cost accounting systems, minimal variation was found for the resource drivers and therefore this sub-component was not included in the analysis.

Schoute (2009) measures cost system sophistication by using two questions like Drury and Tayles (2005). Respondents were asked to indicate the number of cost pools and cost allocation bases used in respective firm's cost systems. Both were measured using a $\log_2 N$ scale, where N is the number of cost pools and cost allocation bases. It is assumed that their nature is best reflected by a base 2 logarithmic function. The justification of using the logarithmic function is that the author posits the influence of both the number of cost pools and the number of cost allocation bases on cost system sophistication is nonlinear. A composite scale was constructed by adding the two $\log_2 N$ scores for each firm.

As an additional robustness check, all analyses have also been conducted using a second, more comprehensive measure for cost system sophistication which was not only based on the two questions as discussed above but also on two additional ones in which respondents were asked to indicate the nature of cost pools and cost allocation bases used in their firm's cost system. Specifically, the respondents were first asked which type of cost pools are used in their firms cost system: functionally oriented (e.g., departmental) cost pools, functionally and process oriented cost pools or process (e.g., activity) oriented cost pools. Next, they were asked which type of cost allocation bases are used in their firm's cost system: only unit-level allocation bases, both unit-level and batch level allocation bases, or both unit-level, batch-level and product-sustaining allocation bases. For both characteristics, three options were coded as 1, 2 and 3. A composite scale was constructed for this measure by standardizing the scores for each of the four cost system design characteristics and taking the average of the resulting Z-scores. Thus, the study also considers similar type of parameters to measure cost system sophistication. However, the methodology applied by Schoute (2009) is more robust than other studies.

The study conducted by Mgbame and Osamuyimen (2010) followed the framework of Al-Omiri and Drury (2007) and applied in Nigerian manufacturing companies whose shares are quoted in the floor of the Nigerian Stock Exchange. Thus, the work doesn't generate anything new in defining or measuring sophistication. Ahmadzadeh et al. (2011) conducted a similar study on the listed companies of the Tehran Stock Exchange. It measures sophistication as a dichotomous variable. Companies adopted ABC system are considered having sophisticated system and coded as 1 whereas, companies without ABC system are considered as having unsophisticated system and coded as 0. This research, similarly, added nothing new in defining sophistication rather used a very generic form of measuring sophistication.

Ismail and Mahmoud (2012) used three different proxy measures for determining the level of cost system sophistication. First, a dichotomous variable was used to measure the level of cost system sophistication. ABC adopters were categorized as sophisticated systems and non-ABC adopters were categorized as non-sophisticated systems. Respondents were asked to express the stage in which ABC systems are implemented to define whether firms are ABC adopters or non-adopters. Second, respondents are requested to state the number of cost centers or cost pools used within the cost systems to assign indirect costs to products or services. Third, respondents were requested to identify how many different types of overhead allocation bases were used in the allocation

process. This study also uses common measures of sophistication without any new dimensions.

On the basis of the above discussion, we may conclude that the word sophistication is used in different terms in different researches and some common parameters are used to measure sophistication as listed in the table (**Table 6.2**) below. Most of the researches are survey based though case study and interview method is also applied.

Cost System	Measurements	Sector/Methodology
Cost System Complexity (Anderson et al., 2002)	Number of activity centers, number of first stage cost drivers and number of second stage cost drivers	Manufacturing Sector
Costing System Design Choices (Abernethy et al., 2001)	Nature of cost pools (activity cost pools vs. responsibility cost pools); number of cost pools (single vs. multiple); and hierarchy type of cost pool	Case study approach in five manufacturing organizations
Cost System Complexity (Drury and Tayles, 2005)	Nature of cost pools (transaction, duration or intensity); number of cost pools; and hierarchy type of cost pool	Survey research
Cost Allocation Method Refinement (Wallace, 2009)	Number of cost pools, resource drivers, cost drivers, the type of cost drivers and resource drivers	Manufacturing and service – survey
Product Costing System Design (Al-Omiri and Drury, 2007)	Number of cost pools, the number of different types of cost drivers used in the second stage of the two-stage overhead assignment process, the types of second stage drivers used and the extent to which direct assignments or resource drivers are used in the first stage of the allocation process	Manufacturing and service – postal questionnaire survey
Cost System Sophistication (Drury and Tayles, 2000)	Number of cost pools and number of cost drivers	Postal questionnaire survey
Defining Sophistication (Brierley, 2008)	Calculation of product costs, Use of Product Costs and Calculation and Use of Product Costs	Survey and interview
Sophistication of Product Costing Systems (Ahmadzadeh et al., 2011)	Adoption or non-adoption of ABC	Postal questionnaire survey
Cost System	Number of cost pools (centers) used, number	Survey

Cost System	Measurements	Sector/Methodology
Complexity (Schoute, 2009)	of cost allocation bases, nature of cost pools and cost allocation bases	
Cost System Sophistication (Ismail and Mahmoud, 2012)	ABC/ Non- ABC, number of cost pools and number of cost drivers	Survey
Product Costing Systems (Mgbame and Osamuyimen, 2010)	Number of cost pools, number of different types of cost drivers used in the second stage of the two-stage overhead assignment process, the types of second stage drivers used and the extent to which direct assignments or resource drivers are used in the first stage of the allocation process	Survey

Table 6.2: A summary on different variations in sophisticated product costing system

The figure (**Figure 6.6**) below presents the gradual improvement of measuring and defining sophistication which is based on the studies of Drury and Tayles, 2000; Abernethy et al., 2001; Anderson et al., 2002; Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Brierley, 2008; Wallace, 2009; Schoute, 2009; Mgbame and Osamuyimen, 2010; Ahmadzadeh et al., 2011 and Ismail and Mahmoud, 2012.

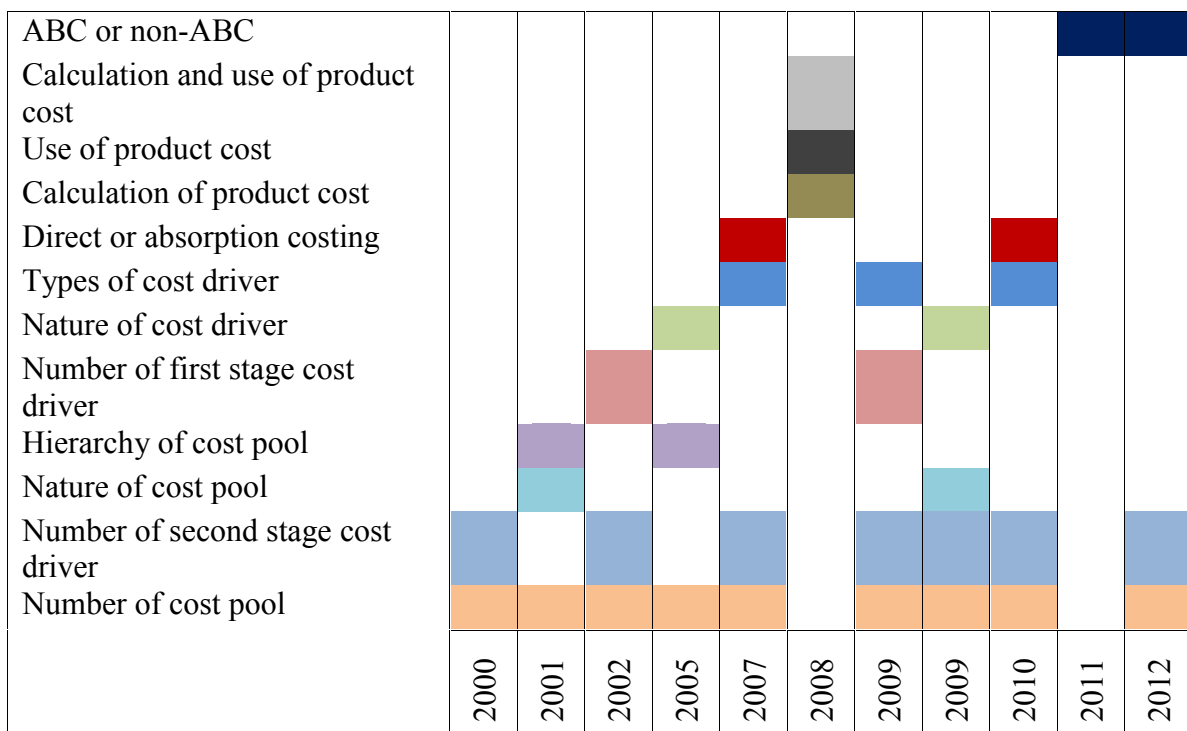


Figure 6.6: Gradual refinement of measuring and defining sophistication

A careful look at the above figure reveals that the addition of new parameters in defining sophistication is reached to its peak in 2007 with the work of Al-Omiri and Drury. Brierly (2008) criticized the way it is defined in 2008 and calls for widening the scope. Other papers simply replicate the established parameters in different time, country and population. A frequency distribution table is presented below (**Table 6.3**) to identify the parameters which are mostly used. It is important to know the significance level of different parameters as established in literature. This may be helpful for the researchers to choose mostly accepted parameters for their own study relating to the measurement of the level of sophistication of product costing. In that case, content validity cannot be questioned.

Category	Parameters	Frequency	Scale
Quantitative	Number of cost pools	9	Ordinal
	Number of cost drivers- first stage	4	Ordinal
	Number of cost drivers- second stage	7	Ordinal
Qualitative	Nature of cost pools	2	Categorical
	Nature of cost drivers	3	Categorical
	Type of cost drivers	4	Categorical
Dichotomous	ABC or non-ABC	2	Dichotomous
	Direct or absorption	2	Dichotomous
Others	Calculation of product costs	1	subjective
	Use of Product Costs	1	subjective
	Calculation and Use of Product Costs	1	subjective

Table 6.3: Frequency distribution of parameters used in measuring sophistication

Above table shows that number of cost pool is the mostly used parameter in measuring product costing sophistication followed by number of second stage cost driver. In few studies, some qualitative issues relating to cost pools and cost drivers are also used although an estimation of availability of data is warranted before choosing such parameters. Very few other papers used dichotomous variables to measure sophistication and one paper used some objective measure claiming that the sophistication is defined broadly with wider scope.

6.5 Goals of Sophisticated Costing Systems

At the time of designing the sophisticated costing systems, it is important to be very specific with the requirements expected from the system so designed. Thus, identification

of the goals is the most important step for the system designer. So far, two broad goals are identified from available literature, viz., costing system targets to calculate accurate cost of the products and costing system leading to accuracy in the decision that management takes regularly. These goals are presented in the figure (Figure 6.7) below at different levels.

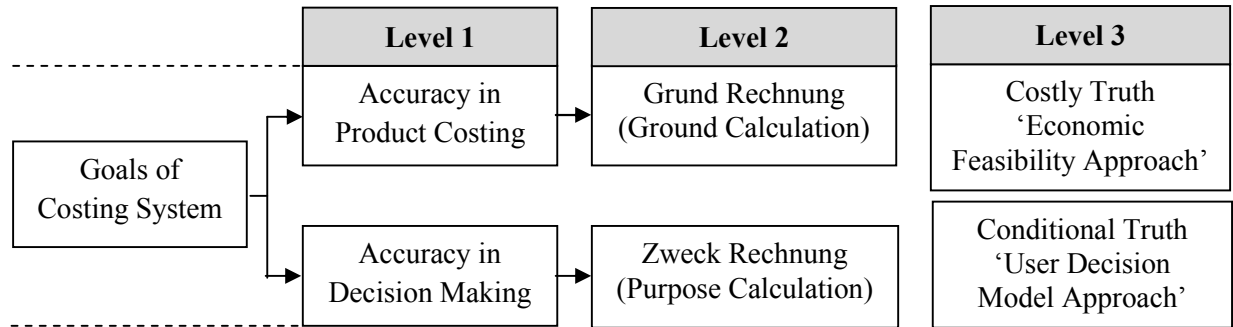


Figure 6.7: Goals of Sophisticated Costing Systems

Level 1: At this level, the very basic (core) level of goals are cited for the easy interpretation of the readers. For long, cost accounting system design targets to provide accurate product costing data. Many renowned management accounting researchers (Drury and Tayles 2000, Abernethy et al. 2001, Anderson et al. 2002, Drury and Tayles 2005, Al-Omiri and Drury 2007) voted for this straight forward purpose of cost accounting system design. Due to ensuring extra accuracy in product costing, ABC receives extra attention and publicity over traditional product costing system. And the journey of sophistication of product costing system begins with the introduction of ABC in product costing literature. However, Brierly (2008) extends the goal of sophisticated system design and brings criticisms to the way how sophistication is perceived and defined. He said that the most important goal that we are missing behind the sophisticated costing system is the extra accuracy level that the system ensures in taking day to day managerial decisions. If we relate the goal of sophisticated cost accounting system with the accuracy of product costing only, we are narrowing down the scope and bringing theoretical sterility to the research. This criticism is timely and frees the research from tunnel version with widening the scope.

Level 2: At this level, the goals of sophisticated costing system are made operational, based on the idea of Eugen Schmalenbach, old German

professor of accounting, who proposed the “Grund Rechnung” (ground calculation) and the “Zweck Rechnung” (Purpose calculation) relating to the application of cost and management accounting. The Grund Rechnung system must be established first for measuring the common data base for various measurement purposes, and the Zweck Rechnung will be done for producing the accounting information for various purposes based on the data of Grund Rechnung. Here the first goal, calculating accurate product costing data, falls under the category of Grund Rechnung where cost accounting system generates product cost across different elements that may be based on actual or standard costing. And the second goal, taking accurate decision, falls under Zweck Rechnung where management may need to take various decisions like pricing, transfer pricing, product profitability, discontinuation of product lines, cost cutting initiatives, cost re-engineering etc. accurately.

Level 3: At this level, goals of costing system design are aligned with the established approaches that exist in cost accounting system design literature. The costing system should be selected considering the cost-benefit of the alternative costing systems. This approach is called the information evaluation approach or economic feasibility or “costly truth” approach. We cannot exert pressure on our customers by implementing costly costing system with the excuse of revealing truth that is not much worthy to them. Under the current popularity of IT the costs of information systems may become reduced, but still TCO (total cost of ownership) of computer systems is much higher. Although the cost of information systems is measurable, it is still hard to measure its benefits. Thus, in the study of sophisticated costing system design, we should bring some parameters that is related to accuracy in product costing and represents the cost of the system. Regarding the second goal, we can purposively bring the famous phrase of the economist J. Maurice Clark, “Different Costs for Different Purposes.” This means the so-called “conditional truth approach.” The conditional truth implies that the costing system should be relevant to the user’s purpose in question. This is also called the “user decision model approach,” which was once used by the AAA's Report of

the committee on Managerial Decision Models (1969) published in the Accounting review.

This ‘Costly Truth’ and ‘Conditional Truth’ paradox is intuitively addressed by Horngren in one of his papers published in 1989 (Horngren, 1989). Bringing two alternatives (System A and System B) in product costing situation, where system A allocates total factory overhead to products based on direct labor costs and system B does the same thing based on multiple overhead rates (considering three different denominators as direct material costs, direct labor hours and machine hours), he shows that System B performs better than System A in terms of accuracy in product costing. Now the question is, if a firm currently deploys system A, will system B be a good buy? The answer, of course, depends on the buyer’s assessment of costs and benefits. This theme is not doctrinaire, it is almost a truism. It doesn’t say that multiple overhead rates are better; rather it depends on the specific circumstances a specific organization faces at a specific time in its life. The challenge to researchers and writers is to provide guidance regarding whether a system is cost-effective (Horngren, 1989).

6.6 Key Constructs of Sophisticated Costing System Design

Based on the discussions made so far on sophisticated costing system design, it can be concluded that most of the researchers put special weights on cost pool and cost driver. It seems that without a proper identification and structuring of cost pools and cost drivers, it is very difficult to design a costing system to achieve the objectives as mentioned in section 6.5. Considering this importance, this section presents a bit details on cost pools and drivers before proposing a wider framework of measuring sophistication.

6.6.1 Cost Pools

Cost pools are logical grouping of resources or aggregating of activities to simplify the assignment of resources to activities and then activities to cost objects. Elements within a group may be aggregated or disaggregated depending on the informational and accuracy requirements of the use of the data. Formation of cost pools is a critical task for the system designer and the accuracy of the system in producing cost data mostly depends on how cost pools are formed. One guideline that comes from Cooper (1990) is the cost

hierarchy. A cost hierarchy categorizes costs into different cost pools on the basis of the different types of cost drivers (or cost allocation bases) or different degrees of difficulty in determining cause-and-effect (or benefit-received) relationships (Horngren et al., 1999). ABC system commonly uses a four-part cost hierarchy to identify cost allocation bases or cost drivers (Horngren et al., 1999).

- a) Output unit-level cost
- b) Batch level costs
- c) Product-sustaining costs
- d) Facility-sustaining costs

Regarding the formation of cost pool, systems that combine unit and batch costs into the same pool, or systems that combine all costs into few over-sized pools contain significant error (Cokins, 2001; Hilton et al., 2006; Turney, 1991). Especially the allocation of all costs to the unit-level will create misinterpretations because “when batch and product level costs are divided by the number of units produced, the mistaken impression is that the costs vary with the number of units” (Cooper and Kaplan, 1991). To overcome these problems, many authors (e.g., Cooper and Kaplan 1988b, p. 98) suggest focusing on the most expensive resources, the “Willie Sutton” rule, but avoid details on how exactly to implement this prescription. Other authors (e.g., Garrison et al., 2008, p 317; Horngren et al., 2003) recommend grouping “like” resources together. Indeed, one could view the Activity Based Costing hierarchy as a recommendation to group resources as per their consumption patterns.

Thus, costing system designer assumes extra pressure to form cost pools from the resources used by a firm and usually choose between two different rules as mentioned below:

- a) Willie Sutton rule
- b) Correlation based rule

Under Willie Sutton rule cost pools are formed on the basis of resource size, whereas under correlation based rule cost pools are created using resource consumption correlations. Correlation based assignment rules lead to significantly lower error than size based assignment rules. Indeed, size based assignments do no better than the random baseline assignment. The intuitive and popular “Willie Sutton” rule receives little support that asks system designers to focus on the largest resources for segregating and allocating. The dominance of correlation-based rule is robust across production environments. In particular, over the range of resource dispersion, the relative gains from using correlation-

based methods do not decrease as resource dispersion increases. Such robustness is particularly surprising for production environments with high resource dispersion, as typified by the existence of a few very large cost pools and many small ones, because the Willie Sutton rule is expected to perform well in such environments.

While correlation-based methods are effective, they are information intensive. A typical firm is likely to have (accounting) data on resource costs that enable size-based rules, but it might not have detailed data on how products consume individual resources. At the same time, there is a question of cut-off correlation coefficient while using correlation-based methods for assigning resources to cost pools. The study (Balakrishnan et al., 2011) explores how the cut-off correlation is used to pool resources and the percent of total cost of resources to pool into a miscellaneous cost pool affect system accuracy. The number of activity pools is endogenously determined rather than fix it as an experimental parameter. It results relatively small errors even when a low correlation cutoff rule of 0.4 is used to determine which resources to group together into the same activity pool. Further, it was possible to group as much as 25% of costs into a miscellaneous cost pool without significantly degrading system accuracy. Thus, the study supports the idea that a relatively small number of cost pools might be enough (in terms of the cost-benefit tradeoff to adding more pools versus system accuracy) even for firms with large numbers of resources. These findings support prescriptions by Turney (1991) that “10-20 cost pools might be enough” as well as by Cooper and Kaplan (1998) that “ABC systems settle down to between 35-50 activity cost drivers.”

As an alternative to a full-information correlation approach, a hybrid system may be proposed where a gross estimate of inter-resource correlation is used to initially group resources into tier and a size-based rule is employed to assign individual resources within a tier to activity cost pools. Such hybrid or blended approach yields results comparable to the full information correlation-based method. This approach supports the ABC prescription to group resources as per the cost hierarchy and then forming separate pools for each tier in the hierarchy.

6.6.2 Cost Driver

A cost driver is defined as any factor or event that causes a change in the cost of an activity (Raffish and Turney, 1991). For example, the quality of parts received by an activity is a determining factor in the work required by that activity and therefore affects the resources required. An activity may have multiple cost drivers associated with it

(CIMA Official Terminology, 2003). The cost driver is at the heart of activity-based costing. A cost driver in ABC is defined more specifically as an allocation base of costs to activities (Horngren et al., 1999). The major distinction between traditional cost accounting and ABC is that ABC uses multiple cost drivers to assign activity costs to products or services (Cokins, 1996). The final output of an activity-based costing is cost driver information (Miller, 1996). Understanding the causal relationship between an activity and its cost driver enables management to focus on improvement efforts on those areas that will produce the best results (Miller, 1996). Because causal relationship can change, according to situation, cost driver for an activity. Therefore it is required to check and update the activity data to make sure that appropriate cost drivers are being used.

Cost driver is the construct that causes the cost or drives the cost to be incurred. It triggers the cost being behind the main scene and thus very important for control purpose. Different authors prescribe different types of drivers in different situations. However, the classifications have similarities greatly and presented here to supplement a closer and complete look on the issue.

Innes and Mitchell (1995) divide the drivers into four different classes:

- a) pure volume driver
- b) weighted volume driver
- c) situational driver
- d) motivational driver

The first three drivers are linked to the actual usage of an activity, whereas the last one is used mostly for steering the firm's processes. The pure volume driver is the simplest and most widely used. It assigns the activity costs evenly, dividing them by the volume of the cost-objects. The number of invoices can be used as the activity driver for the invoicing activity in the accounts department. An equal amount of the costs of the department is attributed to each invoicing.

A weighted volume driver is used in situations where activity usage is not as homogeneous as in the previous example. Orders, for example, can be handled by hand or by computer, depending on the behavior of the customer. Manual order handling can be e.g. three times more time consuming than computerized handling. Using this driver, the assignment of an activity is weighted relatively between different situations before actual assignment. Manual order handling would cost triple when compared with the computerized handling. However, they do not explain the situational driver exhaustively and it is left rather unclear. It may refer to situations where the amount component and

the driver itself should be considered carefully before each assignment in order to obtain reliable and truthful information. The basis for the activity cost driver can vary with the amount of it in this driver type. Motivational cost drivers tend to be used when the intention is to motivate cost-conscious behavior, rather than produce product cost information in the most accurate manner. The classification made by Innes and Mitchell (1995) is not very logical. The first two classes can in fact be incorporated in the situational and motivational drivers. This makes the classification problematic.

Blocher et al. (2008) presents the classification of cost drivers into four categories from a different perspective:

- a) Activity Based
- b) Volume Based
- c) Structural
- d) Executional

Activity based cost drivers are developed at a detailed level of operations using activity analysis where a separate cost driver is determined for each activity.

Volume based cost drivers are related to units produced or quantity of services provided and assume the followings:

- a) the relationship between the cost driver and the total cost is approximately linear within the relevant range
- b) Outside of the relevant range, the law of diminishing marginal returns generally applies (i.e. non-linearity exists).

Structural cost drivers facilitate strategic decision making as they involve plans and decisions that have long term effects. Such drivers also consider scale, scope, experience, technology, and complexity in hopes of improving competitive position. Executional cost drivers facilitate operational decision making by focusing on short-term effects. Workforce involvement, design of the production process, and supplier relationships are considered in an attempt to reduce costs.

Kaplan and Atkinson (1998) present a much more logical way of classifying the activity drivers. They use three different classes as follows:

- a) Transaction driver
- b) Duration driver
- c) Intensity or Direct Charging driver

In a two stage cost allocation process, cost driver is used twice (Figure 6.8). Firstly, cost drivers are required to form cost pools from individual cost categories that is based on the

pattern of resource consumptions and driven by cause and effect relationship. These are called resource drivers. Secondly, cost drivers are required to create a linkage between activities and cost-objects. These are called activity drivers. An activity cost driver is a quantitative measure of the output of an activity. Activity cost drivers measure the quantity of activities required by cost-objects. The selection of an activity cost driver reflects a subjective trade-off between accuracy and the cost of measurement. Activity cost drivers are the central innovation of activity-based cost systems, but they are also the most costly aspects of the ABC system (Kaplan and Cooper, 1998).

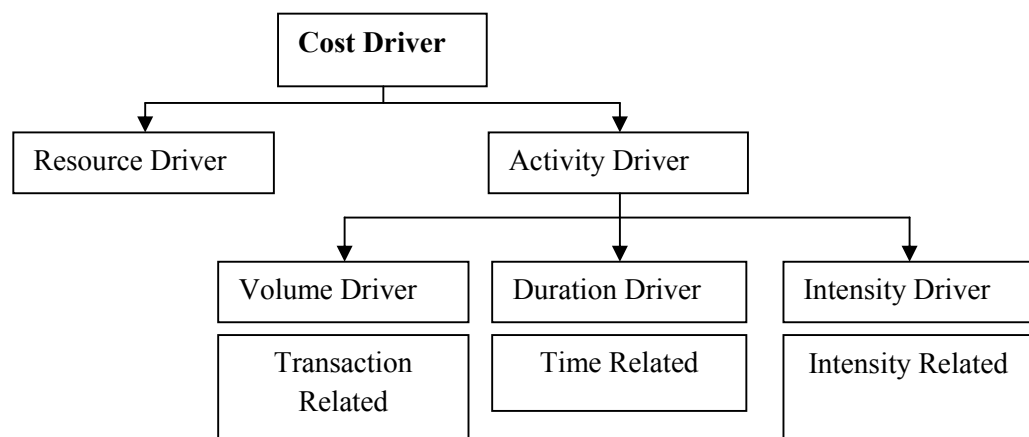


Figure 6.8: Classification of Cost Driver

As already explained, there are two types of cost drivers in an ABC model: resource cost drivers and activity cost drivers¹. The former of these two is used in order to distribute resources to activities and should therefore indicate activity consumption of the resources. The activity costs drivers act as an indication of the cost objects consumption of activities and can be divided into three categories: transaction related, time related and intensity related. “Transactions related” refers to, for example in an IT division, the amount of errands being reported. “Time related” cost drivers refer to how much time each activity consumes. The third category, “intensity related” is appropriate when the cost objects demand special activities such as labor with higher salary or special equipment. This, however, is dependent on a separate registration of the resource utilization for each cost object².

A transaction driver behaves the same way as Innes and Mitchell’s pure volume driver. Transaction drivers count how often an activity is performed. It can be used when all

¹ Kaplan, Robert S. & Cooper, Robin, *Cost and Effect* (1997) HBS Press: Boston.

² Ax, Christian & Johansson, Christer & Kullvén, Håkan *Den nya ekonomistyrningen* (2002) Liber ekonomi: Malmö.

outputs make essentially the same demands on the activity. They are the least expensive type of cost driver. Duration drivers represent the amount of time required to perform an activity. It should be used when significant variation exists in the amount of activity required for different outputs. Intensity drivers directly charge for the resources used each time an activity is performed. Intensity drivers are the most accurate activity cost drivers, but are the most expensive to implement. They should be used only when the resources associated with performing an activity are both expensive and variable each time that activity is performed.

An important empirical question is whether overhead costs depend on activity variables other than volume-related variables like direct labor. Cooper (1987), Johnson and Kaplan (1987), Miller and Vollman (1985) and others assert that a significant portion of manufacturing overheads varies with transactions such as setups, purchase orders, engineering change orders and material movements. Using a sample of 37 plants owned by one firm, Foster and Gupta (1990), however, find that manufacturing overhead is more frequently significantly correlated with volume-related drivers than complexity or efficiency-related drivers. Banker and Johnston (1993) find a similar highly significant relation between overheads and volume measures for a sample of airline firms, but they also find several operating strategy variables to be significant drivers of overhead costs. Using a sample of 31 plants from firms in the electronics, machinery and automobile components industries, Banker et al. (1995) confirm the high correlation between manufacturing overheads and direct labor, but they find that complexity variables representing transactions identified by Miller and Vollmann (1985) are also significant. This empirical question is important because if cost drivers other than direct labor-type volume measures are insignificant, then any benefit from switching from a single volume-based cost driver system is likely to be minimal.

In terms of choosing drivers, most authors advocate that managers consider a cause-effect relation (Garrison et al, 2008; Horngren et al., 2003) but provide minimal guidance on how to select such a driver. Practitioners suggest using the driver for the largest resource in the pool, a product-level complexity index, or a weighted transaction metric (Cooper and Kaplan, 1998). However, there is limited research that examines their efficacy. Furthermore, the rules are vaguely defined and this ambiguity limits the practical guidance they provide. The value of using a composite driver (rather than the driver for the largest resource only) increases in the sparsity of the consumption matrix (i.e., the extent of traceability of resources to products). The intuition is that when any particular

resource only relates to a small subset of products, resource consumption patterns within an activity pool exhibit considerable diversity.

Kaplan and Cooper have combined the duration driver and intensity driver to form an index driver (Cooper and Kaplan, 1998). Some companies estimate duration by constructing an index based on the complexity of the product processed by the activity, assuming that complexity influences the time required to perform the activity. Often, ABC analysts, rather than actually recording the time and resources required for an individual product, may simulate an intensity driver with a weighted index approach. They ask individuals to estimate the relative difficulty of performing the task for one type of product. A standard product may be given a weight of one, a medium-complexity product may be given a weight of three to five, and a particularly complex product can be given a weight of ten.

Forming the levels requires knowledge of the activities' difficulty level distribution. The leveling aims to standardize the amount components of activity cost drivers. There is no need to define separate driver amounts for all the cost-objects; the amounts could be chosen from the standardized levels. As many levels as necessary can be created, depending on the desired accuracy. The suitable number of difficulty levels within an activity depends on the variation of the activity time usage.

The levels can be formed by determining the amounts of each activity demanded by each cost-object. The amounts should be statistically analyzed to define the reasonable levels. The levels can also be formed by direct questions related to resources. The interviewee should be the best person to estimate drivers, for example using the following scale: small, normal, and large demand. Considering invoicing activity, a "quick" invoice may take one minute to complete, a "normal" one five minutes, and a "slow" one as long as half an hour. Using this method, the expertise of a person performing certain activities is utilized to minimize calculations or work measurement. The drawback of this method lies in its inaccuracy. All the activities could be leveled by specific analysis and interviews. Possible inaccuracy could be noticed and somehow even eliminated by, for example, sensitivity analysis.

Consequently, the system records significant gains by combining the mappings from several resources to generate a cost driver. The gain from using an index also increases with the number of cost pools. As the number of cost pools increases, the number of resources per pool falls, and an index with a fixed number of resources in each pool rapidly converges toward the full information approach. These findings underscore that

driver selection might be particularly important in job shop type environments in which products exhibit diversity in both the sets of resources they consume and in the proportion of consumption.

In practice, the number of cost drivers of an ABC-system is particularly important (Cooper, 1989; Babad and Balachandran, 1993; Schniederjans and Garvin, 1997). Often a high number of cost drivers are needed to measure the utilization of overhead resources accurately. However, an ABC-system of low complexity, i.e. a system with a small number of cost drivers, is not only less costly but also easier for management to understand (Merchant and Shields, 1993). Furthermore, it is often desirable to focus management attention on only a few main cost drivers (Hiromoto, 1988).

At the end, some conclusions may be drawn like the common practice of using the driver for the largest resource (e.g., labor hours for the pool of all labor related resources) is inefficient. An indexed driver brings significant gains economically. Such a composite driver, which combines the largest few (2-5) resources in a given pool into an index, is less information intensive than a system that considers the drivers for all resources in a pool but delivers a substantial portion of the potential gains. Indeed, with a medium number of cost pools, an index method can perform even better than the method that uses information from all resources in the cost pool.

6.7 A Proposed Framework of Measuring Sophistication

Discussion on the definitions or measurements of sophistication concludes that there is no single way to consider it. Most of the researchers used a mixture of cost pools and cost drivers related information to measure it. Brierly (2008) tried to introduce a new dimension in defining sophistication, however, it will be very subjective in measurement and, in fact, Brairly (2008) remained silent regarding the measurement of different definitions of sophistication. However, the surveys confirm the existence of contingency theory underlying the research. The research and application of contingency approach is not abundant in recent studies which may restrict it to be a generalized theory. Still, empirical research in the social sciences including accounting has less "external validity" unlike natural sciences. Adoption of contingency approach may be a solution to overcome the limitation.

Initial researches like Drury and Tayles 2000, Abernethy et al. 2001, Anderson et al. 2002, Drury and Tayles 2005, Al-Omiri and Drury 2007, Brierley, 2008 Schoute 2009, and Wallace, 2009 are conducted in economically advanced countries (e. g., UK,

Australia etc.) where a level of sophistication has already been achieved. Some researchers (Mgbame and Osamuyimen, 2010; Ahmadzadeh et al., 2011; Ismail and Mahmoud, 2012) in developing countries (e. g., Iran, Egypt, Nigeria) have tried to replicate such research considering the core parameters of sophistication. But the main theme of contingency framework is that there is nothing universally applicable rather it depends on some social, economic, political, environmental, and other pertinent factors. Thus the definition and measurement of sophistication also depends on some parameters which may vary in terms of its importance in different situations. For example, the way sophistication is measured in economically advanced countries should be different than the way it should be measured in developing or less developed countries. It will be irrational to say that developing or less developing countries do not have sophistication in costing system. Keeping contingency framework under consideration, it would be very difficult to develop and propose any model that will be universally applicable. However, it is an honest effort of the researcher to propose and promote a scale of measuring sophistication of costing system that addresses most of the diversity in management accounting practices across different countries. Literature review on the topic and the wisdom of the researcher identified the following parameters of measuring sophistication in line with the respective goals (**Figure 6.9**).

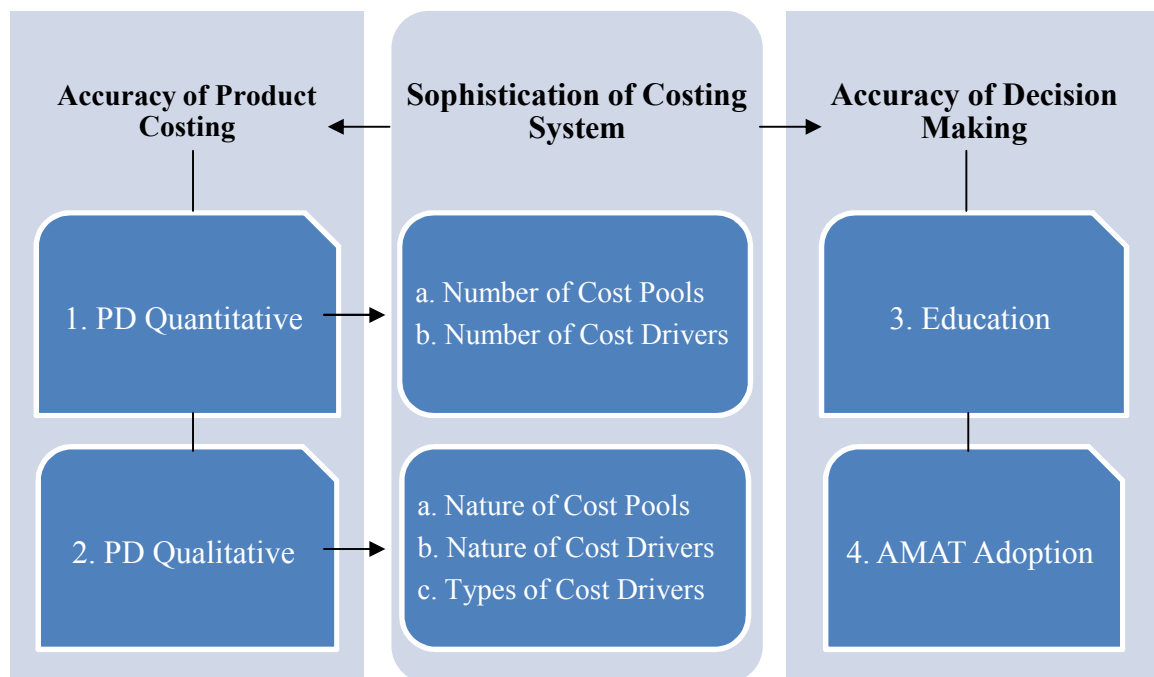


Figure 6.9: Parameters of sophistication of product costing

6.7.1 Accuracy of Product Costing: These criteria confirm the sophistication leading to the accuracy of product costing. The superiority of ABC over traditional costing is on this single ground where traditional costing traces indirect cost with cost objects by using a pre-determined overhead rate (grossly aggregated) leading to distortion in product costing. However, ABC goes for cause and effect relationship with the identification of cost pools and respective cost drivers for product costing. Thus, the study assumes that cost pools and drivers related information will be the appropriate criteria if the goal of sophisticated costing system is ensuring accuracy in product costing.

- a) **PD Quantitative:** This parameter includes the numbers of cost pools and cost drivers. This is very common and becomes core parameter used in most of the studies related to sophistication (Drury and Tayles, 2000; Anderson et al., 2002; Al-Omiri and Drury, 2007; Schoute, 2009; and Wallace, 2009). Respondents may be asked to write the number of cost pools and cost drivers they use. Other way, respondents may be given a scale with pre-set number of cost pools and drivers so that they may choose the respective category where they fall.
- b) **PD Qualitative:** To bring robustness in measuring sophistication, some studies (Abernethy et al., 2001; Drury and Tayles, 2005; Wallace, 2009) address some qualitative characteristics of pools and drivers like types and nature. Nature of cost pools indicate whether they are resource based or activity based and whether there exists any hierarchy. Types of cost drivers mean transaction, duration or intensity based drivers whereas nature identifies any hierarchy exists in identifying the drivers. These are some advanced considerations relating to the measure of sophistication which requires more sophisticated systems.

6.7.2 Accuracy of Decision Making: It's very difficult to measure sophistication of costing system with regard to this very important objective. However, the study identified two proxy criteria, education and adoption of advanced management accounting techniques, to measure sophistication. Practitioners' skill and experience is very important to apply sophisticated costing system successfully. To quantify the skill and experience, we may consider the educational profile of the practitioners, years of experience of the practitioner etc. At the same time, we may develop a composite scale based on the extent of applying different

management accounting techniques to measure the second criteria. This is directly related to objectives under consideration as different management accounting techniques are applied to take different types of decision.

a) Education: Bringing education in measuring the sophistication of product costing system is an obvious addition of the study to the current state of knowledge on the area. None of the studies done so far considered the level of education of practitioners as a parameter of attaining sophistication in costing system design. There should not be any doubt that without the proper knowledge and strong integration between academia and practitioners, it is not possible to bring innovation in practice. Some studies have already identified that accounting education and practices are not properly integrated that is detrimental to the development of the discipline. Sterling (1973) observed a lack of congruence between research in accounting, classroom instruction in accounting, and professional accounting practice. He also noted that some educators/researchers had advocated different stances on issues in the classroom than they recommend in their own research publications.

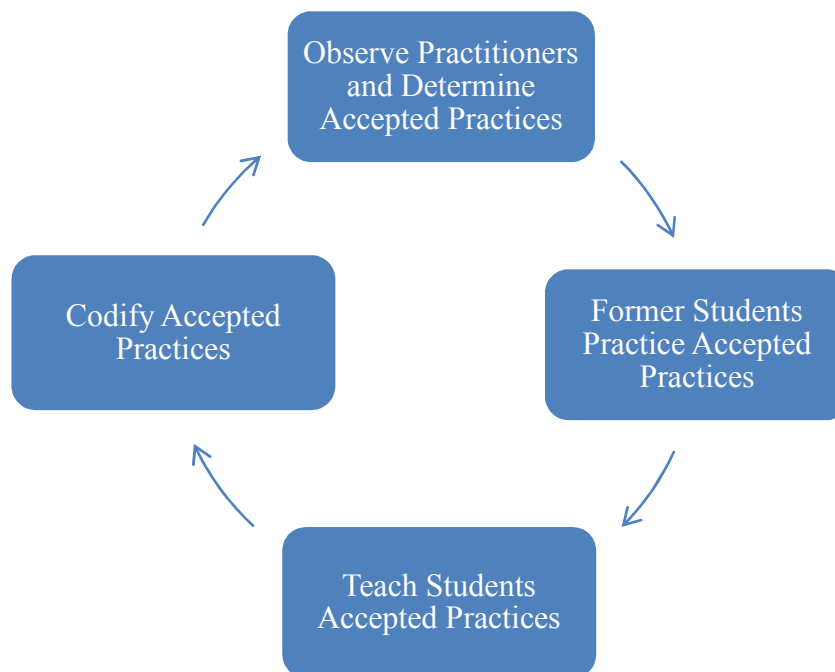


Figure 6.10: Integration of practice, class room discussion, and research

The differences among the parties involved in accounting research, education and practice arose more from isolation than from harmony, more specifically the isolation of research from the education-practice alliance. Sterling (1973) asserted

that the absence of conflict between education and practice was due to harmony engendered mainly by "educators' predilection to prepare students for practice. We educators teach our students acceptable practices so that they can get jobs." He represented the process as presented in **Figure 6.10** above. According to this view it is practice, not education or research that brings about change. That is, practitioners add to their store of accepted practices and then educators observe, codify and teach these additional accepted practices. Bringing education in measuring sophistication may be difficult; however, a proxy measure may be used like the existence of professionals working in costing issues. The importance of professionals in implementing sophisticated system cannot be undermined as the professionals are guided by the rules set by the institutes and learn continuously as a requirement of their membership to the institutes.

b) AMAT Adoption: Adoption of advanced management accounting techniques (AMAT) itself may be a proxy to the measure of sophistication in designing costing systems. For example, some studies (Ahmadzadeh et al., 2011 and Ismail and Mahmoud, 2012) consider the practice of activity based costing (ABC) as sophisticated system and non-use of ABC as unsophisticated system. Similarly, some management accounting techniques relating to costing may be identified and used as a parameter of measuring sophistication. Due to the highest level of subjectivity to the degree of adoption, a Likert scale may be developed to capture the responses easily and later on different data management techniques may be used to calculate respective values.

6.8 Designing the Scale

Different criteria of sophistication of costing systems as identified above needs to be measured independently that will be aggregated later on to form a generalized scale to measure sophistication. Measurement of the criteria may be done as under (**Table 6.4**):

Criteria	Notation	Questions	Measurement
Education	EDUN 1	Number of professional accountants working	Ratio
PD Quantitative	PDQN 1	Number of Cost Pools	Ratio
	PDQN 2	Number of Cost Driver – First Stage	Ratio
	PDQN 3	Number of Cost Driver – Second Stage	Ratio
PD Qualitative	PDQL 1	Nature of Cost Pools	Categorical

Criteria	Notation	Questions	Measurement
	PDQL 2	Nature of Cost Drivers	Categorical
	PDQL 3	Types of Cost Drivers	Categorical
AMAT Adoption	AMAT 1	Average score on a 5-point Likert Scale	Ratio

Table 6.4: Measurement scale of criteria used in sophistication study

The scale designed to measure the level of sophistication of costing system will carry a total of 100 marks. Each of the four criteria will receive a mark out of 100 and later on the marks will be weighted so that the value of sophistication comes out as maximum 100. Each parameter will receive a point on 100 just to generalize the scale without any biasness considering each component having similar impact. Later on, the introduction of weight is made to bring contingency approach in calculation where the researchers are free to consider different organizational and environmental factors with appropriate significance. We believe that the parameters are not same in significance and the level of significance depends on lot of contextual factors. To address this contingency in designing the scale, we propose to use different weights for different parameters, i.e., higher weight for the more important parameter and lower weight for less important parameter. The scale value for measuring the sophistication level may be computed by using the following equation.

$$SOP_i = \sum_{i=1}^4 W_i X_i \in \sum_{i=1}^4 W_i = 1 \tag{1}$$

Here, we are applying a methodology like multi-attribute utility theory to find out the value for sophistication across different alternatives. Let's assume that $X_1, \dots, X_n, n \geq 2$ be a set of attributes associated with the decision. We need to estimate n conditional utilities $u_i(x_i)$ for the given values of all n attributes. Then we can calculate $u(x_1, \dots, x_n)$ by combining the $u_i(x_i)$ of all attributes: $u(x_1, \dots, x_n) = f[u_1(x_1), \dots, u_n(x_n)]$.

Assuming four attributes ($edun, pdqn, pdql, amta, n \geq 2$) we may revise eq. 1 in the form of a utility function in additive form as given below:

$$SOP = w_{edun} \cdot u_{edun}(edun) + w_{pdqn} \cdot u_{pdqn}(pdqn) + w_{pdql} \cdot u_{pdql}(pdql) + w_{amta} \cdot u_{amta}(amta) \tag{2}$$

For solving eq. 2, we need the respective weights and utility value of four criteria we have considered in the study.

6.8.1 Determining Weights: It is important to determine the weights for each criterion since the method deals with multi-goals. Under the multi-goal seeking the optimal solution will usually be multiple as the “Pareto Optimal” solutions, some utility function or weights or trade-off among goals of the decision maker must be applied. For such determination of weights the democratic method (for example, plurality rule or majority rule) is hardly applied as Kenneth J. Arrow’s “impossibility theorem” says. In 1950 Kenneth Arrow (1950, 1963) provided a striking answer to a basic abstract problem of democracy: how can the preferences of many individuals be aggregated into social preferences? The answer, which has come to be known as Arrow’s impossibility theorem, was that every conceivable aggregation method has some flaw. In his book: “Social Choice and Individual Values,” he proved that it would be impossible to integrate the subjective value criterion of various persons in a society into single value criteria via the democratic procedure. Thus the “decision by majority” as the democratic procedure cannot make any unique priority order (unique solution) in the society. Arrow’s conclusion was that only single dictator's priority order can decide the policy of the society as a whole. He focused only on the logical aspect of deriving the social selection. Our objective is to determine criteria weights (w_1, \dots, w_n) for all multi-attribute utility theory contexts in which eq. (2) is applicable. As dictatorship has limitations in itself, we can apply weighting based on the ranks as given by some influential respondents just to incorporate social preference to some extent. Each respondent $(R_i, i = 1, 2, \dots, n)$ may select and rank a subset of n_i criteria ($n_i \subseteq n$) that he or she seems to be relevant, giving each criterion j a rank r_{ij} . Given the ranks of criteria as provided by all respondents, we aim to develop aggregate (group) weights for all n criteria.

In order to develop aggregate criteria weights, we utilize the empirical rank-weight relationship of Alfares and Duffuaa (2006). This linear relationship specifies the average weight for each rank for an individual respondent, assuming a weight of 100% for the first-ranked (most important) factor. For any set of n ranked factors, the percentage weight of a factor ranked as r is given by:

$$w_{r_n} = 100 - s_n(r - 1) \quad (3)$$

Where,

$$s_n = 3.19514 + \frac{37.75756}{n} \quad \text{and} \quad 1 \subseteq n \subseteq 21, 1 \subseteq r \subseteq n \quad \text{and} \quad r \text{ and } n \text{ are integer} \quad (4)$$

Let us assume that we have m respondents and n criteria that are common to all respondents ($n_1 = n_2 = \dots = n_m = n$). We also assume that each respondent i assigns a rank of r_{ij} to factor j .

In this method we first convert individual ranks into individual weights for each criterion, and then calculate the average weight for each criterion among all individuals. The two steps are given as follows:

1. For each respondent i , use equation (3) to convert ranks r_{ij} into individual weights w_{ij} for all n criteria.

$$w_{ij} = 100 - s_n(r_{ij} - 1), \quad i = 1, \dots, m \quad ; \quad j = 1, \dots, n \quad (5)$$

2. However, in the second step, the geometric mean of individual weights is used to determine aggregate weights as proposed by Barzilai and Lootsma (1997).

$$W_j = \sqrt[m]{w_{1,j} \times w_{2,j} \times \dots \times w_{m,j}} \quad \text{where,} \quad j = 1, \dots, n \quad (6)$$

Table 6.5 below shows a solved example for aggregation of weights when the same set (number) of criteria is ranked by all respondents. The example involves three respondents and four decision criteria (PD Quantitative, PD Qualitative, Education and AMAT Adoption).

Criterion	PD Quantitative	PD Qualitative	Education	AMAT Adoption
Rank chosen by Respondent 1	1	2	3	4
Rank chosen by Respondent 2	2	1	3	4
Rank chosen by Respondent 3	1	2	4	3
Weight for Respondent 1	100	87.37	74.73	62.10
Weight for Respondent 2	87.37	100	74.73	62.10
Weight for Respondent 3	100	87.37	62.10	74.73
Geometric average weight	95.60	91.39	70.26	66.05
Percent weight	29.57	28.27	21.73	20.43

Table 6.5: Determination of weights based on the ranks chosen by respondents

6.8.2 Measurement of Parameters: Out of four criteria, three use a ratio scale and one is categorical. This poses a threat to the researcher as the scale is heterogeneous with different scales, values and ranges. To ensure proper justice to the data used in the study and validity to the methods applied, it is important to reduce the diversity among the criteria used in the study. To bring all parameters into a same scale, a process of

normalization is applied here as proposed by Chuang-Stein (1992) which actually results the utility value of different criteria as required in eq. 2. The procedure selects a set of reference ranges against which to normalize all values. To be specific, let X represents an assay value with a corresponding reference range of (L_x, U_x) . Furthermore, let (L_s, U_s) be the reference range chosen to be the standard range for the assay under discussion. Chuang-Stein (1992) proposed normalizing X relative to (L_s, U_s) through the following expression:

$$X_s = L_s + (X - L_x) \frac{(U_s - L_s)}{(U_x - L_x)} \tag{7}$$

In (7), X_s represents the normalized value of X . This normalized value satisfies:

$$\frac{X_s - L_s}{U_s - L_s} = \frac{X - L_x}{U_x - L_x} \tag{8}$$

In other words, X and X_s are of the same unit distance from L_x and L_s respectively, where a unit distance is defined by $U_x - L_x$ and $U_s - L_s$ under the two sets of reference ranges. All of the four criteria we are using to measure sophistication have respective scales with ranges that may be normalized in a common scale of 0-100 by using the equation 7.

6.9 A Hypothetical Example

To apply the rule of normalization across parameters with heterogeneous scale and ranges, let us assume a hypothetical example with all the parameters used in measuring sophistication (Table 6.6 below). The table below presents the example data:

Notation	Questions	Answer (X)	Range		Reference Range
			U_x	L_x	
EDUN 1	Number of professional accountants working	3	15	0	0-100
PDQN 1	Number of Cost Pools	7	9	1	
PDQN 2	Number of Cost Driver – First Stage	4	5	1	
PDQN 3	Number of Cost Driver – Second Stage	6	14	1	
PDQL 1	Nature of Cost Pools	2	3	1	
PDQL 2	Nature of Cost Drivers	2	3	1	
PDQL 3	Types of Cost Drivers	3	3	1	
AMAT 1	Average score on a 5-point Likert Scale	3.4	5	1	

Table 6.6: Hypothetical data across parameters used in measuring sophistication

The range is very important in above table where contingency is operationalized. For example, EDUN 1 shows a range of 15 to 0. It means maximum number of professionals working in sampled firms is 15 and minimum is 0. Thus the respective value of this parameter depends on this range. For a different country of different research, the range may be changed and the scale automatically addresses the difference with different values. We have four criteria to measure sophistication. Criteria education (EDUN) has no sub-criteria. However, criteria number of cost pools and drivers (PDQN); and nature and types of cost pools and cost drivers (PDQL) have sub-criteria that required an extended form of computation to measure the respective normalized points in the final scale value. Finally, the last criteria, adoption of advanced management accounting techniques, may have some sub-criteria which have been averaged to form only one scale value in a 5-point Likert scale just to avoid too much complexity in calculation. We have explained a method of calculating weights in section 6.7.1 based on Arrow’s impossibility theorem where we tried to bring social preference. Based on the hypothetical data and normalization formula (eq. 7), we may compute the scale value as given in **Table 6.7** below:

Notation	X	U_x	L_x	U_s	L_s	X_{ss}	W_{si}	X_s	W_i	$\sum W_i X_i$
EDUN 1	3	15	0	100	0				0.2957	5.914
EDUN								20		
PDQN 1	7	9	1	100	0	75	0.4	30	0.2827	17.069
PDQN 2	4	5	1	100	0	75	0.2	15		
PDQN 3	6	14	1	100	0	38.46	0.4	15.38		
PDQN								60.38		
PDQL 1	2	3	1	100	0	50	0.3	15	0.2173	15.211
PDQL 2	2	3	1	100	0	50	0.3	15		
PDQL 3	3	3	1	100	0	100	0.4	40		
PDQL								70		
AMTA 1	3.4	5	1	100	0				0.2043	12.258
AMTA								60		
Total Point									1.0	50.452

Table 6.7: Scale value computation

The analysis reveals that a firm with the values as mentioned in Table 6.7 will have a total point equal to 50.452 out of 100. Criteria EDUN and AMAT have no sub-criteria and thus the calculations were direct. However, PDQN and PDQL have sub-criteria and the

scale value for each sub-criteria (X_{ss}) has been computed which is then multiplied by the respective sub-weights (W_{si}) to compute the scale value for the criteria (X_s). The benefit of this analysis is that depending on the requirement of the methodology applied in respective studies, sophistication scale may be ratio, ordinal, interval, and categorical.

6.10 Scope of Further Research

This paper opens a good number of avenues to carry out further researches. Firstly, the paper is a proposal that may be applied in practice to confirm its robustness. Secondly, different multi-criteria decision making tools like AHP may be applied to compute the weights for respective criteria and sub-criteria. Thirdly, a methodology is proposed to absorb contingency framework in explicating sophistication which may depend on some contextual variables relating to specific firm (internal) or business environment (external). It may be possible to work on any expectancy gap in practice. Finally, the research may be extended to put a comment of the current level of sophistication achieved by a firm and probable ways of attaining more sophistication. In this chapter, the researcher has tried to put focus on existing literature to innovate something and bring some new areas where further studies may be carried out.

6.11 Conclusion

Dramatic change of management accounting practices in recent years is caused by the use of advanced technologies in production, cut-throat competition among competitors, integrated global market and a change in cost structure. As modern technology takes over the manual production process, the command of prime cost has been reduced greatly giving its way to the manufacturing overheads. Apparently, practitioners of management accounting come from heterogeneous background due to increased significance of overheads. Ensuring accuracy in product costing becomes a challenge to manufacturer due to the dominance of indirect cost over direct cost where tracing overheads becomes very critical. At the same time, managerial decision making based on cost accounting data receives new dimensions where accuracy leaves no other alternatives. Thus, sophistication of costing system becomes a norm in costing system design literature now-a-days.

The main tenet of sophistication in product costing centered on the core concept of identifying the cost with the product for the right portion of organizational resources

consumed by the respective products. However, traditional product costing seriously distort the product cost due to the impact of gross aggregation of overheads whereby high-volume products are under-costed and low-volume products are over-costed resulting a cross-subsidized situation. This is an unethical practice and goes against professionalism where a group of customers gains at the cost of others due to the wrong practice of firms. In a sophisticated product costing system, practitioners try to charge the products accurately for the physical resources consumed by them through an activity analysis under cause and effect manner. Activity based costing is a method developed so far to address these issues where products are being charged via activities following the basic principle of product costing – ‘it is not the product rather activities that consume cost’. However, it doesn’t mean that ABC and sophistication is synonymous though some studies use ABC as a proxy to sophistication. Most of the studies used cost pools and cost drivers to define and measure sophistication. This chapter proposes a holistic approach of measuring sophistication considering underlying contingency framework in management accounting research. The new definition of sophistication covers multi-goals of sophisticated costing system which is ensuring accuracy in product costing and taking the accurate decision in time.

To bring accuracy in decision making in defining sophistication, we have used the level of education of practitioners and level of adoption of different management accounting tools relating to managerial decision making. Education is an important criterion to measure sophistication which none of the papers considers. Practitioners’ philosophy is codified in text from where young learners learn practice in class room and when they come to practice, they enjoy ample opportunity to innovate something and this reciprocity continues until some further developments are coming in the field. At the same time, a score comes from the level of application of different management accounting tools as for example some papers used direct costing (Al-Omiri and Drury, 2007; Mgbame and Osamuyimen, 2010), activity based costing (Ahmadzadeh et al., 2011 and Ismail and Mahmoud, 2012) etc. This consideration acknowledges the call of Brierly (2008) for a wider definition of sophistication addressing the use of cost accounting information. Cost drivers and cost pools are also used as independent parameters to measure sophistication as these are commonly used in different related researches.

Finally, an integrated scale is proposed here to measure the level of sophistication attained by a firm in a holistic manner. Here we have tried to make a balanced scale covering both ‘conditional truth’ and ‘costly truth’ approaches. Weighted method leaves

enough scope of flexibility to the researchers and practitioners to consider underlying contingency in research. The work of Brierley (2008) is the motivation of this research where he acknowledges candidly that the way sophistication is defined in earlier papers made the scope of the research very narrow. The proposal of Brierley (2008) is operationalized here by bringing different definitions into a single scale.

Chapter 7

Analyzing Gaps in Management Accounting Practices: A Proposed Theory and Modeling

This chapter extends discussion covering following main points –

- 7.1 Introduction
- 7.2 Literature Review
- 7.3 Methodology
- 7.4 Gap Analysis
- 7.5 Proposed PERAPPGAP Model
- 7.6 Exploratory Factor Analysis
- 7.7 Computation of Gap Score under PERAPPGAP Model: An Empirical Example
- 7.8 Range of Gap Score
- 7.9 Gap Score and its relationship with intension to switch, net assets and profitability
- 7.10 Conclusion

7.1 Introduction

Management accounting is generally understood as a process or as referring to the use of techniques. It has been defined as the application of appropriate techniques and concepts in processing the historical and projected economic data of an entity to assist management in establishing a plan for reasonable economic objectives, and in the making of rational decisions with a view towards achieving these objectives¹. Similarly, the emergent conceptual framework of management accounting started by the National Association of Accountants defined it as the process of identification, measurement, accumulation, analysis, preparation, interpretation and communication of financial information used by management to plan, evaluate and control within an organization and to assure the appropriate use of and accountability for its resources. Management accounting also comprises the preparation of financial reports for non-management groups such as

¹ AAA Committee on Management Accounting, “Report of the 1958 Committee on Management Accounting,” 210.

shareholders, creditors, regulatory agencies, and tax authorities². These definitions direct the compositions of management accounting practices in a wider framework.

Many scholars (Otley, 1995; Kaplan and Atkinson, 1998, Hoque and Mia, 2001; Fullerton and McWatters, 2002; Haldma and Laats, 2002) argue that the ‘new’ techniques have affected the whole process of management accounting (planning, controlling, decision-making, and communication) and have shifted its focus from a ‘simple’ or ‘naive’ role of cost determination and financial control, to a ‘sophisticated’ role of creating value through improved deployment of resources. However, the degree of application of different management accounting tools, old or new, depends on different contingent factors which are essentially been guided by the contingency theory of management accounting. The contingency approach to management accounting is based on the premise that there is no universally appropriate accounting system applying equally to all organizations in all circumstances (Emmanuel et al., 1990). Rather it is suggested that the particular feature of an appropriate accounting system will depend on the specific circumstances in which an organization finds itself. As depicted in **Figure 7.1**, contingency approach is being shaped by some external and internal contextual factors. The most common internal factors that have been examined in relation to management accounting are organizational size (Khandwalla, 1972; Bruns and Waterhouse, 1975; Merchant 1981), technology (Khandwalla, 1977; Dunk, 1992), and companies’ strategies (Miles and Snow, 1978, Gupta and Govindarajan, 1984; Simons, 1987; Chenhall and Morris, 1995). The major external factors that have been examined at the company level in management accounting and control (including cost accounting) research are external environment (Khandwalla, 1977; Merchant, 1990; Chapmann, 1997; Hartmann, 2000), and national culture (Hofstede, 1984; Harrison, 1992; O’Connor, 1995).

² National Association of Accountants, Definition of Management Accounting, Statement Number IA (New York: NA, March 18, 1981), 4.

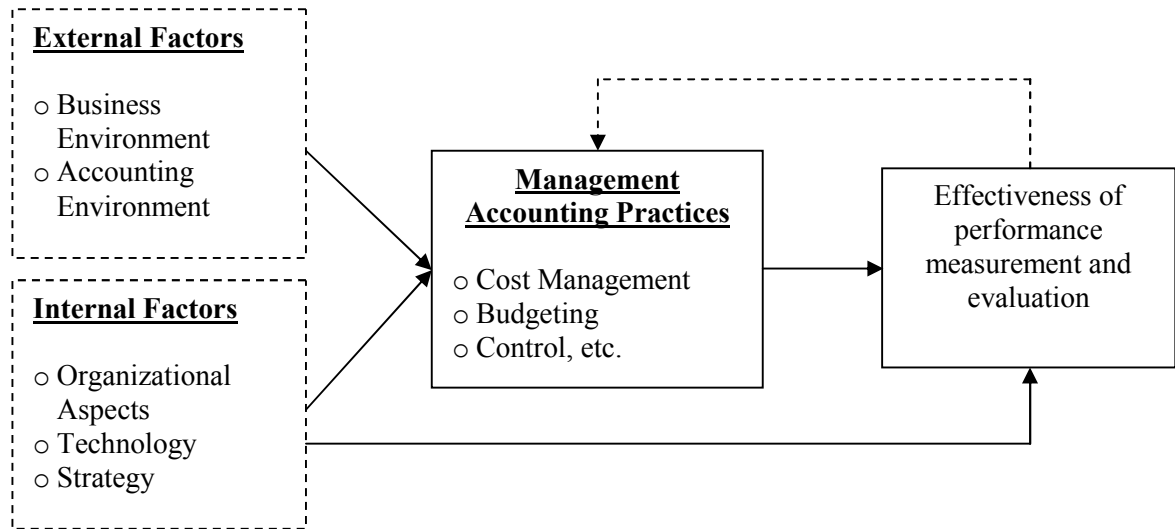


Figure 7.1: Theoretical framework of contingency approach (Haldma and Lääts, 2002)

If a management accounting system is designed without understanding the contingency approach or without the identification of appropriate contextual factors behind such contingency approach, management accounting practices lose its significance and spoil the whole process generating a significant gap. Due to redefining management accounting by IMA in 2008, management accounting practitioners, academics and researchers become interested in studying the nature of management accounting practices. This interest is initially being rationalized by the existence of perceived gap between the theory and practice of management accounting, and specially the generally accepted belief that the traditional wisdom of management accounting as reflected in textbooks is not widely used in practice. Such conceptualization was based on few published studies (Cooper et al., 1983; Berry, 1984; Wilkinson, 1986; Ouibrahim and Scapens, 1988) covering the use of particular management accounting techniques (Hoque, 1991). This is the motivation behind gap analysis in Bangladesh with regard to management accounting practices. This gap analysis is a multi-facet issue which covers the whole varieties of topics relating to gaps like reasons of gaps, different types of gaps, quantifying gaps, agents of gaps, implications of gaps and potential efforts to reduce such gaps. This chapter mainly covers most of these topics and applies a holistic approach of research considering both quantitative and qualitative research methodologies with research triangulation. A gap model is proposed here by applying grounded theory approach which identifies different types of gaps along with the agents who are responsible for such gaps. One of such gap is the difference between practitioners' perceived importance towards

different management accounting techniques and their level of application in practice which has been quantified here with a proposed model. The proposed **PERAPPGAP Model** is made instrumental here in line with a similar model which exists in marketing literature popularly named as **SERVQUAL Model** developed by Parasuraman et al. (1985) to measure gaps between customer expectation and customer perception of service quality along five dimensions. Like **SERVQUAL Model**, a template is also proposed here which can be customized based on the contingent requirements. A methodology is also proposed here to compute the gap score in a scientific way. Later on, the relationship between the gap score and some firm specific parameters are explored to bring contingency approach in the analysis. The qualitative part of the study is based on selective interview and the quantitative part of the research is based on a semi-structured questionnaire survey where the respondents are management accounting practitioners playing strategic role in respective firms.

7.2 Literature Review

Existing literature on gaps in management accounting practices mostly covers the gap between theory and practice. The management accounting curriculum has been the topic of considerable debate over the past 25 years in terms of what should be included in its common body of knowledge (CBK), and whether a gap exists between theory and practice. Scapens (1983) focuses on the “gap between theory and practice” in management accounting and criticizes sophisticated mathematical techniques appearing in textbooks as having limited adoption in practice. Practitioners, he argues, must be able to see the relevance and understand the results of academic research. Scapens (1983) believes that more academic study must be conducted on management accounting in practice in order to be relevant to practitioners. The identification of the existence of a gap may assist practitioners and academics in determining the nature of that gap and how to reduce it. Existence of a possible ‘gap’ in management accounting between theory and practice may indicate that academics are not teaching the latest techniques or are not teaching the traditional methods still in use (Scapens, 1983; Novin et al., 1990).

Prior to the 1960s, accounting academia was oriented towards practice: education was focused on solving practical problems, faculty members had only professional certifications and significant practical experience, and research was mostly practice-oriented (Baker, 2011). Some argue that the introduction of doctoral studies created a

mini revolution inducing a rapidly growing level of sophistication in research (Bricker, 1993). Baker (2011) considers that the turning point was in fact a highly influential report written in 1959 by two American business school deans, who “recommended certain fundamental changes to American higher education for business, focusing on a move away from practical education to a more scientific approach”. It encourages the application of econometric models in doctoral studies which gradually becomes the positivist or empirical paradigm in accounting academia.

This was the start of an evolution towards the use of complex research methodologies, and of theories as the foundation of accounting research, and generally towards a “sophistication” of research. The use of research publications as criteria in the ranking of universities, programs and researchers lead to some extent to a focus on the publication process in itself, and not on the relevance of research. Nowadays it is considered that the selection of the topics for research and methodologies is based on the chances of publication, leading to an accounting research which is “esoteric” and “removed from the problems of the practice” (Gaffikin, 2009).

Kaplan (1984) found that management accounting techniques witnessed little development from 1925 to the mid-1980s. He argued that the reliance of management accounting academics on studies based on economic models rather than on examples from actual organisations contributed significantly to the gap between study and practice. Cable et al. (2007) emphasised the need to refine the accounting programs that were being offered in academic institutions

“to bridge the gap between academic study in accounting and a career in professional practice, aiming to deliver work-ready graduates who will assist in meeting the needs of employer and help alleviate the skill shortage in the ...accounting profession.”

A closer cooperation between accounting academicians and practitioners is recommended to narrow the gap between study and practice (Lovell, 1988). A partnership among authors, researchers, educators and practitioners is also suggested (Siegel & Sorenson, 1994). Accounting educators must participate in internships (Hendricks, 1993). Researchers trained in accounting, economics, behavioural science and organisational theory must conduct collaborative research to help them breakaway from their preoccupation with technical issues (Bhimani, 1994).

It is considered that accounting research has become highly mathematical, employing sometimes exotic theories and with a reduced focus on practice (Bricker, 1993). However, for Baldvinsdottir et al. (2010) it is a surprise how empiricism, which is focused on what is happening in practice, leads to results that are not of interest for practitioners. On the other hand, practitioners seem to expect to find solutions for their immediate problems in research papers (Miller, 1977). Tucker and Lowe (2011) suggest that practitioners are not motivated to read, understand and engage with accounting research. Therefore, practitioners are not interested at all in research: they are reluctant in disclosing data for research and do not get involved in challenges or debates (Parker et al., 2011). However, related literature particularly targets the gap that exists between academia and practice caused by the divergences in objectives as perceived by the academic researchers and practitioners. This study extends the existing analysis of gap with all the possible dimensions.

This research also proposes a particular methodology to quantify the gaps through scoring and tries to find its relationship with different parameters like size of the firm (measured by turnover, net assets), performance (profitability) and ultimate target of applying different management accounting techniques (accuracy).

Organizational size is an important factor that is reported to affect both structure and other control arrangements. Large organizations have more complex and diverse facilities that aid the adoption of a large number of innovations (Nord and Tucker, 1987). Previous empirical studies have noted a positive relationship between company size and the adoption of innovations (Blau and McKinley, 1979; Dewar and Dutton, 1986 and Damanpour, 1992). Otley (1995), for example, reported evidence of the impact of size on control techniques in studies of the role of management accounting systems following merger or takeover. Also, Haldma and Lääts (2002) argue that the sophistication level of cost accounting and budgeting systems tends to increase in the line with a firm's size. Moving from naive to more sophisticated MAPs requires resources and specialists only affordable by large organizations. Thus, gap score has been regressed here with size variables like turnover and net assets to find out any possible cause of gap that may be driven by size variables.

Performance may be an antecedent or an outcome factor of management accounting and organizational change. Low financial performance is said to be one of the reasons for the firm to change its management accounting and internal organizational factors to improve

performance (Granlund, 2001; Laitinen, 2006). Some past researches have examined the impact of management accounting and organizational change on organizational performance (see for example, Baines & Langfield-Smith, 2003; Choe, 2004; Hoque, 2004; Sisaye, 2003; Waclawski, 1996). In this chapter, an effort is also made to find any relationship between profitability (as a financial measure of performance) with the gap score.

Management accounting practices also ensure accuracy in managerial decision making process. Thus the relationship between gap score and accuracy is also sought for in this chapter.

7.3 Methodology

Both quantitative and qualitative research methodology is applied to achieve the research objectives. For the qualitative part, an unstructured questionnaire was used as data collection tool. Patton (1990) identified three types of qualitative interviews, namely, informal conversational interviews, guided interviews and standardised open-ended interviews. Although these types vary in terms of their questioning format and structure, the responses to all these interviews are open-ended and unrestricted to the choices provided by the interviewer. Although an unstructured interview does not follow an official guideline, this study applies the six following steps as advocated by Punch (1998) and Fontana and Frey (2005):

Step 1: Accessing the setting.

Step 2: Understanding the language and culture of the interviewees.

Step 3: Deciding how to present the questions.

Step 4: Locating an informant.

Step 5: Gaining trust and establishing rapport with the interviewees.

Step 6: Capturing the data.

The interview data were not audio recorded because all the respondents who have taken part in interview were professional management accountants holding very important positions in their respective firms, such as chief financial officers, finance controllers, directors of finance, finance managers and company secretaries. Therefore, the traditional

note-taking method was used for capturing data. Each interview lasted for approximately two to three hours. The interviewees were working in various renowned business centres located in Dhaka, the capital city of Bangladesh. The interviewees were contacted for their schedule, and the interviews were conducted in person because face-to-face interviews could offer a greater degree of flexibility than other interview techniques. Despite its labour intensive nature, the face-to-face interview method was preferred for this research because of the sensitive subject matter, complex questions and lengthy interview period. The interviewees were informed as to the purpose of the interview and were encouraged to ask questions for clarification, offer prompt responses and propose new ideas that could not be achieved through the other interview methods. The interview outcomes were codified, drafted and confirmed by the respective interviewees for proper synchronisation. A total of 16 such in-depth interview sessions are organized which results the organic gap model. And for the quantitative part, a questionnaire to study the management accounting practices in Bangladesh was constructed covering mostly every definition of practices of management accounting which has already been introduced in chapter 1. However, this study is based on a small section of the questionnaire where the respondents are asked to mark values on a 5-point **Likert** scale corresponding to different management accounting techniques that is supposed to be applied in Bangladesh. These techniques are identified from different researches conducted so far in Bangladesh on management accounting practices. Technically, the questionnaire presents a comparative scenario before the respondents to choose two values for each technique, one to identify the level of application in the respective firms, and another to specify the level of importance of the techniques as the respondents think of relating to the firm he represents. It is believed that the biased attitude of the respondents could be checked significantly due to the structure of the questionnaire.

7.3.1 Data Analysis

The interviews were analysed using qualitative research methods (Lincoln & Guba, 1985; Miles & Huberman, 1994; Strauss & Corbin, 1998), such as thematic analysis, grounded theory and discourse analysis. Grounded theory was applied to derive a model for identifying the gaps in management accounting practices.

Grounded theory was chosen amongst other possible interpretive approaches for several reasons. Parker and Roffey (1997) stress that *“rather than focusing exclusively on describing field members’ sense-making activities and interactions, grounded theory aims to incorporate the researchers’ understandings, and attempts to develop explanatory theoretical frameworks representing structures and processes observed”*. Grounded theorists attempt to assume the responsibility of interpreting the data, instead of simply reporting it. Another argument for using grounded theory is its ability to generate theory and to ground that theory in data (Strauss and Corbin, 1998). Furthermore, the methodology allows the actors’ own perceptions and meanings to emerge. Grounded theory practitioners argue that studies which begin with pre-defined operational variables developed from positivist hypotheses exclude the possibility of identifying either new ‘variables’ or categories of data, or a more meaningful analysis of the relationships and patterns between variables (Parker and Roffey, 1997). Furthermore, grounded theory is capable of capturing complex social phenomena, as it emphasizes the need for developing many concepts and their linkages (Strauss, 1987).

LoBiondo-Wood & Haber (1994) suggest different scenarios to which grounded theory is particularly suited, which include research where there is comparatively little known about a phenomenon and reality is multi-faceted and where there is no prior theory to explain what has happened or existing theories fail to explain a particular set of circumstances. Kirk & Van Staden (2001) also argue for the use of grounded theory in accounting research in terms of ensuring that theoretical constructs that arise out of the research are based on the understanding and values that the economic actors attach to key concepts and themes that underlie accounting, economic and financial theory. Lye et al. (2005) also justify its use as a valuable research approach in attempting to understand the social construction of accounting.

Parker and Roffey (1997) exhorted its use in accounting research and a body of such research is now emerging. Covaliski & Dirsmith (1986, 1988), applied it to produce grounded theories of budgeting; Czarniawska-Joerges (1988), examined changes in organizational control; Czarniawska-Joerges & Jacobsson (1989), traced the connections between budget processes in organizations and the cultural context in which the organizations exist. Lye et al. (2005) used grounded theory to research the process of change with respect to the Crown Financial Statements for public sector accounting in New Zealand. Goddard and Abdul-Rahman (1998) undertook an inquiry of accounting

practices in religious organizations in Malaysia. Rahaman and Lawrence (2001) researched a negotiated order perspective on public sector accounting and financial control. Goddard (2004) developed a grounded theory of budgetary practices and accountability habitus in UK local government and of accounting and navigating legitimacy in Tanzanian NGOs (Goddard and Assad 2006). However, grounded theory is never applied in gap analysis relating to management accounting practices and the existing theory in this area also reflects a very limited focus which is the main motivating factor of applying grounded theory in this research.

The first stage of the analysis began by examining all interview transcripts. After each interview, the entire discussion was transcribed by the interviewer and confirmed by the interviewees to synchronise the contents and reduce any divergence that might arise from the translation. The transcribed outputs were then analysed using open, axial and selective coding techniques (Strauss & Corbin, 1998). Open coding involved a line-by-line analysis of the transcribed interviews to identify key words and phrases. Axial coding involved clustering the codes to identify the core categories in the data and the relationships among the core categories. Selective coding involved the identification of a central category or categories that answered the research question. To facilitate axial and selective coding, written memos were used to provide meaning to the interview data and outline ideas. The 'wandering in the desert' syndrome (i.e., issues that surround the identification of relevant data, including concerns in data coding) was addressed by using a matrix and cognitive map. Matrices were used to relate a number of key themes to different respondents. The results were cross-tabulated, in which the cases or individuals were outlined on one side of the table, and the main concepts outlined on the top and quotations placed on each cell. The concepts and themes were graphically presented using a cognitive map similar to flowcharts that displayed how one theme or category could influence another. Cognitive maps can be drawn up for each individual to develop summary maps. Cognitive maps are particularly useful in examining personal decision-making processes.

Qualitative data analysis occurs concurrently with data collection to assist the investigators in understanding the research questions and the sampling. This iterative data collection and analysis process eventually leads to saturation, which refers to a point in the data collection where no new categories or themes can emerge, signalling the completion of the data collection process (Kuzel, 1999). Theoretical saturation is achieved when sufficient data have been collected for the researcher to gain an adequate

understanding of the dimensions and properties of emerging concepts and themes (Watling & Lingard, 2012). As the theoretical saturation is achieved after 16 interviews, no more interviews are conducted and gap model has been finalized.

7.4 Gap Analysis

As discussed in the literature review section, existing studies on management accounting cover a potential gap between theory and practice where only academicians and practitioners are considered as key agents. This study has adopted a holistic approach to identify each possible gap and key agents with active roles behind such gaps. Open, axial and selective coding with the help of memos, matrices and cognitive mapping resulted in an exclusive gap model that extends the existing definition of gap in the management accounting literature. The analysis results nine agents and seven different gaps as presented in **Figure 7.2**.

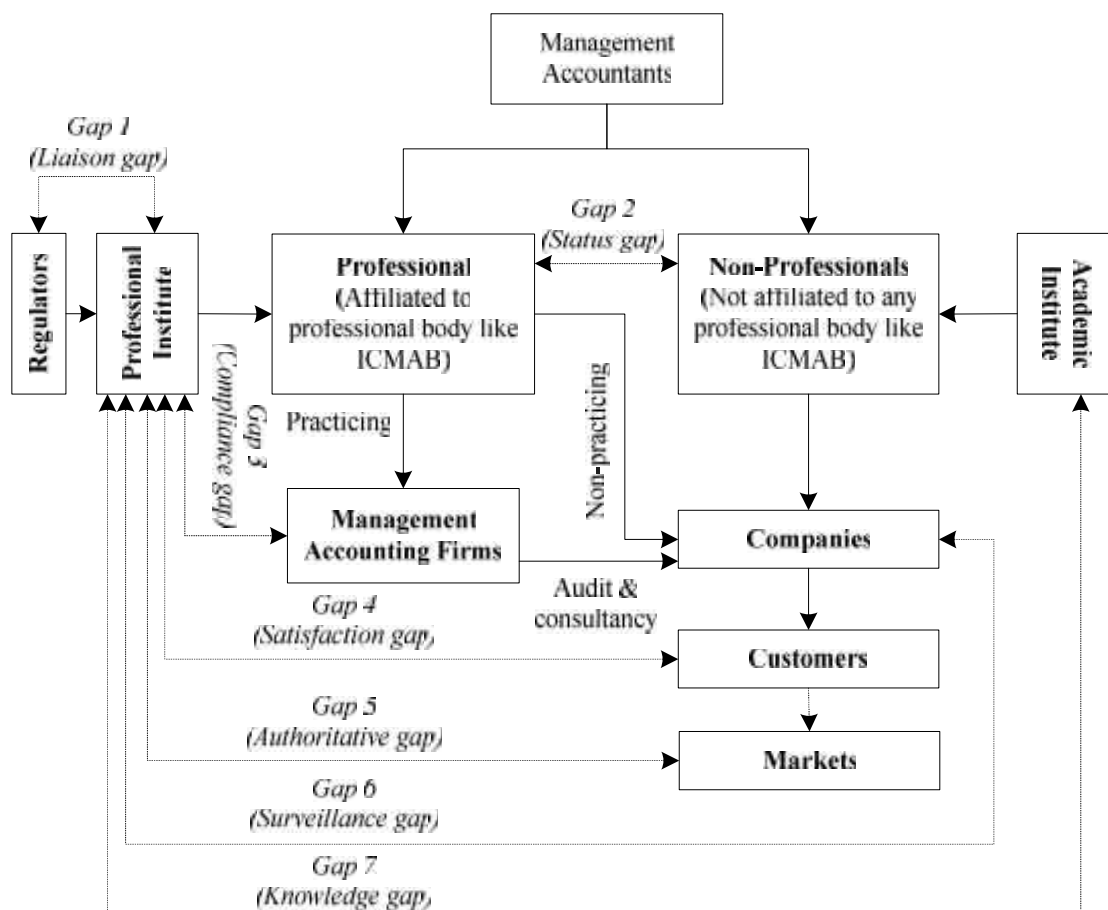


Figure 7.2: Gaps in Management Accounting Practices

Each of the seven gaps is responsible for the low diffusion of management accounting practices in any country. In Bangladesh, the gap in all seven categories is unexpectedly high. Therefore, the management accounting practices in Bangladesh are in poor state. Cognitive mapping helps establishing a model according to the classified interview data. The content analysis of the interview outcomes produced common key themes. The matrices are then used to identify the relationships, and mapping helps in the formation of groups according to internal cohesiveness. All seven gaps are briefly explained below.

Gap 1 (Liaison Gap): This gap is formed between a national professional accounting body (i.e., ICMAB) and a local (i.e., the government of Bangladesh) or an international (i.e., IFAC) regulator on the grounds of mutual interest and benefits. A liaison gap represents the weak efforts that a professional institute demonstrates to local and international regulators in instilling favourable treatment. Professional institutes must be able to lobby with the local regulators to ensure proper recognition and power. They must also maintain close relationships with international bodies to ensure excellent professionalism and highest standards in practice. Maintaining routine engagement is not sufficient for achieving this purpose. The institute must represent itself globally in a different capacity development program.

Gap 2 (Status Gap): This gap is formed between professional and non-professional accountants on grounds of work methods and ego. This gap may arise from the superiority complex on the ground of knowledge base, authority or responsibility in the work place and capacity of having power, all of which are detrimental to the development of sound management accounting practices. The formation of a close linkage between professional and academic institutes in terms of knowledge sharing, faculty exchange programs and twining projects for capacity development could reduce this gap significantly.

Gap 3 (Compliance Gap): This gap is formed between licensed management accounting firms and the institute on grounds of compliance to set rules and regulations. Compliance gap arises when practitioners do not have sufficient guidelines to follow. Although several management accounting firms have already been established in Bangladesh, the jobs of such firms are not well defined and structured. Although the institute has developed a set of rules, they are not enough to allow professionals to face their challenges.

Gap 4 (Satisfaction Gap): This gap is formed between the institute and its customers on grounds that the latter is unsatisfied with the functionality of the former. Satisfaction gap is the most important gap that results in poor management accounting practices in any given country. The ultimate benefit of management accounting practices goes to those customers who are not involved in the process. The customers must be aware of the prices and quality of the products they are buying. The institute must organise awareness building programs where customers may be trained properly and educated on their rights and demands. In this way, the demand for management accounting practices can be properly received and addressed.

Gap 5 (Authoritative Gap): This gap is formed between the institute and its market on grounds of authority, responsibility and power. Authoritative gap comes from the acceptability of the profession by the market at large. No profession can exist and grow without direct support from the market. A low authoritative gap is observed in Bangladesh as the market believes that the management accounting profession can provide value. However, instead of adding value to everyone, such profession only adds value to employers bypassing the value that may be added to other players in the market, such as customers, suppliers and bankers.

Gap 6 (Surveillance Gap): This gap is formed between the institute and the companies because of their weak relationship. By certifying management accountants who work for different companies, the institute supplies the accountants as demanded by the companies. However, given that no notable relationship exists between these two parties, the companies are uninformed of the demands and requirements of the institute.

Gap 7 (Knowledge Gap): This gap is formed between professional and academic institutes because of the non-existence of knowledge reciprocity. Universities all over the world usually collaborate with professional bodies in organising different programs where the professionals and academia can interact closely with each other. These programs create a congenial learning environment from where both the parties are benefited.

All seven gaps negatively affect the status of management accounting practices. Appropriate measures must be taken to reduce such gaps as well as to strengthen the manufacturing sectors through the application of proper management accounting techniques. Further research must be conducted where each gap can be measured by using different behavioural tools and alternative methods for minimising such gaps can be

formulated. **Table 7.8** summarises the gaps and presents directions for further research. The last column of the table proposes several potential techniques that may be used to quantify and update the improvement status of each gap. The gap-reducing strategies proposed by the interviewees are also described.

These gaps are perceived by professional management accountants who are working at different capacities. To justify the model theoretically, the researcher has tried to confirm these gaps according to their nature as proposed by the practitioners. However, quantification of these gaps is outside the scope of this paper. The templates are used to identify the factors in each gap and to provide a five-point scale, with 1 referring to the lowest gap and 5 referring to the highest gap. For example, to confirm the existence of a liaison gap, selected regulators and professional institutes are provided with the following template:

Professional Institute	Liaison Gap								Regulators		
	Co-ordination	1		2		3		4			5
	Lobbying	1		2		3		4			5
Relationship	1		2		3		4		5		

Table 7.1: Template to confirm Liaison Gap

The template obtained an average value of 4.7 according to the responses of 16 respondents. Another template is used to confirm the existence of a status gap as perceived by non-professionals.

Professional Accountants	Status Gap								Non-Professional Accountants		
	Superiority	1		2		3		4			5
	Ambiguity	1		2		3		4			5
Relationship	1		2		3		4		5		

Table 7.2: Template to confirm Status Gap

The template obtained an average value of 4.3 according to the responses of 16 respondents. Another template is used to confirm the existence of a compliance gap as perceived by the professional institute and management accounting firms.

Professional Institute	Compliance Gap								Management Accounting Firms		
	Guidelines	1		2		3		4			5
	Compliance	1		2		3		4			5
	Participation	1		2		3		4			5

Table 7.3: Template to confirm Compliance Gap

The template obtained an average value of 4.1 according to the responses of 16 respondents. Another template is used to confirm the existence of a satisfaction gap as perceived by the professional institute and customers.

Professional Institute	Satisfaction Gap								Customers		
	Involvement	1		2		3		4			5
	Awareness	1		2		3		4			5

Table 7.4: Template to confirm Satisfaction Gap

This template obtained an average value of 4.8 according to the responses of 16 respondents. Another template is used to confirm the existence of an authoritative gap as perceived by the professional institute and market representatives.

Professional Institute	Authoritative Gap								Markets		
	Acceptability	1		2		3		4			5
	Orientation	1		2		3		4			5

Table 7.5: Template to confirm Authoritative Gap

This template obtained an average value of 4.4 according to the responses of 16 respondents. Another template is used to confirm the existence of a surveillance gap as perceived by the professional institute and company managers.

Professional Institute	Surveillance Gap								Companies		
	Interaction	1		2		3		4			5
	Reciprocity	1		2		3		4			5
	Assessments	1		2		3		4			5

Table 7.6: Template to confirm Surveillance Gap

This template obtained an average value of 4.6 according to the responses of 16 respondents. Another template is used to confirm the existence of a knowledge gap as perceived by the professional and academic institutes.

Professional Institute	Knowledge Gap										Academic Institute	
	Interaction	1		2		3		4		5		
	Reciprocity	1		2		3		4		5		
Ignorance	1		2		3		4		5			

Table 7.7: Template to confirm Knowledge Gap

This template obtained an average value of 4.8 according to the responses of 16 respondents. The confirmation from the key agents validates the gap model, which can be easily used as a reference in further studies.

A summary of all the seven gaps as discussed, their nature, ways to reduce each of them and proposed techniques are presented in **Table 7.8** below.

Gaps and Key Agents	Nature of Gap	Effort to reduce gap	Techniques
Gap 1 (Liaison Gap): Regulators and the professional institute	<ul style="list-style-type: none"> • Less coordination • Weak lobbying • Weak relationship with local and international regulators 	<ul style="list-style-type: none"> • Conduct occasional visits to update regulators • Invite regulators in knowledge-based programs • Ensure the highest degree of compliance • Promptly respond to regulatory calls • Actively participate in regulatory requests 	Compliance–noncompliance gap
Gap 2 (Status Gap): Professionals and non-professionals	<ul style="list-style-type: none"> • Superiority complex • Ambiguity in job definition • Weak relationship in the workplace 	<ul style="list-style-type: none"> • Joint programs • More professionals in academia for teaching • Programs certified by a professional institute • Curriculum developed by professionals • Grooming program organised by professionals 	Baseline survey and effect assessment
Gap 3 (Compliance Gap): Professional institute and management accounting firms	<ul style="list-style-type: none"> • Lack of proper guidelines • Weak compliance (oversight) mechanism • Weak participation in the development process of firms 	<ul style="list-style-type: none"> • Prepare and publish guidelines • Train practitioners • Promptly respond to the queries of practitioners • Establish key performance indicators (KPI) for firms • Implement a penalty–reward system according to KPI 	Compliance–noncompliance gap, rich text possession status
Gap 4 (Satisfaction Gap): Professional institute and customers	<ul style="list-style-type: none"> • Lack of customer involvement • Lack of awareness of customers regarding their rights 	<ul style="list-style-type: none"> • Awareness program for customers • Ensure the involvement of customers 	Behavioural study, gap model (i.e., SERVQUAL)
Gap 5 (Authoritative Gap): Professional institute and market	<ul style="list-style-type: none"> • Low acceptability in the market • Wrong market orientation and perception 	<ul style="list-style-type: none"> • Ensure the highest level of acceptability from market players who are the direct beneficiaries, such as suppliers, customers, owners and managers. 	Demand–supply trade off
Gap 6 (Surveillance Gap): Professional institute and companies	<ul style="list-style-type: none"> • Less interaction between companies and professional institutes • No reciprocity of respective requirements and demands • No assessments 	<ul style="list-style-type: none"> • Frequent corporate visits • Corporate dinners, awards and other programs • Corporate presentations and management consultations • Curriculum design and development based on company requirements 	Baseline survey and effect assessment
Gap 7 (Knowledge Gap): Professional and academic institutes	<ul style="list-style-type: none"> • Less interaction between institutes • Less knowledge and wisdom reciprocity between institutes • Ignorance about each other 	<ul style="list-style-type: none"> • Offering of collaborative degrees • Organising of joint conferences, seminars and symposiums • Faculty exchange programs between institutes • Recruitment of more professionals to teach in class 	Baseline survey and effect assessment

Table 7.8: Summary of the Gaps and Future Research Directions

7.5 Proposed PERAPPGAP Model

Different descriptive statistics are used to deal with the management accounting techniques used in the study to give a comparative picture. However, the specialty of this chapter is that it proposes a PERAPPGAP (perception-application gap) Model in the form of a template to calculate a gap score for a company. This template can be replicated to make it more holistic considering any new techniques along with improved methodologies of computing weightage and sub-weightage as applied here. The multi-stage approach of computing gap score under PERAPPGAP Model is presented below:

Stage 1: Group the management accounting techniques considered in the study based on the cohesiveness among them as it is reflected in the responses of the respondents by using CFA or EFA³ or any other methods applied for grouping like cluster analysis, image processing etc. This grouping is important in a sense that all the techniques chosen for the gap analysis should not have the same importance.

Stage 2: Gap of individual technique (GAP_i) should be computed by using the following formula:

$$GAP_i = PI_i - A_i \quad \text{eq. (1)}$$

In eq. (1), PI_i refers to perceived importance for i th technique and A_i refers to the level of application for i th technique.

Stage 3: Based on the gap score of individual technique, total gap score for each group will be computed by using eq. (2) as given below:

$$GAP_GROUP_j = \sum_{i=1}^n w_i (PI_i - A_i) \quad \text{eq. (2)}$$

Here, w_i refers to the respective weight for i th technique which may be either zero or one as per the following norms:

- Set $w_i = \text{zero (0)}$ if $(PI_i - A_i)$ is equal to zero. Here the rationality is that while $(PI_i - A_i)$ is zero; actually there exists no gap in practice.
- Set $w_i = \text{one (1)}$ if $(PI_i - A_i)$ is either positive or negative. Here the rationality is that while $(PI_i - A_i)$ is positive or negative; there really exists gaps between perceived importance and level of application of different management accounting techniques. However, in case of negative value of $(PI_i - A_i)$, it is important that we are using absolute difference.

³ Confirmatory Factor Analysis (CFA) or Exploratory Factory Analysis (EFA) are the common methods of data analysis that is available mostly in every statistical software packages.

Stage 4: And finally, gaps of groups are summed up with respective weights to reach to final gap score by using the following formula:

$$\text{Gapscore} = \sum_{j=1}^5 w_j \times \text{GAP_GROUP}_j \quad \text{eq. (3)}$$

Where, $\sum_{j=1}^5 w_j = 1$

7.6 Exploratory Factor Analysis

Literature review and selective interview before finalizing the questionnaire has identified 21 management accounting tools that may be applicable to Bangladeshi firms. Thus, the questionnaire provides a specific section covering 21 management accounting tools where respondents are asked to choose values for level of application in their respective firms and perceived importance of the tool in the firm he is representing on a 5 point scale. The difference between these two values selected by the respondents is considered the gap. However, considering these 21 tools separately to compute the gap score seems to be irrational as there may exist some underlying relationships among these 21 tools. Thus, exploratory factor analysis is done as a data reduction technique to identify whether any grouping among them is possible or not. This analysis is done three times based on three different dataset as mentioned below:

- a) Based on 113 responses across 21 tools as given by the respondents to represent their choice on ‘Level of Application’
- b) Based on 113 responses across 21 tools as given by the respondents to represent their choice on ‘Perceived Importance’
- c) Based on the gap between the choices for ‘Perceived Importance’ and ‘Level of Application’

A summary of all the analysis done on three different dataset is given below:

		Level of Application	Perceived Importance	Gap
1.	Measure of Sampling Adequacy	.756	.770	.815
2.	Level of Significance	.000	.000	.000
3.	Number of Factors Extracted	6	5	5
4.	Cumulative Percentage	64.950	60.658	71.094
5.	Existence of Complex Structure	Yes	No	Yes
6.	Reliability – Cronbach’s Alpha	.863	.871	.893

Table 7.9: Summary of Exploratory Factor Analysis in three different dataset

Three different analyses grouped the variables in different groups as given in following three tables:

a) As per Application

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Standard Costing	Back-flush Costing	CVP Analysis	Variance Analysis	Cash Flow Statement Analysis	Process Re-engineering
Responsibility Accounting	Target Costing	Variable Costing	Fund Flow Analysis	Ratio Analysis	Keizen Costing
Segment Reporting	Lean Manufacturing	Absorption Costing	Inter-firm Comparison	Budgetary Control	Balanced Scorecard
Theory of Constraints		Total Quality Management			
Activity Based Costing					

Table 7.10: EFA grouping of techniques as per level of application

b) As per Perceived Importance

Group 1	Group 2	Group 3	Group 4	Group 5
Cash Flow Statement Analysis	Theory of Constraints	Responsibility Accounting	Inter-firm Comparison	CVP Analysis
Ratio Analysis	Back-flush Costing	Segment Reporting	Standard Costing	Absorption Costing
Budgetary Control	Process Re-engineering	Balanced Scorecard	Variable Costing	
Variance Analysis	Activity Based Costing	Total Quality Management		
Fund Flow Analysis	Keizen Costing			
	Target Costing			
	Lean Manufacturing			

Table 7.11: EFA grouping of techniques as per perceived importance

c) As per Gap

Group 1	Group 2	Group 3	Group 4	Group 5
Segment Reporting	Cash Flow Statement Analysis	Fund Flow Analysis	Responsibility Accounting	Absorption Costing
Theory of Constraints	Ratio Analysis	Inter-firm Comparison	Activity Based Costing	Target Costing

Back-flush Costing	Budgetary Control	Standard Costing	Keizen Costing	Total Quality Management
Process Re-engineering	Variance Analysis	CVP Analysis	Balanced Scorecard	
	Lean Manufacturing	Variable Costing		

Table 7.12: EFA grouping of techniques as per gap between level of application and perceived importance

Based on the above discussion, exploratory factor analysis result considering the perceived importance data set is selected for further analysis and use. In most of the cases, all the three dataset results are within acceptable range, however, validity analysis results the dataset of perceived importance as more acceptable. This grouping doesn't allow any complex structure of multiple loading of single parameter into more than one. It confirms both the construct and content validity which is absent in other analysis.

7.7 Computation of Gap Score under PERAPPGAP Model: An Empirical Example

In line with the research methodology, a gap score computation worksheet is presented below that helps to compute the gap score for each of the firms participated in the survey. The work paper considers responses of a sample firm with regard to 21 management accounting tools grouped into five categories as per exploratory factor analysis. For each of the statements, the respondents are asked to mark two responses in a 5-point scale; one to represent the level of application of particular tools in the respective firm and another to represent the perceived importance from the same perspective. The column 'gap' refers to the difference between 'level of application' and 'perceived importance' across different management accounting tools which are categorized into five different groups as per exploratory factor analysis. The template presents the scenario of one respondent only. The column 'weight' chooses the value '0' for zero gap, '1' for positive and negative gaps as explained in methodology section. And finally 'gap score' column computes the gap score of each management accounting tool as a multiplication quotient between 'gap' and 'weight'.

Application	A	Perceived Importance	I	Gap	Weight	Gap Score		
Group 1								
A1	CFS is analyzed severely within the company	1	I1	CFS analysis is important for regular decision	4	3	1	3
A2	Ratio analysis is done at regular interval to appraise performance	1	I2	Ratio analysis is perceived to be an important tool to evaluate performance	4	3	1	3
A3	Company uses budget to control cost and other targets	3	I3	Budgetary control is important to keep things under control	1	-2	1	2
A4	Variances are analyzed to control cost and revenue	4	I4	Management conceive variance analysis as an important control tool	1	-3	1	3
A5	Fund flow analysis is applied to establish more control over funds	5	I5	Fund flow analysis is important to run investing and financing activities very smoothly	1	-4	1	4
							15	
Group 2								
A6	Theory of constraint is applied to handle constraint resources	4	I6	Theory of Constraint is important to utilize constraint resources more efficiently	1	-3	1	3
A7	Back-flush costing is applied to keep pace with the advanced production technology	3	I7	Back-flush costing is important to come to the market in time ensuring minimum production lead time	1	-2	1	2
A8	Process re-engineering is applied to ensure best work method in practice	3	I8	Process re-engineering is important to put more focus on value added activities	1	-2	1	2
A9	Activity based costing is applied to handle complexity in product costing	1	I9	Activity based costing is important to trace indirect costs with the ultimate cost objects more accurately	3	2	1	2
A10	Keizen costing is applied to practice continuous development	1	I10	Keizen costing is important to remain competitive in the market always	2	1	1	1
A11	Target costing is applied for product costing when market price of the products are known well ahead	1	I11	Target costing is important to keep the cost under control, within a limit	1	0	0	0
A12	Lean manufacturing is applied to ensure zero-defect during production	1	I12	Lean manufacturing helps us to justify our passion or commitment to quality	1	0	0	0
							10	

Group 3								
A13	Responsibility accounting is practiced to adhere to the ultimate strategic goal	1	I13	Responsibility accounting is important to ensure that everybody is working to achieve 'goal congruence'	3	2	1	2
A14	Segment reporting is applied to evaluate segment wise performance	1	I14	Segment reporting is important to take decision targeting to resource allocation to different segments	4	3	1	3
A15	Balanced scorecard is used to appraise the performance of business units	1	I15	Balanced scorecard is important to integrate both financial and non-financial measure for performance evaluation	4	3	1	3
A16	Total quality management is applied as a drive to ensure quality in totality	1	I16	Total quality management is important to achieve trust and faith of customers	5	4	1	4
								12
Group 4								
A17	Inter-firm comparison is done to evaluate competitive status and to take necessary actions as well	3	I17	Inter-firm comparison is important for competitive appraisal	1	-2	1	2
A18	Standard costing is applied to control cost and product costing	1	I18	Standard costing is important to control cost, price products and analyzing variances	1	0	0	0
A19	Variable costing is applied to appraise economic profit	4	I19	Variable costing is important for CVP analysis	1	-3	1	3
								5
Group 5								
A20	CVP analysis is done to take day to day managerial decision	5	I20	CVP analysis is important for break even analysis, cost structure and product mix decisions	1	-4	1	4
A21	Absorption costing is applied for meeting the external requirements	1	I21	Absorption costing is important for compliance	2	1	1	1
								5

Table 7.13: Gap Score Computation Work paper

The above template results the total gap score across five groups which is as follows:

Group	1	2	3	4	5
Gap Score	15	10	12	5	5

Table 7.14: Summary of gap score across 5 groups

To reach to the final gap score as advocated by one respondent, we need to know the respective weight across different groups total of which will be equal to one. Application of such weight will bring more discipline in the analysis and the gap score will be more meaningful. It will address the respective choice of different groups by respondents which is reflected properly in perceived importance. Otherwise, each group will be considered equally in the final gap score which may lead the gap score into a tunnel version with narrow focus. To compute the weights, following steps are applied:

1. Line wise responses of all the 113 respondents are re-grouped as per the result of EFA. The responses are collected from the scale for perceived importance as these weights represent the respective importance of different groups as advocated by the practitioners.
2. Later on, average scale value is computed for each line item as shown in column 3 of the following table. For example, individual score for 'Fund Flow Analysis' as given by 113 respondents are summed and the divided by 113 to calculate average score.
3. Average score for each group is computed in next step as shown in column 4 of the following table. This is done by summing the average scale value of each item in a group and then dividing the same with the number of items in the group.
4. Average score for each group is summed up and then respective weight for each group is computed by dividing individual average score with the total as shown in column 5 of the following table.
5. Gap score is copied as computed in the above template considering the response given by only one respondent which is shown in column 6 below.
6. Finally, the weighted gap score is computed (column 7 in the table below) by multiplying weights with the gap score (column 5 \times column 6) which is summed to have a final gap score. As per the example, the final gap score results to be 9.55.

Computation of weights and final gap score is shown below (**Table 7.15**):

Group	Management Accounting Tools	Average Score	Average Score of Group	Weights	Gap Score	Weighted Gap Score
1	2	3	4	5	6	$7 = 5 \times 6$
Group 1	Cash Flow Statement Analysis	4.390909091	4.074545455	0.23	15	3.45
	Ratio Analysis	4.045454545				
	Budgetary Control	4.281818182				
	Variance Analysis	3.809090909				
	Fund Flow Analysis	3.845454545				
Group 2	Theory of Constraints	2.909090909	2.971428571	0.17	10	1.7
	Back-flush Costing	2.563636364				
	Process Re-engineering	3.390909091				
	Activity Based Costing	3.245454545				
	Keizen Costing	2.5				
	Target Costing	3.318181818				
	Lean Manufacturing	2.872727273				
Group 3	Responsibility Accounting	3.554545455	3.65	0.20	12	2.4
	Segment Reporting	3.554545455				
	Balanced Scorecard	3.318181818				
	Total Quality Management	4.172727273				
Group 4	Inter-firm Comparison	3.490909091	3.809090909	0.21	5	1.05
	Standard Costing	3.881818182				
	Variable Costing	4.054545455				
Group 5	CVP Analysis	3.363636364	3.440909	0.19	5	0.95
	Absorption Costing	3.518181818				
Total			17.94597394	1.00		9.55

Table 7.15: Computation of Gap Score

7.8 Range of Gap Score

The value of the weighted gap score will follow a range between 0 and 16.60 (Table 7.16). The minimum and maximum value is computed as follows:

Group	Management Accounting Tools	Minimum Gap Score	Maximum Gap Score	Weights	Minimum Range	Maximum Range
1	2	3	4	5	$6 = 3 \times 5$	$7 = 4 \times 5$
Group 1	Cash Flow Statement Analysis	0	$4 \times 1 = 4$			
	Ratio Analysis	0	$4 \times 1 = 4$			
	Budgetary Control	0	$4 \times 1 = 4$			
	Variance Analysis	0	$4 \times 1 = 4$			
	Fund Flow Analysis	0	$4 \times 1 = 4$			
	Total	0	20	0.23	0	4.6
Group 2	Theory of Constraints	0	$4 \times 1 = 4$			
	Back-flush Costing	0	$4 \times 1 = 4$			
	Process Re-engineering	0	$4 \times 1 = 4$			
	Activity Based Costing	0	$4 \times 1 = 4$			
	Keizen Costing	0	$4 \times 1 = 4$			
	Target Costing	0	$4 \times 1 = 4$			
	Lean Manufacturing	0	$4 \times 1 = 4$			
	Total	0	28	0.17	0	4.76
Group 3	Responsibility Accounting	0	$4 \times 1 = 4$			
	Segment Reporting	0	$4 \times 1 = 4$			
	Balanced Scorecard	0	$4 \times 1 = 4$			
	Total Quality Management	0	$4 \times 1 = 4$			
	Total	0	16	0.20	0	3.2
Group 4	Inter-firm Comparison	0	$4 \times 1 = 4$			
	Standard Costing	0	$4 \times 1 = 4$			
	Variable Costing	0	$4 \times 1 = 4$			
	Total	0	12	0.21	0	2.52
Group 5	CVP Analysis	0	$4 \times 1 = 4$			
	Absorption Costing	0	$4 \times 1 = 4$			
	Total	0	8	0.19	0	1.52
Total				1.00	0	16.60

Table 7.16: Range of Gap Score

Thus a gap score close to zero represents better scenario in terms of application of management accounting tools whether a gap score close to 16.60 represents the poorest status.

7.9 Gap Score and its relationship with intension to switch, net assets, turnover and profitability

As the gap score represents the status of the respective firms regarding its implementation status of different management accounting tools, such gap score can easily be collated with other firm specific parameters for a more critical analysis. These variables are profitability, net assets, turnover and intention to switch. This section presents the relationship of gap score with the identified variables.

7.9.1 Gap Score and Intention to Switch

Intention to switch means the possibility of the respondents to switch to another firm within near future. The response is captured by either 'yes' or 'no'. To find out any relationship between gap score and intention to switch, the Mann-Whitney U test is applied. The test is a nonparametric test that can be used to analyze data from a two-group independent groups design when measurement is at least ordinal. It analyses the degree of separation (or the amount of overlap) between the groups. The null hypothesis assumes that the two sets of scores are samples from the same population; and therefore, because sampling was random, the two sets of scores do not differ from each other. The alternative hypothesis, on the other hand, states that the two sets of scores differ. The test results two important tables based on which the decision should be taken whether null hypothesis will be accepted or rejected.

Ranks					Test Statistics ^a	
	Intention to switch	N	Mean Rank	Sum of Ranks		Gap Score
Gap Score	No	93	54.39	5058.00	Mann-Whitney U	687.000
	Yes	20	69.15	1383.00	Wilcoxon W	5058.000
	Total	113			Z	-1.837
					Asymp. Sig. (2-tailed)	.066
					a. Grouping Variable: Intention to switch	

Table 7.17: Test statistics for gap score and intention to switch

Ranks Table

The **Ranks** table is the first table that provides information regarding the output of the actual Mann-Whitney U test. It shows mean rank and sum of ranks for the two groups tested (i.e., yes and no groups). The table is very useful because it indicates which group

can be considered as having the higher gap score, overall; namely, the group with the highest mean rank. In this case, the 'no' group had the highest gap score.

Test Statistics Table

This table shows us the actual significance value of the test. Specifically, the **Test Statistics** table provides the test statistic, U statistic, as well as the asymptotic significance (2-tailed) p -value. From this data, it can be concluded that gap score in the groups do not differ significantly ($U = 687, p = .066$).

Decision

As per the output of Mann-Whitney U test, it can be concluded that the model is not statistically significant and thus null hypothesis is not accepted. In other words, alternate hypothesis is accepted which means that gap score varies with the intention to switch of the respondents. The justification of such conclusion is well-founded. A practitioner who has positive intention to switch, he may not be happy with the job definition which is responsible for low diffusion of management accounting tools leading to wider gap score.

7.9.2 Gap Score and Profitability, Turnover, Net Assets

Profitability is measured in terms of net profit percentage with four groups. Turnover refers to annual sales and net asset is the value which is reached after deducting total liabilities from total assets. Both turnover and net assets are the parameter reflecting the size of the firms. The grouping of all the three parameters is shown below:

Profitability	Turnover (in BDT)	Net Assets (in BDT)
Less than 5%	Less than 100 million	Less than 100 million
5% - 10%	100 - 1,000 million	100 - 1,000 million
10.01% - 20%	1,001 - 10,000 million	1,001 - 10,000 million
Above 20%	More than 10,000 million	More than 10,000 million

Table 7.18: Categories of profitability, turnover and net assets

As these parameters have four groups and distribution free assumptions hold true, **Kruskal-Wallis Test**, a non-parametric test is applied to test the following null hypotheses.

- a) Gap score doesn't vary with the change in level of profitability
- b) Gap score doesn't vary with the change in level of turnover
- c) Gap score doesn't vary with the change in level of net assets

Three different run of the test considering three different grouping variables are presented below in a comparative way for easy interpretation.

Tests	Grouping Variables		
	Profitability	Turnover	Net Assets
Kruskal-Wallis Test			
Test Statistics - Asymp. Sig.	.002	.685	.819
Median Test			
Test Statistics - Asymp. Sig.	.050	.824	.832
Jonckheere-Terpstra Test			
Test Statistics - Asymp. Sig. (2-tailed)	.000	.504	.846

Table 7.19: Test statistics for gap score and grouping variables

The above output results that only first null hypothesis out of three is accepted and the other two are not accepted. It means that the gap score doesn't change due to change in profitability. However, changes in size of the firm in terms of turnover and net assets have a good bearing on the amount of gap score. It means that the size of the firms requires the application of more sophisticated management accounting tools and thus gap score varies for any change in the definition of size of the firms in terms of turnover and net assets. However, in terms of profitability, gap score doesn't vary. The reason may be that none of the participating firms is enjoying super-normal profit due to the application of sophisticated management accounting tools.

Multiple Regression Analysis

Considering the normality in distribution, a multiple regression analysis is conducted to identify the explanatory power of different independent variables on gap score which is the dependent variable. The model is presented below:

$$GS_i = \alpha + \beta_1 Accuracy_i + \beta_2 Profitability_i + \beta_3 Turnover_i + \beta_4 NetAssets_i + \beta_5 Intentiontoswitch_i + \epsilon$$

Regression model results the following output for analysis:

a) **Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.466 ^a	.217	.171	3.44608

a. Predictors: (Constant), Intention to Switch, Turnover, Accuracy, Profitability, Net Assets

b) **ANOVA**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	279.342	5	55.868	4.705	.001 ^a
	Residual	1009.415	85	11.875		
	Total	1288.758	90			

a. Predictors: (Constant), Intention to Switch, Turnover, Accuracy, Profitability, Net Assets

c) **Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	8.528	2.213		3.853	.000		
	Accuracy	-1.163	.368	-.315	-3.159	.002	.927	1.078
	Profitability	10.234	5.420	.191	1.888	.062	.903	1.107
	Turnover	-1.169E-11	.000	-.033	-.315	.753	.831	1.203
	Net Assets	-1.263E-10	.000	-.101	-.960	.340	.829	1.207
	Intention to Switch	1.389	.965	.150	1.439	.154	.848	1.179

Table 7.20: Summary output of results under regression analysis

Model summary reports a correlation coefficient (R) of .466 and coefficient of determination (R^2) of only .217 which refers that the explanatory power of the model is very weak. However, the model is significant ($p < .01$) as reported in ANOVA table. The coefficients table shows the relationship between gap score and each independent variables along with the level of significance. The relationship can be interpreted as following:

Independent Variables	Relationship with Gap Score	Level of Significance
Accuracy	Negative	Significant ($p < .01$)
Profitability	Positive	Marginally Significant ($p < .1$)
Turnover	Negative	Not Significant
Net Assets	Negative	Not Significant
Intention to Switch	Positive	Not Significant

Table 7.21: Relationship between gap score and other variables as per regression result

Negative relationship between gap score and accuracy refers that increase in gap score results decrease in accuracy and vice versa. However, the positive relationship between gap score and profitability which is marginally significant doesn't carry any logical explanation. Turnover and net assets show negative relationship which is not statistically significant. Finally, intention to switch is positively related with gap score; however, it is not statistically significant. The collinearity statistics (Tolerance and VIF) also shows that multicollinearity problem doesn't exist in the dataset.

7.10 Conclusion

Studying management accounting practices in Bangladesh is always challenging due to management accounting as an emerging profession which always attract a twinkling feedback from the practitioners. In many firms in Bangladesh, management accounting functionality is being embedded with overall corporate accounting giving it an overlapping role in corporate decision making. Thus it is very commonly observed that one accountant serves the dual functions; sometimes as financial accountant and sometimes as management accountant. This poor status in practice is caused by different reasons. Firstly, the country is still led by service sector where the requirement of management accounting is not so explicit like financial accounting. Secondly, the demands for management accounting practices are less due to absent of fierce competition in the market. Thirdly, management accounting profession in the country is still in its primitive form which restrains the market from smart diffusion of such practices. Fourthly, socio-economic condition of the country is leaned towards the information generated by the conventional accounting. Fifthly, market awareness regarding the usability of management accounting practices to different stakeholder groups like consumers, regulators, owner-managers etc. is in a very poor state. These reasons collectively pave a weak foundation for the growth and maturity of sound management accounting practices generating a significant gap in the field of management accounting. A generic gap model covering 7 different gaps caused by 9 key agents have been presented here as a result of the application of grounded theory in the field. At the same time, this chapter also proposes and applies a quantitative gap scoring model titled as PERAPPGAP Model.

This chapter proposes a conceptual model based on the responses of practitioners who are working in leading manufacturing firms located in Dhaka region. The questionnaire is a

semi-structured one which captures the responses of practitioners in a face to face communication mechanism. The responses so collected are analyzed in a multistage process under proposed PERAPPGAP Model to calculate a gap score for each participating firm which is later on related with some other firm specific parameters as considered in the study.

As per the findings of the analysis, gap score varies with the intention to switch of the respondents with the meaning that when a practitioner is considering the option of switching for better options, he will depict some sort of reluctance towards the current job resulting a higher gap score. In other hypotheses, gap score is tested with profitability, turnover and net assets of firms. The result shows that the gap score doesn't vary with the profitability, however, it varies with turnover and net assets of firms. It means that the gap score is related with the size variables of firms but it has no bearing on the profit earning capability of the firm. In an extended analysis through regression, it is also found that the gap score is negatively related with accuracy which is statistically significant. This is an important finding which means that the higher gap score will result lower accuracy which is also theoretically justifiable. However, two other parameters in regression model (profitability and intention to switch) show positive direction and two other parameters in regression model (turnover and net assets) show negative direction with relation to gap score. All of these variables are not statistically significant except profitability measure which is marginally significant. These findings confirm the earlier findings of non-parametric tests.

The findings of the study reveal some strategic dimensions. The reasons of higher gap score specific to different firm can be directly identified and addressed to reduce the gap score in a later time period. It also shows the potential benefit that a firm can avail from improvement in gap score. The analysis of gap score creates a supportive environment that will bring different sophisticated management accounting techniques in practice.

Chapter 8

Practitioners' Satisfaction Leading to Sophistication

This chapter extends discussion covering following main points –

- 8.1 Introduction
- 8.2 Literature Review and Hypothesis Development
- 8.3 Research Methodology
- 8.4 Analysis and Findings
- 8.5 Conclusion

8.1 Introduction

Companies in recent days work in a very highly competitive business environment driven by mostly unknown challenges and changes. Deregulation by encouraging private investments through privatization, borderless competition through highly decentralized corporate structure, high dependency on cost effective information and production technologies, customers' demands for greater product diversity, and the development of integrated enterprise-wide information systems have provided the impetus for many companies to implement more sophisticated product costing systems. In response, the role of accountants is said to be changing from bean counters to business partners (Kaplan, 1995; Siegel and Sorensen, 1999) for greater adaption. These changes have also been reflected in the considerable attention that has been given to cost system design in accounting journals, particularly the practitioner oriented journals such as the professional accounting journals. The past few decades have witnessed considerable changes in management accounting practices. From its traditional emphasis on financial decision analysis and budgetary control, management accounting has evolved to encompass a more strategic approach that emphasizes the identification, measurement, and management of the key financial and operational drivers of shareholder value (International Federation of Accountants, 1998; Institute of Management Accountants, 1999).

Much of the empirical work in the area of management accounting follows a contingency approach (Langfield-Smith, 1997; Chenhall, 2003). Such approach assumes that nothing is certain and every action depends on some internal and external contingent factors. Contingency approach, consisting of some internal and external factors, is driving management accounting practices forward giving it a behavioral shape. For example, satisfaction is a behavioral issue that depends on lots of contingent factors within or outside the firm. Identification of factors that may influence the level of satisfaction of both practitioners and customers has received considerable attention. Because satisfying both internal and external parties is the key to success. Addressing the respective requirements of both the parties becomes a prime issue and, in management accounting area, this is done through the establishment of sophisticated management accounting practices to the satisfaction of both the parties. This chapter targets to address the issue of satisfaction of management accountants, sophistication achieved in management accounting practices, and possible influence of satisfaction on sophistication.

Management accountants are the target group of the study. In studying the level of satisfaction, management accountants' perspectives have been considered and presented in chapter 3. In sophistication study, sophistication of management accounting practices has been extended considering different parameters used by different researchers like number of cost pools, number of cost drivers, types and nature of cost pools and drivers, (Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Abernethy et al., 2001) education, and degree of application of different management accounting techniques which are discussed in chapter 6. This chapter focuses on the identification of different contingent factors affecting the level of sophistication achieved by different firms and also searches for any relationship between the sophistication of management accounting practices with the level of satisfaction of management accountants. Management accountants' contribution in establishing sophisticated management accounting practices targeting to achieve broader corporate goals should not be undermined. Thus, the research on identifying the relationship becomes a policy agenda in management accounting research. This is surely a value addition to the current state of knowledge. This chapter has 5 sections in total. The next section presents literature review and hypothesis development followed by research methodology in section 3. Section 4 presents the analysis and findings followed by a discussion of the research findings, the limitations of the research and potential areas for future research through conclusion in section 5.

8.2 Literature Review and Hypothesis Development

Literature review section has broadly been divided into two sections in line with the theme of the chapter. First section deals with different factors showing strong bearing on the level of sophistication. Second section deals with any relationship between practitioners' satisfaction with sophistication.

8.2.1 Factors influencing Sophistication

Bjornenak (1997) has conducted a study on the adoption status of ABC resulting 30 companies as adopters and 23 as non-adopters. The variables studied were cost structure, existing cost system, product diversity and competition. To capture the combination of factors affecting adoption, discriminant analysis and LOGIT regression were used. The best discriminating function was obtained by combining cost structure, the degree of customized production and sales as a percentage of exports. The function classified 71% within the correct group and 67% using the LOGIT model.

Malmi (1999) examined ABC diffusion across Finnish firms based on responses from 490 organizations derived from four surveys. The first survey focused on the metal, engineering and electrotechnical industries and the following three surveys on the forest, food and chemical industries. All units that indicated they were using either ABC or ABM, or were currently implementing ABC were classed as ABC adopters. There were 104 ABC adopters (an adoption rate of 21%). Cost structure, competition faced, strategy, product diversity, production type and size were examined as potential organizational determinants of ABC adoption. Booth and Giacobbe (1998) examined the demand and supply factors influencing ABC adoption decisions in 207 Australian manufacturing firms. Cost structure, product diversity, competition and size were examined as explanatory factors.

Hoque (2000) examined the relationship between just-in-time production, automation and cost allocations based on questionnaire responses from 71 New Zealand manufacturing companies. The respondents were asked to indicate whether allocations based on volume-based or ABC systems were used in their organizations. Hoque tested and found support for the hypothesis ($p < 0.05$) that firms using JIT systems will place less emphasis on the use of activity based allocations than non-JIT firms. The second hypothesis tested by Hoque was that firms using a predominately automated manufacturing system place greater emphasis on the use of activity-based cost allocations than firms without an automated manufacturing system. No significant relationship was found.

Based on questionnaire responses from 204 Irish manufacturing firms Clarke et al (1999) examined the usage of ABC. The respondents were divided into those implementing ABC (N=24), assessing ABC (N=42), rejected ABC (N=26) and having not considered ABC (N=112). Five characteristics of the responding firms were examined.

Gosselin (1997) examined the effect of strategic posture and organizational structure on the adoption of activity management approaches. Activity management was defined as consisting of three approaches: activity analysis, activity cost analysis and activity-based product costing (described as ABC). The research was based on 161 responses from Canadian manufacturing companies. Logistic regression was used to test the hypotheses.

The only study that we could identify that sought to classify cost systems by the level of sophistication, rather than by the discrete alternatives of traditional and ABC systems, was a study by Abernathy *et al.* (2001) using data collected from five research sites in Australia. It is apparent from closer review of the previous empirical studies that virtually all of them have examined whether firms that have adopted ABC differ from those that have not with regard to factors that have been suggested as the most conducive to the adoption of ABC. The term 'adoption' has been subject to different interpretations with some studies defining it as actual ABC implementation and others defining it as consisting of either actual implementation or a desire to implement it. Furthermore, comparisons have differed with some studies comparing those firms that have actually implemented ABC with those that have not and others comparing firms that have considered the adoption of ABC with those that have shown no interest in ABC. It is therefore difficult to compare the findings from the various studies.

Based on the above analysis, the following factors have been identified to study their influence on the level of sophistication achieved by Bangladeshi firms under study.

- a) Cost structure – overhead cost as a percentage of total cost of production;
- b) Competitive environment – composite scale considering price, product and marketing competition;
- c) Product diversity – considers physical size, complexity and batch size of production;
- d) Size of the organization – number of employees as a proxy to size;
- e) Importance of information technology in processing information;
- f) Importance of cost information for decision-making; and
- g) Years in operation.

Cost structure

Assignment of direct costs to costs object under both simplistic and sophisticated costing systems is done accurately without any discrepancy. However, simplistic costing system fails to assign indirect costs to cost objects accurately generating different level of distortion in product costing. As a general rule increasing levels of sophistication in the design of cost systems should lead to the more accurate assignment of indirect costs to cost objects. Johnson and Kaplan (1987) claim that over several decades there has been a dramatic change in cost structures resulting in a need for companies to modify their costing systems.

Cooper (1988a) has also claimed that overhead costs, as a percentage of total costs have increased over the years; particularly in recent years, causing unsophisticated systems based on direct labor hours to report increasingly distorted product costs. In their review of European and USA surveys relating to cost structures, Brierley et al. (2001) found that direct material costs tended to be higher than indirect costs and direct labor costs tended to represent the minority of the costs. They conclude that if indirect costs make up a relative small proportion of total costs in some industries it may not be worthwhile investing in sophisticated accounting methods to allocate indirect costs to products in these industries.

Kaplan and Cooper advocate that organizations with high indirect costs should assign these costs using ABC systems, since traditional systems are likely to report distorted costs. Conversely, where the proportion of indirect costs is low, traditional unsophisticated systems will suffice since they are unlikely to result in the reporting of seriously distorted costs. The message that emerges from the literature is that the level of sophistication required to assign indirect costs to cost objects should be a function of the amount of indirect costs to be assigned. Thus, the following hypothesis is tested:

Hypothesis 1: The greater the proportion of indirect costs within an organization's cost structure, the higher the level of the sophistication of the costing system.

Competitive environment

Intensity of competition has a good relationship with the design and use of management accounting systems (Libby and Waterhouse, 1996; Simons, 1990). Companies facing intensely competitive market environments tend to employ relatively sophisticated management accounting systems. Bruns and Kaplan (1987) identify competition as the

most important external factor for stimulating managers to consider redesigning their costing systems. Cooper (1988b) has also identified that organizations facing fierce competition should implement ABC. It is argued that firms operating in a more competitive environment have a greater need for sophisticated cost systems that more accurately assign costs to products, services and customers. This is because competitors are more likely to take advantage of any errors from managers having to rely on inaccurate cost information to make decisions. For example, in highly competitive industries mistakes made from relying on inaccurate cost information are more likely to be exploited by competitors. Based on the above discussion the following hypothesis is tested:

Hypothesis 2: The greater the intensity of competition that an organization faces, the higher the level of sophistication of the costing system.

Product diversity

Cooper (1988a) and Estrin *et al.* (1994) have argued that product diversity is a major factor that results in the reporting of distorted product costs by traditional costing systems. Product diversity applies when products consume activity resources in different proportions. Greater product diversity requires more sophisticated costing systems to capture the variation in resource consumption by different products. Simplistic costing systems that rely on a small number of cost pools and drivers are unlikely to capture the diversity of consumption of activity resources by cost objects. Significantly distorted product costs are therefore likely to be reported when high diversity exists.

Product diversity includes support, process and volume diversity. Support diversity refers to varying support given to each product by various support departments whereas process diversity refers to differences in consumption among all activities relating to product design, manufacture and distribution. Volume diversity occurs when products are manufactured in different batch sizes. To capture volume diversity a sophisticated costing system is required that establishes separate cost pools for batch-level activities and incorporates non-volume based cost drivers that measure the consumption of resources by batch sizes rather than volume. If volume-related cost drivers are used most of the costs will be assigned to high volume products which are likely to be produced in a smaller number of high volume batches.

Conversely, low volume products whose output may be derived from a large number of low volume batches will be assigned to a smaller share of batch-level activities. Where volume-diversity is high, low volume products are likely to be undercosted and high volume products overcosted.

Within a production setting, Malmi (1999) points out that the conventional wisdom of management accounting assumes that the underlying production process and the type of costing system are somehow related. Thus, the complexity of the production process has an impact on the choice of cost system. The more complex the production process the more complex the costing system which models it. Product diversity determines the complexity of production process. The more complex the products are, the more activities are required to manufacture them. Thus, to measure the resource consumption of different products in a complex setting, complex cost accounting systems involving more cost pools and assignment bases are required.

The variations in consumption of activity resources can be extended to other cost objects besides products. For example, customer diversity exists in an organization which services customers who order high-volume, standard products which require few special demands and other customers who order low-volume, non-standard products requiring large quantities of before and after sales support. Based on the above discussion the following hypothesis is tested:

Hypothesis 3: *The greater the level of product diversity, the higher the level of sophistication of the costing system.*

Size of the organization

Many researchers have argued that organizational size facilitates innovation (Aiken and Hage, 1971; Kimberly and Evanisko 1981; Ettlie *et al.*, 1984). Large organizations have more complex and diverse facilities that aid the adoption of a large number of innovations (Nord and Tucker, 1987). Previous empirical studies have noted a positive relationship between company size and the adoption of innovations (Blau and McKinley, 1979; Dewar and Dutton, 1986 and Damanpour 1992). There is also evidence to indicate that size is an important factor influencing the adoption of more complex administration systems (Moore and Chenhall, 1994). Previous studies have also noted a positive relationship between company size and management accounting system sophistication.

In particular, some studies of ABC adoption rates have shown that adoption is much higher in larger organizations (Innes *et al.* 2000, Malmi, 1999). A possible reason for this is that larger organizations have relatively greater access to resources to experiment with the introduction of more sophisticated accounting systems. Several surveys have also indicated that an important factor limiting the implementation of more sophisticated management accounting systems is the prohibitive cost (Innes and Mitchell, 1995; Shields, 1995). As larger organizations have more resources to develop innovative systems it is also more likely that they will be able to implement more sophisticated costing systems. Also larger organizations are more likely to have a larger and more diversified range of activities leading to greater product, service and customer diversity thus creating the need for more sophisticated costing systems to measure resource consumption by different cost objects. Therefore, the following hypothesis is tested:

Hypothesis 4: *The greater the size of an organization, the higher the level of sophistication of the costing system.*

Importance of information technology in processing information

Management accounting system should be compatible with providing critical information at the demand of the decision makers. This information is mostly intuitive in nature and very much situational which is not known previously. This information is very costly due to the decision making usefulness which will provide competitive edge in the market. Thus information technology used in processing information should be highly integrative, real-time and should allow query based solution. Sophisticated system thus demands such information technology which is intelligent enough to respond to the needs of the decision maker instantly. Dependence on information technology in a simplistic system environment is not that much critical. Even a simplistic system cannot provide required information real time rather defers it with reference to some future time period. This is due to low investment on information technology, skilled manpower and other infrastructure. Therefore, the following hypothesis is tested:

Hypothesis 5: *The greater the importance of information technology in procession information, the higher the level of sophistication of the costing system.*

Importance of cost information for decision-making

A major role of product costing systems is to provide relevant cost information to manage the cost and mix of existing activities, products, services, locations and customers. Relevant information should be generated to ensure that only profitable activities are undertaken. The costing system plays a crucial role here in generating information for periodic profitability analysis for distinguishing between profitable and unprofitable activities. When unprofitable activities are identified cost reduction alternatives, such as outsourcing or redesign, are considered. If cost reduction or actions taken to generate additional revenues cannot make these activities profitable, and there are no other strategic reasons (such as maintaining a full product line) for continuing the activities, they are likely to be subjected to discontinuation. If the cost system does not capture accurately enough the consumption of resources by products, the reported product costs will be distorted, and there is a danger that managers may drop profitable products or continue the production of unprofitable products. Organizations are, however, likely to differ in terms of the required accuracy of cost information for profitability analysis. If profit margins are high for all products, lower levels of product cost accuracy will suffice since the profitability analysis is likely to report all activities as being profitable for either higher or lower levels of cost assignment accuracy. Alternatively, more accurate product costs may be required if product profit margins are low, or capacity constraints exist, so that it is necessary to rank product profitability for product mix decisions.

In some situations cost information extracted from the costing system also plays a crucial role in determining selling prices. Where product costs are used to determine selling prices, the undercosting of products can result in the acceptance of unprofitable business whereas overcosting can result in bids being rejected and the loss of profitable business. Alternatively, organizations may be price-takers or other factors such as quality, delivery, etc. may result in cost information playing a less crucial role. Thus, more accurate cost information is likely to be required for the former situation rather than the latter.

The above discussion suggests that the importance of cost information for pricing decisions is likely to influence the accuracy of cost information and thus the sophistication of the costing system. Therefore, the following hypothesis is tested:

Hypothesis 6: The greater the importance of cost information for decision-making, the higher the level of sophistication of the costing system.

Years in Operation

Sophisticated costing system demands different firm specific parameters which are usually related to number of years the firm is under operation. Age has been found to be associated with the likelihood of survival, where older firms are more likely to survive than their younger counterparts (liability of newness) (Hannan and Freeman, 1989). And sophisticated costing system supplements the survival issues of firms through providing valuable information timely. Age acts through the learning that accrues from experience in a way similar to the mechanisms that govern the learning curve. Even if the company is not growing, learning about management can be translated into improved management control systems (MCS). Learning requires experience, experimentation, and interaction with other firms that can only be acquired over time as processes are executed again and again until a dominant design is chosen. Management control systems then emerge to formalize this learning by codifying routines and liberating management attention from repetitive tasks. If MCS facilitate the process of management, age will be related to their emergence (Davila, 2005). Thus the possibility of using sophisticated system increases as the firm grows older. Therefore, the following hypothesis is tested:

Hypothesis 7: The higher the age of the firm, the higher the level of sophistication of the costing system.

8.2.2 Satisfaction and Sophistication

The study will enrich the scope of management accounting research by bringing management accountants' satisfaction in explaining sophistication of management accounting practices. Current literature is limited to the study of level of sophistication with the identification of contextual factors explaining the level of sophistication without considering any impact of practitioners' satisfaction on it. *The study concludes with the premise of whether there exists a relationship between management accountants' satisfaction to bring sophistication in management accounting practices.* The establishment of this relationship is perceived to be important for the empowerment of management accountants and diffusion of management accounting practices through continuous change and innovations. The hypothesis taken to be tested is -

Hypothesis 8: High satisfaction of management accountants leads to high sophistication in management accounting practices.

To test the hypothesis whether sophistication is influenced by the level of satisfaction, a regression analysis is done considering sophistication as dependent and satisfaction as independent variables. The theoretical model is given in Figure 8.1 below:

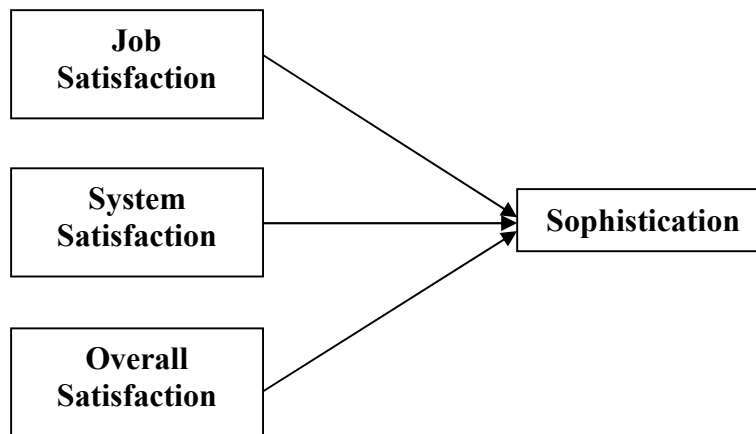


Figure 8.1: Sophistication and Satisfaction

If satisfaction can lead to sophistication, then management should prioritize the level of satisfaction of management accountants. Satisfaction of management accountants is very much important for ensuring sound management accounting practices and at the end, the sophistication.

8.3 Research Methodology

This study is based on semi-structured questionnaire survey as discussed in chapter 1 and applied a quantitative form of research. To derive a measure for cost structure the questionnaire required the respondents from manufacturing units to separately estimate their organization's direct labor, direct materials, variable manufacturing, and fixed manufacturing costs as a percentage of total costs. Cost structure was measured by indirect costs as a percentage of total costs for the purpose of analysis.

Three questions were used relating to the competitive environment. The first question asked the respondents to indicate on a 7-point Likert scale (anchored 1 = Low and 7 = extremely intensive) the extent of competition for the major products/services of their organizations. The second question is related to the intensity of price competition within the industry that the business unit operated. The 7-point scale was anchored as 1= Negligible intensity and 7 = extremely intensive. The final question required a classification of the market activities of the responding firms' competitors during the past five years using a scale of 1 (much easier to predict) to 7 (much harder to predict). Three

questions were used to measure product diversity. The first one required the respondents to indicate the point on a 7-point Likert scale (anchored 1 = Highly standardized and 7 = Totally customized) that most appropriately described the physical sizes of the products produced by the companies. The second question focused on support diversity (complexity). The respondents were asked to estimate how much variation existed in the consumption of support department overheads by their organization's different products or services. The 7-point scale was anchored as 1 = Little variation and 7 = Considerable variation. Third question was related to variation in batch size on a 7-point Likert scale (anchored 1 = less variation and 7 = Highest variation).

Company size was measured by number of employees on an interval scale. Years in operation is also measured on interval scale. Four questions were used to measure the importance of cost information for decision-making on a 7-point scale (anchored 1 = Of little importance and 7 = Of vital importance). Four questions were also used to measure the importance of information technology for information processing on a 7-point scale (anchored 1 = Of little importance and 7 = Of vital importance).

Value of sophistication is computed as per the methodology presented in chapter 6 considering four different parameters like PD Quantitative, PD Qualitative, Education and AMAT Adoption with their respective weights and sub-weights. The methodology results a value between 1 and 100 for every firms where a value close to 100 means sophisticated system and values close to 1 means unsophisticated system. For the application of logistic regression, the dependent variable sophistication is converted to categorical variable as follows:

Unsophisticated System	= Value between 1 and 50
Sophisticated System	= Value between 51 and 100

8.4 Analysis and Findings

This section presents major analysis and findings of the study in four different sub-sections below.

8.4.1 Correlation coefficient measures for the different categories of sophistication

The correlation matrix for the dependent variable (based on the 100 point scale and the classification by the two categories of cost system sophistication) and the independent variables is presented in **Table 8.1**. It indicates that the alternative measures of cost system sophistication are highly correlated ($p < 0.01$) amongst themselves. Use of

information technology and level of competition are positively correlated ($p < 0.01$) with use of cost data. Level of competition is also positively correlated ($p < 0.01$) with use of cost data. Number of employees is positively correlated ($p < 0.01$) with sophistication based on 100 point scale whereas it is negatively correlated ($p < 0.05$) with sophistication classified by two categories. On the other hand, years in operation is positively correlated ($p < 0.05$) with number of employees.

Spearman Correlation Coefficients

	1	2	3	4	5	6	7	8
1. Sophistication								
2. Sophistication (2 Categories)	-.739**							
3. Cost Structure	-.081	.084						
4. Production Variation	.125	-.023	-.033					
5. Use of Cost Data	.071	.046	.042	.161				
6. Use of Information Tech.	.089	-.079	.155	-.009	.573**			
7. Level of Competition	.000	.119	.129	-.046	.548**	.292**		
8. Number of Employees	.341**	-.219*	-.035	.164	.036	.132	-.049	
9. Years in Operation	.160	-.116	.036	-.068	.128	.087	.024	.212*

Table 8.1: Correlation Coefficients

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

8.4.2 Multiple Regression Analysis

Multiple linear regression is a method of analysis for assessing the strength of the relationship between each of a set of explanatory variables (sometimes known as independent variables, although this is not recommended since the variables are often correlated), and a single response (or dependent) variable. In this study, the level of sophistication is assumed to be explained by some other variables and multiple regression is used aptly as an important statistical technique to conclude the explanatory power of different variables in explaining the level of sophistication. Applying multiple regression analysis to a set of data results in what are known as regression coefficients, one for each explanatory variable. These coefficients give the estimated change in the response variable associated with a unit change in the corresponding explanatory variable, conditional on the other explanatory variables remaining constant.

A strict interpretation of the requirements for using linear regression analysis is that both the dependent and independent variable should be measured on an interval or ratio scale, although categorical measures can be used for independent variables if appropriate

indicator (dummy) variable coding schemes are used. However, there are many statisticians (e.g. Bryman and Cramer, 1999; Miles and Shevlin, 2001) who argue that ordinal scales provide a suitable approximation to interval scales and, therefore, a linear regression model can be used. Also many management accounting researchers (Sheilds, 1995; Guilding, 1999; Hoque, 2000a; Hoque, 2000b) have used multiple regression models to test hypotheses where both the dependent and independent variables are measured on ordinal scales.

The following model was used to test the hypotheses:

$$Y = b_1 + b_2\text{COSTR} + b_3\text{PRODVA} + b_4\text{USECOST} + b_5\text{USEINFOTECH} + b_6\text{COMP} + b_7\text{SIZE} + e$$

Where:

Y	= Sophistication based on 100 point scale
COSTR	= Manufacturing overhead as a percentage of total production costs
PRODVA	= Product variation
USECOST	= Use of cost data
USEINFOTECH	= Use of information technology
COMP	= Level of Competition
SIZE	= Size measured by number of employees
AGE	= Years in operation

Table 8.2 presents the results of the regression analysis. The fit of a multiple regression model can be judged in various ways, for example, calculation of the multiple correlation coefficient or by the examination of residuals. The table includes some statistics to specify the fit of the model. A measure of the fit of the model is provided by the multiple correlation coefficient, R , defined as the correlation between the observed values of the response variable and the values predicted by the model. The value of R^2 gives the proportion of the variability of the response variable accounted for by the explanatory variables. The table includes the multiple correlation coefficient, R , its square, R^2 , and an adjusted version of this coefficient as summary measures of model fit. The multiple correlation coefficient $R = 0.345$ indicates that there is a weak correlation between the observed level of sophistication and those predicted by the regression model. In terms of variability in observed level of sophistication accounted for by our fitted model, this amounts to a proportion of $R^2 = 0.119$, or 11.9%. Since by definition R^2 will increase when further terms are added to the model even if these do not explain variability in the population, the *adjusted* R^2 is an attempt at improved estimation of R^2 in the population.

The index is adjusted down to compensate for chance increases in R^2 , with bigger adjustments for larger sets of explanatory variables. Use of this adjusted measure leads to a revised estimate that 6.0% of the variability in level of sophistication in the population can be explained by the explanatory variables. The table also provides an estimate of the standard deviation of the error term (under “Std. Error of the Estimate”). Here we estimate the mean absolute deviation as 10.966, which is moderate considering that the level of sophistication range from 1 to 100.

Durbin-Watson test is important to check whether there exists any serial autocorrelation. In multiple regression analysis, it has been assumed that the error term is independent with a mean value of zero but in practice, it may happen that the errors are not independent instead *auto-correlated*. Such error autocorrelation, or "serial correlation", has many undesirable but correctable consequences (e.g., the least-squares estimates are sub-optimal, standard confidence intervals for β are incorrect; the error term is forecast able). Thus, it is highly desirable to try to detect error autocorrelations. The Durbin-Watson Test for serial correlation assumes that the ε_i are stationary and normally distributed with mean zero. It tests the null hypothesis H_0 that the errors are uncorrelated against the alternative hypothesis H_1 . Since d is approximately equal to $2(1-r)$, where r is the sample autocorrelation of the residuals, $d = 2$ indicates no autocorrelation. The value of d always lies between 0 and 4. If the Durbin–Watson statistic is substantially less than 2, there is evidence of positive serial correlation. As a conservative rule of thumb, Field (2009) suggests that values less than 1.0 and greater than 3.0 are definitely cause for concern. Small values of d indicate successive error terms are, on average, close in value to one another, or positively correlated. If $d > 2$, successive error terms are, on average, much different in value to one another, i.e., negatively correlated. In regressions, this can imply an underestimation of the level of statistical significance. In this analysis, the value of d is calculated as 1.767 which is not lower than 1 or substantially less than 2. Thus, it may be concluded that the autocorrelation that may exist in the analysis is not alarming.

The variation in the response variable can be partitioned into a part due to regression on the explanatory variables and a residual term. The latter divided by its degrees of freedom (the residual mean square) gives an estimate of σ^2 , and the ratio of the regression mean square to the residual mean square provides an F -test of the hypothesis that each of

$\beta_0, \beta_1, \beta_2, \dots, \beta_n$ takes the value zero. The ANOVA (**Table 8.2**) provides an F -test for the null hypothesis that none of the explanatory variables are related to level of sophistication, or in other words, that R^2 is zero. Here we can clearly reject this null hypothesis ($F(7, 105) = 2.030, p < 0.05$), and so conclude that at least one of the explanatory variables is related to the level of sophistication.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.345	.119	.060	10.96690	1.767

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1709.015	7	244.145	2.030	.008
	Residual	12628.654	105	120.273		
	Total	14337.669	112			

Coefficients

	Unstandardized Coefficients		Standardized Coefficients (Beta)	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error				Zero-order	Partial	Part	Tolerance	VIF
(Constant)	32.821	5.892		5.571	.000					
Cost Structure	-.060	.083	-.068	-.718	.474	-.030	-.070	-.066	.948	1.055
Production Variation	1.229	.854	.137	1.438	.153	.086	.139	.132	.922	1.084
Use of Cost Data	-.289	1.400	-.033	-.206	.837	.068	-.020	-.019	.321	3.116
Use of Information Technology	.475	1.131	.053	.420	.675	.075	.041	.039	.525	1.903
Level of Competition	.193	1.108	.024	.174	.862	.041	.017	.016	.449	2.228
Number of Employees	8.012E-5	.000	.027	.285	.776	.104	.028	.026	.928	1.078

Years in Operation	.207	.061	.325	3.372	.001	.307	.313	.309	.903	1.107
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Table 8.2: Regression Results

As per the regression analysis shown in **Table 8.2**, only one explanatory variable become significant. The standardized beta coefficient of years in operation is computed as .325 ($p < .05$). Five of the seven variables show positive relationship and two shows negative relationship. As cost structure and use of cost data result a negative coefficient, they will not be a right predictor of level of sophistication. Thus, we may conclude that only one variable out of seven has the explanatory power.

The table also reports correlation under zero-order, part and partial categories. Zero-order correlation is the Pearson correlation between each predictor and the outcome variable. It also produces the partial correlation between each predictor and the outcome, controlling for all other predictors of the model. Finally, it produces the part correlation between each predictor and the outcome. This correlation represents the relationship between each predictor and the part of the outcome that is not explained by other predictors in the model. As such, it measures the unique relationship between a predictor and the outcome. The variance in the dependent variable explained by each explanatory variable is expected to be independent. As multicollinearity is essentially a sample phenomenon, the significant distinction is not between the existence and nonexistence of multicollinearity, but between its various degrees (Gujarati, 2003). So, evidence regarding the extent of multicollinearity in our regression is required.

Multicollinearity is a high degree of correlation among several independent variables when a regression model incorporates a large number of independent variables. It is because some of them may measure the same concepts or phenomena. Existence of multicollinearity is not only a violation of OLS assumption but also it violates the assumption that X matrix is full ranked, making OLS impossible. When a model is not full ranked, that is, the inverse of X cannot be defined, there can be an indefinite number of least squares solutions. However, there is no clear-cut criterion for evaluating multicollinearity of linear regression models. Correlation coefficients of independent variable may be checked. But, high correlation coefficients do not necessarily imply multicollinearity.

In multiple regression models, collinearity can be related to the existence of linear dependencies among the columns of the X matrix. For each regressor x_j , the tolerance

(Tol) can be computed as $Tol_j = 1 - R_j^2$, where R_j^2 is the coefficient of determination obtained in each of the k auxiliary regressions of the form:

$$x_{ji} = \delta_0 + \delta_1 x_{1i} + \cdots + \delta_{j-1} x_{j-1i} + \delta_{j+1} x_{j+1i} + \cdots + \delta_k x_{ki} + v_i$$

Thus, Tol_j shows the proportion of variance x_j that is not accounted for by the remaining $k - 1$ regressors and can be used as an index of the degree of collinearity associated to x_j . Another index of collinearity of x_j , called variance inflation factor (VIF) can be obtained as a measure of the increment of the sampling variance of the estimated regression coefficient of $x_j(b_j)$ due to collinearity. It shows how multicollinearity has increased the instability of the coefficient estimates (Freund and Littell, 2000). Putting differently, it tells us how ‘inflated’ the variance of the coefficient is, compared to what it would be if the variable were uncorrelated with any other variable in the model (Allison, 1999). VIF_j can be computed as the j th diagonal value of the inverse of the R correlation matrix among the regressors or alternatively as $1/Tol_j$.

However, there is no formal criterion for determining the bottom line of the tolerance value or VIF. Some argue that a Tol_j less than 0.1 or VIF_j greater than 10 roughly indicates significant multicollinearity. Others insist that magnitude of model’s R^2 be considered determining significance of multicollinearity. Klein and Nakamura (1962) suggests alternative criterion that R_j^2 exceeds R^2 of the regression model. In this vein, if VIF_j is greater than $1/(1 - R^2)$ or a Tol_j is less than $(1 - R^2)$, multicollinearity can be considered as statistically significant. The last column of the table indicates both Tol_j and VIF_j is within the range causing no multicollinearity that may be of concern.

8.4.3 Logistic Regression

Logistic regression is used to predict a categorical (usually dichotomous) variable from a set of predictor variables. With a categorical dependent variable, discriminant function analysis is usually employed if all of the predictors are continuous and nicely distributed; logit analysis is usually employed if all of the predictors are categorical; and logistic regression is often chosen if the predictor variables are a mix of continuous and categorical variables and/or if they are not nicely distributed (logistic regression makes no assumptions about the distributions of the predictor variables). For a logistic regression,

the predicted dependent variable is a function of the probability that a particular subject will be in one of the categories.

In logistic regression, the dependant variable is required to be dichotomous. Thus, the dependent variable is coded as 1 for the category ‘sophisticated system’ and 0 for the category ‘unsophisticated system’. The case processing summary below states that there are 113 cases used in the analysis with no missing cases.

Case Processing Summary			
Unweighted Cases ^a		N	Percent
Selected Cases	Included in Analysis	113	100.0
	Missing Cases	0	.0
	Total	113	100.0
Unselected Cases		0	.0
Total		113	100.0

a. If weight is in effect, see classification table for the total number of cases.

The following table shows the coding of dependant variable as assumed in the study. The analysis kept the original values for the dichotomous variable level of sophistication. If the variable was coded as, for example, 3 and 4, these would have been re-coded to 0 and 1. In this case, 0 means unsophisticated and 1 means sophisticated.

Dependent Variable Encoding	
Original Value	Internal Value
Unsophisticated System	0
Sophisticated System	1

The data entry method is chosen as Enter and thus the SPSS starts by inserting only a constant in the model in Block 0. Other variables are not considered. The Block 0 output is for a model that includes only the intercept. Given the base rates of the two decision options ($86/113 = 76\%$ decided unsophisticated, 24% decided sophisticated), and no other information, the best strategy is to predict, for every case, that the firms are having unsophisticated system. Using that strategy, you would be correct 76% of the time.

Block 0: Beginning Block

Classification Table ^{a, b}					
	Observed		Predicted		Percentage Correct
			Sophistication (2 Categories)		
			Unsophisticated System	Sophisticated System	
Step 0	Sophistication (2 Categories)	Unsophisticated System	86	0	100.0
		Sophisticated System	27	0	.0
	Overall Percentage				76.1
a. Constant is included in the model.					
b. The cut value is .500					

Under Variables in the Equation, the intercept-only model is $\ln(\text{odds}) = -1.159$. If we exponentiate both sides of this expression we find that our predicted odds $[\text{Exp}(B)] = .314$. That is, the predicted odds of sophisticated system .314. Since 27 of our subjects have sophisticated system and 86 have unsophisticated system, our observed odds are $27/86 = .314$. The Wald chi-square tests the null hypothesis that the constant equals 0. This hypothesis is rejected because the p-value (listed in the column called "Sig.") is smaller than the critical p-value of .05 (or .01). Hence, we conclude that the constant is not 0. The df is the degrees of freedom for the Wald chi-square test. There is only one degree of freedom because there is only one predictor in the model, namely the constant.

Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-1.159	.221	27.579	1	.000	.314

Variables not in the Equation					
			Score	df	Sig.
Step 0	Variables	coststruc	.062	1	.804
		variation	.053	1	.817
		usecostdata	.186	1	.666
		useinfotech	.145	1	.704
		competi	.414	1	.520
		employees	.047	1	.829
		years	8.624	1	.003
Overall Statistics			10.886	7	.144

On Step 1 in Block 1 below, SPSS enters all the variables in the model. The coefficients here give us a measure of how well the model fits. We must look mostly at the Model coefficient. It is analogous to the multivariate F test for linear regression. The null hypothesis states that information about the independent variables does not allow us to make better prediction of the dependent variable. Therefore we would want that this chi-squared value is significant (as in this example).

Omnibus Tests of Model Coefficients gives us a Chi-Square of 10.022 on 7 df, not significant. This is a test of the null hypothesis that adding the variables to the model has not significantly increased our ability to predict the decisions made by our subjects.

The following table shows the chi-square statistic and its significance level. In this example, the statistics for the Step, Model and Block are the same because we have not used stepwise logistic regression or blocking. The value given in the Sig. column is the probability of obtaining the chi-square statistic given that the null hypothesis is true. In other words, this is the probability of obtaining this chi-square statistic (10.022) if there is in fact no effect of the independent variables, taken together, on the dependent variable. This is, of course, the p-value, which is compared to a critical value, perhaps .05 or .01 to determine if the overall model is statistically significant. In this case, the model is not statistically significant because the p-value is more than the critical value. These values (step, block and model Chi-Squares) test whether or not all of the variables entered in the equation (for model), all of the variables entered into current block (for block), or the current increase in the model fit (for step) have a significant impact. As the values for each chi-square is not significant, it indicates that the variables added to the model don't impact the dependant variable significantly.

Block 1: Method = Enter

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	10.022	7	.187
	Block	10.022	7	.187
	Model	10.022	7	.187

Under Model Summary we see that the -2 Log Likelihood statistic is 114.245. This statistic measures how poorly the model predicts the decisions - the smaller the statistic the better the model, a perfect model has a -2 Log Likelihood value of zero. The Cox &

Snell R^2 can be interpreted like R^2 in a multiple regression, but cannot reach a maximum value of 1. The Nagelkerke R^2 can reach a maximum of 1. The log-likelihood ratio statistic was used for selecting parameters in the logistic regression model. The SPSS statistical package presents not the log-likelihood itself but the log-likelihood multiplied by -2 (SPSS Inc. 1998). Output from SPSS denotes log-likelihood multiplied by -2 as “ -2 Log Likelihood”. By multiplying the log-likelihood by -2 it approximates a chi-square distribution (Menard, 1995). Larger values of -2 log likelihood indicate worse prediction of the dependent variable.

Model Summary			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	114.245 ^a	.085	.127
a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.			

The Hosmer-Lemeshow tests the null hypothesis that there is a linear relationship between the predictor variables and the log odds of the criterion variable. Cases are arranged in order by their predicted probability on the criterion variable. These ordered cases are then divided into ten groups (lowest decile [prob < .1] to highest decile [prob > .9]). Each of these groups is then divided into two groups on the basis of actual score on the criterion variable. This results in a 2×10 contingency table. Expected frequencies are computed based on the assumption that there is a linear relationship between the weighted combination of the predictor variables and the log odds of the criterion variable. For the outcome = no (decision = unsophisticated) column, the expected frequencies will run from high (for the lowest decile) to low (for the highest decile). For the outcome = yes column the frequencies will run from low to high. A chi-square statistic is computed comparing the observed frequencies with those expected under the linear model. A nonsignificant chi-square indicates that the data fit the model well.

Hosmer and Lemeshow Test			
Step	Chi-square	df	Sig.
1	9.563	8	.297

Contingency Table for Hosmer and Lemeshow Test						
		Sophistication (2 Categories) = Unsophisticated System		Sophistication (2 Categories) = Sophisticated System		Total
		Observed	Expected	Observed	Expected	
Step 1	1	11	9.764	0	1.236	11
	2	10	9.474	1	1.526	11
	3	9	9.296	2	1.704	11
	4	6	9.180	5	1.820	11
	5	10	8.986	1	2.014	11
	6	9	9.501	3	2.499	12
	7	9	8.406	2	2.594	11
	8	8	8.084	3	2.916	11
	9	8	7.134	3	3.866	11
	10	6	6.175	7	6.825	13

Classification Table ^a					
	Observed	Predicted			
		Sophistication (2 Categories)		Percentage Correct	
		Unsophisticated System	Sophisticated System		
Step 1	Sophistication (2 Categories)	Unsophisticated System	85	1	98.8
		Sophisticated System	24	3	11.1
	Overall Percentage				77.9

a. The cut value is .500

Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	coststruc	.000	.019	.001	1	.975	.999
	variation	.162	.201	.651	1	.420	1.176
	usecostdata	-.196	.303	.419	1	.517	.822
	useinfotech	.195	.259	.564	1	.453	1.215
	competi	-.106	.238	.199	1	.656	.899
	employees	.000	.000	.174	1	.677	1.000
	years	.038	.014	7.234	1	.007	1.038

	Constant	-1.829	1.263	2.098	1	.148	.161
a. Variable(s) entered on step 1: coststruc, variation, usecostdata, useinfotech, competi, employees, years.							

The last table produced by SPSS is the one containing the variable coefficients. The formula should read as follows.

$$\text{Logit}(p) = \ln\left(\frac{p}{1-p}\right) = -1.829 + .000(\text{coststruc}) + .162(\text{variation}) + -.196(\text{use costdata}) + .195(\text{use infotech}) + -.106(\text{competi}) + .000(\text{employees}) + .038(\text{years})$$

To find out the probability of being sophisticated system by a firm with 50% manufacturing overhead costs, degree of variation 2, level of use of cost data 5.75, level of use of information technology 6, level of competition 4, number of employees 300 and years in operation 21, let us substitute the equation first and find the exp to obtain the odds.

$$\text{Logit}(p) = -1.829 + .000(50\%) + .162(2) + -.196(5.75) + .195(6) + -.106(4) + .000(300) + .038(21) = -1.088$$

$$\exp^{-1.088} = 0.33688$$

Let us transform it to obtain the probability as $\frac{\exp^{-1.088}}{1 + \exp^{-1.088}} = 0.25199$

Odds Ratio (OR)

The ratio of two odds is called odd ratio, where odds are computed from two respondents. For example, let us consider the steps as used above to calculate the odds for a firm having 6 cost drivers, keeping other information intact.

Logit formulation of the model will be –

$$\text{Logit}(p) = -1.829 + .000(10\%) + .162(3) + -.196(5.75) + .195(6) + -.106(4.333) + .000(18000) + .038(17) = -1.1313$$

$$\exp^{-1.1313} = .32261$$

Let us transform it to obtain the probability as $\frac{\exp^{-1.1313}}{1 + \exp^{-1.1313}} = 0.2439$

Thus the OR will be $\text{Odd}_1/\text{Odd}_2$, i.e. $0.25199/0.2439 = 103.32$. It means the first firm enjoys 103.32 times higher probability of attaining sophistication as compared with the second firm.

These estimates tell us the relationship between the independent variables and the dependent variable, where the dependent variable is on the logit scale. These estimates tell the amount of increase (or decrease, if the sign of the coefficient is negative) in the predicted log odds of level of sophistication = 1 that would be predicted by a 1 unit increase (or decrease) in the predictor, holding all other predictors constant. For the independent variables which are not significant, the coefficients are not significantly different from 0, which should be taken into account when interpreting the coefficients. (See the columns labeled Wald and Sig. regarding testing whether the coefficients are statistically significant). Because these coefficients are in log-odds units, they are often difficult to interpret, so they are often converted into odds ratios. It can be done by hand by exponentiating the coefficient, or by looking at the right-most column in the Variables in the Equation table labeled "Exp(B)". For every one-unit increase in product variation, we expect a .162 increase in the log-odds of **level of sophistication**, holding all other independent variables constant. In most cases, this is not interesting. Also, sometimes zero is not a realistic value for a variable to take.

The S.E. is the standard error associated with the coefficients. The standard error is used for testing whether the parameter is significantly different from 0 by dividing the parameter estimate by the standard error to obtain a t-value. The standard errors can also be used to form a confidence interval for the parameter. The Wald and Sig. columns provide the Wald chi-square value and 2-tailed p-value used in testing the null hypothesis that the coefficient (parameter) is 0. In case of using a 2-tailed test, one should compare each p-value to preselected value of alpha. Coefficients having p-values less than alpha are statistically significant. For example, if one chose alpha to be 0.05, coefficients having a p-value of 0.05 or less would be statistically significant (i.e., one can reject the null hypothesis and say that the coefficient is significantly different from 0). If anyone uses a 1-tailed test (i.e., one predicts that the parameter will go in a particular direction), then one can divide the p-value by 2 before comparing it to preselected alpha level.

- a) For the variable **cost structure**, the p-value is .975, so the null hypothesis that the coefficient equals 0 would be accepted.
- b) For the variable **product variation**, the p-value is .420, so the null hypothesis that the coefficient equals 0 would be accepted.

- c) For the variable **use of cost data**, the p-value is .517, so the null hypothesis that the coefficient equals 0 would be accepted.
- d) For the variable **use of information technology**, the p-value is .453, so the null hypothesis that the coefficient equals 0 would be accepted.
- e) For the variable **competition**, the p-value is .654, so the null hypothesis that the coefficient equals 0 would be accepted.
- f) For the variable **size (number of employees)**, the p-value is .677, so the null hypothesis that the coefficient equals 0 would be accepted.
- g) For the variable **years in operation**, the p-value is .007, so the null hypothesis that the coefficient equals 0 would be rejected.

8.4.4 Satisfaction and Sophistication

Based on the theoretical model, a regression analysis is done which results a worrying picture as shown in **Table 8.3** below. This table shows the model summary, ANOVA and coefficients together to analyze the fitness of the model.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.139 ^a	.019	-.008	11.35845	1.799

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	275.113	3	91.704	.711	.548 ^a
	Residual	14062.556	109	129.014		
	Total	14337.669	112			

Coefficients

	Unstandardized Coefficients		Standardized Coefficients (Beta)	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error				Zero-order	Partial	Part	Tolerance	VIF
(Constant)	32.976	6.234		5.289	.000					
Management Accountants Satisfaction	1.118	1.686	.100	.663	.509	.133	.063	.063	.396	2.525

Satisfaction with the System	.302	.889	.037	.340	.735	.093	.033	.032	.751	1.331
Satisfaction with the Job	.198	1.444	.021	.137	.891	.116	.013	.013	.383	2.613

Table 8.3: Regression Results (Sophistication and Satisfaction)

The model is not statistically significant having a very weak explanatory power. The value of R and R² are .139 and .019 respectively. Even none of the independent variables is statistically significant though the beta coefficients results positive values. This result provides an indication that practitioners' level of satisfaction doesn't influence sophistication of firms in terms of adoption of different management accounting practices. A summary of test of all hypotheses are given in Table 8.4 below.

Hypothesis	Expected Sign	Supported	Not Supported
Hypothesis 1: The greater the proportion of indirect costs within an organization's cost structure, the higher the level of the sophistication of the costing system.	+		X
Hypothesis 2: The greater the intensity of competition that an organization faces, the higher the level of sophistication of the costing system.	+		X
Hypothesis 3: The greater the level of product diversity, the higher the level of sophistication of the costing system.	+		X
Hypothesis 4: The greater the size of an organization, the higher the level of sophistication of the costing system.	+		X
Hypothesis 5: The greater the importance of information technology in procession information, the higher the level of sophistication of the costing system.	+		X
Hypothesis 6: The greater the importance of cost information for decision-making, the higher the level of sophistication of the costing system.	+		X
Hypothesis 7: The higher the age of the firm, the higher the level of sophistication of the costing system.	+	X	
Hypothesis 8: High satisfaction of management accountants leads to high sophistication in management accounting practices.	+		X

Table 8.4: Summary of test of hypothesis

All hypotheses are rejected (in other words, null hypothesis accepted) except hypothesis 7 which explains that the level of sophistication achieved by firms is influenced by the number of years the firm is in operation (age). The sophistication effort of the firms is exposed through their respective age which demands more sophisticated system as the firms are getting older.

8.5 Conclusions

Attainment of sophisticated management accounting practices by firms is driven by different contingent factors. Management accounting practices throughout the world follow contingency framework as it is not mandated by law and the practices are not standardized like financial accounting. This study, based on the literature review, has identified seven contingent factors that may influence the level of sophistication. The analysis comes out with a very worrying picture that mostly all the factors except 'years in operation' carry no significance in explaining the level of sophistication achieved by the firms. This finding is very important for understanding the business environment in Bangladesh. The demand for management accounting information is not that much critical to management and thus they may not be that much serious with the sophisticated management accounting tools. Rather, accounting system is mainly designed based on the mandatory needs of the market and management accounting is embedded within financial accounting and reporting system.

The significance of years in operation (age) parameter gives a new dimension to the study of sophistication in a country like Bangladesh which is struggling with a mass of first generation firms. As these firms are growing older, they are trying to perform professionally. This may be a good reason why years in operation influence the level of sophistication. Other factors which theoretically demand sophisticated management accounting systems have been proved irrelevant in Bangladesh. Bangladesh still needs more maturity on some internal and external factors as considered in this study to instill sophisticated management accounting systems.

Very interestingly, practitioners' satisfaction on the system and job has no impact on sophisticated management accounting systems which demonstrates the application of a peculiar institutional theory. Institutional theory has recently emerged in the literature on management accounting change, particularly through the conceptual framework presented by Burns and Scapens (2000), which places organizational rules and routines into the focus of analysis. Management accounting practice is depicted as a collection of

relatively stable rules and routines. By rules, Burns and Scapens refer to the formal ways in which ‘things should be done’, being necessary to co-ordinate and give coherence to the actions of individuals or groups. Routines refer to the informal practices actually in use. Whereas rules become changed by explicit decisions at discrete intervals, routines have the potential to become changed in a cumulative implicit process of daily action. Compared to rules and routines, institutions – a third major element of the framework – have a more generic character. They are the socially constructed and shared ‘taken-for-granted’ assumptions which identify categories of human actors and their appropriate activities and relationships (Hamilton, 1932; Barley and Tolbert, 1997), shape and constrain rules and routines within an organization, and determine the meaning structures and values of individual actors. The fourth key category of their framework, the realm of action, refers to the participants’ specific everyday behaviors in the organization.

Management accountants are working most of the times to carry out the desire of owner managers at the cost of the desire of the market. They are working as a part of the rules and routines applicable to firms where the reflection of sophistication is completely absent. Thus the study rightly concludes that the practitioners’ satisfaction doesn’t influence the level of sophistication of management accounting practices.

Chapter 9

Findings, Recommendations and Conclusions

This chapter extends discussion covering following main points –

- 9.1 Introduction
- 9.2 Findings of the Research
- 9.3 Recommendations
- 9.4 Limitations of Research
- 9.5 Areas for Potential Research Interest
- 9.6 Contribution to Knowledge
- 9.7 Conclusion

9.1 Introduction

This chapter brings a modest conclusion of the thesis with summary presentations on major findings, recommendations, areas for potential research interests, contributions to existing body of knowledge with concluding remarks. Section 9.2 identifies the findings of the research followed by different recommendations of the researcher in section 9.3. Next section offers some new areas for future researchers to put emphasis on followed by identification of specific contributions of the research. Finally the thesis comes to an end with the conclusion.

9.2 Findings of the Research

The findings of the research are very important due to the fact that this type of research is rarely conducted in Bangladesh scenario and it opens the scope of conducting researches in this area in the days ahead. In that case, the findings of this thesis will surely work as a benchmark. The findings of the research have been discussed with reference to key words based on the thesis title.

9.2.1 Satisfaction

One of the important key words of the thesis is satisfaction which gives the research a behavioral dimension. In satisfaction study, the thesis mainly focuses on the factors that affect management accountants' satisfaction in the workplace, the resultant impact on value dimension via product and service quality and its possible relationship with corporate profitability. This study results the following findings:

- a) Management accountants' satisfaction with the system depends on organizational support, supervisory support and business environment support.
- b) Management accountants' satisfaction with the job depends on organizational support, supervisory support, business environment support and management accountants' satisfaction with the job.
- c) Satisfaction of management accountants depends on Management accountants' satisfaction with the job but doesn't depend on Management accountants' satisfaction with the system.
- d) Employee satisfaction affects employee loyalty.
- e) Satisfaction doesn't affect employee commitment.
- f) Employee satisfaction affects product quality.
- g) Employee satisfaction affects service quality.
- h) Employee loyalty affects employee commitment.
- i) Employee commitment affects product quality.
- j) Employee commitment affects service quality.
- k) Product quality doesn't affect value.
- l) Service quality affects value.
- m) Management accountants' satisfaction does not have any relationship with profitability.

The study concludes that the satisfaction of management accountants depends on organizational support, supervisory support and business environment support. However, satisfaction failed to strengthen employee commitment and product quality is not an important predictor of value. These findings provide some market inefficiencies and highlight the typical Bangladeshi environment. The study also reveals that employees may be satisfied but they are not highly committed and thus satisfaction cannot restrain them from

switching a job. But the worrying picture is that practitioners' satisfaction failed to show any relationship with the profitability. Thus satisfaction is not a policy issue at least to the internal management having no relationship with strategic goals of the firms. The study also concludes that management accountants' satisfaction depends on the job, not with the system they use. Thus the study results some interesting findings relating to satisfaction.

9.2.2 Management Accounting Practices

The nature of management accounting practices installed in different firms is driven by contingency framework. The diffusion of innovation theory also undertakes different dimensions depending on some constructs. This research presents some important findings on diffusion of management accounting practices in Bangladesh as discussed below:

- a) Out of the responding firms, one firm is found to use as much as 356 different cost pools;
- b) Some firms in Bangladesh use as much as 50 different cost allocation bases;
- c) Most of the cost allocation bases are volume based, however, time based and intensity based drivers are also used;
- d) Firms employ good number of professional accountants;
- e) Bangladeshi firms run material intensive (about 61%) production process leaving a very small percentage for overhead expenses (23%);
- f) Firms concentrate on homogeneous mass production;
- g) Firms have a wide variety of production lines and stock keeping units;
- h) Product variation in terms of complexity, production size and batch size is moderate;
- i) Cost data is mostly used for production and pricing decision;
- j) Firms face moderate competition;
- k) Adoption of traditional management accounting tools like cash flow statement analysis, budgetary control etc. are very common.
- l) Low adoption of advanced management accounting tools like lean manufacturing, theory of constraints, Kaizen costing, target costing, and activity based costing etc.
- m) Application of highly diffused management accounting tools has significant relationship with accuracy, however; it is not significant with profitability, turnover and net assets.

- n) Bangladeshi firms have demonstrated a good picture of applying different management accounting techniques like new product development, product costing, research and development etc. in sample scenarios.

Due to a material intensive cost structure, Bangladeshi firms failed to absorb most of the advanced management accounting tools. Thus, the study results weak diffusion of management accounting tools showing no commendable relationship with firm specific factors like turnover, net assets, profitability etc. Still, the market brings the application of world class practices in sample cases. It can be expected that potential change in cost structure (more percentage on manufacturing overhead) will provide a good foundation for the diffusion of management accounting practices in coming days.

9.2.3 Sophistication of Management Accounting Practices

Study on sophisticated management accounting practices start at the beginning of this century. The literature provides definitions of management accounting sophistication based on some parameters like number of cost pools and drivers, types and nature of cost pools and drives etc. There are some criticisms of defining sophisticated management accounting practices. This study has presented a new definition of cost system sophistication considering the goals of management accounting which are as follows:

- a) Accuracy of Product Costing
- b) Accuracy of Decision Making

Measurement of sophistication based on cost drivers and pools considers only one of such goal as mentioned above, i.e., accuracy of product costing. This study extends the definition to include another important goal of management accounting, i.e., accuracy of decision making. The factors used to measure sophistication are as follows:

- a) PD Quantitative:
 - i. Number of cost pools
 - ii. Number of cost drivers
- b) PD Qualitative:
 - i. Nature of cost pools
 - ii. Nature of cost drivers
 - iii. Types of cost drivers

- c) Education
- d) AMAT Adoption

This research also provides a model for measuring sophistication under multi-attributes decision making approach in a scale of 100.

9.2.4 Gaps in Management Accounting Practices

Studying gaps in management accounting practices are not new. However, most of these studies are limited to explain the gap between theory and practices. Such coverage makes the analysis narrow though gap in management accounting has a wider framework. This study, for the first time, has offered a wider definition of gap covering seven different categories of gaps where nine different agents play a critical role. These gaps are as follows:

No	Types of Gap	Agents
Gap 1	Liaison Gap	Professional Institute vs. Regulators
Gap 2	Status Gap	Professional Accountants vs. Non-professional Accountants
Gap 3	Compliance Gap	Professional Institute vs. Management Accounting Firms
Gap 4	Satisfaction Gap	Professional Institute vs. Customers
Gap 5	Authoritative Gap	Professional Institute vs. Markets
Gap 6	Surveillance Gap	Professional Institute vs. Companies
Gap 7	Knowledge Gap	Professional Institute vs. Academic Institutes

Table 9.1: Gaps in management accounting and agents responsible for gaps

This study also provides the nature of the gaps and the efforts that can be initiated to reduce the gaps as well. It also proposes a method of computing gap score considering the level of application and perceived importance of different management accounting tools which can be customized. The calculated gap score has been regressed with some parameters which provide some important findings as follows:

- a) Gap score varies with the intention to switch of the respondents
- b) Gap score doesn't change due to change in profitability
- c) Gap score changes due to size and net assets

9.2.5 Practitioners Satisfaction Leading to Sophistication

One of the important targets of the thesis is to find out whether there exists any relationship between practitioners satisfaction with sophistication. However, it also analyzes the factors that may affect sophistication of firms and presents disappointing picture as discussed below:

- a) The proportion of indirect costs within an organization's cost structure doesn't affect the level of the sophistication of the costing system.
- b) The intensity of competition that an organization faces doesn't affect the level of sophistication of the costing system.
- c) The level of product diversity doesn't affect the level of sophistication of the costing system.
- d) The size of an organization doesn't affect the level of sophistication of the costing system.
- e) The importance of information technology in procession information doesn't affect the level of sophistication of the costing system.
- f) The importance of cost information for decision-making doesn't affect the level of sophistication of the costing system.
- g) The age of the firm affect the level of sophistication of the costing system.

It means none of the factors except the age of the firm have an impact on the sophisticated management accounting practices. This finding also confirms the previous findings. As the firms are not matured, they are smoothly running their operation based on simplistic costing systems. And finally it also concludes that the satisfaction of management accountants doesn't lead to sophistication in management accounting practices. The institutional theory in Bangladesh paves a strong foundation in support of the findings as resulted in the study. Management accounting practices are embedded within financial accounting and reporting system. The regulators are not even very much concerned with the specific role of management accountants in a practical set up. As per Rogers' diffusion of innovation theory, most of the Bangladeshi firms belong to laggard category. Bangladeshi firms fail to show important categorization as per Abrahamson's Framework. Most of the firms follow the fashion perspective of imitating other organization.

9.3 Recommendations

This section presents the recommendations based on the findings of the study. These recommendations are the researchers' own recommendations.

- a) Behavioral dimensions are very important for success in business. Firms need to identify the satisfiers properly and must have some plans to address those satisfiers properly within the organizational fit. Employees' satisfaction, customers' satisfaction (value dimensions as proxy) and profitability are linked as it is discussed in balanced scorecard. However, translating satisfaction to profitability is a corporate management issue which should be taken care of for long term success. The main beneficiaries of the jobs of management accountants are the customers and thus it should be understood how this relationship can be materialized effectively through managing quality for both products and services to the satisfaction of end users.
- b) Diffusion of management accounting practices depends on the firms' internal and external environment. Sometimes firms decide to instill highly sophisticated management accounting tools to achieve competitive advantage in the market. If the market doesn't put any pressure, firms will unlikely spend money on accounting system design. At the end of the day, management accounting system is costly which should be rightly compensated with the benefit coming out from the system to make the decision of implementing the system worthy to the management. Thus the regulators should be concerned to develop a highly competitive market to pave the foundation of fair play. All the market agents should have a clear role to play to ensure a favorable environment for high diffusion of management accounting practices.
- c) Sophistication in management accounting practices requires a pressurized environment which will conserve the resources (through maximum utilization of resources) and ensure proper value for money for the consumer. All the competitive forces (customers, suppliers, rivals etc.) need to play their respective roles to exert pressure which will mandate the firms to adopt management accounting practices ensuring a knowledge environment for the practitioners and educators.
- d) The decision on application of different management accounting tools is not taken professionally. Organizations should have a proper mechanism of appraising the use

- of different management accounting tools for the betterment of the firms' performance. It should study the nature of gaps the firm is exposed to and necessary corrective measures should be taken for improving the performance.
- e) Strengthening the management accounting profession in Bangladesh is very important to ensure balanced economic growth. The Institute of Cost and Management Accountants of Bangladesh (ICMAB) should come up with a holistic approach in the form of development of management accounting education, training, research, production of various rich documents in the field of audit and consultancy, lobbying with the regulators, meets with various stakeholders like major employers etc.

9.4 Areas for Potential Research Interest

This study has brought some new dimensions in management accounting research which may be exploited by the researchers who are planning to work in this area. Some of the areas are explained below with some details.

9.4.1 Management Accounting and Corporate Governance

Management accounting, which was traditionally intended for internal use in companies, has, through its ability to measure value and present both current and forward looking information, developed into a key instrument to companies for delivering effective corporate governance to all relevant stakeholders. Many practices commonly associated with management accounting are, and certainly should be, implicated in corporate governance. Without absolving auditors and regulators of their responsibilities as external monitors, good corporate governance additionally requires that appropriate internal reporting and monitoring practices are embedded in organizations. Whilst the customary sharp distinction between financial and management accounting has a useful pedagogical and academic role, it cannot always be maintained in the practice of organizational accounting. However, management accounting is not given sufficient emphasis, at the board level, as a provider of timely and relevant information to facilitate the execution of good corporate governance. In a paper by Mayanja and Van der Poll (2011), it has been discussed how various management accounting tools and techniques can be employed to facilitate corporate

governance. Management accounting ought to be of immense value to the board of directors in formulating and controlling the strategy of a company. Some of the management accounting tools which may be employed in the formulation of a strategy includes: SWOT analysis, PESTEL framework, Porter's five competitive forces model etc.

Management accounting reports geared towards control may be presented to show exceptional performance on the identified critical success factors, hence attract the attention of decision makers to institute control measures. Such reports may be able to show how much the current operation differs from the expected strategy and thereby enable the board to make meaningful decisions about the control action to pursue. This may be done in well-presented management accounting reports using Variance analysis, Balanced scorecard etc. Different management accounting tools are highly used to approve major financial decisions, to evaluate the performance of chief executive officers and board of directors, to support and counsel the CEO, and finally to comply corporate governance requirements. However, this paper addresses two major areas of management accounting to strengthen corporate governance. First area covers how management accounting plays important role in value chain to ensure efficient utilization of resources and second, it addresses how different agents of management accounting practices can come closer to reduce the gap among them leading to good corporate governance.

9.4.2 Governance and Value for Money (VfM)

Governance means the process of decision-making and the process by which decisions are implemented (or not implemented)¹. IFAC's (2009) governance framework is composed of two dimensions: the performance dimension and the conformance dimension, which together represent the entire value creation, resource utilization, and accountability framework of an organization. Performance responsibilities focus on opportunities and risks, strategy, value creation, and resource utilization, and guide an organization's decision-making. Conformance responsibilities include compliance with laws and regulations, best practice governance codes, accountability, and the provision of assurances to stakeholders in general. This International Good Practice Guidance brings together globally recognized and applicable good practice principles on effective governance into an international benchmark

¹ What is good governance? Retrieved from <http://www.unescap.org/sites/default/files/good-governance.pdf>

for the accountancy profession. It will help professional accountants to further improve the governance structures and processes in the organizations they work for— something critical to ensuring an organization’s viability and accountability.

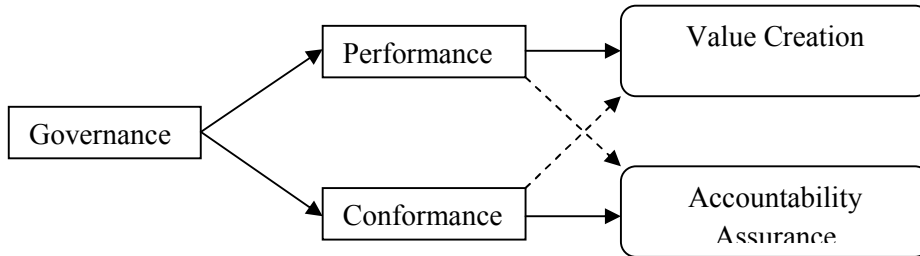


Figure 9.1: IFAC Governance Framework

The performance dimension of IFAC’s governance framework put emphasis on ‘Value for Money’ which is defined by National Audit Office (NAO)² as being the ‘optimal use of resources to achieve intended outcomes’. The value for money concept is best described with the help of 3E which is shown in following figure 9.2 below³:

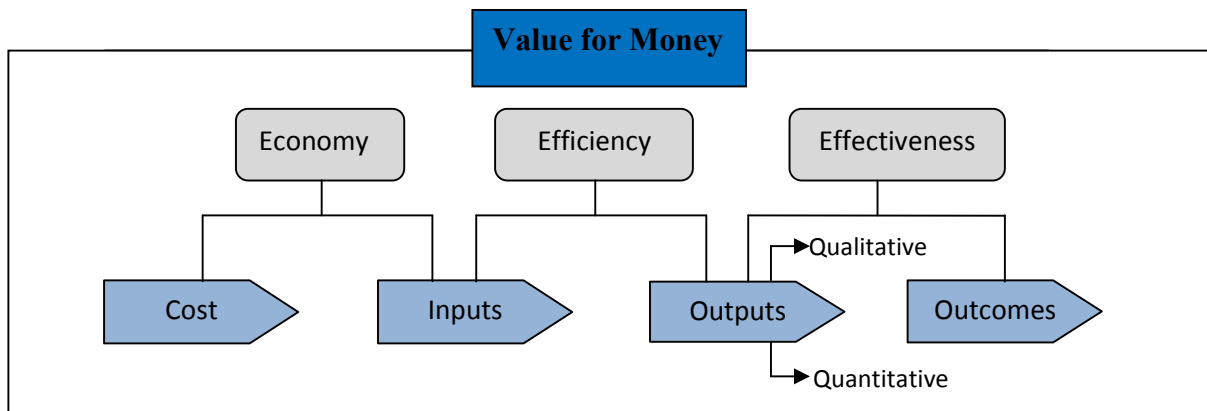


Figure 9.2: 3E of Value for Money (VfM) Concept

Economy: It is ‘a measure of what goes into providing a service’. Unit costs are typically used as an economy measure. ‘The whole life costs of inputs such as the direct and indirect costs of acquiring, running and disposing of assets or resources should be considered’.

² NAO Analytical framework for assessing Value for Money.

³ Adapted from *Value for money in the use of resources*, 3.5, Audit Commission webpage, accessed 12 October 2010; direct quotes marked.

Efficiency: It is ‘a measure of productivity, in other words how much you get out in relation to what is put in’. This examines the relationship between inputs and outputs; for example, planned versus actual delivery of milestones by service providers, or benchmarked comparison among programs working to same or similar outcomes but using different pathways to achieve intended outcomes.

Effectiveness: It is both qualitative and quantitative measures of increase or decrease in outcomes that show that a program ‘is effective in delivering its intended objectives’. This examines the relationship between outputs and outcomes.

9.4.3 Cost audit and its implication

Requirements of mandatory cost audit by selective firms in Bangladesh and its effective implementation may bring some new height in management accounting practices. Realizing the needs of Cost Audit for the economic development and also for the effective and appropriate control of the organizations and the economy as a whole, the Government of Bangladesh made cost audit compulsory in 2001 through promulgation of an SRO no. BAM/PPM/AP/17/87/397 dated December 11, 2001 the contents of which are given below: (a) Cost Audit shall be done in Nationalized Sugar Industries and in all Public Limited Companies; (b) Such Cost Audit shall be completed from the financial year ended June 30, 2001 and from any other financial year ended after the above date of June 30, 2001; (c) Such Cost Audit shall be done by a Cost and Management Accountant in pursuant to provisions made in the Cost Audit (Report) Rules, 1997; and (d) Cost Audit shall be made on the basis of books of accounts maintained according to the provisions of section 181 (1) of Companies Act, 1994. In two other different occasions, the Government of Bangladesh issued Gazette Notification to mandate cost audit in specific companies. On December 26, 2002, 6 companies in jute sector and 5 companies from fuel and power sector come under the requirement. And on December 3, 2009 Government introduces cost audit in 62 companies out of which 42 companies come from Textile Industries, 12 companies come from Pharmaceuticals Industries and remaining 8 companies come from Nationalized Fertilizer Industries. A summary of the requirements of cost audit is given in the **Table 9.2** below:

Gazette Notification No	Date	Industry	No. of Companies	Effective from
BAM/PPM/AP/17/87/397	December 11, 2001	Nationalized Sugar Industries and all Public Limited Companies	All	Financial year ended June 30, 2001
BAM/ABA-4/17/87/Part/6	December 26, 2002	Publicly Traded Companies in Jute Sector	6	Financial year ended June 30, 2001
BAM/ABA-4/17/87/Part/6	December 26, 2002	Publicly Traded Companies in Fuel and Power Sector	5	Financial year ended June 30, 2001
BAM/ABA-4/17/87/Part/138	December 03, 2009	Publicly Traded Textile Companies	42	Financial year ended June 30, 2006
BAM/ABA-4/17/87/Part/139	December 03, 2009	Publicly Traded Pharmaceutical Companies	12	Financial year ended June 30, 2006
BAM/ABA-4/17/87/Part/140	December 03, 2009	All Nationalized Chemical Fertilizer Companies	8	Financial year ended June 30, 2006

Table 9.2: Gazette Notifications of Cost Audit

Compulsory requirement of cost audit by different classes of firms requires sound management accounting practices in line with the record rules. It is expected that the new requirement will bring professionalism in practice if it can be properly implemented. The Institute of Cost and Management Accountants of Bangladesh shows its concern for the mandatory implementation of the government's directives through its members and other different mediums. Even recently, the institute has taken the initiative to change its name to the Institute of Chartered Management Accountants of Bangladesh with other structural changes to make it aligned with international body and expedite its capacity. The ICMAB has published a volume of Bangladesh Cost Accounting Standards (BCAS) comprising 10 standards which takes the profession one step further. These standards will provide some guidelines to the practitioners and it can be studied at academia also to reduce the gap.

Another achievement on the way of strengthening accounting profession is the recent approval of the Financial Reporting Act (FRA), 2015. In a report prepared by a team from the World Bank, based on findings from a diagnostic review carried out in Bangladesh in January–March 2003, it was suggested to establish a Financial Reporting Council that will work as an independent oversight body. Based on the suggestions, a financial reporting ordinance was approved by the caretaker government in 2008. The slow progress was the result of the strong criticism made by the Institute of Chartered Accountants of Bangladesh justifying on the ground that such council will make the accounting and reporting environment inferior. However, the new government, without considering the ordinance, has approved the Act. With the approval of the Act, the accounting practice will be better if quality watchdog function may be guaranteed. As the Institute of Cost and Management Accountants of Bangladesh has also been involved in the process, it can play a strong role for improving the management accounting practices as well. At the same time, it has been observed in recent times that the society is getting responsive with the management accounting process through demanding quality products at affordable price and being environmentally responsible. All of these forces together are expected to give the management accounting practices a better shape in Bangladesh.

9.5 Contribution to Knowledge

The research has some specific contribution towards the existing body of knowledge. These are pointed out below:

- a) Study of management accountants' satisfaction, value dimensions and profitability with a clear link of how satisfaction leads to profitability is a new kind of research. Management accounting research has been given a behavioral dimension by bringing customer relationship management in studying diffusion of sophisticated management accounting practices.
- b) The definition of sophistication has been extended embedding product costing goals and decision making goals together. A robust method of measuring sophistication has been provided using multi-attribute decision making model.
- c) A generic gap model in the field of management accounting practices has been presented using grounded theory which is completely new. This gap model provides a

- broader perspective of gap which was previously limited to the gap between theory and practices.
- d) A quantitative model has been proposed to compute gap score for every firm considering the gap between level of application and perceived importance of applying different management accounting tools. This model can be easily replicated depending on any changing requirements.
 - e) Applying contingency framework in studying diffusion of management accounting practices is a completely new research in Bangladesh. Studying the status of diffusion with relation to some contingent factors adds some weights to explaining the outcome.
 - f) The researcher has tried to apply mastery on using different quantitative and qualitative methodology amid of difficulty in collecting data. Finally, it is the first attempt to carry out such a study based on the internal sometimes secret database in a country like Bangladesh where research is not so welcomed by the practitioners like most of the other countries.

9.6 Conclusion

Management accounting profession is accepted worldwide after the industrial revolution due to the demand of new sets of accounting information that the conventional financial accounting fails to provide. Global competition, advent of advanced manufacturing systems and modern information technology added extra impetus for the development of this profession in 20th and 21st centuries. Bangladesh, as a representative of third world country, is not an exception to that drive. Rather, it is still considered as a target for safe investment by the international community due to cheap labor, favorable regulatory environment, less natural calamities and low cost of doing business across some selective parameters. Thus the demand for management accounting increases day by day.

As the only institute responsible for looking after the profession, the Institute of Cost and Management Accountants of Bangladesh is trying to establish professionalism in practice. It is trying to reduce the observed gaps in the market though the efforts may not be enough. However, due to very difficult targets that Bangladesh needs to achieve to be graduated to

middle income country by 2021, development of different economic parameters via strong industrial sector has no other alternatives.

After independence, the decision of nationalization of industries may be appropriate for the country, however, it was not in line with the development of management accounting profession. Due to the requirement of compliance to accounting standards, the development of accounting profession was concentrated to financial or public accounting. However, the inefficiency of the public sector along with the different political philosophy and prescription of donor agencies, the government has established a privatization board to facilitate the private sector led industrialization process by transferring the SOEs to their former Bangladeshi owners and sale/transfer of shares to the investors and buyers. This creates an enabling environment for young entrepreneurship development and balanced industrialization through fair competition, infrastructural development and policy up-gradation. The development of management accounting profession is closely related to this movement from nationalization to privatization.

This study mainly targets to study the diffusion of management accounting practices in Bangladesh which is completely new. The study has been extended by bringing satisfaction and sophistication along with management accounting practices. A semi-structured questionnaire and selective interviews have been used to collect required data. The analysis results some interesting outcome, however, doesn't show any relationship between satisfaction and sophistication which is explained through new institutional theory. It is expected that the research will work as a very first piece of work in Bangladesh in the area and guide the new researchers to carry out further research work in coming days which will enrich the management accounting research in Bangladesh.

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Appendix A: Final Questionnaire



University of Dhaka

Diffusion of Management Accounting Practices in Bangladesh: Practitioners' Satisfaction towards Sophistication

Quite a rich number of literature supports that employee satisfaction brings a positive impact on profitability via value dimensions. You must accept that management accountants, for a lot of reasons, come very close to customer to ensure their value for money. Through this study the researcher hopes to find out any linkages between management accountants' satisfaction with profitability via value confirmation. The researcher appreciates your taking time to complete the questionnaire. It should take 10 to 20 minutes.

Declaration: Your answers are completely confidential, so be as frank as you wish. This is not a test- your opinion is the only right answer. Do not sign your name; we do not wish to know who you are. The answers will be combined into groups for reporting purposes.

Respondents Profile

- Position :
Educational Qualification (Latest) :
Years of Experience :
No. of Job (including current one) :
Any intention to Switch very recently? : Yes No

Corporate Profile

Name : _____

Year of Establishment : _____

Number of Employees : _____

Market Share (%) : _____

Annual Turnover (Approximately) : _____

Net Profit (as a percentage of sale) : _____

Net Assets : _____

Cost of Quality Reporting : Yes No

Appraisal Cost : % Sales

Prevention Cost : %

External Failure Cost : %

Internal Failure Cost : %

Part 1

As a management accountant of the company you work for, can you please indicate your degree of satisfaction (in a 7 point Likert scale) with the meaning as specified below relating to every statement?

1	2	3	4	5	6	7
Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Indifferent	Somewhat Satisfied	Satisfied	Very Satisfied

SL	Statements	Degree
1	You are happy with the benefits you receive for the job you are responsible	
2	Working guidelines or policy is supportive to carry out your duties smoothly	
3	Employer treats every employee equitably	
4	Your employer takes proper care of your personal requirements (problems)	
5	You are happy with the work environment your employer ensures	
6	Supervisor always have constructive suggestions to perform better	
7	Your supervisor believes and practices self respect and honor	
8	You enjoy sufficient independence from your supervisor in performing your duties	
9	You enjoy sufficient authority to perform the duties you are responsible for	
10	Attitude of your supervisor is positive	
11	The economic scenario (e.g., inflation, interest rate) has positive impact on your performance (demand of your product, product cost, price etc.)	

12	You are happy with the level of involvement of customers and their support	
13	You believe that the competition you face in the market is healthy and fair	
14	Regulatory supports like tax, customs, company act etc. are positive and constructive	
15	You are happy with the availability and performance of your prime suppliers	
16	We have less natural uncertainty (political unrest, natural calamities, seasonal fluctuations etc.) that help us to manage risk easily and smoothly	
17	To do your job properly, you receive enough support from -	
	a) Organization	
	b) Supervisor	
	c) Business Environment	
18	You are satisfied with the management accounting system you use for your job	
19	You are happy with the job (duties and responsibilities) you do	
20	You are satisfied with the support you receive from top level management relating to cost management issues	
21	As a management accountant grade your overall level of satisfaction	

Part 2

As an employee of the company, you must have different degrees of involvement and commitment towards the betterment of your company. Please indicate your level of agreement by choosing different values (in a 7 point Likert scale) with the meaning as given below:

1	2	3	4	5	6	7
Highly Disagreed	Disagreed	Somewhat Disagreed	Indifferent	Somewhat Agreed	Agreed	Highly Agreed

SL	Statements	Degree
1	You are loyal to your organization	
2	Your level of commitment towards achieving corporate goal is very high	
3	You are actively involved to ensure product quality to the satisfaction of customers	
4	You are actively involved to ensure service quality (after sale) to the satisfaction of customers	
5	You believe that your customers are happy with the functionality of your product	
6	Customers are happy with the quality of your product	
7	You provide products at affordable price that your customers always solicit	
8	You are always in time in terms of new product/feature development	
9	Image of your company always attracts customers to belong to your company	
10	Your company always maintain good relationship with your customers	
11	Your customers are highly satisfied with the value that you create and provide them	

Part 3

About Management Accounting Practices

1. The typical procedure for assigning indirect costs (i.e. overheads) to products (or services) involves a two-stage process. In the first stage indirect costs are allocated to cost centres (also known as cost pools). Please indicate below for the *first stage* approximately how many separate cost centres are used to assign indirect costs to products/services.

cost pools (WRITE APPROXIMATE NUMBER)

2. In the second stage of the two-stage process, indirect cost/overhead allocation rates are established for each cost centre to assign overheads to products/services. Please indicate below how many different types of indirect cost/overhead allocation recovery methods are used for assigning indirect costs to products/services.

different types of allocation bases (WRITE APPROXIMATE NUMBER)

3. Mention the name of first and second stage cost drivers you use:

First Stage Cost Driver (Resource Driver)	Second Stage Cost Driver (Activity Driver)		
➤	➤	➤	➤

4. It is customary to use the expertise of professional accountants (like, CA, CMA, ACCA, etc.) for designing and applying costing systems successfully. Please indicate below how many professional accountants work in your firm.

Professional accountants (WRITE APPROXIMATE NUMBER)

5. Please mention rough percentage of the following cost elements as a percentage of total costs:

Direct Material	_____	Administrative Expenses: Direct	_____
Direct Labor	_____	Indirect	_____
Fixed Manufacturing Overhead	_____	Marketing Expenses: Direct	_____
Variable Manufacturing Overhead	_____	Indirect	_____
Total Manufacturing Costs	100%	Total Non-Manufacturing Costs	100%
	_____		_____

6. Which classification best describes the structure of the production process in your firm?

- | | |
|----------------------------------|---------------------------|
| a) Homogeneous mass production | c) Serial unit production |
| b) Heterogeneous mass production | d) Unit production |

7. How many production lines does your firm have?
8. How many different products (stock-keeping units) are being produced in your firm?
9. Please indicate, by circling the appropriate number below, to what extent the products produced in your firm differ on average on the following dimensions (Scale: 1=not at all, 2=to a little extent, 3=to some extent, 4=to a considerable extent, and 5=to a very great extent)

Physical size Complexity Batch Size

10. Please tick one box to indicate the sector which most appropriately describes the activities of your firm.

Manufacturing sector Retail sector Service sector
 Financial and commercial sector Conglomerate Other

11. On a scale of 1 (strongly disagree) to 7 (strongly agree) please circle for each row below one of the numbers to indicate the extent to which you agree or disagree with the following statements which relate to the use of cost data within your business unit.

	Strongly disagree	Neutral	Strongly agree
(a) The cost of products or services must be highly reliable to compete in our markets	1 2 3	4	5 6 7
(b) Cost data is extremely important because of our cost reduction efforts	1 2 3	4	5 6 7
(c) Cost information is the most important factor when making product/pricing service decisions	1 2 3	4	5 6 7
(d) The business unit performs many special studies relating to product/service introduction, redesign, mix, discontinuation, or cost reduction decisions	1 2 3	4	5 6 7

12. On a scale of 1 (strongly disagree) to 7 (strongly agree) please circle for each row below one of the numbers to indicate the extent to which you agree or disagree with the following statements relating to your business unit's information technology.

	Strongly disagree	Neutral	Strongly agree
(a) The organisation's information systems (i.e. sales, purchasing, manufacturing etc) are highly integrated with (i.e. accessible by) each other.	1 2 3	4	5 6 7
(b) The information system offers user friendly query capabilities to various users	1 2 3	4	5 6 7
(c) A wide array of cost and performance data is available within the system	1 2 3	4	5 6 7
(d) Manufacturing (or service) provision and other operating data in the information system are updated 'real time' rather than periodically	1 2 3	4	5 6 7

13. On a scale of 1 (strongly disagree) to 7 (strongly agree) please circle for each row below one of the numbers to indicate the extent to which you agree or disagree with the following statements relating to the extent of competition your firm faces.

	Strongly disagree			Neutral	Strongly agree		
(a) Price competition	1	2	3	4	5	6	7
(b) Product competition	1	2	3	4	5	6	7
(c) Marketing competition	1	2	3	4	5	6	7

14. Please indicate on a scale of (1) to (7) how satisfied you are with the accuracy of your cost system relating to the assignment of overheads (indirect costs) to your products or services for decision making purposes.

Not very satisfied				Neutral				Extremely satisfied
1	2	3	4	5	6	7		
[]	[]	[]	[]	[]	[]	[]	[]	[]

15. Rate the following management accounting tools in terms of their application and perceived importance in your firm in a 5-point scale:

SL	Mgt. Accounting Tools	Application					Perceived Importance				
1.	Cash flow Statement Analysis	1	2	3	4	5	1	2	3	4	5
2.	Ratio Analysis	1	2	3	4	5	1	2	3	4	5
3.	Budgetary Control	1	2	3	4	5	1	2	3	4	5
4.	Variance Analysis	1	2	3	4	5	1	2	3	4	5
5.	Fund Flow Analysis	1	2	3	4	5	1	2	3	4	5
6.	Inter-firm Comparison	1	2	3	4	5	1	2	3	4	5
7.	Standard costing	1	2	3	4	5	1	2	3	4	5
8.	CVP Analysis	1	2	3	4	5	1	2	3	4	5
9.	Variable Costing	1	2	3	4	5	1	2	3	4	5
10.	Absorption Costing	1	2	3	4	5	1	2	3	4	5
11.	Responsibility Accounting	1	2	3	4	5	1	2	3	4	5
12.	Segment Reporting	1	2	3	4	5	1	2	3	4	5
13.	Theory of Constraints	1	2	3	4	5	1	2	3	4	5
14.	Back-flash Costing	1	2	3	4	5	1	2	3	4	5
15.	Process Reengineering	1	2	3	4	5	1	2	3	4	5
16.	Activity-Based Costing	1	2	3	4	5	1	2	3	4	5
17.	Kaizen Costing	1	2	3	4	5	1	2	3	4	5
18.	Target Costing	1	2	3	4	5	1	2	3	4	5
19.	Balance Scorecard	1	2	3	4	5	1	2	3	4	5
20.	Lean Manufacturing	1	2	3	4	5	1	2	3	4	5
21.	Total Quality Management	1	2	3	4	5	1	2	3	4	5

Thank You