IMPACT OF INFORMATION SYSTEM ON FIRM'S PERFORMANCE:

SMALL AND MEDIUM ENTERPRISES IN BANGLADESH

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ABSTRACT

The challenge before Bangladesh today is how to make her existing SMEs compete with their equal-level rivals from abroad by modernizing themselves with up-to-date technologies and production processes. Along with that comes the question of how to develop the culture and practice of setting up new industries able to thrive in global competition right from the beginning Globalization, as one knows, has not only challenges but also enormous opportunities for those who have the capability of utilizing them. For them to the most important issue will be choice of correct technology. The main purpose of this study is to investigate the impact of information system in SMEs performance in Bangladesh. To accomplish this objective sample has been selected from industrial area in Dhaka Bangladesh and questionnaire was distributed to the respondents. There is positive relationship has found among ease of use, skills and knowledge and information quality with SMEs performance in Bangladesh.

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With profound regards to all scholars of management studies in past, present and future.

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INTRODUCTION

1.0 Background of the Study

The economy of Bangladesh is at the crossroads. Rapid liberalization has put most existing industries under severe strain because of their inability to compete with consumer goods being freely imported after the withdrawal of quantitative restrictions and the drastic reduction of import tariffs. Some producers have been successful in improving their products and significantly increasing external market access, most are languishing. The challenge at present is not to compete in top class brand products, which are also available in abundance in local markets, meant for those affluent consumers used to shopping in Milan, Zurich, London or New York. The challenge before Bangladesh today is how to make her existing SMEs compete with their equal-level rivals from abroad by modernizing themselves with up-to-date technologies and production processes. Along with that comes the question of how to develop the culture and practice of setting up new industries able to thrive in global competition right from the beginning Globalization, as one knows, has not only challenges but also enormous opportunities for those who have the capability of utilizing them. For them to the most important issue will be choice of correct technology.

Several information systems (IS) adoption research studies involving SMEs have identified factors that influence IS adoption behavior by these enterprises. Closer

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inspection of these studies reveals that only limited factors were found to actually influence the adoption behavior. External expertise and top management skills and knowledge are some of the important factors in IS adoption by SMEs (Chau and Hui, 2001). Perceived benefits are also an important factor affecting SMEs willingness to adopt IS (Levy and Powell, 2003). The rapid growth of technological innovations and the fusion of information technology has drastically changed the way companies compete. Many business enterprises are implementing the information technology for the purpose of gaining competitive advantage in their industry. In its various manifestations, IT processes data, gathers information, stores collected materials, accumulates knowledge and expedites communication (Chan, 2000). Gaining competitive advantage through the use of information technology requires business owners to have a firm grip over this vital corporate resource and manage its use (Beheshti, 2004).

Identifying why and how firms adopt technological innovations, and more specifically ''information technology'', is fundamental for ensuring a successful adoption process (Swanson and Wang, 2005). A research stream has identified variables that can explain why firms adopt information technology with different intensities and speeds (Teo and Pian, 2003).

IT is recognized as a viable, competitive actor via increased productivity, better profitability, and value for customers (Hitt and Brynjolfsson, 1996). Role of IT in competitiveness has been primarily focused on large organizations. However, in today's global market, and in the era of e-commerce, small and medium size

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enterprises (SMEs) can employ IT to increase their competitive position along with their large counterparts (Beheshti, 2004). Barau et al. (2001) showed that small businesses were utilizing the Internet more than their counterparts. In order to take full advantage of IT and to compete in the global business environment, top executives must recognize the strategic value of IT and exploit it. However, there has been little research on the factors inducing small and medium-sized firms (SMEs) to introduce information technology (Premkumar, 2003; Riemenschneider Harrison, and Mykytyn, 2003; Morgan et al., 2006). SMEs are the engine of the economies of many countries. For instance, in the United States, small businesses create two-thirds of the new jobs, produce 39% of the gross national product (GNP), and generate more than half of the technological innovation (Kuan and Chau, 2001). In Europe, 99.8% of the firms are SMEs, responsible for two-thirds of the turnover and business employment (Carayannis et al., 2006). In Southern Europe, the importance of SMEs in the total employment is even higher. For instance, SMEs generate 70% of the employment in Spain (European Commission, 2005).

In this competitive age to win the competition across the countries, a country should response its technological change with increasing its ability of economics resource. However, the globalization of the economy has forcing many businesses to change in order to survive in this competitive era (Guinea et al, 2005). The ability of a national economy to adapt with the changing demands has been associated and achieved by flexibility and responsiveness of small and medium

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business enterprises (Hunter & Long, 2003). Small and medium business enterprises as largest proportion of economics pillar in a country need to response competitive environment facing business. In many countries, small and medium business enterprises has important role in creating employment and supporting economic growth. This condition also exists in Indonesian economy, where small and medium business enterprises has important role in creating employment opportunities and generating income, especially in rural areas (Tambunan, 2000). Because it is important role of small and medium business enterprises in supporting economic growth, Indonesian government had to builds and develops the strong small and medium business enterprises in order to win the global competition.

1.1 Problem Statement

Most of the previous research has centered on large firms. Some studies suggest that information system theories and practices developed for large firms may not be suitable for small ones (Premkumar, 2003). SMEs are different from large firms in several ways. In SMEs, decision-making is centralized in a reduced number of persons, standard procedures are not well laid out, there is limited long-term planning, and there is greater dependence on external expertise and services for information systems (Premkumar, 2003). Furthermore, SMEs face substantially greater risks in information system implementation than large businesses, since they have inadequate resources and limited education about information systems

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(Cragg and King, 1993). Pressured by rising costs, ever more demanding customers, and the need to preserve profitability while standing out from the competition, small and medium organization found themselves forced to invest in new customer service channels such as customer relationship management system. Recent literature on IS shows that several scholars have investigated the adoption of the system in large firms but not in the small and medium companies.

As DeLone and McLean (1992), Rai et al. (2002), and Sabhrewal et al. (2006) suggest that the observed empirical relationship among the various dimension of IS success might due to the exclusion of the other factor affecting them. By reviewing and examination dimensions of IS success along with the factor affecting of IS success, could mitigate those problem (Sabhrewal et al, 2004). The application of computer based information in large organization has been carefully studied and several models of growth have been proposed although its result still inconsistent (Huff, et.al, 1988, Nolan 1973, Saarinen, 1989). However, very little knowledge is known about the evolution of computing in small and medium firm, even though more and more small firms has installed computer or if they already installed, have continued to upgrade (Cragg & King, 1993). Many of information system research are based on application of information system in large companies, and only a little research had studied adoption of information system in small and medium business enterprises. Because small and medium business enterprises have different characteristics from large companies, an in depth studies about the adoption of information systems in SME had to be done.

1.2 Research Questions

This study seeks to investigate the impact of information system in SMEs in Bangladesh. Therefore, this study intends to answer the following questions:

1. What is the relationship between ease of use of information system and firm performance in SMEs in Bangladesh?

2. What is the relationship between skills and experience of information system user and firm performance in SMEs in Bangladesh?

3. What is the relationship between information quality of information system and firm performance in SMEs in Bangladesh?

1.3 Research Objectives

The main purpose of this study is to investigate the impact of information system in SMEs performance in Bangladesh. Beside this study will determine the relationship between ease of use and firm performance. Skills and knowledge is necessary for use the information system. Thus this study seeks to investigate the relationship between the firm performance and skills and knowledge. Enhancing the efficiency and effectiveness of the firm performance by implanting the information system in SMEs in Bangladesh is aim of the study.

1.4 Significance of the Study

The significance of this research is to apply the model in the context of computerized acceptance to the information system in the small and medium sized companies in Bangladesh. This research can help the decision makers in SMEs in Bangladesh to make decision for future base on the information provided by the system. Besides this, this study will help in SMEs to implement the information system effectively. Not only the SMEs in Bangladesh but also the large firms can use the findings of this study to enhance the firm performance.

1.5 Scope and Limitation

Time constraint was a major limitation as the whole project had to be completed within a term. Sample size was limited. Had the survey been conducted on many other SMEs, results could have been more conclusive. The research was conducted in Dhaka in Bangladesh. For a more generalized perception, this research should be conducted in other cities as well.

1.6 Organization of Chapters

This study is divided into five chapters. Chapter one highlights the background of the study, problem statement, objective, research questions, significance of the study, and scope and limitation of the study. Chapter two presents the previous studies

concerning about the dependent and independent variables investigate in this study. Based on the literature review, theoretical framework of the investigation developed and three hypotheses are formulated. Chapter three focuses on the methodology used to present and investigate the study. Discussion emphasizes on the research design, variables and measurement, data collection technique, and data analysis technique. Chapter four will represent the result of the statistical analysis.

Finally chapter five presents the discussion, conclusion and recommendation.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter discusses the small to medium enterprise (SME) sector and the impact of information system. There are a variety of issues impacting upon the adoption and use of information system in today's business environment. There cannot be one single definition of an SME due to the diversity of the modern business. A clear description of the key characteristics of the SME comes from the Bolton Committee in its report on small firms in 1971. The report states that to qualify as an SME, a firm should be 'an independent Business, managed by its owner or part owners and having a small market share' (Bolton Committee Report, 1971). There are some factors to consider however, the main one being that size is relevant to the sector in which the business is operating. This means that a firm can be small in relation to a sector where the market is large and there are many competitors, whereas a firm of similar proportion can be considered large in another sector with fewer players and/or smaller firms. It also states that in some cases it may be more appropriate to define the SME either by the number of employees in the sector and in others, by the level of turnover in the sector.

2.1 Technology Acceptance Model (TAM)

The study of people's reactions to computing technology has been an important topic in IS research since the 1980s. The theoretical foundation for the study of whether a person is willing to use a technology comes from research on adoption and diffusion (Moore and Benbasat, 1991; Rogers, 2003). Research in this area has continued to develop over the decades producing other theories, including the technology acceptance model (Davis et al.1989; Venkatesh & Davis, 1996), the theory of planned behavior (Mathieson 1991; Taylor & Todd, 1995), and social cognitive theory (e.g., Compeau & Higgins, 1995; Hill et al. 1986, 1987). In an effort to better understand how individuals make decisions regarding new technology, studies based on these theories have examined variables related to individuals' beliefs and intentions regarding the acceptance and continued use of new IT (Bhattacherjee, 2001). Researchers have studied different aspects of the phenomenon and have produced insights into the cognitive, affective, and behavioral reactions of individuals to technology and into the factors which influence these reactions. No theoretical framework has been more successful at this than the TAM (Davis et al., 1989).

The TAM proposes that the use of technology is motivated by an individual's attitude toward using the technology, which is a function of their beliefs about using the technology and an evaluation of the value of actually using it. This is based on "the cost-benefit paradigm from behavioral decision theory" (Davis, 1989, p. 321), which posits that human behavior is based on a person's cognitive

tradeoff between the effort required to perform an action and the consequences of the action (Jarvenpaa, 1989). Therefore, the TAM asserts that a person will use a technology if the benefits of doing so outweigh the effort required to use it (Davis, 1989).

Among the behaviors commonly measured are: system usage (Venkatesh, 1999), and user satisfaction (Bhattacherjee, 2001). Some researchers have studied both of these dimensions as a composite (Gelderman, 1998). User satisfaction actually represents a cognitive and affective outcome that is less tangible in terms of classification as a behavior. Al-Gahtani and King (1999) pointed out that system usage is a more precise measure of IT acceptance.

Introduced to the academic world by Davis *et al.* (1989), the *Technology Acceptance Model* (TAM) is merely an adaptation of Fishbein & Ajzen's TRA. Nevertheless, TAM has proved to be an exceptionally useful tool at predicting future system usage, specifically during the *user acceptance testing* phase of IS implementation project. During this testing, users are monitored to establish whether a system meets all their requirements, and will support the business process for which it was designed.

TAM assigns considerable weight to two key determinants-*perceived usefulness* and *perceived ease of use* (Davis, 1989; Davis *et al.*, 1989). These two concepts are fundamental in understanding the core workings of TAM. Davis (1989) defines *perceived usefulness* as "the degree to which a person believes that using a particular system would enhance his or her job performance." Simply put, people

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are more likely to use an information system that they believe will help them perform their job better.
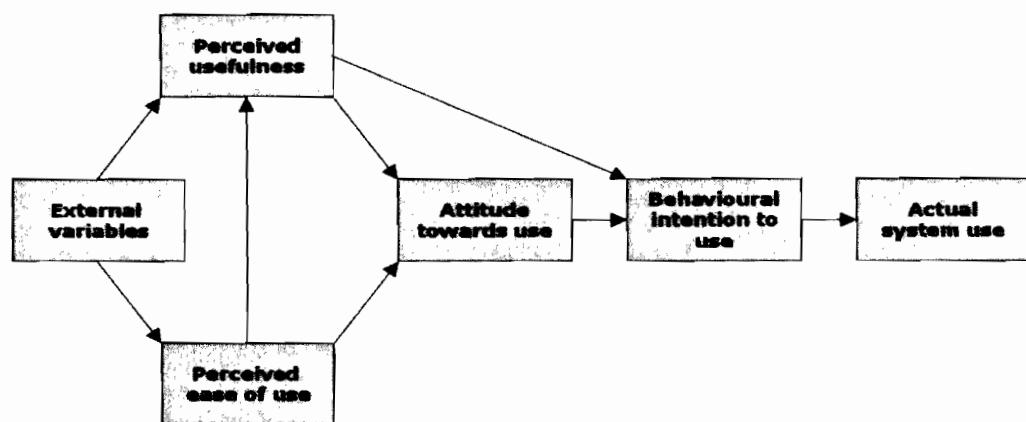
Figure 2.1: *Technology Acceptance Model (Davis et al., 1989)*

2.2 Behavioral Intention to Use technology

According to TPB, perceived behavioral control, together with behavioral intention, can be used to directly predict behavioral achievement, or actual behavior. However, the predictive power of perceived behavioral control on actual behavior can be significantly muted, and rendered unrealistic, when, as examples, a person has little information about the behavior, when available resources and/or requirements have changed, or when emergent, new, and unfamiliar elements impinge on the situation. Furthermore, the influence of perceived behavioral control on behavior is more important as the behavior becomes less volitional. When the person has complete control over the behavior in question, that is, when the behavior is completely voluntary, intentions alone should adequately predict

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behavior (Ajzen and Fishbein, 1980). In these cases, it is the existing behavioral intention to perform the behavior that can significantly predict actual future behavior. Behavioral intention has long been recognized as an important mediator in the relationship between behavior and other factors, such as attitude, subjective norm, and perceived behavioral control (Ajzen, 1991; Ajzen and Fishbein, 1980).

2.3 Innovation Diffusion Theory (IDT)

Rogers (1983) explained the process of innovation diffusion as one which is dictated by uncertainty reduction behavior amongst potential adopters during the introduction of technological innovations. Even though innovations typically offer its adopters novel ways of tackling day-to-day problems, the uncertainty as to whether the new ways will be superior to existing ones presents a considerable obstacle to the adoption process. To counter this uncertainty, potential adopters are motivated to seek additional information, particularly from their workplace peers (Brancheau & Wetherbe, 1990).

Innovation Diffusion Theory (IDT) consists of six major components: *innovation characteristics, individual user characteristics, adopter distribution over time, diffusion networks, innovativeness and adopter categories,* and the *individual adoption process* (Tornatsky & Klein, 1982; Rogers, 1983; Brancheau & Wetherbe, 1990; Moore & Benbasat, 1991; Taylor & Todd, 1995).

Arguably the most popular of the six components of IDT centers on the characteristics of the innovation itself. After analyzing a variety of previous

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innovation diffusion studies, Rogers (1983) singled out the following five characteristics of innovations that consistently influence the adoption of new technologies:

| Relative Advantage | → | Compatibility | → | Complexity | → | Observability | → | Trialability |
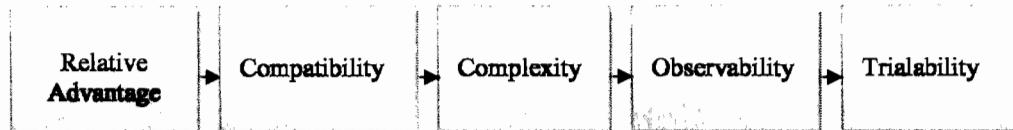
Figure 2.2: *Innovation Diffusion Theory (IDT) Model* (Rogers, 1983)

2.4 Theory of Planned Behavior

A social psychology model frequently used to explain a variety of behavioral intentions is the Theory of Planned Behavior (TPB; Ajzen, 1985, 1991). The TPB is an extension of the theory of reasoned action (TRA; Fishbein and Ajzen 1975), and the TRA is an improvement over Theory of Information Integration (TII; Norman Anderson 1971). The TPB extended the TRA by the addition of Perceived Behavioral Control (PBC) because the TRA has difficulty explaining behaviors over which one does not have volitional control. The TPB model proposes that intention to perform a behavior is the immediate antecedent of that behavior (Courneya, Bobick and Schinke 1999; Ajzen 2002). Whereas intention, in turn, is determined by three conceptually independent variables labeled attitude, subjective norms and perceived behavioral control (PBC). TPB has successfully been used in previous studies to control undesirable behaviors, indicating good correlations between behavior and planned behavioral control. According to TPB, an

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individual's performance of a certain behavior is determined by his or her intent to perform that behavior. Intent is itself informed by attitudes toward the behavior, subjective norms about engaging in the behavior, and perceptions about whether the individual will be able to successfully engage in the target behavior. According to Azjen (1985), an attitude toward a behavior is a positive or negative evaluation of performing that behavior. Furthermore, attitudes are informed by beliefs, norms are informed by normative beliefs and motivation to comply, and perceived behavioral control is informed by beliefs about the individual's possession of the opportunities and resources needed to engage in the behavior (Azjen, 1991). Azjen compares perceived behavioral control to Bandura's concept of perceived self-efficacy (Bandura, 1997). TPB also includes a direct link between perceived behavioral control and behavioral achievement.
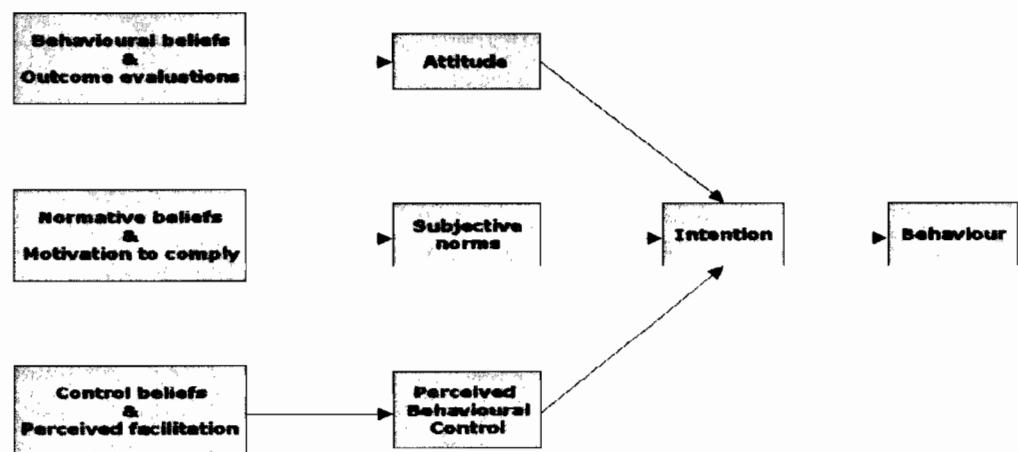
Figure 2.3: *Theory of Planned Behaviour (Ajzen, 1991)*

2.5 Microeconomic Theory

Microeconomic theory provides a set of well-defined constructs where they interrelate to each other through theoretical models and mathematical specifications. In examining the relevant theory applied in many of the previous studies of IT value and provides a guide to interpreting the various findings. Hitt et al. (1996) stated that there are three frameworks which are consistently used namely, theory of production, theories of competitive strategy and theory of the consumer. The theory of production has been used extensively to evaluate the productivity of various firm inputs such as capital, labor and R & D expenditures (Berndt, 1991).

More recently, it has been used to assess IT investments. The theory posits that firms possess a method for transforming various inputs into output, represented by a production functions. For example, previous research by Brynjolfsson and Hitt (1995) and Lichtenberg (1995) demonstrated that the theory of production has been particularly useful in providing empirical estimations of the economic impact of IT and also showed that IT investment generate positive returns. In line with this, Dewan and Min (1997) used the same computer world survey data as Brynjolfsson and Hitt (1995) and Lichtenberg (1995) to examine whether IT is a net substitution or complement for the traditional inputs of ordinary capital and labor, and estimate output and substitutions elasticity. Therefore, their analysis confirmed earlier findings of positive marginal returns to IT investment. Competitive strategy theory will be used to predict the relationship between IT and

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profit or market value. Much of the previous research in this area has examined correlations between measures of IT spending and measures of profitability (Dos Santos et al., 1993; Markus & Soh, 1993; Strassmann, 1990). On other hand, the result did not show clearly either a positive or negative relationship between IT and profit. Competitive advantage is "normally defined as the ability to earn returns on investment persistently above the average for industry" (Porter, 1985). The only way IT can lead to sustained supernormal profits is if the industry has barriers to entry. Moreover, a barrier to entry is "broadly defined as anything that allows firms to earn supernormal profit, such as patents, economies of scale, search costs, product differentiation, or preferential access to scarce resources" (Bain, 1956). Therefore, Hitt et al., (1996) stated that there are two possible ways in which IT value is related to barrier to entry. The first is that in industries with existing barriers to entry, it may be possible for firms in a particular industry to increase profits through the innovative use of IT, provided the barriers to entry remain intact. Second, the use of IT may raise or lower existing barriers or create new ones, thus changing the profitability of individual firms and industries.

Theory of the customer is also grounded in microeconomic theory which can be used to estimate the total benefit that a given purchase confers to consumers. The demand curve for a product represents how much consumers would be willing to pay for each successive unit of product. However, in practice they need only pay the market price, so consumers with valuations higher than the market price retain the surplus. By adding up the successive benefits of each additional unit of good,

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the total benefit can be calculated as the area between the demand curve and the supply curve. Furthermore, in a competitive industry, the surplus from an input to production will be passed along to customers, so the area under the demand curve for an input such as IT will also be an accurate estimate of customer surplus (Schmalensee, 1976). Therefore, by examining how the actual quantity of IT purchased has changed over time, an estimate of the demand curve can be traced out, and the total customer surplus can be calculated (Brynjolfsson, 1996). Besides the three theories above there are still the other theories which are categorized in microeconomic such as data envelopment analysis (DEA), Tobin's q ratio and real options pricing (Melville et al.,2004).

Data envelopment analysis (DEA) is a linear programming model for constructing the nonparametric production frontier and measuring technical efficiency. The integration of IT into the various activities of production process presumably is able to reduce or eliminate some rectifiable causes for technical inefficiency. In other word, the deployment of IT in an organization is able to enhance its capability to produce more output using the same amount of input or, alternatively, produce the same level of output less input (Shao & Lin, 2002). Bharadwaj et al. (1999) analyzed the impact of announcements of IT investments on a firm's stock prices and found that while announcement of innovative IT investment tended to positively impact the market value of the firms, investments in non-innovative IT spending tended to have zero or negative effect on stock price.

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Furthermore, they used Tobin's q, a financial market-based measure of firm performance and examined the association between IT investments and firm q value, after controlling for a variety of industry factors and firm-specific variables. The results showed that IT investment had a significantly positive association with Tobin's q value. To account for the inherent risk and uncertainty of IT investments, option pricing models have been applied to the IT context. Conducting a real-option analysis of point-of-sale (POS) debit services by an electronic banking network, Benaroch and Kauffman (1999) describe the logic of option pricing as how it can handle getting the timing right, scaling up or even abandonment, as the organizations learns about its business environment with the passage of time.

2.6 Importance of SMEs

Most of the previous research has centered on large firms. Some studies suggest that information system theories and practices developed for large firms may not be suitable for small ones (Premkumar, 2003). SMEs are different from large firms in several ways. In SMEs, decision-making is centralized in a reduced number of persons, standard procedures are not well laid out, there is limited long-term planning, and there is greater dependence on external expertise and services for information systems (Premkumar, 2003). Furthermore, SMEs face substantially greater risks in information system implementation than large businesses, since they have inadequate resources and limited education about information systems

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(Cragg and King, 1993). They have difficulties in recruiting and retaining internal information system experts due to the scarcity of qualified information system experts and the limited career advancement prospects in SMEs (Kuan and Chau, 2001).

There is considerable abundance of literature concerning enterprise adoption of IT, for instance, Brown and Lockett (2007) have discussed IT adoption in the specific context of SMEs. More widely Frambach and Schillewaert (2002) described a model of organizational innovation adoption. They suggest a number of determinants that influence the organizations decision on whether to adopt a new innovation; like Customer Relationship Management. Importantly, they suggest that enterprise innovation adoption arises both at the organizational level but also at the individual adopter level. Broadly outlined, these factors are briefly described to highlight key areas of research. Firstly, innovation supplier marketing effort that makes enterprise aware of the technology can provide increased adoption. Further increments in adoption can be provided via enterprise network participation and inter-connectivity provided via social networks. In Rogers (1995) innovation diffusion terminology this may, in part, be viewed as word of mouth effects that are known to positively influence the diffusion of innovations among early and later adopters. The previously discussed innovation supplier marketing effort, of course, would capture Rogers's media effects. Environmental influences can also place sufficient pressure on enterprises to adopt novel technologies. For example, if the prime of a group of companies encourages the use of a new integrating

supply chain system, it may be more effective for the supply chain partners to adopt the technology to enhance communication (i.e. a positive network externality); or even essential to remain in the supply chain. Strategically, if a competitor adopts the technology, it may be essential for other competing enterprises to do so if they are to remain viable within the industry sector.

SMEs comprise an essential sector of all countries' economies and in some countries constitute more than 90 per cent of businesses. Given the economic importance and their intrinsic community value, the role of small businesses in emerging markets based on EC is a major policy issue for governments. Smaller companies can benefit disproportionately from the opportunities offered by information technologies and EC. The internet can make size irrelevant, because it can level the competitive playing field by allowing small companies to extend their geographical reach and secure new customers in ways formerly restricted to much larger firms. On the other hand, it is conceivable that the dynamics of electronic markets could create conditions that might impede SME involvement, relating to access to networks and connectivity, technical standards, or institutional arrangements that might have anti-competitive effects or pose barriers to entry. This means that both governments and the business community must remain attentive to developments in the electronic marketplace in order to prevent or remove barriers to full SME participation.

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2.7 Information System and Firm's Performance

SMEs information system implementation and success have been extensively researched. Recent research development focuses on the relationship between firms strategies alignment with information system (Tan, 1996; Li and Ye, 1999). These studies suggested that there are positive relationship between strategy and strategic information technology. A study conducted by Shin (2001) discovered that IT investments will be more efficient if the systems implementation is align with the firms' strategy. This argument is supported by Cragg et al. (2002) asserting that IT implementation which is align with business strategy proves to have positive impact on firms' performance. In addition, Davenport (1998) highlighted the importance of having a good fit between firms' requirement and technology capabilities. The mismatch between what is needed by the firms and service offered by the new technology will yield poor performance. Nevertheless, HyvÖnen (2007) also added that sophisticated information technology aligned with ineffective performance measure will yield lower performance outcome. This raises the need for careful planning and strong justification process to be undertaken before firm reaches the decision to implement an information system. This issue is more profound within SMEs due to their limited resources and experience in IT field (Mitchell, Reid, & Smith, 2000). Other authors (Bruque, 2007; Riemenschneider et.al, 2003) investigated factors that influence the adoption of information technology in SMEs. Both authors generally agreed that SMEs adoption of information technology were mainly influenced by the perceived

benefits of implementing the systems and stems from the pressures received from competitors, customers, and suppliers to ensure business continuity and survival in the increasingly competitive environment.

Many firms invest in advanced information technology aiming at collecting more information to assist decision making performance which will eventually lead to improve efficiency and firms' profitability. Study showed that firms' that acquire extensive IT resources are able to create competitive advantage (King, 1989). Nevertheless, prior researches have difficulty providing evidence on positive relationship between IT investments and firms' performance (Mahmood & Mann, 1993; Ismail, 2007).

2.8 IS Skills and Knowledge

Top management with higher levels of IS skills and knowledge have a better understanding of the net perceived benefits of IS and in most instances will be more comfortable to be enabled for use and utilise IS (Chang et al., 2003; Thong, 2001). In addition, SMEs are likely to rely on external experts during their IS implementations (e.g., Thong, 2001; Cragg and King, 1993). Thus, the support from the external experts' makes it easier for SMEs to understand the perceived net benefits that can be realised from becoming enabled and utilisiling IS (Lee, 2004; Attewell, 1992).

Despite the significant contribution that IT has made to business, many studies indicate that there are a large number of unsuccessful IT implementations in SMEs and that the adoption rate is very slow (Acar et al., 2005; Shin, 2006). Researches give three main reasons for this. First, management doesn't know or is unclear on how and why their firms adopt IT in the first place (Levy et al., 2001). Second, there is a misconception toward the IT adoption process mainly because managers do not understand the relationship between IT and the firms themselves (Bull, 2003) or are uncertain about the opportunities that IT can offer (Southern and Tilley, 2000). Finally, firms do not have the capabilities to expand their IT resource (Acar et al., 2005; Claessen, 2005) because of lack of business and IT strategy, limited access to capital resources, emphasis on automating, influence of major customers and limited IS skills (Ballantine et al., 1998; Bhagwat and Sharma, 2007; Bruque and Moyano, 2007).

Knowledge management (KM) is a "conscious strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that will improve organizational performance" (O'Dell & Grayson, 1998, p. 6). KM can be thought as "encouraging individuals to communicate their knowledge by creating environments and systems for capturing, organizing, and sharing knowledge throughout the company" (Martinex, 1998, p. 88). Its goal is to identify and leverage collective knowledge in an organization to help the organization compete (Von Krogh, 1998; Alavi & Leidner, 2001). Research by Tanriverdi (2005) reveals that IT resources of a firm can enhance its

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KM ability and influence its organizational performance. The study provided empirical results for (1) IT relatedness of a firm's business units would enhance its cross-unit KM capability; (2) KM capability can achieve superior firm performance.

2.9 Ease Use of IS

Businesses are also concerned about information theft and consider conducting transactions on-line to be risky (Ratnasingham, 2003; Pavlou, 2002). Prior studies on trust in technology assert that perceived net benefits such as security and quality can be achieved by properly managing the security-based mechanisms (e.g., encryption, UserID and password) (Ratnasingham, 2003, Kendall et al., 2001). Prior studies also reveal that a lack of trust in trading partners during IS activities can lead to uncertainties such as unknown future events and their trading partners' responses to such events (e.g., Chan and Lee, 2002; Deeter-Schmelz et al., 2001). Firms lacking previous experience or relationships with the trading partners or potential partners are likely to perceive lower net benefits in relation to the adoption of IS (Pavlou, 2002). SMEs cultural orientation can be conceptualised in terms of their strategic posture that is defined by Covin and Slevin (1991) as the competitive orientation of a firm. These perceptual stances can range from the highly positive entrepreneurial stance to one of conservatism and resistance to change. SMEs with strong entrepreneurial culture are viewed as those in which the top managers or owners are willing to take risks and to favour change and if it

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leads to competitive advantage (Weaver et al., 2000). SMEs whose culture is characterised as entrepreneurial will most likely be able to deal with uncertainty, and thus, would perceive high benefits in adopting and utilising IS (Curry and Moore, 2003; Hoffman and Klepper, 2000).

2.10 Information Quality

Quality information is one of the competitive advantages for an organization. In an information system, the quality of the information provided is imperative to the success of the systems. Information quality is a term to describe the quality of the content of information systems. Data quality which is related closely with information quality has been an issue of interest to practitioners and researchers for many years. Significant effort has gone into defining what is meant by data quality (Ballou and Tayi, 1998). Over time techniques and procedures have evolved, designed to leverage and to make sure that the level of customer data required by transactions processing systems is of appropriate level of quality (Wang, Storey, and Firth, 1995). Information quality is a measure of value that the information provides to user of that information. Quality is a somewhat subjective measure of the utility, objective, and integrity of gathered information (Turban et al., 2006).

Information systems processing is similar to production processing in manufacturing organizations. If the product (information) is not delivered on time (timeliness) and the product (information) does not conform to the needs

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(relevance) of customers (users), then the customers (users) will be dissatisfied and the firm will lose business (Clikeman, 1999). Information provided by an IS that does not conform to its users' needs is subject to heavy maintenance costs and disruption of operations in the organization, resulting in high costs to the organization (Swanson, 1997). When better operational information is available, organizations benefit in terms of reducing labor costs, reducing waste, better utilizing machinery, and lowering inventory costs (Banker et al., 1990). Thus, high information content (i.e., accurate, complete, and relevant information) leads to better product cost control and increased organizational efficiency (i.e., increased profit margin, increased decision making efficiency). Data quality is at the heart of information quality in that poor data quality results in poor information quality. Poor data quality, and hence poor information quality, has adverse effects on organizations at operational, tactical, and strategic levels (Redman, 1998). At the operational level, customers will be dissatisfied and employees will lack job satisfaction because of inaccurate or incomplete information. At the tactical level, the quality of decision making will be adversely affected by irrelevant information. Selection and execution of a sound business strategy will become difficult because of inaccurate or delayed information. On the other hand, high information quality in terms of information content (i.e., accuracy, completeness, relevance to decision making) can lead to high organizational impact in terms of market information support (i.e., anticipating customer needs) and internal organizational efficiency (i.e., high-quality decision making).

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2.11 Theoretical Framework

IV   DV
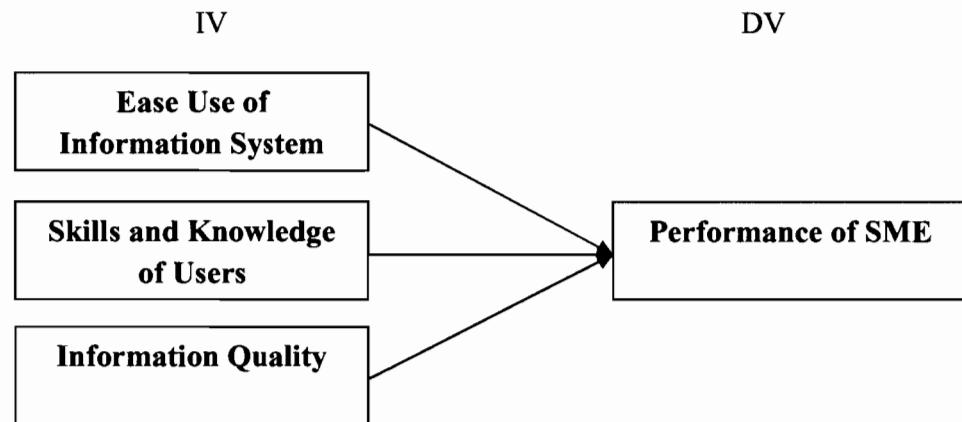
Figure 2.4: Research Model

2.12 Hypothesis

H1: there is a relationship between ease of use of information system and firm performance in SMEs

H2: there is a relationship between skills and experience of information system user and firm performance in SMEs in Bangladesh?

H3: there is a relationship between information quality of information system and firm performance in SMEs in Bangladesh?

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CHAPTER THREE

METHODOLOGY

3.1 Introduction

This study will provide a brief description about the method to conduct the study for investigating the impact of information technology in SMEs in Bangladesh. In this part to the study we will be discussing the tools used to accomplish this study and the methods which are used in this study.

3.2 Type and Nature of Study

This chapter describes the research methods used for impact of information technology in Bangladeshi small and medium firms performance. Research methodology is a set of procedures or methods used to conduct research. Quantitative research involves questionnaire for the collection of data. These research methods are important to gather information such as users' preferences, opinions and suggestions.

3.3 Type of Investigation

Based on objective of this study this is a causal study quantitative in nature. When a researcher wants to delineate the cause of one or more problems, then the study

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is called a causal study. In this study researcher's objective is to investigate the impact of information technology in small and medium sized firms in Bangladesh.

3.4 Study setting

In this study we are aiming to conduct the study in Bangladesh. It is aimed to take the data within three months time and the intention of time will be setting from November 2010 until January 2011.

3.5 Unit of Analysis

Unit of analysis in this study is the managers in Bangladeshi small and medium sized manufacturing firms.

3.6 Sample

Population of this study is all firms in industrial area in Dhaka are practicing information system in SMEs in Bangladesh. Researcher will use the judgment sampling method to achieve the objective of this study. 150 managers will be selected from industrial areas that are practicing IS in their firm as sample for this study. The questionnaire has distributed to the 150 managers in the industrial area of Dhaka in. Among those all questionnaires will be collected from the managers.

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The data and this is a targeted sample. The data will be focused those firms especially where IS is being practiced.

3.7 Data Collection Method

The search for the standardized instrument and the making of questionnaire is conducted to execute the survey. There are various methods in collecting information or more precisely data gathering. It can be carried out by searching the related topic literatures, white papers, technical papers, marketing reports, conferences proceedings, product data sheets, product brochures, web pages, project focus groups, with experienced personnel, distributing questionnaire, or even communicate to people. The research methods used for this dissertation purpose are the review of literatures and books from the Internet, and data gathering by distributing questionnaires among managers.

In this regards data will collect through questionnaire distribution to the managers in SMEs in Bangladesh.

3.8 Questionnaire Design

In the first phrase, this research adopts an expert-opinion survey, which uses judgment sampling to choose the sampling objects for SMEs in Bangladesh. Two parts will be designed to questionnaire demographic and interval scale. I will use

personally administrated questionnaire which will consist a Likert interval scale, "strongly agree, agree, neutral, disagree, and strongly disagree to" rate the specific question about IS impact on SMEs in Bangladesh. Interval scale of questions has been adopted from the previous studies. There are three independent variables. Knowledge and skills related questions have been adopted from D.C. Yen et al (2003). Ease of use variable questions adopted from the Technology Acceptance Model (Davis, 1989). Information quality and firm performance related question has been adopted from the Slone (2006).

3.9 Summary

This chapter discussed about the research method used in this study. Distributions of questionnaire have been used as data collection research instruments. It is intended that the findings of this research study will be used local and regional authorities to assess and evaluate the IS impact in SMEs.

CHAPTER FOUR

FINDINGS

4.1 Introduction

This chapter presents the results of the statistical analysis into four sections. The first section illustrates the overview of data collected. The second section explains the respondent's demographic profile. The third section covers the results from the statistical methods, including reliability test, descriptive statistics, correlation analysis, and regression analysis.

4.2 Overview of Data Collection

A total of 150 questionnaires were distributed to executives in Dhaka, Bangladesh by questionnaire administrator appointed by researcher. Of the 120 returned questionnaires, 20 questionnaires were discarded due to incomplete data. Hence, 100 questionnaires were used in the statistical analysis, representing a response rate of 80%.

4.3 Demographic Profile of Respondents

Table 4.1 depicts the demographic profile of respondents. Appendix B1 provides the demographic profile of respondents in detail. In this study, demographic variables consisted of gender, education level, and experience of respondents.

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As revealed in Table 4.1, 80% of the respondents were males with the remaining of 20% being females. The education level of respondents' majority of the respondents has master degree (67%) and the lowest number of respondents has PhD degree. The largest percentage of the respondents reported they have 10 to 15 years work experience in the firm; on the other hand the lowest number of respondents has more than 20 years experience which is 8%.

Table 4.1: Demographic Profile

Demographic Variables	Categories	Frequency	Percentage (%)
Gender	Male	80	80
	Female	20	20
Education level	Bachelor	29	29
	Master	67	67
	PhD	4	4
Working Experience	Less than 5 year	1	1
	5-10 years	27	27
	10-15 years	52	52
	15-20 years	12	12
	More than 20 Years	8	8

4.4 Analysis

This section will discuss the results of the statistical analysis, including reliability test, descriptive statistics, correlation analysis, and regression analysis.

4.4.1 Reliability Test

Reliability tests were conducted on Ease of Use, Skill and knowledge, Quality of Information and performance of SME. The Cronbach's alpha values of the study variables are shown in Table 4.2. The detail of reliability analysis is given in Appendix B2. As revealed in Table 4.2, the reliability coefficient of the study variables exceeded the minimum acceptable level of 0.70 (Nunnally & Bernstein, 1994). The values of reliability for variables are ease of use 0.80, skill and knowledge 0.91, Quality of Information 0.83 and performance of SME 0.94.

Table 4.2: The Value of Reliability by Items, Variables and Tools Survey

No	Variable	Item	Correlated Item-Total Correlation					*a*
1	Ease of Use	5	0.82	0.75	0.45	0.82	0.94	0.80
2	Skill and Knowledge	5	0.52	0.78	0.84	0.88	0.83	0.91
3	Information Quality	5	0.68	0.47	0.75	0.57	0.68	0.83
	Performance of SME	10						0.94

4.4.2 Descriptive Statistics

Ease of use, skill and knowledge, information quality and performance of SME variables were measured based on a 5-point Likert scale. Table 4.3 highlights the results of the descriptive analysis in terms of means and standard deviations for interval scale variables. The detail of descriptive statistics referred to Appendix B3.

From Table 4.3, observed that ease of use had a mean value of 4.20 with standard deviation of 0.55. This indicated that majority of the respondents were agreed on ease of use have the positive impact on performance of SME.

For the skills and knowledge, the mean and standard deviation values were 4.43 and 0.45 respectively. Regarding the information quality variable the mean value was 4.33 whilst the standard deviation value 0.51, performance of SME variable has the mean 4.21 with the standard deviation 0.58. The values above indicate that most of the respondents agreed on that skills and knowledge has the positive impact on firm's performance of SMEs in Bangladesh.

Table 4.3: Descriptive Statistics of the Study Variables (N=100)

Variables	Mean	Standard Deviation
Ease of Use	4.20	0. .55
Skill and Knowledge	4.43	0.45
Quality of Information	4.33	0.51
Performance of SME	4.21	0.58

4.4.3 Correlation Analysis

To examine the bivariate relationship among the variables, a Pearson's correlation analysis was carried out. Table 4.4 displays the results of the correlation analysis of the study variables. The detail of correlation analysis is depicted in Appendix B4.

The Pearson correlation has been used to measure the significance of linear bivariate between the independent and dependent variables thereby achieving the objective of this study (Sekaran, 2003). Variable association refers to a wide variety of coefficients which measure the strength of a relationship. Correlation is a bivariate measure of association (strength) of the relationship between two variables. It varies from 0 (random relationship) to 1 (perfect linear relationship) or -1 (perfect negative linear relationship). It is usually reported in terms of its square (r2), interpreted as percent of variance explained (Hair et al., 2006).

Base on Table 4.4, Ease of Use of information system has a positive correlation with performance of SME (r = 0.954, p<0.01). Skills and knowledge of information system has the positive correlation with performance with the value r =0. 99, p<0.01. Information quality with the value r= 0.74, p=0.01 has the positive correlation with the performance of SME.

Pearson's r2 is the percent of variance in the dependent variable explained by the given independent when (unlike the beta weights) all other independents are allowed to vary. A rule of thumb is that multi-collinearity may be a problem if a

correlation is > 0.90 in the correlation matrix formed by all the independents (Hair et al., 2006).

Thus in this study all the independent variables are correlated with the dependent variable performance of SME. It indicated that in the manufacturing firms in Bangladesh important aspects of information system on SMEs performance are ease of use, skill and knowledge, information quality.

Table 4.4: Pearson's Correlation Analysis of the Study Variables

Variables	1	2	3	4
Ease of Use	1.00			
Skill and Knowledge	0.27**	1.00		
Quality of Information	0.65**	0.94**	1.00	
Performance of SME	0.95**	0.99**	0.74**	1.00

Note, ** $p<0.01$

4.4.4 Regression Analysis

Based on the discussion made in subsection 2.12 of Chapter 2, four main hypotheses were developed. The regressions analyses were conducted to examine the hypothesis:

H1: there is a relationship between ease of use of information system and firm performance in SMEs

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H2: there is a relationship between skills and experience of information system user and firm performance in SMEs in Bangladesh?

H3: there is a relationship between information quality of information and firm performance in SMEs in Bangladesh

The detail of the output for regression result is shown in Appendix B5.

4.4.4.1 Regression between Ease of Use of IS and Performance of SME

The first hypotheses of this research postulated the relationship between ease of use has significant influences on performance of SME in Bangladesh. Regression analysis was conducted to test HI, with performance of SME as the dependent variable. The regression result is presented in Table 4.5. The detail of the outputs for this regression is shown in Appendix B5.1.

According to Appendix C5.1, the ease of use variable was significantly in the high positive correlation (0.95). The coefficient of determination (R^2) is 0.91, representing that 91 % of the cases will be correctly predicted by the regression equation and 9% not. The variable had a tolerance value of more than 0.10 and a variance inflation factor (VIF) of less than 10.

As shown in Table 4.5, the beta values for the independent variable ease of use have positive impact on firm performance in SMEs in Bangladesh. Specifically, the result revealed that ease of use has ($\beta = 0.91$, *p < 0.01)* positive impact on SMEs performance in Bangladesh.

Based on the linear regression the result is statistically significant; $F_{(1, 98)} = 983.402$, $p < 0.01$. it is indicated that there is positive relationship between ease of use and firm's performance of SMEs in Bangladesh as stated in **H1.**

Table 4.5 Ease of Use of IS and Performance of SME

Independent Variable	Standard Beta
Ease of Use	0.95**
R^2	0.91
$Adj.R^2$	0.91
R^2 Change	0.91
F Change	983.402
Sig. F Change	0.00

4.4.4.2 Regression between Skills and Knowledge and SMEs Performance

According to Appendix B5.2, skills and knowledge was significantly in the high positive correlation (0.99). The coefficient of determination (R^2) is 0.99, representing that 99% of the cases will be correctly predicted by the regression equation and 1% not. The variable had a tolerance value of more than 0.10 and a variance inflation factor (VIF) of less than 10.

As shown in Table 4.6, the beta values for the skills and knowledge was significant. This implied that the knowledge and skills has a positive influence on SMEs performance in Bangladesh. Specifically, the result revealed that skills and knowledge has ($\beta = 0.99$, $p < 0.01$) positively related with SMEs performance in Bangladesh.

Simple regression was conducted to investigate how skills and knowledge has positive influence on SMEs performance. The results are statistically significant F $(1, 98) = 857.78$, p< 0.01. So as stated in **H2** there is a positive relationship between independent variable skills and knowledge and firm performance of SMEs in Bangladesh.

Table 4.6: Skills and Knowledge and SMEs Performance

Independent Variable	Standard Beta
Skills and Knowledge	0.99**
R^2	0.99
$Adj.R^2$	0.99
R^2 Change	0.99
F Change	857.78
Sig. F Change	0.00

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4.4.4.3 Regression between Information Quality and SMEs Performance

According to Appendix B5.3, the information quality and SMEs performance variable were significantly in the high positive correlation (0.74). The coefficient of determination (R^2) is 0.55, representing that 55% of the cases will be correctly predicted by the regression equation and 45% not. The variable had a tolerance value of more than 0.10 and a variance inflation factor (VIF) of less than 10.

As shown in Table 4.7, the beta values for the independent variable information quality was significant. This implied that the information quality has a relationship with SMEs performance. Specifically, the result revealed that information quality ($ß = 0.54$, $p < 0.01$) positively related with SMEs performance in Bangladesh.

Simple regression was conducted to investigate the relationship between information quality and SMEs performance. The results are statistically significant $F (1, 98) = 118.92$, $p < 0.000$. So information quality and SMEs performance have positive relation; **H3** is accepted.

Table 4.7: Information Quality and SMEs Performance

Independent Variable	Standard Beta
Information quality	0.74**
R^2	0.55
$Adj.R^2$	0.54
R^2 Change	0.55
F Change	118.92
Sig. F Change	0.00

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CHAPTER FIVE

DISCUSSION CONCLUSION AND RECOMMENDATION

With regards the factors, and in the context of SMEs, our findings demonstrate that various elements influence the adoption of information system. First, there is a broad consensus on the part of the respondents that the adoption is motivated by the growth experienced by the firm. Growth makes it necessary for firms to adopt new and more powerful technological solutions. This conclusion is in line with other research demonstrating the importance of size in technology adoption models for SMEs (Premkumar, 2003).

The previous chapter presents the results of data analyses intended to test the research model for this study. In this final chapter, the results of empirical tests are summarized and discussed from the perspective of their practical and theoretical implications, possible limitations and future research opportunities. This chapter also determined the discussion of the research framework. The examination was confirmed the direct relationship between ease of use and skills and knowledge and information quality with SMEs performance in small and medium sized firms in Bangladesh.

The result of correlation, the regression and multiple regressions in assessing the variables or the empirical relationship between independent and dependent variables were positively significant as hypothesized. The positive association

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between three independent and one dependent variable was supported. Furthermore, empirical research supporting the theoretical framework has been development in the study. Analyze IS adoption is the scientific activities and as a combination of representing (theory) and empirical research to explore the technology acceptance of information system in SMEs.

The result of correlation, the regression in assessing the variables or the empirical relationship between ease of use, skills and knowledge and information quality contribute were positively related to firm performance of SMEs in Bangladesh.

The set of items that correspond to each theoretical construct was initially subjected to an examination of Cronbach's alpha are confident reliable more than 0.7 as recommended. Thus, all measures in the ease of use, skills and knowledge and information quality and performance of SMEs items were appeared internally consistent, reliable and valid. The high influence among independent variables to dependent variable confirmed the hypothesis. The main objective is achieved, and this chapter concludes the relationship and level of influence of ease of use, skills and knowledge and information quality on SMEs performance in Bangladesh.

The technology acceptance model is a management system (not only a measurement system) that enables SMEs to clarify their vision and strategy in technology enhancement and translate them into action. It provides feedback around both the internal business processes and external outcomes in order to continuously improve business performance and results.

At the same time, the SME's policies of benchmarking and building closer relationships with the technology supplier can be fostered if it establishes a complete network of relationships (by means of collaboration agreements, strategic alliances, joint ventures, etc.) with firms that are innovative in information technology.

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Appendix A: Cover Letter and Questionnaire

Questionnaire

Impact of Information System on Firm's Performance: Small and Medium Enterprises in Bangladesh

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Md. Shamimul Azim
College of Business
Universiti Utara Malaysia
06010 UUM Sintok, Kedah
Malaysia

20 December 2010

Dear Respondent,

Impact of Information System on Firm's Performance: Small and Medium Enterprises in Bangladesh

I am MSc (Management) student in Universiti Utara Malaysia. Currently, I am conducting a study with the above-mentioned title as a partial requirement for the master's degree.

Your honest opinion is sought to ensure the success of the study. All information provided will be kept strictly confidential and used for academic purpose only. In this questionnaire, I would like to answer the question. You would probably take about 20 minutes to answer the questionnaire. Please return the questionnaire to all my friends who already distributed it.

Should you have any queries, please do not hesitate to contact me. Thank you very much for your time and kind support.

Sincerely

Md. Shamimul Azim

Part A

Demographic Profile

Please fill in the answer, which most describe you at the space beside the question.

1. You are:

(a) Male   (b) Female

2. What is your highest education level?

[a] Bachelor

[b] Master

[c] PhD

2. Your Working Experience

[a] less than 5 years

[b] 5-10 years

[c] 10-15 years

[d] 15-20 years

[e] Above 20 years

Part: B

Please read the description given. Then rate the frequency by circle the corresponding next to the statement. Use the following scale:

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

		Strongly Disagree	disagree	Neutral	Agree	Strongly agree
1	**Ease of Use**					
a	It is difficult to learn how to use information system.					
b	I feel comfortable with information system rather manually					
c	My interaction with the new information system is clear and understandable					
d	I believe it is easy to get the new information system do what I want it to do					
e	Overall I believe the new information system is easy to use					
2	**Skills and Knowledge**					

a	Knowledge of specific functional areas need to use information system					
b	Application systems knowledge for information system					
c	I needs IS technological skills					
d	I should have knowledge about packaged products (spreadsheet, word processing, etc.)					
e	I should have knowledge about operating system					
3	**Information Quality**					
a.	Our system Provide specific and complete information					
b.	System provides relevant information					
c.	System provides accurate information					
d.	System keep secured information for the company					
e.	Overall information provides by system is helpful and has quality for the firm					
4	**Firm Performance**					
a.	IS enables the organization to respond more quickly to change.					

b.	IS saves money by reducing system modifications or enhancement costs					
c	IS provides the ability to perform maintenance faster	THANK YOU				
d.	IS enables the organization to catch up with competitors					
e	Improves customer relations.					
f	IS saves money by avoiding the need to increase the work force					
g	aligns well with stated organizational goals					
h	Saves money by reducing communication costs					
i	Enhances competitiveness or creates strategic advantage.					
j	Overall IS enhance effectiveness and efficiency for our firm					

Thank You

Appendix B: Statistical Output

Appendix B1: Demographic Profile

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	80	80.0	80.0	80.0
	female	20	20.0	20.0	100.0
	Total	100	100.0	100.0	

Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelor	29	29.0	29.0	29.0
	Master	67	67.0	67.0	96.0
	PhD	4	4.0	4.0	100.0
	Total	100	100.0	100.0	

Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<5	1	1.0	1.0	1.0
	5-10	27	27.0	27.0	28.0
	10-15	52	52.0	52.0	80.0
	15-20	12	12.0	12.0	92.0
	>20	8	8.0	8.0	100.0
	Total	100	100.0	100.0	

Appendix B2: Reliability Analysis

Reliability: Ease of Use

Reliability Statistics

Cronbach's Alpha	N of Items
.804	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
EU1	16.8100	4.378	.822	.688
EU2	16.9700	4.373	.746	.711
EU3	16.8800	5.076	.499	.796
EU4	16.8100	4.378	.822	.688
EU5	16.5700	6.854	.094	.879

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Reliability: Skills and Knowledge

Reliability Statistics

Cronbach's Alpha	N of Items
.908	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SK1	17.6300	3.670	.520	.937
SK2	17.6600	3.176	.786	.883
SK3	17.7400	3.124	.843	.871
SK4	17.7600	3.154	.876	.865
SK5	17.7300	3.189	.837	.873

Reliability: Information Quality

Reliability Statistics

Cronbach's Alpha	N of Items
.829	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
IQ1	17.2600	4.154	.677	.779
IQ2	17.2500	5.038	.468	.834
IQ3	17.4100	4.103	.746	.759
IQ4	17.3200	4.604	.568	.810
IQ5	17.2800	4.123	.675	.780

Reliability: Firm Performance

Reliability Statistics

Cronbach's Alpha	N of Items
.935	10

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
FP1	37.6200	32.339	.172	.949
FP2	37.9100	26.689	.839	.923
FP3	37.9100	26.689	.839	.923
FP4	37.9800	26.909	.748	.927
FP5	37.9700	27.767	.699	.930
FP6	37.9100	26.689	.839	.923
FP7	37.9100	26.689	.839	.923
FP8	37.9600	26.746	.760	.927
FP9	37.9100	27.214	.746	.927
FP10	37.9100	26.689	.839	.923

Appendix B3: Correlation Analysis

Correlations

		mean_EU	mean_SK	mean_IQ	mean_FP
mean_EU	Pearson Correlation	1	.270**	.654**	.954**
	Sig. (2-tailed)		.007	.000	.000
	N	100	100	100	100
mean_SK	Pearson Correlation	.270**	1	.095	.986**
	Sig. (2-tailed)	.007		.348	.162
	N	100	100	100	100
mean_IQ	Pearson Correlation	.654**	.948	1	.740**
	Sig. (2-tailed)	.000	.348		.000
	N	100	100	100	100
mean_FP	Pearson Correlation	.954**	.986**	.740**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	100	100	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

Appendix B4: Regression Analysis

Appendix B4.1: Regression between Ease of Use and Firm Performance

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.954[a]	.909	.908	.17547	.909	983.402	1	98	.000

a. Predictors: (Constant),
mean_EU

Appendix B4.2: Regression between Skills and Knowledge and Firm Performance

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.987[a]	.987	.989	.13268	.987	857.78	1	98	.000

a. Predictors: (Constant),
mean_SK

Appendix B4.3: Regression between Information Quality and Firm Performance

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.740[a]	.548	.544	.39179	.548	118.926	1	98	.000

a. Predictors: (Constant),
mean_SK