Review of Literature
2.1 Introduction

Since the introduction of IT as a useful aid for business success, many independent research studies have been conducted about IT adoption and the factors affecting the adoption decision in organizations throughout the world. The research studies about adoption models started with the introduction of electronic data interchange (EDI) into the business world, and continued with personal computer acceptance models, information system (IS) adoption models, communication technology adoption (CTA) models, Internet adoption models, website adoption models and of late, the e-Commerce adoption models corresponds to the latest IT advances.

Small businesses are the backbone of the economy in many countries. There is a growing recognition worldwide that Small and Medium Enterprises (SMEs) have an important role to play because of their greater resource-use efficiency, capacity for employment generation, technological innovation, promoting inter-sectoral linkages, raising exports and developing entrepreneurial skills. Their flexibility of location is an important advantage in reducing regional imbalances. The future of SMEs is of major policy concern given their strategic importance in any discussion of reshaping the industrial sector. This is more so in the case of India, which has one of the longest history of government support to the small-scale industrial sector since independence compared to most developing countries.

SMEs have long been found to be different from large firms in IT implementation context and they are not a simple scaled-down model of large firms (Raymond, 1985, Thong et. al., 1996). In general, small businesses face substantially greater risks in IT implementation than large businesses do because of inadequate resources and limited education about IT (Cragg and King, 1993, Ein-Dor and Segev, 1978). These differences caused special IT adoption models to be proposed focusing on SMEs and their unique characteristics.
The growth of the Internet as a shopping medium has revealed the evolution of the behaviour of e-Customers as they acquire e-Purchasing experience (Gefen et. al., 2003; Yu et. al., 2005; Hsu et. al., 2007). In offline commerce, the motivations that lead a potential customer to make a purchase are not the same as those that influence an experienced customer (Hernandez et. al., 2009). Likewise, some studies on Information Technologies (IT) have found that the perceptions that influence adoption may have different effects on individuals' subsequent decisions (Tornatzky et. al., 1983) because experience may modify their behaviour (Venkatesh and Morris, 2000; Gefen et. al., 2003).

Despite these differences, very few works have conducted a separate analysis of the perceptions related to adoption and the perceptions related to "Post-Adoption" or acceptance (Karahanna et. al., 1999; Vijayasarathy, 2004). Most of them consider that, because of the limited development of the new channel, very few e-customers had made several purchases and that, thus, there were hardly any behavioural differences between adoption and acceptance (Chen et. al., 2002; Ahn et. al., 2004). The main objective was to discover the motivations that led to adopting the Internet as a purchasing channel compared with the offline market (Chen et. al., 2002; Klopping and McKinney, 2004).

In recent years, e-Commerce has grown enormously. Accordingly, the beliefs and attitudes presented in the adoption stage of e-Commerce vary with respect to the motivations underlying the "Post-Adoption" stage (Karahanna et. al., 1999; Gefen et. al., 2003; Yu et. al., 2005). The literature on the subject made a distinction between two decisions: the adoption of e-Commerce (the decision by potential e-customers to make the first purchase) and channel acceptance (re-Purchase decisions by those who have carried out at least one purchase, who we call experienced e-customers). E-customer experience is considered as a moderating variable of other perceptions, modifying their influences upon final behaviour. Therefore, it was suggested that the firms that wish to triumph in this new channel should differentiate their customer enticement and loyalty strategies according to the Internet shopping experience of the customers.

E-Commerce adoption by small and medium size enterprises (SMEs) is getting attention by academics, governments and international
organizations as small and medium size enterprises (SMEs) are an important sector of the economy and the economy could substantially benefit from this technology.

Kaynak et. al., (2005), in their study on factors affecting the adoption of electronic commerce in 237 SMEs in Turkey, have found that e-Commerce adoption, was significantly influenced by its perceived benefits. However, the perceived limitations of e-Commerce applications were found to have no statistically significant effect on e-Commerce adoption. The analysis also showed that company and industry-specific factors, with the exception of amount of resources allocated for export development, did not appear to have any significant impact on e-Commerce adoption.

2.2 Information and communication technology

Information and communication technology (ICT) connectivity (PCs and Internet) is very widespread in businesses of all sizes. As is the case with all technologies, small businesses are slower than large ones to adopt new ICTs. Commercial considerations and potential returns are the principal drivers of small business adoption and profitable use. Principal reasons for non-adoption are lack of applicability and little incentive to change business models when returns are unclear. SMEs also face generic barriers to adoption including trust and transaction security and IPR concerns, and challenges in areas of management skills, technological capabilities, productivity and competitiveness. The issues for governments are to foster appropriate business environments for e-Business and ICT uptake (e.g., to diffuse broadband, enhance competition), and target programmes to overcome market failures to the extent that they are needed in particular areas (e.g., skill formation, specialised information). Everything was done using modern Internet tools and applications like the B2B solution models. The interactive business applications and tools that are Web enabled are the requirements now for the modern business activities of today.

Small firms have long been found to be different from large firms in the information systems (IS) context and they are not a simple scaled-down model of large firms (Raymond, 1985, Thong et. al., 1996). In general, small businesses face substantially greater risks in IT implementation than large businesses do because of inadequate resources
and limited education about IT (Cragg and King, 1993, Ein-Dor and Segev, 1978). Compared with larger firms, small firms have a general lack of computer knowledge, have inadequate hardware and software, and need to rely on outside resources, experience a lack of financial resources and technical support, have recruitment difficulties, and have a short-range management perspective imposed by a volatile competitive environment (Soh et. al., 1992). Although, in theory, appropriate IS can help small businesses to develop their markets, to increase sales turnover and to raise profitability, severe constraints on financial and human resources often cause small businesses to lag behind large businesses in the use of information technology (IT) (Welsh and White, 1981). But the benefits of e-Commerce are not only for large firms; small and medium sized enterprises (SMEs) can also benefit from e-Commerce.

The research findings based on MIS environments in large firms cannot necessarily be generalized to small firms (DeLone, 1981, DeLone, 1988, Ein-Dor and Segev, 1978, Lai, 1994, Raymond, 1985, Raymond, 1990). Since small firms have distinctive and unique computing needs, as well as different technology acceptance patterns compared with large ones (Cragg and King, 1993, Massey Jr., 1986, Rogers, 1995), there is a need to investigate the applicability of the IT adoption models in general and e-Commerce adoption model in particular to small firms.

The literature on global IT adoption and diffusion focused on factors influencing e-Commerce adoption in many countries. Even though there are many similarities and dissimilarities regarding the diffusion and adoption of IT and computing power in general, many similarities are also expected in SMEs' e-Commerce adoption. For example, OECD (2002) ranked India among the top 100 in the world in terms of computing power per person, with interesting factors to see whether they are also similar or dissimilar regarding IT adoption and factors affecting e-Commerce adoption in small and medium enterprises.

2.3 The Internet

Internet serves as the platform for the application of ICT not only for the business operations but also used to cater the needs of the household. People use Internet for communication purpose like browsing the resources
on the World Wide Web (WWW). Similarly e-Mail communications, information exchanges and file sharing between the Strategic Business Units (SBU) are the common phenomenon of the regular business transactions. Internet serves as the life-line in the modern business. It is also one of the cheapest, most convenient and the secured mode of communication system available in the public domain. Internet Search Engines plays a vital role catering the need of the people in information search. Through the Web-sites of the WWW, people can access and locate specific types and locations of information's as per their requirement. The modern business portals serve the need of the global customers and help in conducting business in a wonderful manner. The web catalogues fulfills the need of the customer and provide required assistance to the prospective customers not only in the process of selection but also in many other ways. The availability of the various modes of Internet connectivity helps the people to choose the cost effective communication system as per their requirement. Due to these tremendous features, Internet gains popularity day-by-day and plays the role as the backbone infrastructure of the modern business and communication system.

2.3.1 Active Internet entities

As per the IMRB survey (2007-08, Annual Review, volume 2) report, the rate of growth of Internet access in India is described below for the last 10 years.

![Figure: 2.1 Growth of Internet access in India](image_url)

Note: Entities are establishments/individual with Internet connection; an entity may house/ be multiple user/s)

Source: IMRB, 2008.
Figure 2.1 indicates that the overall growth of the Internet is around 27% in between the period 1999 to 2008. The number of active Internet users by the end of 2008 has gone up to 52million, out of which 29% are used for business purpose and the rest 71% are households. The study further reveals that in the metros and the mini-metros in India, 46% Internet uses are for business purpose.

2.3.2 Mode of Internet access in businesses

Apart from the phenomenal growth of Internet usage in the recent past in home and other institutional applications, the growth of Internet usage in business increases rapidly and significantly in India, which is mainly due to the easy availability, efficiency, effectiveness and convenience, as well as the flexibility in selection of Internet connection among the different cheap alternative modes and cost effective options. Again as per the survey of IMRB, due to the abundant availability of these cheap and convenient alternatives, people select their Internet connections as per their requirements and usage. This factor is again contributing towards the overall growth of Internet usage as a whole in the country. Table 2.1 exhibits the mode of Internet usage chosen by the different users in India during 2007 and 2008.

<table>
<thead>
<tr>
<th>Table 2.1 Modes of Internet Connections</th>
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<tbody>
<tr>
<td>Contribution to the total March March</td>
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<tr>
<td>by Access Type 2007 2008</td>
</tr>
<tr>
<td>Dial-Up 38% 16%</td>
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<tr>
<td>ISDN 19% 18%</td>
</tr>
<tr>
<td>Leased Line 15% 7%</td>
</tr>
<tr>
<td>DSL / Cable Link 38% 43%</td>
</tr>
<tr>
<td>VSAT 1% 2%</td>
</tr>
<tr>
<td>Data Card * 12%</td>
</tr>
<tr>
<td>Others * 2%</td>
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</tbody>
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Source: IMRB, 2007-08, Annual Review, Volume 2

The types of Internet connection availed by the users by the end of March 2008 are broadly Dial-up(16%), ISDN(18%), Leased Line(7%), DSL/Cable Link(43%), VSAT(2%) and Data Card(12%). The table indicates that substantial increase is observed in Data Card connection which was negligible in 2007. Similarly DSL/Cable Link has indicated its dominance in
the overall scenario in both the years and also showing increasing trends. One more interesting fact is observed that Dial-up connection has lost its significance and the noted decrease by 22%. It is expected that in future Data Card will be a major source of connection.

2.3.3 Web-site

Web-site serves as the platform for accessing Internet. Information in the web are organised and stored in the remote Web-Servers. Through the URL, and the remote addresses of the web-sites the information can be searched and accessed. It is also used for conducting e-Business. The purpose and relationships of web-site with e-Commerce in existing frameworks has been indicated in different research studies. The main interest of the prior researches was to find existing frameworks or categories describing the possible purposes of websites or electronic transactions. Several authors have published categories of Web business, many of which contain similarities. Hoffman, Novak and Chatterjee (1995) have suggested six categories of commercialization efforts among websites, which include: (1) online store front, (2) Internet presence, (3) content, (4) mall, (5) incentive site, and (6) search agent. While these categories of websites may all exist as commercial efforts, several represent ways to develop new business opportunities using the Internet, rather than using Web access for existing, traditional businesses methods. A framework that focuses on the functionality of websites based on a traditional organization's needs is one suggested by Ho (1997), which classifies business purposes of a commercial website as: (1) promotion of product and service, (2) provision of data and information, and (3) processing of business transactions. With respect to these purposes, Ho (1997) defines them as follows: "Promotion is specific to the products and services that a business offers to customers. Provision pertains to the supply of information to gain good will, exposure, credibility, or to expedite communication. Processing refers to those business transactions that are beyond the generation of sales leads by promotion." Hoffman et. al., (1995) include both promotion of products and services and information in their category of "Internet presence", while they include processing of business transactions in their category of "online storefront". Similarly, Baldwin and Currie (2000) classify e-Commerce strategic opportunities as
informational or transactional. They go on to suggest that transactional sites pose greater risks to both the buyer and the seller; therefore, the need for the establishment of trust and security is further required.

Estimates of website uses are: advertising (94%), providing in-depth product or service information (85%), obtaining new sales leads (71%), and providing services to customers (50%) (Levy, 1998). Only 32% of firms with a Web presence use it for direct sales of products or services (Levy, 1998).

2.4 E-Commerce

E-Commerce, the business in electronic mode is defined as a part of the e-Business System. As a whole, e-Business is described as performing or conducting all the necessary operation or the transactions by using the means like Internet and other electronic modes on regular and consistent basis to fulfill the obligations of the business. E-Business is mainly described as the interaction between the business partners, where the interaction is enabled by information technology. The key change in the information technology is available to "enable" business transactions electronically. E-Business lowers transaction costs to the point where entire new classes of customers and services are profitable. E-Business is cheap, having hundreds of millions of participants already, and reaches into everything a business does. The technology of e-Business is different. It is smaller, faster and much more fragmented. There is no e-Business system available from a single firm. This technology is rapidly changing business in many industries. E-Business sees the end of the attempt to run a business with centralized and monolithic IT solutions.

E-commerce is the buzzword of the modern businesses and commercial activities. With the unusual growth of Internet and being used as a vital, sophisticated medium for businesses, the threshold for conducting successful business online increases the popularity of e-Commerce. By definition e-Commerce is part of e-Business. E-Commerce is basically an electronic form of a business transaction, which involves direct financial transaction with the electronic process using Internet technologies. The Internet is changing and revolutionizing the way companies, and people transact business globally. E-Commerce is a business transaction
(buying or selling) on a secure link over the Internet. With the advent of e-Business, modularized applications and tools developed by many Companies are completely transforming the company from a traditional company to a new e-Business enabled company sharply reduced costs of doing business and better services to customers.

The e-Business solutions and tools help in improving the business and fully streamline the whole operations. For example, a survey conducted by Worren (2002) in USA found that 36% of small businesses established web sites primarily to advertise and promote their business, compared to 9% who established one to sell or market online. The decision to transform the business from a traditional business to an e-Business is a major one.

E-Commerce over the Internet is relatively a new way of conducting business. Though only few years old, it has the potential to radically alter economic activities and the social environment. Singapore, like many other countries in Asia-Pacific region, is trying to be in the forefront of becoming an intelligent island. Active efforts are underway to break down the barriers on all frontiers— technical, infrastructure, policy-related, social and educational to introduce e-Commerce as part of everyday living for Singaporeans. There is, therefore, much research interest to examine the consumer perception towards on-line shopping and the factors influencing the adoption of e-Commerce by consumers in Singapore. Singapore has the highest Internet penetration in the Asia-Pacific region. In Info-com Development Authority of Singapore’s e-Commerce survey, it has been reported that 74% houses have computers, 65% of them are connected to Internet and broadband access is available to 90% of the population. Most childcare centres and kindergartens provide Internet awareness and computer lessons to children between 5 to 6 years old and the Internet education has been extended to all primary and secondary schools since early 1999 (Phelps and Mok 1999). Businesses in Singapore are highly computerized, due to a long history of computerization in the public and private sector. However, despite the high awareness and penetration rate of Internet in Singapore, the adoption of e-Commerce by consumers is believed to be slow.
2.4.1 Usage of e-Commerce

According to the survey conducted by IMRB among the Industry players, the E-Commerce Industry in India was worth Rs. 7080 crore at the end of 2006-07, Rs. 9210 crore at the end of 2007-08. The adoption and usage of e-Commerce in a country is a function of the overall environment for Internet usage in that country. To correctly understand the likely growth path for e-Commerce in India it is imperative to understand the Internet environment in the country. Some of the key variables that need to be understood are the proportion of computer literates, Internet penetration, frequency of access to the Internet, purpose of Internet access, etc. A correct mapping of these would help in understanding the overall framework of e-Commerce in the country.

![Figure 2.2 PC literates and Internet users](image-url)

Source: I-Cube 2006, Syndicated Research of e-Technology Group@IMRB, March 2006.

The PC literate population is on a fast growth curve having grown 100% in 2006 over 2004. Though in India, overall penetration is still low the important factor is that a critical mass of users is shaping up which will fuel rapid growth over the next 3-4 years. A claimed Internet User is defined as one who has ever accessed Internet. A subset of Claimed Internet users, Active Internet Users are defined as those who have accessed Internet at least once in the last one month. They are the regular users of Internet and are aware of the recent trends and applications emerging on the Internet. The population of Active Internet Users was 21 million in March 2006. As these Internet Users mature with respect to exposure and awareness of Internet, they tend to spend more time online; access Internet more frequently and surf non-communication based applications and advanced online applications like gaming, e-Commerce,
etc. However, as it is evident from different studies that e-Commerce is still not the key driver of the Internet. Internet usage in the country is still driven by email and information search. Thus, e-Commerce is surely going to be adopted by the Internet users as a way to shop. They are buying a variety of products online and visiting various websites to buy products.

2.4.2 E-Commerce in developing countries

For SMEs in developing countries e-Commerce poses the advantages of reduced information search costs and transactions cost (i.e., improving efficiency of operations- reducing time for payment, credit processing and the like). Surveys in this field show that information on the customers and markets, product design, process technology, and financing source and terms is most valuable to SMEs. The Internet and other ICTs facilitate access to this information. In addition to this, the Internet allows automatic packaging and distribution of information (including customized information) to specific target groups. However, there is doubt regarding whether there is enough information on the Web that is relevant and valuable for the average SME in a developing country that would make investment in Internet access feasible. Underlying this is the fact that most SMEs in developing countries cater to local markets and therefore rely heavily on local content and information. For this reason, there is a need to substantially increase the amount and quality of local content (including local language content) on the Internet to make it useful especially to low-income entrepreneurs. e-Marketer from all over the world, estimates that SME e-Business revenues will increase from $6.53 billion to $28.53 billion by 2005 in Eastern Europe, Africa and the Middle East combined; $127.25 billion in 2003 to $502.69 billion by 2005 in the Asia-Pacific region; $23.51 billion in 2003 to $89.81 billion by 2005 in Latin America; from $340.41 billion in 2003 to $971.47 billion by 2005 in Western Europe; and from $384.36 billion in 2003 to $1.18 trillion by 2005 in Northern America (OECD, 2007).

It was found that 68% of manufacturers are not conducting business transactions using e-Commerce, while 80% of the surveyed firms reported having a website (Digital Economy 2000). It is possible that organizations are minimizing risks by avoiding the Web for direct sales, and some evidence suggests that some organizations delay transaction-based e-
Commerce until after security is well-established (Baldwin and Currie, 2000; CIO Customer Publishing, 1999). It could be that concerns about security and a lack of trust have dampened, and will continue to dampen, the use of direct sales or transaction-based e-Commerce.

The World Wide Web has caused a "fundamental paradigm shift in the way businesses operate" (Palmer and Griffith, 1998, pg. 45). Frameworks for determining the nature of this paradigm are just beginning to emerge and are in exploratory stages. While some work on trust, risk and security in e-Commerce has been published, it tends to focus on the consumer's perspective (Gefen, 2000; Hoffman, Novak, and Peralta, 1999). Alternatively, there is a need for greater focus on the organization's perspective since it is believed that if organizations limit the purpose/functionality of their e-Commerce sites due to factors such as trust and security, then the growth of e-Commerce will be impacted.

2.4.3 The nature of e-Commerce

E-Commerce is a frequently discussed concept that currently lacks a widely accepted definition and theoretical model, although a body of empirical research is beginning to emerge on which to build initial theories and frameworks. One often cited definition of e-Commerce is "the sharing of business information, maintaining business relationships, and conducting business transactions by means of Internet-based technology" (Riggins and Rhee, 1998). Alternately it has been defined as "anything that enhances your relationships with an existing customer and increases the revenue you get from the customer" (Sullivan, 1998). A common element of these definitions is the importance of customer relationships, their establishment and their maintenance. While the common element is relationships and their maintenance, little e-Commerce research addresses the interaction of e-Commerce website purpose and type of relationships they are designed to establish and maintain.

Similarly, the purpose of an e-commerce site may have a significant impact on transaction costs and the website's perceived risk exposure. For example, a website that merely promotes products does not reduce transaction costs or require a high level of security to the same degree as one that performs online, database-updating transactions. However, transaction-based websites reduce the time and effort required by an
organization to complete transactions, as well as reduce errors caused by manual data entry. With transaction-based systems, however, comes an increased risk over a promotional (non-transaction based) website. Automation of purchases and sales transactions removes most of the manual control systems and paper trails and increases vulnerability, thereby requiring greater cooperation and trust between participating organizations (Premkumar and Ramamurthy, 1995, Talwatte, 2000). Integrating e-Commerce with other internal systems may increase benefits. However, it also adds to additional risks in installing and opening those internal systems to the outside world. As a result, the purpose of the e-Commerce website may have an impact on the decision to establish a website, the level of trust required, the need for security, and ultimately the perceived success of the website.

### 2.4.4 The role of e-Commerce

The goals of promotion, provision of data, and processing of business transactions involve potentially different relationships with different partners. Steinfield et.al., (1995) argue that current e-Commerce models do not fully capture the existence and impact of interpersonal relationships among the firms and the degree of trust between the firms engaging in e-Commerce. IT is not currently sufficiently advanced enough to eliminate, or seriously reduce, the relationship-related costs associated with preventing opportunistic behaviour (Baldwin and Currie, 2000). Therefore, the level of trust and/or the ability to secure the technology influences e-Commerce development. In addition, some researchers (Nouwens and Bouwman, 1995) conclude that the existing organizational structure and culture dictate telecommunications network development, implementation and use. In general, dominant players develop electronic hierarchies that build on existing relationships rather than market-based relationships formed through supply and demand.

This view is supported by Kling and Lamb (1999), who used a socio-technical viewpoint to review studies reflecting digital economies and concluded that inter-organizational relationships must be carefully considered in the design of inter-organizational networks. One important dimension of an e-Commerce framework must involve the motivation for it - whether the purpose is transaction based with a known partner and a
previous relationship, or whether the purpose is promotion and provision based with unknown partners and no previous relationship. This dimension may mediate the effect of other factors, such as trust or security concerns, that exist depending on the presence, absence or current state of existing relationships.

2.4.5 Trust in e-Commerce

Mayer, Davis and Schoorman (1995) have proposed a model of organizational trust that defines and clarifies when organizational trust occurs. The model posits the types of relationships and contexts in which trust has an effect. It emphasizes that contextual factors, such as the stakes involved, the balance of power in the relationship, the perception of the level of risk, and the alternatives available to the trustor are important in relations involving trust. Understanding trust's role in affecting outcomes comes from understanding its involvement within a relationship.

Therefore, it is important to test the effects of trust perceptions in inter-organizational relationships and their impact on the implementation and perceived success of e-Commerce, including EDI. Opportunities for organizational trust occur when two parties must work together in a relationship that involves risk (Mayer et. al., 1995). Therefore, trust may be defined as "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control the other party" (Mayer et. al., 1995). An important distinction implied by this definition is the difference between trust, trusting behaviour, and risk-taking behaviour. While trust is the willingness to be vulnerable and assume risk, trusting behaviour and risk-taking behaviour both involve the assumption or the actual taking of risk.

The difference between trusting behaviour and risk-taking behaviour is that trusting behaviour involves risk-taking behaviour in a relationship, such as shipping a large supply of goods without prepayment to an identifiable but out-of-sight virtual partner (Mayer et. al., 1995), whereas risk-taking behaviour may not involve relationships. Another important point about these distinctions is that trust and trusting behaviour require that there need be no substitute forms for trust, such as being able to monitor or control a virtual relationship. Adopting an IT innovation,
particularly involving telecommunications, involves some degree of risk-taking behaviour, but that behaviour may or may not require trust depending on the existence of a relationship and on the availability of substitute forms of trust, such as monitoring and controlling mechanisms.

A similar view, espoused by Ring and Van de Ven (1994), suggests that there are two views of trust in the current research - a business risk view and a view based on confidence in another's goodwill. The risk-based view assumes that parties to transactions can reduce their risk through formal means such as insurance/control mechanisms. In the case of cyber-transactions these mechanisms include the ability to secure transactions.

2.4.6 Security in e-Commerce

Mayer et. al., (1995), defined that the risk-taking behaviours may be influenced by both organizational trust, and also by monitoring and controlling mechanisms designed to reduce risk. Although trust and the existence of control mechanisms are theoretically distinct constructs, their influence on the adoption of e-Commerce is often blurred with respect to risk-taking behaviours. For example, entering into the situations that are risky, without having a previous relationship and with or without the ability to monitor or control the relationship that has been termed as swift trust (Meyerson, Weick and Weick, 1996). Similarly Ring (1996) uses the term fragile trust to describe initial, monitored relationships without a previous relationship. Swift and fragile trust have been described as unique forms of trust that occur in systems which allow participants to act as if trust were present although there is no history or relationship (Meyerson, et. al., 1996). Note that this refers to the decision to engage directly in commerce absent an existing relationship or history. True trust takes time to develop (Talwatte, 2000) and is aided by familiarity (Gefen, 2000). Thus, swift trust and fragile trust are equivalent to cooperation and risk-taking without a prior relationship and could be criticized as not trust at all. Such cooperation may occur when lack of available alternatives may require it, even in the absence of trust (Mayer et. al., 1995). If there are external control mechanisms that will punish a deceitful party, or if there are motives that lead the party to behave in a way that coincides with the trustor's desires, there can be cooperation for anticipated mutual benefit without true trust (Mayer et. al., 1995). Therefore, as an alternative to
certain types of relationship-based trust, or to reduce the risk and vulnerability an organization assumes in a cyberspace-related IT innovation, organizations can attempt to secure their transactions as much as possible. Barney and Hanson (1994) refer to this type of trust as a "semi-strong" form of trust, which exists in situations where vulnerabilities exist but where many of them are protected through various governance methods. The ability to control and secure a new IT should therefore be an important variable, particularly where risk-taking in processing important business transactions occurs, as in e-Commerce. For example, Bergeron and Raymond (1997) found that control procedures were positively related to both EDI implementation and to the attainment of EDI advantages. As previously mentioned, the ability to secure e-Commerce has been found to be the most important factor in an organization's decision to implement e-Commerce (Baldwin and Currie, 2000; CIO Custom Publishing, 1999). This can range from protecting the information about customers to protecting the organization's website from competitors who try to disable it. Transactions on a proprietary network, such as that used in traditional EDI, are easier to secure than messages transmitted over an open network. Security may be even more important in Internet transactions because of the accessibility of the Internet and the need to establish the customer's legitimacy and privacy (Baldwin and Currie, 2000; Palmer and Griffith, 1998). It is suggested that third parties, such as those used in EDI networks, may become the norm for other transaction-based e-Commerce (Wenninger, 1999). As validation of the importance of security to e-Commerce use, a survey of 2000 corporate purchasing decision makers found that 70 percent of them are currently not buying over the Internet because of security concerns (Larson, 1998).

2.4.7 The characteristics of e-Commerce adopters

The literature contains examples of the many variables that have been used to try to explain the behaviour of adopter categories. Pessemier et. al., (1997) considered a total of 57 variables, grouped into seven types: socio-economic, trial-proneness, product variables, informational variables, interest, media exposure and social activities. It is, however, the demographic and socio-economic variables that have been employed most in the majority of papers. Uhl et. al., distinguished three categories —
innovators, intermediates and laggards — and came to the conclusion that the most discriminatory variables are family size, life cycle, age and family income, with innovators enjoying high incomes and laggards low incomes. Ickerson and Gentry showed that the early adopters of PCs at that time were middle-aged individuals, homeowners, with higher incomes and educational levels than non-adopters. Greco and Fields also demonstrated that early adopters, in this case of home video ordering systems, have higher levels of income and of education. According to Parthasarathy, the early adopters of an innovation are well educated, more affluent and more risk taking than others.

Research on IT-based innovations suggests that gender, education, income, and occupation all influence the use of e-Commerce. Various researchers found that people who are most likely to use the e-Commerce are young males, and have high socio-economic status. In one early study, users of the e-Commerce in USA were found to be well educated and affluent with a mean yearly income of US$ 60,800.6. Later studies have found that while the average education and income have dropped, e-Commerce users were still above the general population in these areas. In another study, slightly over 50% of respondents reported having a college degree, and the average yearly income was US$ 52,000, though the author of the study warns of the danger of self-selection bias. Research on females who shop on-line reveals that they are well-educated professionals with high incomes. Lee suggested that the low interest among women is due to a shortage of interesting female-oriented Web sites and lack of appropriate products. Coolieen et al., showed a high rise (38.7%) of e-Commerce users as female and average age was 35.1, with 36.5% of respondents over 40. However, in another study, Coolieen et al., showed that only 33.6% e-Commerce users were females.

The literature on the subject identifies mostly the demographic and socio-economic variables that explain the behaviour of e-Commerce adopters. The importance of various demographic and socio-economic variables as discussed by various authors is described below.

**Gender** - It has been reported in some studies that gender is a significant factor in adopting Internet-based technology. Thus, it would be
interesting to find out if gender has a significant relationship with the willingness to adopt e-Commerce, as it is based on Internet as well.

**Age group** - Various studies conducted on the diffusion of innovation technologies have shown that age is an important factor in the adoption of an innovation. Thus, it would be interested to see if this is true for Singaporeans as well, since it is widely observed that a younger person is more susceptible in adopting new technologies and more adaptable to changes.

**Education level** - It is widely reported that innovators are highly educated individuals. Therefore, the author also wants to assess whether the education level attained by an individual is significantly related to the willingness in adopting e-Commerce as e-Commerce is considered an IT innovation.

**Income level** - It is a common belief that the adopters of innovations are financially better off than the non-adopters. The research also shows that the adopters of Internet-based technologies belonged to higher income groups. Therefore, it is logical to see if the adopters of e-Commerce follow the same pattern as well.

**Exposure to the Internet** - Another factor, which is included in this study, is the individual's level of exposure to the Internet. Various studies have shown that the individuals with higher level of exposure to Internet tend to adopt Internet-based technologies earlier than those who have less exposure to the Internet. Since e-Commerce is based on Internet, it would be interesting to find if individuals with high level of exposure to the Internet are more likely to adopt e-Commerce.

In its report Digital Economy 2000 (June 2000) the U.S. Department of Commerce declared that the digital economy is no longer emerging; it has arrived. The report further states that the remarkable growth of the Internet shows no signs of abating. In January 2000, the World Wide Web contained more than one billion unique pages, while, in October 1997, it contained only 100 million. Likewise, it indicates that Internet access grew from 171 million in 1999, to 304 million in March 2000, representing an increase of 78 percent. Similarly, Anderson Consulting projects that the electronic economy will overtake the traditional industrial economy by 2003 (Talwatte, 2000). Therefore, it is increasingly important that companies
actively participate in the digital economy to remain competitive. While the digital economy has a promising future, two related issues may prove to be a formidable barrier to its growth. A Cahner's In-Stat Research study (cf. CIO Customer Publishing, 1999) points out those companies consider security to be the most important problem for electronic commerce. According to Peter Keen (2000), there is only one thing that can slow down the Internet and e-Commerce growth surge: a loss of confidence among customers about the protection of their privacy and the security of systems. Keen (2000) points out that early warning signs include coordinated attacks that flooded the systems of leading e-Commerce players; including Yahoo, eBay, ZDNet, Buy.com and Amazon.com, and the news that Double-Click and other firms that collect customer information are able to associate just about any transaction or query with a specific person. Moreover, it is believed that many organizations are rushing into e-Commerce without adequate concerns about liability and security (Baldwin and Currie, 2000; CIO Custom Publishing, 1999). Keen (2000) writes: A new alliance between IT and financial control and audit must be made. The foundation of e-Commerce is in building and maintaining trusted relationships. To put customer confidence at risk is to put every element of your company's online business strategy at risk. Some describe the appropriate relationship as a bonded, close relationship with customers (Levy, 1998). A recent study by Ernst and Young and the Information Technology Association of America found that of the IT executives surveyed, 62 percent believe trust is the most significant barrier to e-Commerce (Talwatte, 2000). Therefore, as Web-based methods of conducting EDI and e-Commerce become increasingly common, attention must be paid to how security and trust evolve and how relationships develop in e-Business transactions. Thus, the two most significant issues emerging regarding the development of ecommerce are trust and security (Baldwin and Currie, 2000). However, the need for trust and secure transactions depends on the use and capabilities of the site used to conduct e-Business.

2.4.8 Usage of e-Commerce in India

Since the introduction of E-Commerce, there have been debates on future of its prospects in India. The players in the online marketplace are still struggling to settle with a successful business model. Most of them are
settling for Advertising Model, hoping it would help them breakeven. However, to grow beyond, the majority of the revenue needs to be generated from customers. Customers on the other hand, have become choice-spoilt. There is no dearth of offerings for them. They skip from one seller to other in search of best deals in the standardized products market.

Lal (2005) in his study "New technologies and Indian small and medium Enterprises" identifies and analyses the factors that influenced the adoption of new technologies in SMEs. The findings of the study suggest that industry-specific characteristics such as skill- and export-intensiveness have bearings on the type of ICT adoption. The size of operation measured in terms of sales turnover influenced the adoption of new technologies. The results also suggest that there are marginal differences in the labour productivity and profitability of firms that adopted varying degree of ICTs.

Tarafdar and Vaidya (2006) in their study on "Challenges in adoption of e-Commerce in India" indicated that organisations differ significantly in their inclination to deploy e-Commerce. They have proposed a framework for adoption of e-Commerce by explaining why organisations vary in adopting e-Commerce and also have highlighted the role of top management, aspects of Organisational culture, characteristics of IS professionals and Organisational structure.

2.4.9 Physical operations of existing e-Commerce enterprises

Amazon.com is perhaps the best-known e-Commerce competitor today. Started in 1995, Amazon.com set the standard for on-line merchandising (Harvard Business Review, 1999; Johnson and Liftin, 1999; Karpinski, 1999; McCarthy, 1999) and internal e-Commerce software development (Cooke, 2000; Hof, 1999a; Hof, 1999b). Besides setting the pace for on-line innovation, Amazon.com invested substantial capital in developing its behind-the-scenes operations. In 1999, Amazon.com spent an unprecedented $300 million to build five new distribution centers and hired hundreds of customer service operators. As a result of stocking more Inventories, Amazon.com shipped more than 99% of its holiday purchases on-time at a time when many e-Commerce retailers struggled. Yet many analysts believe that Amazon.com's back-end order fulfilment process must be analyzed, step-by-step, from delivery by the supplier to shipping the
product out the door. Inventory management that results in greater operational efficiency is also considered a necessary step forward (Biederman, 1999; Hof, Green, and Brady, 2000; Richman, 2000). Meanwhile, Amazon.com made a strategic decision to offer other e-Commerce retailers access to its customers through its "Z-shops" (Corral, 1999; Epner, 1999). Longer term, Amazon.com has studied the possibility of becoming a 3PL- (3rd party logistics) provider for several of the z-shop merchants (Hof, Green, and Brady, 2000).

In contrast to Amazon.com, some start-up e-Commerce companies have operations as simple as the delivery service originally provided by Internet grocer Peapod, Inc. Founded in 1989, employees at first shopped for goods in local grocery stores and delivered them to customers. Originally the service was provided as a convenience, and goods were priced accordingly. Today, Peapod has 1,400 employees, 150 delivery vans and dedicated fulfillment centres that stock over 12,000 dry groceries, fresh, frozen and dairy products. They no longer hire employees to scour the shelves of supermarkets to "pick" goods, but rather use a continuous replenishment inventory system for order fulfillment (Biederman, 1999). Though Peapod metamorphosed into an efficient distribution machine, many other small start-ups have similar starts, with premium-pricing part of the strategic mix.

Webvan.com took quite a different strategic approach, bypassing existing grocery supermarkets altogether and immediately charging 5 to 10% less for groceries than traditional outlets. Making huge investments in physical infrastructure, Webvan.com thought big from the beginning. Webvan.com offers thousands of SKUs of perishable goods, cosmetics, and over-the-counter drugs. Orders are fulfilled from huge distribution centres that feature state-of-the-art warehousing technology and textbook operations practices. Webvan.com is relying on its network of automated warehouses to make its operations less costly to operate than traditional supermarket retailers. According to Webvan.com, its automated centre in Oakland is as efficient as twenty supermarkets minus the labour and associated expenses (Saccamano, 1999). A central problem of grocery delivery is determining how to distribute perishable goods quickly and of adequate quality (Brodeur, 1999). Currently, consumers that use
Webvan.com can select a 30-minute time window for delivery. Logistical issues remain a concern as investors continue to pour money into physical infrastructure that is capable of delivering at the speed of the Internet (Corral, 1999; Ferguson, 2000; Katz, 1999; Partch, 1999; Saccomano, 1999; Tweney, 1999). Picking costs are a second stumbling block. Webvan.com uses carousels that rotate product to a stationary picker’s position, but such systems entail a large up-front investment and are hindered by the delicate nature of some of the merchandise, the need for physical inspection of produce, the need for temperature control, and the variability of size across product types (Wellman, 1999).

Many brick-and-mortar stores are also trying to develop an e-Commerce strategy, by establishing the proper balance between in-store appeal and e-Commerce efficiency (Chain Store Age, 1999; Scally, 1999). Sears adopted a strategy to make retailing seamless by providing information on the Internet combined with the ability to return merchandise to brick-and-mortar stores. Some analysts agree that successful retailers of the future will need to sell and return into all three channels - in store catalogue, and Web (Blumenthal, 1999; Karpinski, 1999). Yet, many brick-and-mortar merchants are finding that they lack the core competency to concentrate on backroom operational efficiency instead of high-visibility merchandising (Gollobin, 1999; Katz, 1999). Some brick-and-mortar retailers are even turning to other organizations with those core competencies to do the order fulfilment function of e-Commerce. For example, Wal-Mart, recognizing that its well-known distribution expertise involves large shipments among distribution centres and high-volume retail stores, partnered with Fingerhut to provide order fulfilment services for small packages to individual customers (Chain Store Age, 1999). Third-party-logistics (3PL) providers like SubmitOrder.com provide similar services for companies that lack core competency in order fulfilment (Mateyaschuk, 2000).

Therefore, many variables feed the ultimate physical operations strategy pursued by e-Commerce merchants. Each of these strategies must be aligned with the product and service mix pursued by the merchant. The scenario of the different operational strategies for e-Commerce operations are interlinked with these above defined variables and attributes.
those make it a successful one, by intertwining the various strategies which are required and well defined with ought most care and policy formulation.

2.4.10 E-Commerce operations strategies

Operational decisions on implementation are based on market size, product type, and market breadth (Wellman, 1999). Market size is partly determined by geographic targeting and partly by the ability to attain market share. Product types may vary greatly or be restricted to a few specialty items, and the breadth of market coverage may be quite narrow or extraordinarily diverse. Each of these key decision variables is an important determinant of the operations mix that must support e-Commerce sales. The greater the variety, breadth, and geography covered, the more complex the operations. Major strategic choices currently available include:

1. **Fully-integrated, high-variety, high-volume e-Commerce merchants (sans brick-and-mortar) with highly developed physical operations.** Amazon.com and Webvan.com are representative of this type of choice (Biederman, 1999; Corral, 1999; Ferguson, 2000; Hof, Green, and Brady, 2000; Katz, 1999; Partch, 1999; Richman, 2000; Saccomano, 1999; Tweney, 1999). Having selected market coverage that is both broad and deep, both organizations established their own complex operations, including development of technologically advanced storage and distribution infrastructure. Much of the operation was developed in-house, and management practices tend to be highly risky as each venture seeks a high degree of control and refinement over its inventory practices. “First mover” investment in a new and uncertain business model is what makes this strategy so risky.

2. **Geographically- or product-focused e-Commerce merchants with low-technology operations.** This choice is often made by individual entrepreneurs without access to large amounts of investment capital. It tends to be low risk and seeks limited market coverage. Peapod, Inc. got it start this way, targeting a restricted geographic area. Many other specialty merchants make this operational choice. Party goods sold on partyworks.com are the product of simple warehousing, hand picking, and limited contract requirements with wholesalers (Ross, 2000). The risk in this strategy is that mass-marketers with highly efficient
operations will overtake market share and push the smaller operations out of business if smaller operations cannot carve out a strategic competency that makes shopping with them attractive. Price competition is particularly problematic for smaller organizations since attempts to differentiate websites or services are so easy to imitate (McCune, 1999). Furthermore, lower prices are just one click away, and upscale location and store appearance are not part of the strategic mix that can be differentiated.

3. **E-Commerce merchants that outsource operations to 3PL-providers.** This choice may be made by companies with either full market coverage or limited market coverage. Wal-Mart is the best example of a mass retailer choosing a well-known 3PL-provider to provide the core competency of order fulfilment (*Chain Store Age*, 1999). Other 3-PL providers target smaller merchants for services that include order fulfilment, distribution, call centres, and processing services. The economies of scale and expertise that accrue to 3PL-providers make this the strategy of choice for those merchants who want to ramp-up e-Commerce quickly and inexpensively (Mateyaschuk, 2000). Longer term, this strategy may be risky if 3PL-provider service is poor, if 3PL-providers begin to compete directly with merchants, or if more focused competitors are able to provide more efficient operations.

4. **Brick-and-mortar merchants that combine traditional and e-Commerce operations (click-and-mortar merchants).** Toysrus.com is good example of a retailer that seeks to combine traditional and e-Commerce operations. While many analysts suggest this strategy is the best choice for long term survival (*Chain Store Age*, 1999), others recognize the vastly different operations requirements for different channels (Kuchinskas, 1999). Operations for the two channels will almost certainly have to be separated in order for each to perform at its optimal level. To date, traditional merchants have had limited success combining the two. The risk in pursuing this strategy is that “channel conflict” will undermine the performance of one or the other channels (McCune, 1999).

In addition to these strategic choices for operations, Ricker and Manhattan Associates (Dalton, 1999) suggest that the decision to build
distributed delivery centres or centralized operations sites must be considered. Those businesses that can provide on-time delivery, a minimum of fulfilment errors, and convenient service are more likely to build markets share, so making an adequate strategic choice for operations is crucial for survival.

2.4.11 Issues in making operations choices

Besides making a strategic choice about how to establish e-Commerce operations, merchants have to consider many other operational differences between traditional and e-Commerce enterprises. Some of the most significant decisions are made in the operations categories of supply chain management, order fulfilment technology, inventory management, quality control, and information integration.

Supply chain management - Choices about supply chain management are highly dependent on the basic level of vertical integration selected, as well as contractual agreements between e-Commerce distributors and suppliers. Developments in business-to-business (b-to-b) e-Commerce are shaping contractual and transactional efficiencies as never before. Among the most important developments are the establishment of on-line B-to-B marketplaces (Brack, 2000; Buss, 2000; Carbone, 1999; Fraza, 2000; Hahn, 1999; Jastrow, 1999; Johnson, 2000; Procknow, 1999; Purchasing, 1999; Stundza, 1999), extensions of Enterprise Resource Planning (ERP) systems to include web transactions (Barnes, 1999; Boudette, 2000; Menezes, 2000), and standardization of procurement forms for use in web transactions (Bort, 1999; Tedeschi, 2000). Rapid development is somewhat hampered by the lack of existing standards for extensible markup language (XML) (Berry, 2000; Bort, 1999; King, 1999; Messmer, 1999; Tedeschi, 2000) , but software companies are writing programs using what may become de facto standards. Once XML becomes widely available, companies will decide the extent of relationship management they must engage in order to reach efficient supply chain performance.

Many aspects of e-Commerce are essentially supply chain management problems, with the elimination of middlemen as a probable long-term consequence for certain strategies (Tosh, 1999). Supply chain “shortening” is not a certainty. While wholesalers, distributors, or retailers
in some industries may find that it is more efficient to eliminate one of the links in the supply chain for more direct access to the consumer, other industries may find that task specialization drives how supply chains evolve. Economist Ronald Coase (1999) uses his theory of transaction costs to argue that supply chain efficiency will increase as firms contract out those activities for which they are ill-equipped, allowing them to expand their core businesses without taking on additional tasks related to the expansion. He further argues that it makes sense to contract out those activities for which transaction costs decrease faster than organization costs, but to retain those activities that have lower organization costs than transaction costs. Given the degree of uncertainty about how supply chains will develop, it seems incumbent for firms engaged in e-Commerce to closely observe how their particular industries are shaping up or risk being eliminated from the supply chain.

The shipping end of the supply chain includes interesting operational and transactional dynamics as well. At this stage of development distribution infrastructure and workable logistics may not yet be in place for an ultimate level of distribution efficiency. The distribution problem becomes one of converting relatively centralised high-volume capability (as in the case of Wal-Mart) into decentralized and efficient small-volume capability (Dalton, 1999; Schwartz, 1999). Some merchants choose to centralize as many operational activities as possible, then outsource distribution activities. For example, e-Commerce merchants that ship flowers use general-purpose shippers like Federal Express rather than a florist network like FTD. In essence, flower-arranging and packaging is highly centralized for e-Commerce merchants, and shipping is outsourced to general-purpose shippers that centralize shipments before dispersal. The opposite is true of traditional florist networks, with flower arranging, packaging, and shipping duties dispersed immediately to full-service shops in their network. But centralization of operational activities is not necessarily the only workable model. Interestingly, the FTD florist network is the model used by a Midwest wine merchant selling wine online and using a network of liquor stores to fulfil orders (McCune, 1999). Merchandise returns remain a difficult "re-distribution" issue, with some analysts arguing that merchants must have brick-and-mortar stores to
accept returns. Yet, many brick-and-mortar stores refuse to accept returns of merchandise ordered on the Internet (Quick, 1999). Each industry is developing its own peculiarities in how to solve the distribution problem.

Transportation capacity and service is also an issue (Machalaba, 2000). General purpose shippers are hoping to play a larger role in e-Commerce distribution. In particular, the U. S. Postal Service, United Parcel Service (UPS), Mailboxes, Etc., and Federal Express are each attempting to offer unique innovations. The U. S. Postal Service is emphasizing e-stamps and printable labels for ease of shipping and returning merchandising (Barr, 2000; Grygo, 1999). UPS is advertising its wide area coverage, high-tech sorting efficiency, and low cost delivery service (Ackerman, 1999; Hahn, 1999; Parker, 2000; Razzi, 1999; Rose, 1999; Slania, 1999; Walker, 1999). Federal Express recently purchases Roadway Package Service (RPS) to extend its ground services (Kroll, 1999; C. Murhpy, 2000), and Mailboxes, Etc. is advertising its services for returning e-Commerce merchandise. Many general purpose shippers are also increasing communications capabilities by backing real-time tracking information and shipping manifests directly into client’s information networks (Blanchard, 1999; Schwartz, 1999). In addition to these mainstay general-purpose shippers, new services are springing up to serve selected neighbourhoods with regular weekly pick-ups and deliveries (Kroll, 1999), but many of these innovations are in their infancy and much remains to be done. Furthermore, shipping to international destinations remains problematic, with shipping costs and tariffs often so excessive that international e-Commerce cannot be competitive (Biederman, 2000; Cottrill, 2000; Parker, 2000).

**Order fulfilment technology and facilities** - The current state of e-Commerce allows for a wide range of technological choices in physical operations. The choice of technology is heavily dependent on the type of strategy pursued, however. Simple warehousing, hand-picking, and labor-intensive packing are part of an approach that requires little capital investment. Such an approach assumes low volume and convenience as a strategy, with the underlying belief that customers are willing to pay for such a convenience, or that order volume will remain small enough to effectively use labour-intensive methods. A vastly more sophisticated
approach is to deliver goods to many consumers using a highly automated sorting, assembly, and packaging system. The underlying premise of such automation is to follow a strategy of low cost and efficiency without sacrificing convenience. It is a more comprehensive approach to achieving the benefits of technology, but far more risky as well.

Host computers, bar code readers, conveyors, sorters, carousels, and storage racks form the backbone of order fulfillment technology (Maloney, 2000). More advanced systems may include automatic storage and retrieval systems (ASRS’s), robotic picking mechanisms, radio-frequency technology, and Automated Guided Vehicles (AGV’s) (Cooke, 2000; Thomas, 1999), but many order fulfillment operations retain a moderate to high degree of human labour (Biederman, 1999; Jeff, 1999; King, 1999; Knill, 1999; Krantz, 1999; Seattle Post-Intelligencer, 1999b). Technology developments that improve order fulfillment capability include: more modularity in containers and packaging for easier automated handling and palletizing (Apple, 1999), data capture technologies beyond barcoding and RF tags (Bushnell, 1999; Razmilovic, 1999), new equipment designs for boosting picking rates (Rider, 1999), datasharing and new software for continuous replenishment (Rider, 1999; St. Onge, 1999), and optimization of pallet load capabilities (White, 1999).

Warehouses containing order fulfillment technology are themselves the source of many decision-making requirements. Distribution warehouses are no longer the domain of low-tech industry. Increasingly, clusters of high-tech warehouses are forming hubs of order fulfillment expertise, with warehouse management systems, Electronic Data Interchange (EDI), Internet data exchange, real-time inventory systems, and radio-frequency communications *de riguer* in such facilities (Thomas, 1999; Biederman, 1999). Many companies are left with the decision of building their own warehouse or buying and refurbishing an existing warehouse (Knill, 1999). The decision is partly driven by the existence of adequate facilities in selected locations. With speedy delivery considered one of the major strategic objectives of most e-Commerce firms, location of warehouses can be an important competitive edge. Clusters of high-tech warehouses with proximity to airports (Cooke, 1999; King, 1999; Martinez, 1999) or ground shipping distribution centres (King, 1999; Schriner, 1999;
Zeitchik, 1999) are shaping the “silicon distribution alleys” of the future. Currently, warehouses in Louisville, KY (Schriner, 1999), Montgomery, AL (King, 1999), Memphis, TN (King, 1999), Coffeyville, KS (King, 1999), and Portland, OR (Murphy, 2000) are positioned to take advantage of transportation facilities established in those cities. Real estate developers are predicting a focus on only 25 markets as future centres of distributions (Martinez, 1999).

**Inventory management** - In traditional retailing, the visual effects of high levels of inventory, along with the need to turn high volumes of inventory per square foot, make heavily stocked shelves desirable. With e-Commerce, choices about desirable levels of inventory are greatly expanded. Inventory levels may vary not only by consumer demand, but also by the contractual agreements between e-Commerce retailers and suppliers. For example, Amazon.com stocks bestsellers, but uses quick-response communications to order some books from its suppliers before distributing them to consumers (Kotha and Dooley, 1999). Certain industries already practice direct-from-the-manufacturer delivery, but other industries have yet to establish common practices (Tosh, 1999). Perishability is a concern that plays into inventory decisions as well (Saccomano, 1999). Inventory practices will be greatly affected by the evolving choices available to “invisible” e-Commerce operations; e-Commerce retailers’ practices should more closely resemble behind-the-scenes operations of manufacturers than the stocking practices of traditional retailers.

Inventory management systems for e-Commerce revolve around software and coding tools that allow data-sharing, continuous replenishment, and quick response capabilities. Bar coding and RF tags are important inventory identification technologies (Rider, 1999), and used in conjunction with ERP software or other inventory management software, they allow excellent tracking of inventory (King, 2000). For those merchants that hold their own inventory, data-sharing for continuous replenishment is essential (Knill, 1999). Merchants using 3PL-providers or direct-from-manufacturer shipments need direct communications in the form of software integration so that orders are received in real-time by the distributors (Kuchinskas, 1999; Mateyashchuk, 2000).
Integration of information flow - The degree of integration among various sources of e-Commerce information is an important determinant of the efficiency of e-Commerce operations. Some merchants currently integrate order entry information directly to accounting, inventory, and fulfilment software. This practice is far more efficient than printing out orders and manually carrying them to stock handlers and bookkeepers, who must manually re-enter data to update inventory and accounting records. The degree of integration of information greatly affects staffing, speed of operational performance, and human error resulting from data entry. Real-time visibility into inventory for the customer is considered an advantage as well. End-to-end integration is considered one of the key components of successful e-Commerce performance (Davidson, 2000; Kuchinskas, 1999, Mateyaschuk, 2000). Software integration may be completed by making modifications to existing software or ERP systems (Kuchinskas, 1999), by outsourcing modification tasks, or by upgrading to systems making use of new developments like XML capability (Davidson, 2000).

Quality - Never has the concept of “do it right the first time” been more important than now in the retailing industry. The costs and inconveniences associated with returning defective, inappropriate, or mis-packaged goods are extremely high for e-Commerce merchants. Customer loyalty is extremely dependent on receiving the correct, defect-free goods quickly. Since many consumers use e-Commerce for the convenience of avoiding in-store shopping, the inconvenience of returning goods is even greater anathema to them than to the traditional shopper (Grover, 1999; Quick, 1999; Seattle Post-Intelligencer, 1999). Successful e-Commerce merchants recognize the importance of minimizing returns and measuring quality performance. Serious order-fulfilment organizations commit to seven or eight different quality performance measurements as part of their contract (Tosh, 1999). Luckily, the electronic information tools available to e-Commerce merchants allow excellent monitoring and control of quality using statistical analysis and other controls. Nonetheless, on this particular dimension of performance (quality), results have been spotty at best, and reportedly very problematic at the current stage of e-Commerce development (Quick, 1999).
2.4.12 Value system in e-Commerce

The electronic form of business structure divides the business activities an organisation performs into distinct technological and economical activities (Porter et al., 1985). The activities within the value chain are called "value activities". These value activities fall into nine generic categories that are divided into two groups. The two groups are: the physical creation (i.e. manufacture) of a product, taking that product to market, and the ongoing after sales service and support of that product and the support activities that provide the inputs (e.g., raw materials, components) and business infrastructure to enable the primary activities to take place.

The definition by Porter et al., (1985) has maintained its longevity by providing a generic value chain definition without specific reference to Information Technology (IT). Thus the role of information technology in the value chain and the importance of information technology in modern business environments can be viewed through the structure. The "value system" is the combination of organisations value chains within an industry. Clearly this can become quite complex. Information technology has always played a critical role in an organisation's value system. The omnipresence of Internet commerce provides a new dimension to an organisation's value system.

2.5 SMEs and IT adoption

Small and medium enterprises, both in size and shape, are not uniform across the globe. This asymmetry comes in the way of any effort of their integration. The way they are defined depends on the stage of economic development and the broad policy purposes for which the definition is used. According to a World Bank study, there are said to be more than 60 definitions of small and medium industries used in 75 countries surveyed (Kim Seung Jin and Suh Jang-Won, 1992). The most commonly used definitions relate to either size of employment and/or quantum of capital investment /fixed assets. As the process of economic development leads to changes in industrial sector shares in GDP and the contribution of sub-sectors within industry, the definition is extended to include not only manufacturing industries but all enterprises which fall within or below the defined cut-off point. In the ASEAN countries in
general, the definition is restricted to SMIs in the manufacturing sector only, whereas in the OECD group, the definition is broadened to include all Small and Medium-sized Enterprises. SME refers to small and medium size enterprises. The term Small or Medium sized Business or SMB has also become more standard in a few countries. For example in Germany SMEs had a limit of 500 employees, while, in Belgium it could have been 100.

2.5.1 IT adoption in SMEs

After reviewing substantial amount of literature about IT adoption models mostly in SMEs, it was revealed by Grandon and Pearson (2004) that despite of different names given to the factors influencing the adoption decision, all factors could be re-categorised into five main factors: organizational readiness, compatibility, external pressure, perceived ease of use, perceived usefulness (Grandon and Pearson, 2004). Grandon and Pearson's model represents a fusion of two independent research streams: the strategic value of certain information technologies to top managers and factors that influence the adoption of e-Commerce in SMEs. The casual relationship between perceptions of strategic value and factors that influence the adoption of e-Commerce is presented through the research model given below.

In their study of “A model of Internet adoption by SMEs” Jenni Mehrten, Paul B. Cragg and Annette M. Mills (2001) discussed the significant factors that influenced their Internet adoption. From their study it is evident that SMEs uses a preliminary model of Internet adoption,
which signifies that three factors significantly affect Internet adoption by small firms: perceived benefits, organisational readiness, and external pressure. The study identified both similarities and differences between Internet adoption and EDI adoption in small firms. The findings have important implications for managers and service providers. Mário M. Caldeira and John M. Ward (2002) in their study of “Understanding the successful adoption and use of IS/IT in SMEs: an explanation from Portuguese manufacturing industries” identify the factors enabling or inhibiting the adoption and use of information systems and technology (IS/IT) in Portuguese manufacturing Small and Medium-sized Enterprises (SMEs) and discusses how these factors interrelate in determining relative success in the adoption and use of IS/IT. The factors influence IS/IT adoption in SMEs in various contexts. They devise and implement a strategic change framework, which is used to structure the factors and ensure that comprehensive evidence about their nature and effects could be measured. Further these factors were identified and used across a range of situations – in different industries, at different levels of adoption on a varied range of degrees of success in IS/IT use. They found that certain factor combinations and relationships appear to determine the relative degrees of IS/IT success across the firms. Top management perspectives and attitudes towards IS/IT adoption and use play an important role in the development of internal IS/IT competencies and provide an important contribution to the development of a context that enables IS/IT success.

Dieter Fink (1998) in his study, Guidelines for the Successful Adoption of Information Technology in Small and Medium Enterprises tries to establish the factors that lead to the successful adoption of Information Technology (IT) by Small and Medium Enterprises (SMEs) in today’s turbulent times. In his study, the opinions of owners and managers of Australian SMEs concentrates on 10 factors representing modern IT adoption practices were obtained. The study reveals three major IT acquisition phases and their significances. First, SMEs should assess IT benefits, the organisational culture and IT suitable for the firm. Second, they should determine if sufficient internal resources are available and appropriate procedures exist for the successful selection and implementation of IT. Third, SMEs need to evaluate the external
environment, support and resources, particularly if in-house resources and support are lacking. At the end of each phase, the decision should be made on whether or not to continue with IT acquisition. The recommended phased approach minimises the overall risk of technology acquisition.

Thuy Uyen and H. Nguyen (2009) in their study of "Information technology adoption in SMEs: an integrated framework", describes the information technology (IT) adoption in small and medium-sized enterprises (SMEs) by analysing and contrasting the reviews of the studies related to IT adoption from various databases such as Business Premier, Science Direct, Jstor and Emerald Insight etc. Their finding suggests that SMEs adopt IT for many reasons. In general, the majority of the changes result from pressures from both internal and external sources. In addition to these drivers, there are factors that influence the process either directly or indirectly. Based on these different perspectives a conceptual framework has been composed of those perspectives that are relevant to the adoption of IT in SMEs.

According to Hazbo Skoko, Branka Krivokapic-Skoko, Marinko Skare and Arnela Ceric (2006), many SMEs are currently adopting information and communication technology (ICT) and services based on it, but however, there is no concrete evidence that how they are doing it and what are the organisational and environmental factors associated with the adoption process. In that study, they proposed a model of ICT adoption in Australian and Croatian SMEs, founded on premises that SMEs are the main economic developing factor in all modern economies and that the adoption and the use of ICT represents the fundamental source of competitiveness and the basis for their survival on the world market. The model is developed by applying Qualitative Comparative Analysis (QCA) and Boolean algebra, which is necessary and sufficient in identifying the factors for ICT adoption by SMEs in Australia and Croatia.

2.5.2 Factors of ICT adoption in SMEs

The rapid economic and technological developments in the globally oriented business world make the strategic use of information and communication technology (ICT) essential. Small and medium-sized enterprises (SMEs) are running behind regarding the application of ICT.
Therefore it is necessary to stimulate the diffusion and adoption of this technology within this group. A so-called ICT scenario model can be used to communicate with entrepreneurs the strategic application of ICT.

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<tr>
<th>Table 2.2</th>
<th>The phase division of the ICT scenario model *</th>
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<tbody>
<tr>
<td>0</td>
<td>No usage of information technology</td>
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<tr>
<td>1</td>
<td>Internal oriented functional integration</td>
</tr>
<tr>
<td>2</td>
<td>Internal oriented multifunctional integration</td>
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<tr>
<td>3</td>
<td>External oriented process integration</td>
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<tr>
<td>4</td>
<td>Business process redesign</td>
</tr>
<tr>
<td>5</td>
<td>Business scope redefinition under influence of IT</td>
</tr>
</tbody>
</table>

* based on e.g., Tan (1995) and Venkatraman (1991)

The core of the ICT scenario model is an evolutionary perspective regarding the development of the strategic application of ICT in an enterprise. Additionally, three aspect areas are relevant: strategy, organisation and technology. With these 'ingredients' scenarios can be worked that describe per phase IT adoption possibilities seen from sector and business perspective. IT scenarios give entrepreneurs mental space to (re)consider its business and ICT options. In the study, The Diffusion and Adoption of Information Technology in Small- and Medium-sized Enterprises through IT Scenarios, W. H. C. Knol; J. H. M. Stroeken (2001), discusses the rapid economic and technological developments in the globally oriented business world make the strategic use of information technology (IT) essential. Small and medium-sized enterprises (SMEs) are running behind regarding the application of IT and therefore it is necessary to stimulate the diffusion and adoption of this technology within this group. In the study the IT scenario model is described, with which communication can be established with entrepreneurs from SMEs concerning the strategic application of IT. Theoretical approaches and concepts regarding the diffusion and adoption of IT are the essential components of the model. The IT scenario model consists of an environmental aspect, six phases and three aspect areas.

According to Business Line (2008), the IT spends by the Indian small and medium enterprises grew at 24 per cent and are expected to continue
at this rate - the fastest amongst BRIC economies. The share of the domestic firms in IT expenditure stood ahead of Russia at 22.9 per cent, China at 20.4 per cent and Brazil at 19.4 per cent. According to a Microsoft-Access Markets International Partners (AMI) report based on 250 companies that were surveyed, Indian SMEs are on a growth trajectory with 60 per cent of PC-using businesses expecting 20 per cent growth and 16 per cent of them expanding their branch operations.

The report cited that 45 per cent of the Indian SMEs had crossed the first wave of building basic infrastructure which included investments in portable PCs or notebooks, equipped with anti-virus and productivity suites. However, the second stage which included deployment of servers, firewalls and other applications had only 10 per cent users in the ‘connectivity phase’, who were using Web sites for transaction purposes. And only 2 per cent companies are in the third wave of IT adoption which included ERP applications, intranet, managed security solutions. “Companies in this segment are witnessing the highest growth as they have learnt to use and connect IT to maximise their workflow efficiency, save costs and see a greater impact on their bottom-line,” said Mr Raju Chellam, Vice-President, AMI Asia-Pacific. Among the major factors driving IT adoption, 50 per cent were using it to manage growth, 41 per cent found it boosting efficiency and the remaining 39 per cent considered it compelling as it influenced large customers.

2.5.3 The drivers, benefits and challenges of ICT adoption by SMEs

To be successful in the 21st century, any country in the world needs to develop an ideas-based economy and society. This implies an economy and society that are proficient at both creating ideas and translating a considerable proportion of them into new business opportunities. The payoffs are jobs, wealth and a better quality of life. In this scenario, many developed countries have already concluded that their future relies on increasing investment in the underlying capability of the knowledge economy and creating an environment favourable to the rapid translation of new ideas into new business opportunities (Archrol and Kotler, 1999; Vilaseca, 2003). The benefits frequently attributed to an e-Commerce implementation include increased number of transactions, new customers,
better service to key customers, and increased profit and market share. Costs associated with an e-Commerce implementation include cost of hardware, software, development and possible loss of customer goodwill (Sutanonpaiboon and Pearson, 2006).

In particular, small and medium sized companies (SMEs) will be able to seize this opportunity in a wide variety of ways and small entrepreneurs have a critical role to play. Therefore, it is important that small entrepreneurs take into account that the world in which organizations exist and operate is continuously changing. Changes in interdependencies, relationships, values, and norms among business have made organizational, cultural, and strategic innovations as well as creative adaptation from being a mere issue of casual interest to a key research topic with major importance (Ahuja, 2000).

In this context, anyone in a leadership position knows that technology drives change, and change demands technology. Certainly, Information and Communication Technology (ICT) has favoured a multiplicity of changes in several industries. Thus, a major challenge for SMEs has been the exploding advancement and the ever-growing ICT developed within the past few decades (Cela, 2005).

2.5.4 ICT and Internet usage in SMEs: current situation

Nowadays, the use of ICT by SMEs is increasingly common according to survey for OECD countries. Internet access is also frequent among SMEs (Figure 2.4). While Internet penetration is normally higher in larger enterprises, it is detected that the gap between larger firms and SMEs is narrowing. In most OECD countries, Internet penetration rates for medium-sized companies (50-249 employees) are approximately the same1 than for larger enterprises (more than 250 employees), with penetration rates of over 90%.2 As shown in Figure 2.4, small firms (10-49 employees) have a slightly lower penetration rate, generally between 80% and 98%, and in Hungary and Portugal, more than 70% have Internet access.
Ada Scupola (2009), in his study "SMEs' e-Commerce adoption: perspectives from Denmark and Australia" tries to provide an insight about factors affecting business-to-business e-Commerce adoption and implementation in small to medium-sized enterprises (SMEs), highlighting similarities and differences between Danish and Australian SMEs. The study is based on focusing on a theoretical model of technological, environmental and organisational factors influencing e-Commerce adoption and implementation. Subsequently, a questionnaire based on the research model has been developed and face-to-face interviews were conducted in Danish and Australian companies. The results are based upon the significant factors affecting SMEs' business-to-business e-Commerce adoption and implementation and provide new, interesting insights. The study also identifies the similarities and differences between Denmark and Australia. Ada Scupola (2003), in his study "Adoption of E-Commerce in SMES: lessons from stage models" describes, the results of the early adopters of electronic commerce. The Price Waterhouse Coopers stage model is widely used in the analysis for adoption of e-Commerce.
use of the model is based on the fact that it takes into consideration many factors such as adoption benefits and barriers, uses, evolution of e-Commerce capabilities, and the measures that should be taken to increase adoption and diffusion of e-Commerce in SMEs. The result of the application of this model reveals things like, while having many strengths, likewise also some limitations, the most important being not taking into consideration is the changes in the company capabilities and business processes that have to take place in order to go from one level to the next of e-Commerce capabilities.

2.6.1 Factors affecting adoption of e-Commerce in SMEs

According to Mirchandani and Motwani (2001) factors such as enthusiasm of top management, compatibility of e-Commerce with the work of the company, relative advantage perceived from e-Commerce, and knowledge of the company’s employees about computers has a greater impact on the adoption of e-Commerce in SMEs. They suggested further attributes such as the degree of dependence of the company on information, managerial time required, planning and implementing the e-Commerce application, the nature of the company’s competition, and the financial cost of implementing and operating the e-Commerce applications did not influence the process of adoption. Ryan and Prybutock (2002) emphasised that the organizations that have previously installed user-centric technologies are more inclined to adopt new technologies.

Thus their research suggests that implementation costs may be an important factor while deciding to adopt or not to adopt e-Commerce by the SMEs. Ajzen, 1991, Riemenschneider and McKinney (2001-2002) in the context of Theory of Planned Behaviour (TPB) found that cost is an important factor in the decision to adopt Web-based e-Commerce. Subramanian and Nosek (2001) provided a framework to determine the factors that differentiate between adopters and non-adopters of e-Commerce. Further they have developed an instrument to validate the perceptions of strategic value that an Information System (IS) may provide. Empirical study conducted by Subramanian and Nosek (2001) on 71 firms confirms three factors that were thought to create strategic value in Information Systems: operational support, managerial productivity, and
strategic decision aids. Kuan and Chau (2001) identified the factors influencing the adoption of EDI in small businesses using a technology, organization, and environment framework. Further research carried by Lacovou et. al., (1995) focuses on the factors influencing the adoption of electronic data interchange (EDI) are perceived benefits, organizational readiness, and external pressure. To measure perceived benefits, they used awareness of direct and indirect benefits. Variables measuring organizational readiness were financial and technological resources. To measure external pressure, they considered competitive pressure and imposition by partners. They found that both perceived benefits and organizational readiness moderated adoption and that a strong relationship existed between external pressure and adoption of EDI.

Chin and Gopal (1995) examined how relative advantage, ease of use, compatibility, and enjoyment influenced the intention to adopt GSS. Chang and Cheung (2001), studied those affecting the intention to use the Internet/WWW. Among the factors considered were near and long-term consequences, complexity, affect, social factors, and facilitation conditions. Complexity and long-term consequences did not significantly influence the intention to adopt the Internet/WWW. According to Beatty et. al., (2001) factors influencing SME Web site adoption depends upon the time needed for the adoption. They categorised SMEs into different groups according to the technology adoption. They found that early adopters placed significantly more emphasis than late adopters did on perceived benefits for having a Web site in SME. The early adopters viewed using the Web as being compatible with their current organizational processes and their existing technological infrastructures. Firms that adopted Web sites later appear to place less emphasis on benefits, and adopted them in spite of the lack of compatibility between the Web and their existing technology. There finding suggests that external pressure of peers, industry, or government may play a role in the adoption of information technology at least for later adopters. Riemenschneider et. al., (2003) combined the theory of planned behaviour Ajzen, (1991) and the technology acceptance model (TAM) (Davis, 1989) into one model. This combined model was better at predicting the adoption of web sites by executives of SMEs.
2.6.2 Application of Internet and e-Commerce in SMEs

The emergence of the Internet has allowed Small- and Medium-sized Enterprises (SMEs) to compete effectively and efficiently in both domestic and international markets. It is a well-known fact that e-Commerce and Internet technologies can benefit an organisation. Developing countries have the potential to achieve rapid and sustainable economic and social development by building an economy based upon an ICT enabled and networked SME sector capable of applying affordable yet effective ICT solutions (UNDP, 2004). Information and Communication Technologies (ICT) play a prominent role in the field of commerce and trade nowadays. While the developed world forges ahead with e-transformation of businesses, the developing world struggles to keep pace with emerging technologies. In a challenging global society, effective use of ICT is critical for the success of businesses especially SMEs. In their handbook, Heeks and Duncombe discuss the opportunities that ICT provides for SMEs in developing countries. SMEs, vital to the economy in any country, are very often recognized as an economy growth engine (Brouthers et. al., 1998). They often occupy strategic positions in the economy, whereas large companies lack their flexibility. The SME sector plays a significant role in its contribution to the national economy in terms of the wealth created and the number of people employed (Rashid et. al., 2001). With the development of ICT and the shift to a knowledge-based economy transformation and the introduction of ICT is becoming an increasingly important tool for SMEs both to reinvigorate corporate management and promote growth of the national economy (UNDP, 2004). Despite advances in IT and the acceptance by large organizations of such technologies, the same level of adoption is not evident among SMEs. This also suggests that SMEs face significant and unique challenges in adopting ICT and e-Commerce. This low level of adoption particularly impedes SMEs in developing countries.

The literature reveals that many studies have been carried out in developed countries to investigate the factors inhibiting adoption of ICT and e-Commerce. These studies have looked at organizational perspectives, owner/manager perspectives and environmental perspectives. Among the few research studies carried out in developing countries are studies that investigate the facilitators/inhibitors affecting adoption. Predominantly
these studies investigate the technological, organizational, physical and socio-economical environmental factors that hinder the adoption of ICT and ecommerce. The differences between developed and developing countries (such as available infrastructure, social and cultural issues) do not support generalizing the findings for developed countries to developing countries. SMEs in developing countries are faced with barriers that are specific to them, some more pronounced than would be in the case for SMEs in developed countries.

To understand the lack of, or slow uptake of ICT and e-Commerce technologies, it is appropriate to look into the environment in which they operate. Due to the many constrains inherent to developing countries they are faced with many barriers within the organization and also outside the organization. To gain a better understanding and assist them in overcoming the barriers it is imperative to examine these barriers in depth. SMEs are hindered in adopting the technologies, due to the impediments that arise as a result of the many barriers within the organisations, i.e., the Internal Barriers. They are also inhibited by another set of impediments that arise due to infrastructure (technological, economic), political, legal, social and cultural barriers that exist in the country, i.e., the External Barriers. For an SME to successfully adopt the technologies these two sets of barriers need to be addressed as SMEs are affected by both. The internal barriers that arise within the organization may be resolved within the organization, but they may have to work within the constraints of the external barriers, which are beyond their control and therefore may require government intervention.

Information and Communication Technologies (ICTs) can significantly impact the market-oriented dimensions of products and services as well as manufacturing processes, working practices and management practices. ICTs can generate increased levels of uncertainty and put pressure on the firm's knowledge and skill base, individual roles and relationships, particularly in small and medium-sized enterprises (SMEs). The exposure of SMEs to ICTs may vary as will their preparedness to respond to technological change. Ramsey et. al., (2004) argue that the structure and size of SMEs make the obstacles they face unique. But, on the other hand, SMEs are usually considered to be more flexible in terms of their structures,
systems and processes and engender a greater willingness to rise to the
challenges of innovation and change (Department of Trade and Industry
(DTI), 1994). It is perhaps surprising, therefore, that the evidence (e.g.,
Smallbone et. al., 2001; Dawn et. al., 2002; Houghton and Winklhofer,
2004) relating to SME adoption of ICTs has suggested a slow response and
limited progression. In this work they explore the apparent conundrum in
the expected responsiveness in adoption, against the belief that SMEs are
generally better positioned to respond and adapt to change. We identify
barriers or factors deterring ICT progress in Australian SMEs. The
expectation that SMEs might emulate larger organizations in progressing
through the stages has not proved to be the case. Preece (2000: 13), for
example, concluded that website usage was primarily marketing related
and firms 'do not use them for ordering delivery of products/services,
within the supply chain, or for changing business processes'. This differed
from the case in large firms and Brown and Lockett (2004) suggested that
they adopted critical applications such as enterprise resource programs and
management resource programs more readily as these had the potential to
yield significant improvements in efficiency and effectiveness. The low level
of adoption has been examined in terms of the influence of barriers
preventing adoption or factors depressing the rate of adoption (e.g.,
Smallbone et. al., 2001).

It is observed from the above studies that the achievement of the
added value outcomes are dependent on the influence of the barriers and
diffusion agents, which in turn are influenced by the current SME profiles.
Barriers are differentiated from diffusion agents as the former prevent
adoption and the latter dissipate the impact or pace of adoption.

Research addressing the added value outcomes focused initially on
information search and knowledge acquisition and more increasingly
effective communications and transaction efficiency and effectiveness (DTI,
2000; Brown and Lockett, 2004). There are three broad categories of
barriers or diffusion agents. The 'strategic' category, exemplified by the
work of Levy and Powell (2000), Levy et. al., (2001) and Brown and
Lockett (2004), focuses attention on the development of strategic
information systems to help position and integrate investments (e.g., e-
Business). This is important as others (e.g., Smallbone et. al., 2001)
recognise that previous failure to realise strategic benefits and also the unexpectedly long timescales involved influence the rate and success of adoption. The lack of compatibility with existing channels and the consequences of changing structures, processes and relationships for the business as a whole (Preece, 2000; Houghton and Winklhofer, 2004) provide a further set of Barriers. Brown and Lockett (2004) raise a number of criticisms of studies in the field, arguing that the focus had been primarily on the single organisation, thus failing to recognise that many small firms are part of networks, both formal and informal.

The technological category comprises a mixture of formal and informal responses by organisations and employees to technology and its consequences (Iacovou et al., 1995; Mehrtens et al., 2001; Hussin et al., 2002), including external pressures (competitive as well as following fashion), the availability of key resources, the preparedness to adopt new technologies and the perceived benefits. Houghton et al., (2001) and Houghton and Winklhofer (2004) focus attention more specifically on technical difficulties and lack of IT knowledge, observing that these have a tendency to depress the rate of adoption. Preece (2000) concludes that the scale of the required 'Set-up Costs', including financial and human capital, combined with the lack of professional advice, delays adoption. Brown and Lockett (2004) contend that perceived application complexity is the key factor. While 79% of SMEs they studied were comfortable with very low levels of complexity (e.g., email), a smaller proportion (56%) were also comfortable with low levels of complexity (e.g., Web or MS Office applications). Little evidence was found of high and very high complexity applications (e.g., financial transactions, e-market, e-Business and supply chains). They attribute this finding to the absence of professional support (e.g., hardware, software and applications support agencies) afforded to the larger firms and not available in the same manner to the SMEs. The third category of organisational, social and behavioural issues recognises the complexity of the relationships, internally and externally. Ramsay et al., (2004) assert that it is 'well recognised that for SMEs to get the full benefit of the Internet and EB (Electronic Business), company and market structures may have to be re-invented'. Southern and Tilley (2000) also conclude that the processes involved in the SME are 'by no means a simple
linear development whereby observers can expect an incremental build-up of knowledge and expertise on ICT to be established'.

However, personal contacts or networks transferring knowledge, self-confidence and enthusiasm may stimulate the adoption process. Lawson et al., (2003) conclude that what they termed 'soft' (i.e., acquiring technical competence and skills) barriers were prevalent at the operational level, while 'hard' (i.e., changing social and cultural infrastructures) barriers were more relevant at the strategic level. High workloads and the absence of spare capacity in many SMEs constrain the adoption and effective implementation of ICTs (Houghton and Winklhofer, 2004). Underlying most of the barriers or diffusion agents are perceptions of increased uncertainty and risk. Uncertainty arises from adopting new technologies and the implications this has for markets and relationships. Risk perceptions arise from the failure to adapt, the significance of the negative consequences and the need to fundamentally change organisational behaviour and practices. Organisations can address these changes in a number of ways including the development of new forms of relationships (Brindley and Wright, 2005) and networks designed to ameliorate some of the uncertainties and risks.

An important attribute of effective inter-organisational networks which addresses uncertainty and risk is that of trust. Ritchie and Brindley (2000), Dawn et al., (2002) and Brindley and Wright (2005) assert the importance of trust and that networks, clusters and partnerships engendering this attribute can produce more successful ICT adoption. Trust is a key antecedent of take-up either by SMEs themselves or by their suppliers and customers. Houghton and Winklhofer (2004: 380) called this 'a trusting and committed relationship'; while Smallbone et al., (2001) suggest that a barrier to adoption may be consumer reluctance in terms of trust/security. Brown and Lockett (2004) develop this notion further in what they termed an 'E-Trust platform' which essentially rejects the requirement to build trust between the three key parties: the technology intermediary, the enterprise intermediary and the community intermediary. Houghton and Winklhofer (2004) also argue that an important requirement in the adoption of higher-level complexity e-Business applications by SMEs is trust in a third party.
2.6.3 The research model

Several theories/models have been advocated as appropriate for the study of technology adoption. Each theory/model has been utilized in numerous studies that have focused on the intention to adopt or to use a specific information technology. The most popular of these theories include the Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB), Innovation Diffusion Theory (IDT), Social Cognitive Theory (SCT), and the Unified Theory of Acceptance and Use of Technology (UTAUT). Two theories, i.e., Ajzen’s TPB and Davis’ TAM are among the most popular and well supported theories.

Most of these theories/models are based on the idea that an individual’s adoption of a new technology is determined by factors that are perceived to influence intention to use the technology. These factors vary according to the theory or model that is being used in that particular research. For example, the Technology Acceptance Model (TAM) suggests that adoption is based on two related constructs: perceived ease of use and perceived usefulness (Sutanonpaiboon and Pearson, 2006). Davis defines perceived usefulness as “the degree to which a person believes that using a particular system would enhance his or her job performance”, on the other hand perceived ease of use “refers to the degree to which a person believes that using a particular system would be free of effort” (Davis, 1989).

The theory of planned behaviour (TPB) is a well-established intention model that has been proven successful in predicting and explaining behaviour across a wide variety of domains, including the use of information technology (Agarwai, 2000). The TPB establishes that, a small business executive’s decision or behavioural intention (BI) to pursue a course of action, such as creating a presence on the web or adopting e-Commerce, is a function of attitude (A), subjective norm (SN), and perceived behavioural control (PBC). The TPB also theorizes that BI will ultimately result in the action. SN is the degree of perceived social pressure that the executive feels to adopt a technology. PBC is how easy or difficult an executive thinks that adoption will be, involving potential obstacles (Riemenschneider et. al., 2003).

On the other hand, a fundamental approach for the study of the adoption of new technologies is the Diffusion of Innovations Theory (DOI)
(Rogers, 1995, Tornatzky and Klein, 1982). The focus of DOI research is on the "perceived characteristics of the innovation" that either encourage (e.g., relative advantage) or inhibit (e.g., complexity) adoption (Chwelos et. al., 2001). Rogers, an authority on innovation theory, defined an innovation as an idea, practice, or object that is perceived as new by an individual or other unit of adoption (Rogers, 1983). An important context identified by Rogers is characteristics of the innovation. IS researchers have combined them with other contexts to provide a richer and potentially more explanatory model (Thong, 1999).

In a meta-analysis of 75 studies, Tornatzky and Klein examined the relationship between innovation characteristics and adoption. They found that the 10 characteristics most frequently used were relative advantage, complexity, communicability, divisibility, cost, profitability, compatibility, social approval, trialability and observability. Out of these, relative advantage means the degree to which an innovation is perceived as better than its precursor (Rogers, 1995). Similarly, compatibility refers to the degree to which an innovation is perceived as consistent with the existing values, needs, and past experiences of the potential adopter and complexity means the degree to which an innovation is perceived as difficult to use, parallels perceived ease of use quite closely (Rogers, 1995). They were found to be consistently related to adoption and salient to the attitude formation (Tornatsky and Klein, 1982). Recent studies in IT adoption have found these variables to be also important in the context of adoption of various information technologies (Premkumar and Roberts, 1999).

2.6.3.1 IT adoption in SMEs: theoretical perspective

A fundamental approach to studying the adoption of new technologies is the diffusion of innovations (Rogers, 1995). Many studies have investigated explanatory variables for inter-organizational systems adoption, IS and IT adoption (e.g., Kurnia and Johnston, 2000; Chau and Tam, 1997; Premkumar and Ramamurthy, 1995) as well as e-Commerce adoption (e.g., Grandon and Pearson, 2003). The studies focusing on the perception and adoption of e-Commerce in SMEs are summarised here as illustrated in Table 2.3.
### Table 2.3 Summary of studies of IT adoption in SMEs

<table>
<thead>
<tr>
<th>Source</th>
<th>Influencing Factors</th>
<th>IT Studied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iacovou et. al., (1995)</td>
<td>External pressure, Perceived benefits, Organizational readiness</td>
<td>EDI adoption</td>
</tr>
<tr>
<td>Chwelos et. al., (2001)</td>
<td>Readiness, External pressure, Perceived benefits</td>
<td>EDI adoption</td>
</tr>
<tr>
<td>Kuan and Chau (2001)</td>
<td>Technology, Organization, Environment</td>
<td>EDI adoption</td>
</tr>
<tr>
<td>Iqbaria et. al., (1997)</td>
<td>Intra-organizational factors, Extra-organizational factors, Perceived ease of use, Perceived usefulness</td>
<td>Personal computer acceptance</td>
</tr>
<tr>
<td>Thong (1999)</td>
<td>CEO characteristics, IS characteristics, Organizational characteristics, Environmental characteristics</td>
<td>IS adoption</td>
</tr>
<tr>
<td>Premkumar and Roberts (1999)</td>
<td>Relative advantage, Top management support, Organizational size, External competitive pressure</td>
<td>Online data access, e-mail and the Internet</td>
</tr>
<tr>
<td>Mehrtens et. al., (2001)</td>
<td>Perceived benefits, organizational readiness, External pressure</td>
<td>Internet adoption</td>
</tr>
<tr>
<td>Mirchandani and Motwani (2001)</td>
<td>Enthusiasm of top management, Compatibility, Relative advantage knowledge of the company’s employees about computers</td>
<td>E-Commerce adoption</td>
</tr>
<tr>
<td>Riemenschneider et. al., (2003)</td>
<td>Attitude, Subjective norm, Perceived behavioural control, Perceived usefulness, Perceived ease of use</td>
<td>Website adoption (web presence)</td>
</tr>
<tr>
<td>Scupola (2003)</td>
<td>Organizational Characteristics (innovation champion, employees’ IS knowledge), Environmental Characteristics (competitive pressure, customer/ supplier pressure, government, quality of access to e-Commerce related services), Technological Context (E-Commerce Barriers; E-Commerce Benefits; E-Commerce Related Technologies)</td>
<td>E-Commerce contexts</td>
</tr>
<tr>
<td>Grandon and Pearson (2004)</td>
<td>Organizational readiness, External pressure, Perceived ease of use, Perceived usefulness</td>
<td>E-Commerce adoption</td>
</tr>
<tr>
<td>Sutanonpaiboon and Pearson (2006)</td>
<td>Entrepreneurial orientation, Environment, E-Commerce ease of use for customers, E-Commerce usefulness for customers, Organizational readiness</td>
<td>E-Commerce adoption</td>
</tr>
</tbody>
</table>

**Source:** Gharoshi, M. (2006); E-Commerce Adoption Model in Iranian SMEs

Iacovou et. al., studied factors influencing the adoption of EDI by seven SMEs in different industries. They identified three factors, i.e., perceived benefits of EDI, organizational readiness, and external pressure - as the main reasons that could explain the EDI adoption behaviour of small firms (Iacovou et. al., 1995). This model is very similar to the general framework in Innovation studies suggested by Tornatzky and Fleischer (Tornatzky and Fleischer, 1990).
The results of the study conducted by Iacovou et. al., suggested that a major reason that small firms become EDI-capable is due to external pressure (trading partners). Indeed, more than 70 percent of the respondents in recent surveys identified customer pressure/mandate as one of the primary reasons for adopting EDI (Iacovou et. al., 1995). Chwelos et. al., considered the same factors (readiness, perceived benefits, and external pressure) influencing the adoption of EDI in 286 SMEs. By testing all these factors together in one model and choosing senior purchasing manager for survey, they are able to investigate their relative contributions to EDI adoption decisions. They show that the constructs in the model can be categorized into three levels: technological, organizational, and inter-organizational. They also hypothesize that these categories of influence will also be determinants of the adoption of other emerging forms of Inter-Organizational Systems (IOS), such as Business-to-Business electronic commerce exchanges.

Their findings indicate that competitive pressure is the single most important factor contributing to intent to adopt EDI, followed by IT sophistication, financial resources, trading partner readiness, enacted trading partner power, and perceived benefits, respectively. These results are somewhat surprising, in that they indicate that the most important determinants of EDI adoption are competitive necessity and the availability of the enablers that compose the readiness construct, rather than imposition by trading partners, which has emerged as the most salient factor in earlier work (e.g., (Bouchard, 1993, Premkumar and Ramamurthy, 1995)). They considered the trading partner as influencing external pressure and readiness while external pressure was considered to be influenced by the dependency on trading partner and enacted trading partner power. As in the case of Iacovou et. al., external pressure was the most important factor contributing to intent to adopt EDI (Chwelos et. al., 2001).

Kuan and Chau (2001) conducted a study in Hong Kong to understand factors distinguishing EDI adopters from non adopters. They propose a perception-based small business EDI adoption model integrating Tornatzky and Fleischer’s (1990) framework and the results of Iacovou et. al., (1995)’s study. They test this model with a survey and arrived at the
conclusion that perceived direct benefits were distinguishing adopter from non-adopter firms, while perceived indirect benefits were not a distinguishing factor. Perceived financial cost and perceived technical competence was more an obstacle for non-adopters then adopter firms.

Based on theories from the technological innovation literature, Thong developed an integrated model of Information Systems (IS) for adoption in small businesses. Thong highlighted the fact that the technological innovation literature has identified many variables as possible determinants of organizational adoption but this "suggest that more research is needed to identify the critical ones" and provided four groups of variables: CEO (the characteristics of organizational decision makers), IS (technological innovation characteristics), organizational characteristics, and environmental characteristics (Thong, 1999).

In order to develop an integrated model that specifies the above variables, a questionnaire survey was conducted by Thong in 166 small businesses in Singapore. Data analysis shows that small businesses with certain CEO characteristics (innovativeness and level of IS knowledge), innovation characteristics (relative advantage, compatibility, and complexity of IS), and organizational characteristics (business size and level of employees' IS knowledge) are more likely to adopt IS. While CEO and innovation characteristics are important determinants of the decision to adopt, they do not affect the extent of IS adoption. The extent of IS adoption is mainly determined by organizational characteristics. Finally, the environmental characteristic of competition has no direct effect on small business adoption of IS (Thong, 1999).

Premkumar and Roberts identified the state of use of various communications technologies and the factors that influence the adoption of these technologies in small businesses located in rural communities in the US. Based on an initial study, they found that the communications technologies mostly used are fax, online access to computers, electronic mail, electronic-data-interchange and Internet. Since fax is ubiquitous and well diffused in the society, they did not consider it relevant for their study. Since all the four technologies require computer interaction, they used prior research on IT adoption (Premkumar and Roberts, 1999)
A research model was postulated that contains 10 independent variables under three broad categories — innovation, organizational and environmental characteristics. The dependent variable, adoption of information and communication technologies, was measured as the degree of adoption of those mentioned four modern communication technologies by the organization. Data from 78 organizations were collected using a structured interview process. Within the innovation factor, they included relative advantage, cost, complexity, and compatibility. Organizational characteristics included top management support, and IT expertise. Finally, within the environmental characteristics variable, competitive pressure, external support, and vertical linkages were considered (Premkumar and Roberts, 1999).

The results of Premkumar et. al., suggested that relative advantage, top management support, and competitive pressure were factors influencing the three communication technologies. Compatibility, complexity, external pressure, and organizational size were found to be significant discriminators between adopters and non-adopters of online data access technology. Cost was found to be an important discriminate factor only for the adoption of the Internet. IT expertise was not found to be an important factor that discriminates between adopters and non-adopters. Finally, vertical linkage was found to be an important discriminate factor for online data access and the Internet adoption (Premkumar and Roberts, 1999).

Further, many studies have discussed the advantages of using the Internet for publicity, advertising, online selling, communication and collaboration (Cockburn and Wilson, 1996, Cappel and Myerscough, 1996). Therefore, the Internet adoption model can also be studied to give us greater insight into IT adoption models. In order to develop a model of Internet adoption, Mehrtens et. al., conducted a case study on seven SMEs. First, they considered four SMEs that had adopted the Internet. Based on work by Iacovou et. al., in the results of the preliminary analysis, they devised their model using perceived benefits, organizational readiness, and external pressure as determinant factors. While Adoption of the Internet can be viewed as an innovation for a firm, these factors were consistent across the different Internet innovations of email, web browsing, and
having a web site (Mehrtens et. al., 2001). In addition, an additional three non-IT SMEs, of which two had adopted the Internet and one had not, were then examined to refine the preliminary model. At the end, Mehrant's model proved that all the factors were found to affect Internet adoption by the small firms. The final model was similar in form to the EDI adoption model. However, some significant differences were identified between Internet adoption and EDI adoption, particularly for the definitions of organizational readiness and external pressure. The resulting model has added substantially to the understanding of the decision by small firms to adopt the Internet. Chang and Cheung (Chang and Cheung, 2001) also determined factors that influence Internet/www adoption with similar results.

Using "Combine and Conquer" strategy with the Theory of Planned Behaviour (TPB) and the Technology Acceptance Model (TAM), Riemenschneider et. al., (2003) have applied a series of loosely to tightly integrated models to the IT adoption decisions, and more particularly Web site adoption of small businesses (Riemenschneider et. al., 2003). In order to investigate the Web site adoption and with application of Structural Equation Modelling (SEM) techniques, they have found that there were progressive improvements in fit as the models become more and more fully integrated. The results indicate that a "Collected" model representing the underlying categories of cognitions from the TPB and the TAM provided a better fit than either the TAM or the TPB alone. In this Collected model, it appears that the improved social contact (with customers, vendors, etc.) facilitated by the Internet is the driving force behind web site adoption.

Mirchandani and Motwani (2001) investigated factors that distinguish small businesses that are adopters of e-Commerce from non-adopters. Factors that were considered not important include lack of managerial time to plan e-Commerce, cost, the nature of the company's competition and the degree of the company's dependence on information. Among the relevant factors there are employees' IT knowledge, top management support, e-Commerce compatibility with the business the company is in, and perception of e-Commerce relative advantage.

Igbaria et. al., draw upon the technology acceptance model as the theoretical basis for a pragmatic explanation of key factors affecting
personal computing acceptance in small firms. They use results from a survey of 358 users in small firms in New Zealand. Igbaria et al., tested a structural model examining the hypothesized relationships among the following constructs: 1) intra-organizational factors, 2) extra-organizational factors, 3) perceived ease of use, 4) perceived usefulness, and 5) personal computing acceptance (i.e., system usage) (Igbaria et. al., 1997). Igbaria et al., findings are encouraging and provide theoretical and practical insights into personal computing acceptance in a small firm context. The study found considerable support for TAM in small firms. Perceived ease of use was found to be a more important determinant of personal computing acceptance than perceived usefulness, a result that is not consistent with prior research in large firms. This may be due to the fact that small firms in New Zealand may be in the early stages of technology adoption. The results also confirmed management support and external support as the two most significant exogenous variables. (Igbaria et. al., 1997).

Scupola (2003) adopted Tornatzky and Fleischer's (1990) model to investigate e-Commerce adoption in Southern Italy. Among the environmental characteristics Scupola (2003) found that competitive pressure, customer and supplier pressure, role of government, quality of access to e-Commerce related services were important factors influencing e-Commerce adoption. Innovation champion, financial resources and employees' IS knowledge were among the most important organizational characteristics. Regarding the technological context Scupola (2003) found three groups of factors influencing e-Commerce adoption: e-Commerce barriers, e-Commerce benefits and e-Commerce related technologies. Therefore, the factors influencing e-Commerce adoption in SMEs can be re-conducted to the three contexts (Tornatzky and Fleischer's, 1990, and Kurnia and Johnston, 2000). These contexts are the external environmental context, the organizational context and the technological context.

The external environmental context is the arena in which an organization conducts its business and in the specific context of e-Commerce adoption in SMEs it includes competitive pressures and pressure from trading partners (e.g., Iacovou et. al., 1995), the role of government (e.g., Iacovou et. al., 1995; Kuan and Chau, 2001), and technology support infrastructure such as access to suppliers of technology related services as ICT consulting services (Scupola, 2003).
The organizational context represents the factors internal to an organization that influence an innovation adoption. Variables that might influence e-Commerce adoption are employees' IS knowledge (Thong, 1999; Mirchandani and Motwani, 2001); innovation champion (Premkumar and Ramamurthy, 1995; Poon and SWATMAN, 1999); CEO characteristics or top management support (Mirchandani and Motwani; 2001).

The technological context represents the pool of technologies available to a firm for adoption, which can be both the technologies available on the market and the firms' current equipment. The decision to adopt a technology depends not only on what is available on the market, but also on how such technologies fit with the technologies that a firm already possesses (Tornatsky and Fleischer, 1990; CHAU and TAM, 1997). For example Iacovou et. al., (1995) found that relative advantage (e.g., perceived benefits and barriers), compatibility (both technical and organizational) are among the main technological attributes influencing EDI adoption, while Scupola (2003) includes in the technological context e-Commerce barriers, e-Commerce benefits and Internet related technologies. A model of e-Commerce adoption in small and medium size enterprises can therefore be conceptualized as follows:

**Figure 2.5 A Model of E-Commerce Adoption in SMEs**
2.6.3.2 Perceived strategic value of IT adoption in SMEs

Understanding IT's business value is an important issue in today's technology-intensive world, and there is a need to establish a method that appropriately represents IT's value in a business context (Lee, 2001). Studies about the impact of IT investment on firm performance (some define firm performance more as an end variable, such as profitability, while others define it more as an intermediary variable, such as productivity (Lee, 2001)) have frequently generated controversial or inconsistent results (Banker et. al., 1993, Brynjolfsson, 1993, Hitt and Brynjolfsson, 1996, Strassmann, 1985, Strassmann, 1990). For example, after reviewing previous research, Loveman concludes that corporate IT investment has had practically no impact on productivity (Loveman, 1994). Meanwhile, others have reported observing varying degrees of positive performance impact due to IT investment (e.g., (Banker et. al., 1990, Barua et. al., 1995, Brown et. al., 1995, Brynjolfsson and Hitt, 1996, Hitt and Brynjolfsson, 1996, Banker et. al., 1993, Segars and Grover, 1994, Weill, 1992)). Others suggest that since IT investment is inherently related to company strategy (Bharadwaj et. al., 1993, Kettinger et. al., 1995, Mahmood and Mann, 1993, Palvia, 1997, Rai et. al., 1997), the relationship between IT and firm performance should be studied within a strategic management framework.

Different reasons such as measurement problems, possible lags between IT investments and impacts, redistribution of outputs within an industry, methodological deficiencies, poor quality of data sets and mismanagement has been identified for this controversy (Barua et. al., 1995, Brynjolfsson, 1993). In this phase, some of the researches focused on the relationship between IT investment and firm's performance, needs discussion. Hitt and Brynjolfsson investigated how IT affects productivity, profitability, and consumer surplus (Hitt and Brynjolfsson, 1996). The first task (productivity) means whether IT has enabled the production of more "output" for a given quantity of "inputs." The second (profitability) considers whether firms are able to use IT to gain competitive advantage and earn higher profits than they would have earned otherwise. The final issue (consumer surplus) is concerned with the magnitude of the benefits that have been passed on to consumers, or perhaps reclaimed from them.
In order to understand the relationship between the three measures of IT value it is useful to consider how the concept of value is treated in economics. There are only two ways to obtain value: value can be created, and value can be redistributed from others. While the processes of value creation and value redistribution are often linked, they can also be considered separately (Stabell and Fjeldstad, 1998).

Productivity is most closely associated with the process of value creation. If IT investments are productive, then more output is realized for a given quantity of input, leading to increased value that can be distributed among IT investors, suppliers, customers, or other economic agents. Business profitability and consumer surplus are also affected by value redistribution. If a firm is able to use IT to create and retain value, then IT investment can lead to increased business profitability. In overall, their findings indicate that IT has increased productivity and created substantial value for consumers while business profitability is unchanged. Their theoretical discussion suggests that it is possible for firms to realize productivity benefits from effective management of IT, without seeing these benefits translate into higher profitability. Firms are making the IT investments necessary to maintain competitive parity but are not able to gain competitive advantage (Hitt and Brynjolfsson, 1996).

On the other hand Barua et. al., concluded that the productivity gains from IT investments have generally been neutral or negative. They test a new process-oriented methodology to audit IT impacts on a Strategic Business Unit (SBU) or profit center's performance. They have empirically demonstrated that many of the significant IT impacts occur at low levels in the organization, and that they can be traced and measured, also IT related factors showed a significant positive effect on intermediate level variables (Barua et. al., 1995).

In some of the researches about business values of IT, the concept of perceptions of owner/manager has been considered in depth. For example, Tallon et. al., did an inclusive and comprehensive study on measuring IT payoffs through perceptual measures and argued that executives rely on their perceptions in determining whether a particular IT investment creates value for the firm. They develop a process-oriented model to assess the impacts of IT on critical business activities within the
value chain. Then, using these activities to represent the locus of value within the firm, they use business executives’ perceptions to assess the actual, rather than the expected, impacts of IT on each activity. Contrary to media reports that executives are dissatisfied with IT, their study finds that executives are, with some exceptions, satisfied that their current level of IT spending will help them to achieve their business goals. Furthermore, the goals that these executives espouse for IT investments influence their choice of management practices such as strategic alignment and IT investment evaluation, which in turn influences the level of perceived IT payoffs. In particular, firms whose IT was closely aligned with the business strategy had higher perceived payoffs from IT while in firms where strategic alignment was weak, perceived IT payoffs were significantly lower. Their analysis confirms that executives in firms with more focused goals for IT perceive greater payoffs from IT across the value chain (Tallon et. al., 2000).

Li and Ye discussed and empirically tested the moderating effects of environmental dynamism, firm strategy, and CEO/CIO arrangement on the impact of IT investment on firm performance. The environment is the totality of outside factors considered by top managers in their decision-making (Eriksson and Wiedersheim-Paul, 1999). In an environment characterized by greater dynamism, top managers will experience much more uncertainty, or lack of information related to the current state of the environment, potential impact of those developments on their firms, and furthermore, strategic options available to them (Milliken, 1987). Investment in IT may be an effective way to provide timely and relevant information to top managers and thus to help reduce uncertainty (e.g., (Ahituv et. al., 1998)).

Firms adopting different strategies tap different benefits of IT investment. Firms with greater external orientation may need to depend on the preemptiveness, fending-off-threats, functionality, and synergy as benefits of IT investments (Sethi and King, 1994), while firms with greater internal orientation may only need to depend on efficiency and fending-off-threats. It stands to reason that firms with greater external orientation may require more IT investments (Eriksson and Wiedersheim-Paul, 1999).
Li and Ye's study attempted to determine the links between the three key contextual factors and IT's performance impact, and the finding was that IT investment appears to have a stronger positive impact on financial performance when there are greater environmental changes, more proactive company strategy, and closer CEO/CIO ties (Eriksson and Wiedersheim-Paul, 1999). There is evidence that a firm's extent of IT deployment in business strategies and value-chain activities is often influenced by the CIO's participation in top management teams (Armstrong and Sambamurthy, 1996).

Modelling problems have been at the centre of the difficulty in measuring IT's business value. First, "Information Technologies" as a general term includes so many different functions and features, some of them may have been designed for purposes other than increasing short-term profitability (Lee, 2001). Lee created a multi-level business value model that connects the use of IT to a firm's profit. She concluded that although there exists a causal relationship between IT and profit, this relationship is indirect and complex. She pointed out that the effect of incorporating IT should not be considered alone and argued that there are other variables that can influence the relationship.

In modelling IT's business value, it is important not only to realize that IT is complementary with many other variables and that such complementarity is critical, but we also need to know what variables are complementary with IT and in what directions such complementarity exists. Therefore she identifies IT's complementary factors. A unique characteristic of information systems is the likely gaps between spending, functions, and use. Many companies spend millions of dollars on information technologies and systems but are unable to develop adequate or usable functions (Lee, 2001). In her research she also reports the actual IT functions, uses, gaps between functions and uses, and any policy established to shorten such gaps. In addition, the model also offers explanations as to why IT impacts lower- or intermediate-level variables, but not high-level variables such as profit. According to her, IT business value model for mortgage industry, the impact of IT on intermediate-level variables such as cycle time or origination cost is simple and direct. Toward the top level of the model, more variables and interactions come into play. Due to the complementary
nature of IT and these variables, IT will not make a positive impact to profit if any of the complementary variables has an unfavourable condition. Therefore, more management efforts are needed to ensure favourable overall results. It is perceivable that not every company is able to deliver this kind of careful planning and management (Lee, 2001).

Few studies have focused on the perceptions of top management regarding the strategic value of e-Commerce. Diffusion of Innovation theory suggests that individuals or decision makers within an organization evaluate an innovation’s characteristics (relative advantage, compatibility, complexity, trial ability, and observability) and their perceptions’ of these characteristics will determine whether that individual or organization will adopt this innovation (Fichman, 2000). Therefore, the purpose of perception is economy of thinking. It picks out and establishes what is important to the organism for its survival and welfare (Boring, 1946). Perceptions also influence attitudes, behavioural intentions, and the actual behaviour of individuals as shown in the technology adoption model (Davis et al., 1989).

Amit and Zott are among the few that have tried to deal with this and even though they focused on e-Business, their results can be generalized to e-Commerce (Huff et al., 2000). They explore the theoretical foundations of value creation in e-Business by examining how 59 American and European e-Businesses that have become publicly traded corporations create value. They observed that in e-Business new value can be created by ways in which transactions are enabled. They developed a value-drivers model which included four factors found to be sources of value creation: efficiency, complementarities, lock-in, and novelty.

Efficiency enhancements can be realized in a number of ways. One is by reducing information asymmetries between buyers and sellers through the supply of up-to-date and comprehensive information. The speed and facility with which information can be transmitted via the Internet makes this approach convenient and easy (Amit and Zott, 2001). Improved information can also reduce customers’ search and bargaining costs (Lucking-Reiley and Spulber, 2001), as well as opportunistic behaviour (Williamson, 1975).
Complementarities are present whenever having a bundle of goods together provides more value than the total value of having each of the goods separately (Amit and Zott, 2001, Brandenburger and Nalebuff, 1996). These complementary goods may be vertical complementarities (e.g., after-sales services) or horizontal complementarities (e.g., one-stop shopping, or cameras and films) that are provided by partner firms.

The value-creating potential of an e-Business is enhanced by the extent to which customers are motivated to engage in repeat transactions (which tends to increase transaction volume), and by the extent to which strategic partners have incentives to maintain and improve their associations (which may result in both increased willingness to pay of customers and lower opportunity costs for firms) (Amit and Zott, 2001). Amit and Zott pointed out that “the greater the transaction efficiency gains that are enabled by a particular e-Business application, the lower the cost and hence the more valuable it will be”.

Amit's findings suggest that no single entrepreneurship or strategic management theory can fully explain the value creation potential of e-Business. Rather, an integration of the received theoretical perspectives on value creation is needed. To enable such integration, they offer the business model construct (which is an important locus of innovation and a crucial source of value creation for the firm) as a unit of analysis for future research on value creation in e-Business. A business model depicts the design of transaction content, structure, and governance so as to create value through the exploitation of business opportunities. (Amit and Zott, 2001).

Some of Amit and Zott's factors of value creation of e-Commerce were confirmed in Saloner and Spence's work. These researchers pointed out that the most important area in which e-Commerce can create value is by reducing transaction costs involved in bringing buyers and sellers together (Saloner and Spence, 2002). Further, through an empirical study of 73 firms (some of them SMEs), Subramanian and Nosek identified three factors that were found to create strategic value in IS: operational support, managerial productivity, and strategic decision aid. In each of these factors they utilized different items that were found to have high convergent validity and reliability. Their factors seem to be applicable to e-Commerce.
The perceptions of strategic value of information systems by top management are classified into those three conceptual types by them based on a review of the strategic use of information systems literature (Subramanian and Nosek, 2001). The value chain (Porter and Millar, 1985) and the strategic thrust approach (Bharadwaj, 2000) can be used in identifying and expressing these three types and in relating the use of these types to the different functional areas of the organization.

The first conceptual type is the perception of an operational support value for information systems (Perceived Strategic Value of Information System, SVIS-SUPPORT). In this type, information systems is primarily used to reap operational efficiency benefits and aid operational strategy through cost reduction, improved customer service and distribution channels, improved support to operations, support linkages with suppliers and increased ability to compete (Subramanian and Nosek, 2001). This conceptual type is derived from the "vision to automate" role of information technology. Vision to automate is seen by CEOs as the promise of IT to save money, improve quality, and make the organization more effective (Segars and Grover, 1998). This type can also be considered as a combination of transactional (operational efficiency) and strategic (operational expansion) IT objectives used in Weill (Weill, 1992). This type is supported in the works of Kim and Michelman (1990), Mahmood and Soon (1991), Porter and Millar (1985), Sethi and Carraher (1993) and Sethi and King (1994) and other researches based on Porter (1980).

The second is the perception of information systems as managerial productivity enhancement tools (PSVIS-PRODUCTIVITY). In this type, information systems provide better access to information, improves productivity (help in the management of time), provide a means to use generic methods and models in decision making, and improve communication among managers (Subramanian and Nosek, 2001). This type is based on the "vision to informate up" role of information technology (Segars and Grover, 1998) and informational IT objective (Weill, 1992). The vision to informate up role is seen as the ability of IT to provide more clear and organized views of the state and dynamics of the business (Segars and Grover, 1998). Informational IT provides the information infrastructure to manage the firm and meet other management objectives
(Weill, 1992). The evidence for this role is seen from the fact that data sharing and communication across departments, and high penetration and use of office automation and communication technology were expressed as needs of CEOs, functional managers, and information technology managers (Moynihan, 1990).

The third is the perception of information systems as strategic decision aid tools (PSVIS-STRATEGIC). In this type, information systems support strategic decisions of managers, support cooperative partnerships in the industry and provide information for strategic decisions (Subramanian and Nosek, 2001). This type is supported in "vision to transform". The vision to transform is seen as the role of IT in effecting change in organization/industry relationships, including relationships with customers and suppliers (Segars and Grover, 1998). As an example, information systems aid in the generation and evaluation of alternatives for such decisions as new product development, R&D planning, and mergers and acquisitions (Subramanian and Nosek, 2001).

Due to lack of research in identifying factors that create strategic value of e-Commerce, their model was used as the basis for the strategic value portion of the study of Grandon and Pearson (2004). In their model for the first research stream (perceived strategic value) Grandon and Pearson suggest three factors as determinants of the perceived strategic value of e-Commerce exactly the same as Subramanian and Nosek's model. According to Sutanpiaboon's work and the pilot test which was held through interviewing with experts, one of the Grandon and Pearson's indicators of organizational productivity "improving distribution channel" split into two indicators "increase the availability of products or services to customers" and "help the organization to reach new customers".

2.6.3.3 Causal link between perception and adoption

Support for the causal link between perceptions of strategic value and adoption comes from different studies that associate individual perceptions and behaviour (Grandon and Pearson, 2004). The theory of planned behaviour (TPB), mentioned earlier, is a well-established intention model that has been proven successful in predicting and explaining behaviour across a wide variety of domains, including the use of
information technology (Agarwal, 2000). In general terms, the TPB establishes that perceptions influence intentions which in turn influence the actual behaviour of the individual. By considering the intention to adopt e-Commerce as the target behaviour, the use of intention models theoretically justifies the causal link between perceptions and adoption of e-Commerce (Grandon and Pearson, 2004).

Also, so many researchers have studied the influence of attitude of top managers on the degree of IT usage and adoption (Adams, 1972, Barki and Hartwick, 1989, Busch et al., 1991, Jarvenpaa and Ives, 1991, Lederer and Mendelow, 1988, Reich and Benbasat, 1990, Rifkin, 1989, Rockwell, 1968, and Sanders and Courtney, 1985). Since the advent of management information systems, executive support (mostly the managers) has been considered necessary to fully exploit the benefits of information technology (IT) (e.g., (O'Toole and O'Toole, 1966)). Executive involvement is concerned with the psychological state of the CEO, reflecting the degree of importance placed on information technology by the chief executive. Involvement refers to a CEO's perceptions and attitudes concerning IT—that is, the degree to which a CEO views IT as critical to an organization's success (Jarvenpaa and Ives, 1991). Some said that managers' perception and attitudes toward other types of IT are strongly associated with its use (Grandon and Pearson, 2004); e.g., hypotheses developed by Jarvenpaa and Ives suggested a CEOs involvement in IT and active personal participation in IT management were associated with a firm being progressive in its use of IT (Jarvenpaa and Ives, 1991).

2.7 Link to this research

The importance of the SME sector in India and more so in Orissa is a pertinent area in which the research has been undertaken. The development of Computer application in business and its impact on the SME sector has been corroborated from different studies in India and in other parts of the world. A clear understanding of the issues relating to Computer usage provides insight into the factors impacting on current usage and as such is a useful addition to this research. Issues relating to the adoption of EDI, as a forerunner to the Internet, have been outlined. The impact of the Internet on business operation and the user attitudes have been studied by
different researches, in more detail at specific levels of the business-to-business (B2B) and business-to-consumer (B2C) relationship and the use of IT and the Internet to support the processes associated with it. It will also provide a rationale as to why it is important to discuss elements despite the fact it is not core to this research, by making a link between (B2C) and (B2B) elements of the retail business.

This section has taken a brief look at the impact of the Internet on the SME sector relating to the relationship with the end user. Technologies that improve the processes undertaken by the SME sector have been in existence for some time, however the introduction of the Internet to support existing technologies and develops new-ones have wide range of implications on the sector and how it interfaces with its end user customers. The use of (B2B) e-Commerce is becoming more widespread, especially given the reduction in costs afforded by the Internet. The literature suggests that the pace of change appears to be accelerating and that this is already impacting on the SME sector. Fillis et. al., (2004) suggest that ‘understanding the attitudes, motivations, values and subsequent behaviour of the owner/manager are central to understanding how and why e-Business is accepted and implemented by some smaller firms and not by others’. Quayle (2003) suggests that further research is needed on SMEs and their electronic supply chain management capability - this research aims to go some way to filling that gap. The final part of this chapter looks at the issues relating to the relationship between the buyer and seller and the likely impact this will have on the adoption and use of IT and the Internet.

The relationship between supply chain partners is important to the well-being of the organisation. This is particularly the case of the retail SME who are reliant upon their suppliers to provide attractive well priced products in the right quantity and at the right time that they are needed. A close business relationship that has both commitment and trust will provide long term benefits for SMEs and their supply chain partners. The Internet has changed the concept of the supply chain extensively providing the SME organisation with the ability to initiate and sustain new relationships with geographically disparate suppliers.
2.8 Conclusion

This chapter aimed to pull together a number of disparate concepts and ideas that relate to the research topic. As the thesis looks at the expansive academic areas of SMEs and the impact of the Internet, it was deemed necessary to give an overview of the issues relating to these areas prior to focusing on the specific themes outlined in the title.

The importance of SME in Indian economy and the need to assist this sector in being as productive and efficient as possible in the face of increasing international pressure. An overview of technological change in respect of computer usage, and latterly the Internet was then presented. This general overview indicated the importance of the way technologies in general have developed and its impact on shaping attitudes towards IT and the Internet and its many uses in business. The specific experience of the SME sector and the impact of Internet upon it is discussed serving as a basis for the more focused view relating to the SME experience.

This chapter set out to provide some of the reasons as to why this research needs to be undertaken in this area. From the literature the general picture emerges of extensive research relating to all aspects of acceptance of technology in larger companies, but far less so when it comes to their SME counterparts. Also identified here are the reasons as to why the SME has to be looked at differently when considering the issue of technology acceptance. This is due to the fact that they often operate in a different environment with different forces working upon them and as such have different needs. The information contained in this chapter will be used in conjunction with the information into the specific technology acceptance literature in this chapter when developing the primary research and discussing the implications of the findings.
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