Chapter 1

Introduction
1.1 The prologue

Information and communication technology (ICT) has brought about a complete change into every walk of life today with business not being an exception to it. Over last thirty years, major changes have been witnessed in the working of the businesses compared to that of the old days. In early twentieth century; oil, coal and steam were the raw materials that fuelled most of the factories of the industrial revolution. But today, whether a company is engaged in providing banking or financial services, or is running an international telephone network or managing shopping malls or office towers, or is involved in the transportation business, the raw material that fuels the company and brings competitive edge is information. Organisations are increasingly embracing new generation business tools like the e-Commerce and e-Business for attaining their goals. E-Commerce is emerging as a new way of helping business enterprises to compete in the marketplace and thereby contributing to their economic success. The use of information technology (IT) as a new business tool has strong commercial applications that help the organisations to use all the Internet resources to their advantage.

The use of ICT has become inevitable to the modern business operations. Application of ICT and its enhanced features in managing a business has become both a necessary and a contributing factor to the economic growth, increased business opportunities, enhanced competitiveness and better access to the markets. In India, small enterprises, in general, are found to be lacking the knowledge required to extract the most out of the investment in implementation of ICT and e-Commerce in their businesses to gain the competitive advantage. The application of e-Commerce for Small Scale Industries (SSIs) and rural businesses are, however, growing steadily due to improved access to the technical support and communication infrastructure in India, as per the Organisation of Economic Cooperation and Development (OECD) study of 2004. The OECD 2002 study ranked India among the top 100 countries in
the world in terms of adoption of IT and computing power per person. It also stands among the most advanced countries in the adoption of e-Commerce and computing power in business. States like Orissa too have low ICT penetration in the Small and Medium Enterprises (SMEs) segment as revealed by the Orissa MSME Development Policy-2009.

A significant feature of the Indian economy has been the rapid growth of the SSI sector since independence. The SSI sector has been assigned an important role in the industrialisation of the country by the government of India. SSIs are distinguished from the large and the medium-scale industries on the basis of capital resources and labour force in the units. In 2005-2006 there were more than 3.75 million SSI units operating in India, with a fixed investment of Rs.120.5 billion (US$2.3 billion). The SSI sector has employed about 22 million people, produced output worth of Rs.8430 billion (US$176 billion) and Rs.2950 billion (US$61 billion) of export. In relative terms the shares of SSIs in the Indian economy in the year 2005-06 has been to the tune of 40% of the industrial output, 80% of the industrial employment and as much as 35% of the total exports, which by themselves signify the role of SSIs in the economic development of the country (Policy Brief, Economic Survey of India, 2007; OECD, 2007). SMEs have emerged as the most dynamic sector of Indian economy accounting for over 55% of the total value of industrial production, over 40% of Indian export and more importantly providing employment to 17.5 million persons in 31.75 lakh units in this sector (Desai, 2010).

In an increasingly competitive and globalised world, SMEs need to compete more effectively to boost domestic economic activities and contribute toward increasing export earnings. SMEs also continue to play an important role in increasing employment and thus contributing to poverty reduction on a sustainable basis. With spread of technology and infrastructure, rural businesses will be the biggest beneficiaries of e-Commerce. The Internet can help small enterprises to present themselves to the world. It can create interfaces for inquiries about local businesses and their offerings. Business support agencies can play a key role in helping small enterprises get the benefits of e-Commerce. Agencies can also look beyond the technology and understand how real commercial benefits can
flow to individual enterprises by adopting the new business methods that are required to use e-Commerce effectively.

The need for adopting e-Commerce by SMEs in India is driven by global, national and regional business trends. These are related to different factors like markets, costs, new technologies and political factors. Globalisation of the production and supply of goods and services and the need to integrate small enterprises more effectively into the supply chains of larger businesses can happen through the adoption of ICT. It will manage the increased customer expectations by accessing to web-based information about products and services. Some other important needs for adoption of e-Commerce are an overall need for technological up-gradation, greater role for information in business and the need to access, process and communicate it effectively and efficiently. Government deregulation and liberalisation, lowering costs of access, bilateral and multilateral trade agreements, adaptation to higher quality standards such as ISO9000, etc. are acting as an enabler in this area.

Individual sectors, for example financial or business services require individual analysis to assess market entry requirements. It is also important to understand e-Commerce on sector-by-sector basis. E-Commerce can provide substantial benefits to small enterprises through improved efficiencies and raised revenues. It enables a newer way of working in the future by embracing the new economy. It enables small business entrepreneurs to gain access to better quality information, thus empowering them to take informed decisions in their businesses.

According to a survey conducted by the Indian Market Research Bureau (IMRB, 2008), the e-Commerce Industry in India was a worth of Rs.7080crore and Rs.9210crore at the end of 2006-07 and 2007-08 respectively. 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 ecosystem 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. However, as it is evident from different studies, 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 for shopping. The Internet users are buying a variety of products online and visiting various websites to buy products. Given the rate of growth in e-Commerce users, size of the e-Commerce industry is expected to reach Rs.10220 crore at the end of 2009-10, a big jump of over 30% of current industry size.

Many of these benefits can be gained through relatively modest investments in new technology. Greater benefits accrue as the enterprise moves up the e-Commerce adoption ladder. It is important to realise that the benefits outlined are not exclusively tied to e-Commerce. For example, market benefits may be achieved more effectively through better business networking and the building of personal business relationships, rather than through use of the Internet. This emphasises the importance of adopting an approach towards e-Commerce that puts business objectives first, rather than believing that technology alone can deliver the benefits described above focusing more the behavioural aspects.

The present study broadly aims at examining the nature and extent of IT interventions in the SMEs in the state of Orissa. The study addresses issues like the benefits the small firms are going to get by investing in IT and its ultimate effect on the firms' productivity, profitability and customer satisfaction. The study also examines IT interventions as a source of strategic value to the SMEs in terms of operational support, managerial productivity and strategic decision aids.

1.2 Importance of the study

ICT applications can provide several benefits across a wide range of intra and inter firm business operations and transactions. Certainly, ICT applications can contribute to improve information and knowledge management inside the firm, can reduce transaction costs and can increase the speed and reliability of transactions for both business-to-business (B2B) and business-to-consumer (B2C) transactions. In addition, they are also effective tools for improving external communications and quality of services for established and new customers. More specifically, SMEs can
obtain a wide range of benefits from the use of ICT (Cela, 2005). Brady et. al., (2002) have emphasized enhancement of the productivity and effectiveness of certain activities by using IT. Similarly, some authors favour the adoption of new organizational, strategic and managerial models for creating IT environments (Johnston and Lawrence, 1998; Kahn, 1996, 2001). Further several other studies indicate that the benefits of IT for SMEs will provide access to new environments as well as the generation of new markets and business models (Corbitt, 2000; Javalgi and Ramsey, 2001). Vilaseca (2003) observed that increased efficiency for SMEs can be achieved by improved qualifications and specialization of human resources.

As noted before, a greater degree of integration is a key factor for internal relationship by involving consumers and other functional agents in teamwork to develop new products (Kanh, 1996, 2001). ICT increases the integration in different ways. They provide universal connectivity in synchronous and asynchronous modes that facilitate and enhance the process of collaboration, and information and knowledge exchange (Magretta, 1998; Prasad et. al., 2001). On the other hand, ICTs may facilitate the development of cooperative behaviour among agents that share the same cultural and common goals. Prasad et. al. (2001) suggest that ICTs are important tools to increase levels of consumer loyalty and trust in the company.

Further, Leeders and Wierenga (2002) suggest that ICTs not only help to transfer knowledge among the team members, but also support the creation of new knowledge within a particular area. The adoption of ICT is completely changing and revolutionising the way companies do their business today (Cannon, 2007). Even if partners do not have a common location, culture, history or future, ICTs can enhance collaboration and knowledge transfer and use (Smith and Blanck, 2002). With the widespread use of ICTs, global or virtual teams have become a reality. Robers (2000), while analysing the ability and willingness to cooperate, has found that ICTs increase teamwork integration in two ways, firstly, facilitating and speeding knowledge transfer, both tacit and explicit, and secondly, reinforcing the levels of trust and confidence that normally develop in face-to-face meetings.
1.3 Relevance of the study

The firms in developing countries are in the preliminary stages of adoption of e-Commerce. The transition of firms in these countries to more sophisticated levels of use of e-Commerce and its adoption depends on to a great extent, on the inclination of the management to use technology for their business (Tarafdar and Vaidya, 2006). Adoption of IT, more particularly e-Commerce facilitates the process of buying and selling products or services by using electronic data transmission via the Internet and the World Wide Web (WWW). It provides many benefits to sellers and buyers. Napier et. al. (2001) have pointed out that by using e-Commerce sellers can access narrow market segments that are widely distributed while buyers can benefit by accessing global markets with larger product availability from a variety of sellers at a reduced cost. Improvement in product quality and the creation of new methods of selling for the existing products are also the benefits of e-Commerce.

It is believed that IT has mostly benefited the large firms, but small and medium firms can also be benefited out of it. In addition, it can ‘level the playing field’ with big business, provide location and time independence, and ease communication with the target market (Chong, 2000; Iacovou 1995). Many other studies have indicated the potential benefits of adopting e-Commerce by small and medium firms. In spite of the potential benefits, adoption of IT and e-Commerce is not a panacea for small businesses. Most of the small firms even in developed countries are not showing interest to do on-line business transactions due to the potential threats like security issues, payment problems, consumer confidence, etc. Moreover, most of the small firms in India are operating in local markets without any presence in the global market. For example, the SMEs hardly could get any benefit of the LPG Policy of Government of India by integrating themselves to the global market. Rather the situation is such that neither they are ready to take the advantage of the global market nor they perceive it to be beneficial. They evaluate the cost of adopting e-Commerce technology as higher than the additional benefits they are going to reap out of it.
The basic research objective of the present study is to identify the most important factors affecting the adoption of e-Commerce in SMEs in Orissa and tries to find out the similarities and differences with the global scenario. It also tries to provide an insight into the perceived benefits of e-Commerce adoption by the CEOs or owners and the factors practically hindering the process of adoption. The relevance of the study is being established by using the two-step model, where the importance of the factors influenced in the process is being traced along with their strategic intent. This study focuses on the relationship between various factors affecting the perception of e-Commerce adoption along with the factors of adoption process.

The factors of perceived ease of use is being evaluated along with the perceived usefulness, to provide a deeper insight to the current position of e-Commerce adoption process in the SMEs of Orissa as a special emphasis to redefine the relevance of the study. Emphasis will also be laid on understanding the trend of global ICT adoption by the SMEs and by comparing the factors influencing e-Commerce adoption in many countries with special emphasis on Orissa. Given the backdrop that there are many similarities and dissimilarities regarding the diffusion and adoption of ICT throughout the world as revealed from different studies, the findings of the study will help the SMEs of Orissa in the process of adoption and diffusion of ICT in their operations and particularly helps in suggesting a conducive environment with a clear vision in the process of adoption of e-Commerce and e-Business system.

1.4 The research model

The study represents a fusion of two independent research streams (1) the strategic value of certain information technologies to the top managers and (2) factors that influence the adoption of IT. The former has been studied by Subramanian and Nosek (2001) and others while the latter has been investigated by Davis (1989) and others primarily through the technology acceptance model (TAM). This causal link has been studied and the results have indicated that managers' perception and attitude toward the other types of IT like information management systems, office...
automation processes, official communication systems, online maintenance of records and inventories, contracts and tenders management along with the online financial management systems, and human resource practices etc. are strongly associated with the use of IT in the SMEs. Jarvenpaa and Ives (1991) suggested a CEOs involvement in IT and active personal participation in IT management was associated with a firm being progressive in its use of IT. They defined involvement as ‘CEOs perceptions and attitudes concerning IT’ and participation as ‘the CEOs activities or substantive personal interventions in the management of IT’.

After reviewing substantial amount of literature about the IT adoption models mostly in SMEs, it was revealed by Grandon and Pearson 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 (OR), compatibility (CC), external pressure (EP), perceived ease of use (EU) and perceived usefulness (PU) by (Grandon and Pearson, 2004). The Grandon and Pearson’s model of e-Commerce adoption is the best-suited one, being applied through this research because of considering a comprehensive set of factors affecting the process of adoption and also its contribution about considering the concept of perceived strategic values and its effect on adoption process of IT in SMEs of Orissa.

1.5 Research questions

Review of relevant studies on IT adoption in SMEs have indicated many issues out of which the present study endeavours to address the followings.

1. What are the determining factors of the perceived strategic value of information technology in SMEs?
2. How do the strategic value of e-Commerce, as perceived by managers/owners of SMEs, influences their decision to adopt IT?
3. What are the factors to be involved in the decision to adopt IT by top managers/owners of SMEs?
The above questions when addressed will validate the proposed two-step model and will lead to the understanding of the relationship between these two steps.

1.6 Research objectives

The research objectives have been derived from the questions put in the previous section. The present study tries to examine the relationship between IT adoption and the value creation for the firms. The broad objective of the study is to understand the status and factors of adoption of IT in SMEs in Orissa. The specific objectives are –

1. To study the growth and development of SMEs in Orissa
2. To examine the levels of IT interventions in SMEs in Orissa
3. To identify the factors which affect the adoption of IT in SMEs
4. To suggest a model for improvement of IT adoption by SMEs in Orissa

1.7 Scope of the study

The scope of the present study is confined to the SMEs registered under DICs in Orissa. The study was conducted with a limited sample size (141 respondents), which may not be a proper representation of the SME population of the State; hence the results cannot be generalised. The study is exploratory and these findings should be viewed from this perspective. As the sample respondents are not selected through random methods, there is a chance of biasness in sample selection, further reducing the validity of the results. Similarly, the conservative attitude of respondents restricted the sample size. Lack of earlier research in this field in Orissa, restricted the scope and direction of the present research. Further research may be directed at testing these initial findings using a larger sample selected randomly. In this context, the present research work constitutes a preliminary work, being necessary to contrast the observed findings empirically in order to define with a higher level of accuracy, the role of ICT in the formulation and practical implementation of ICT.
1.8 Research hypotheses

The TAM is an adaptation of the theory of reasoned action (TRA) (Fishbein and Ajzen, 1975). It focuses exclusively on the analysis of IT user behaviour and establishes a priori two key perceptions: (1) ease of use; and (2) the usefulness (Davis, 1989; Davis et. al., 1989). Perceived usefulness (PU) is the degree to which a potential user believes the use of a specific tool will improve his/her performance, and perceived ease of use (PEOU) is the perception that using a specific technology will not require additional effort (Davis 1989). Recently, researchers have included other new concepts, either as antecedents of PEOU and PU or as intermediaries between these two variables. The factors considered are varied and can be highlighted as internal motivators, such as self-efficacy or attitude (Chen et. al., 2002; Bruner and Kumar, 2005).

Attitude is another concept which is widespread in models that study the acceptance of new technologies. It has also been included both in one of the original formulations of TAM (Davis et. al., 1989) and in some other studies later on (Chen and Tan, 2004; Schneberger et. al., 2007/2008). In all of them, attitude has played an intermediary role between perceptions and final behaviour (Ahn et. al., 2004; Yu et. al., 2005). According to Winter et. al., (1998), individuals who have a positive attitude towards computers makes greater use of them because of their lower anxiety before, during and after using them.

In the case of e-Commerce, PEOU and PU explain the user’s attitude. Furthermore, attitude determines the final behaviour (Ahn et. al., 2004; Vijayasarathy, 2004). The perceived ease of use of e-Commerce has a significant and equal weight for all frequent Internet users, independent of their experience as e-customers (Gefen et. al., 2003; Yu et. al., 2005). In other words, when the principal reason for using the Internet is to purchase a product, individuals are already familiar with the mechanism and there are presumably no significant differences between potential and experienced e-customers.

Given the above, the following sets of hypotheses have been formulated, which can be tested and addressed at the latter part of the study to be established:
H₀₁: Gender and age of the sample respondents are independent of all the components of Perceived Strategic Value and adoption of e-Commerce.

H₀₂: There exists no correlation between the Perceived Strategic Value and the Adoption of e-Commerce.

H₀₃: Variables like organisational support (OS), managerial productivity (MP), and Strategic Decision Aids (DA) do not influence the perception of strategic value of e-Commerce by the entrepreneurs / managers.

H₀₄: Variables like organisational readiness (OR), eternal pressure (EP), compatibility (CC), perceived ease of use (EU), and perceived usefulness (PU) do not influence the adoption process of e-Commerce in the SMEs under study.

H₀₅: Perceived Strategic Value does not influence the adoption process of e-Commerce in the sample SMEs.

1.9 Research design and methodology

1.9.1 Data source

The present study is mainly based on field survey and is exploratory in nature. The subjects for the study are the top executives of the firm who are either the top managers or the owners. The units for the study are mainly of small and medium sized enterprises (SMEs) from a variety of industries operating in Orissa and are registered with the District Industries Centres (DICs) of the state. The sources of data are mainly primary in nature, which have been collected from the owners / top managers through a structured questionnaires designed for the purpose.

1.9.2 Sample profile

The present study has been conducted on the small and medium enterprises (SMEs) in the state of Orissa. Data have been collected using a structured questionnaire and the respondents were approached personally. In order to seek fair and frank responses on their attitude and perception towards the use of e-Commerce / e-Business adoption in SMEs of Orissa and the perceived benefits out of the adoption of IT, the sample respondents were asked to give their views on these parameters. Further, discussions were made with the owners / managers of sample SMEs regarding their knowledge on costs and benefits of adopting technology to
improve performance and for the future growth. Respondents were asked to give their opinion about the level of acceptance of technology on a seven-point Likert scale ranging from one indicating strongly disagree to seven indicating strongly agree on parameters like strategic value of e-Commerce, adoption of e-Commerce, barriers and benefits of e-Commerce.

The sample for the study comprises of 141 owners / managers of the SMEs. While choosing a respondent, purposive sampling method was followed to give proper representation to different types of industries across different product category. Important demographic characteristics like age, level of education, experience, number of employees and geographic location of the unit were taken into consideration. All these characteristics have important bearings upon the respondents' evaluation of technology adoption in operations.

1.9.3 Instrument development and data collection

As stated above, the data for the study were collected through a structured questionnaire from the respondents. After reviewing the literature, relevant dimensions were identified to draft the preliminary questionnaire. Then a pilot survey was conducted to solicit the opinion regarding development of the questionnaire. For designing the questionnaire, the scale suggested by Grandon and Pearson (2004) was suitably modified for the purpose. Respondents were asked to complete the survey that have the following major sections for drafting the questionnaire:

- demographic questions (respondent’s gender, age, education, years of work in present position, and years of work in present firm).
- general questions about the firm (number of employees and industry).
- questions about the technology in the organization (number of PCs, presence of Internet Service Provider (ISP), presence of web site, and utilisation of e-Commerce).
- questions asking the extent to which IT is perceived as contributing / hindering factor to the SMEs (benefits and barriers).
- questions to measure the factors involved in e-Commerce adoption.
A seven-point Likert scale, from strongly disagree to strongly agree has been used to measure the questions about perceived strategic value and adoption of IT.

The results of the pilot study were validated by conducting the reliability test (Chronbach’s α). The final questionnaire has six sections. The first two sections deal with demographic profile of the respondent and the unit. The third section deals with the perception of strategic value of e-Commerce and the fourth section with adoption of e-Commerce. The last two sections enumerate the perceived benefits and barriers by using e-Commerce. Further, a follow up interview was conducted with the respondents to check the reliability and correctness of the data.

1.9.4 Tools and techniques used for data analysis

The data collected through the questionnaires are tabulated in a data sheet and are processed through the statistical package SPSS. Cross tabulations and frequency distributions are made to understand the underlying relationships among the demographic variables and factors of adoption under study keeping the broad objectives in mind. The perception of respondents regarding the benefits and barriers were also tabulated by calculating the weighted average and then compared across different demographic parameters by using analysis of variance (ANOVA) and t-test. Chi-square statistics were calculated to test the goodness of fit of the distribution. Correlation and multivariate analysis such as factor analysis; canonical analysis and structured equation model too have been used in the study.

The significance of the differences of two observed sample means drawn from independent populations is tested through t – test. ANOVA is also used to test for differences among the means of populations by examining the amount of variation within each of these samples, relative to the amount of variation between the samples. Similarly, Chi-square ($\chi^2$) test is used to analyse the association between two cross tabulated variables by computing percentages, which are categorised into two or more groups. The degree of association between two variables is computed
by using correlation coefficient, denoted by 'r'. Similarly, confirmatory factor analysis was used to validate the underlying factors suggested in earlier studies (Davis et. al., 1989) confer the present research work.

Further, canonical analysis, a multivariate statistical model that studies the interrelationships among sets of multiple dependant variables and multiple independent variables, was used to measure the relationships among the components of perceived strategic value and that of adoption of e-Commerce. Structural equation model was also used to study causal relationships among the underlying variables in the model.

1.10 Limitations of the study

The major limitations of the present research work are as follows:

- The study was conducted with a limited sample size of 141 owners / managers of SMEs working in Orissa. Due to lack of cooperation of the respondents, the sample size remained small; which may not be a proper representation of SMEs of the State. Hence, generalizations of the results from the research should be made with caution.

- As the present study constitutes a preliminary work, the conclusions of the study are based on exploratory findings from few case studies and are viewed from that perspective. The results need further investigation in the form diagnostic studies.

- Further the results cannot be compared due to lack of evidences /
  studies on e-Commerce adoption in Indian organisations. Further, it hinders the practical relevance of adoption of e-Commerce in SMEs of Orissa.

- Purposive sampling technique was used in the selection of respondents from the SME sector; which may not provide the clear picture as well as their position accurately in the SME population of the entire state.
1.11 Chapterisation

The work is structured as follows. Chapter-I introduces the topic along with its importance, objectives and methodology, scope and limitations. Chapter-II reviews the existing literature of ICT adoption and frameworks for adoption in SMEs. Chapter-III discusses the growth and development of SMEs in Orissa. Chapter-IV presents the Data Analysis of Organisational Survey on the respondents' profile. Chapter-V critically analyses the Perception, Motivation and Constraints of the Entrepreneur in adopting e-Commerce technology. Also this chapter suggests the development of a Structural model for IT adoption process i.e., e-Commerce adoption by the SMEs and Chapter-VI discusses the benefits and barriers of e-Commerce adoption. Chapter-VII i.e., the last chapter briefly presents the major findings, the suggestions and the conclusion of the research.
Notes and references


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