Chapter 3

Research Methodology
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This chapter addresses the research methodology and research design used in the study. Any methodological considerations depend upon the following factors:

a) Nature of research and their design
b) The past research work done
c) The present research practices
d) Comparison of different methods available
e) Choice of research method for this study and its justification

The following subsections are also added to the above in this chapter:

f) Overall objectives of the research and hypotheses
g) Sampling design
h) Measures used and questionnaire design
i) Sources of data collection, methods and data analysis
j) Limitations of the study

3.1 Nature of Research and their Design
In most of the organizations, research is an important managerial tool that exerts a major influence on decision making. For managers, the purpose of research is to fulfill the need for knowledge of the organization, the market, the economy, or
reduce uncertainty. This requires information about how the environment, employees, customers, or the economy will respond to executives’ decision. The emphasis of research is on shifting decision makers from intuitive information gathering to systematic and objective investigation.

The decision-making process associated with the development and implementation of a strategy involves four inter-related stages:

a) Identifying problems and opportunities
b) Diagnosing and assessing problems or opportunities
c) Selecting and implementing a course of action
d) Evaluating the course of action

Research, by supplying managers with pertinent information, may play an important role by reducing managerial uncertainty in each of the above stages.

Research has been strongly influenced by two major trends in business: increased globalization and the rapid growth of the internet and other information technologies.

There are three types of research designs available to the researcher viz. Exploratory research, Descriptive research and Experimental research.

A) Exploratory Research: In this type of research, the major emphasis is on converting broad, vague problem statements into small, precise sub-problem statements, which is done in order to formulate specific hypothesis. Exploratory study is used in the initial stages of research.
There are **four methods** employed for conducting exploratory research. They are: Literature search, experience survey, focus groups and analysis of selected cases.

**B) Descriptive Research**

It is essentially a research to describe something. It can describe the characteristics of a group such as – customers, organizations, markets etc. Descriptive research provides “association between two variables” like income and place of shopping, age and preferences. Descriptive study requires a clear specification of “Who, what, when, where, why and how” of the research.

There are **two types** of descriptive research: Longitudinal study and Cross sectional study. Cross-sectional study can be conducted in two ways namely field study and field surveys.

**C) Experimental or Causal Research:**

Descriptive research suggests a relationship if any between the variables, but will not establish the cause and effect relationship between them. In order to ascertain the causal relationship between the variables, the researcher carries out an experiment. Experimental research is a research process in which one or more variables are manipulated, which demonstrate the cause and effect relation. Experimentation is done to find out the effects of one factor on the other. It is done to find out the effect of one or more independent variables on a dependent variable.
3.2 Past Research Work Done

This subsection maps out various research methods employed by different researchers in their study falling in area concerned with E-commerce and its related issues. This will give a fair idea to the researcher regarding the scope of the study and the relevance of the methods followed by researchers in the past. This will also help enumerate the various alternative research methods for the present study from which the most appropriate one can be finalized.

A) Study One: “Studies in Health Service Supply Chains” researched by Lisa Fallon and Leone Dunn, University of Wollongong, NSW, Australia.

**Purpose:** The study investigated the business processes of two health care services providers. It examined the state of research in health service supply chains with the primary aim to analyze the business processes of ‘non-traditional’ health care services, whilst focusing on their supply chains.

**Methodology adopted:** The study utilized a detailed case study technique through which it was possible for all the research objectives to be met. Results from one of the reviews in literature highlighted the importance of organizations to focus on both their internal and external (supply chain) processes. Accordingly, two organizations, one providing ‘aged care service’ and the second providing ‘corporate health assessments’ were used to represent non traditional health care
service providers. The case studies of two organizations ensured that the internal business processes and supply chains of each organization could be analyzed. By using case studies, the researcher gained a detailed contextual view of business processes within each organization. As the primary purpose of this research was to study and analyze the internal and external business processes of health care organizations, the nature of this study was both exploratory and explanatory. With time playing an important role in the design and execution of the research project, the researchers found the cross-sectional approach most appropriate and feasible for their work. Qualitative and quantitative data was collected using four data collection methods: observations, questionnaires, semi structured interviews and document analysis.

B) Study Two: “A New Model for the E-commerce Security” by Harsha Wijesinghe and Parwaiz Karamat from Southern Institute of Technology and The Open Polytechnic of New Zealand.

Purpose: This study examined the security of business applications in a society, which is in transition to a full electronic commerce environment. The main focus of this study was to identify the factors that were influential to the measurements of security. The model expected to be derived at the end of the study would be in a position to identify security measurements, specific to the business requirements, or improve an existing program.
Methodology adopted: For this research, case study approach was used as the main methodology. The information was drawn from a representative sample of organizations, which were involved in E-commerce. By using a structured questionnaire, both qualitative and quantitative information were gathered. The research utilized a number of other methodologies too in addition to the above. Initially it began with qualitative methods followed by simulation. Two organizations that had adopted popular security measurements and guidelines were approached. After establishing the initial trust with these organizations, the researchers went ahead in arranging a set of interviews and focus group discussions with them for assimilating information and further analysis.

C) Study Three: “A Model of Factors Influencing Electronic Commerce Adoption among SMEs in Brunei Darussalam” by Hong-Cheong Looi, Department of Computing & Information Systems, Institut Teknologi Brunei Darussalam

Purpose: This research aimed to develop a model of factors motivating and inhibiting electronic commerce adoption among small and medium enterprises (SMEs) in Brunei Darussalam. The following research questions were formulated to address the issues:

1. What factors influence the adoption of E-commerce by SMEs in Brunei Darussalam?
2. What is the relationship that exists between these factors and the decision to adopt E-commerce? To what extent do these factors explain the decision to adopt E-Commerce?

The first research question was addressed by reporting the findings of a qualitative study to identify the major inhibitors and motivators. The second research question was addressed by a subsequent field survey and quantitative analysis that provided further insights into the relationships among the factors identified.

**Methodology adopted:** This study used a qualitative research technique in its collection of data. The face-to-face interview method was adopted because of the exploratory nature of the research question and also because of the interview’s ability to identify and generate the range of relevant issues that a subsequent quantitative study can address at a later stage. The sample for the study consisted of ten SMEs randomly chosen from a local business directory. A semi-structured questionnaire derived mainly from a review of research literature was used in the interview. The interview involved discussions with the key decision makers (i.e. SME owners) about their feelings and interpretations on E-commerce adoption and its perceived benefits and barriers. The instrument collected data on the enterprise profile, benefits of E-commerce adoption, perceived barriers, perceived motivators and ranking of factors. The data so collected was subject further to quantitative tests for gathering insights into the relationship patterns amongst the factors identified.
D) **Study Four:** “Measuring E-commerce System Success” by Catherine McLeavey and Professor Sid L. Huff, School of Information Management, Victoria University of Wellington, Wellington, New Zealand

**Purpose:** The study was concerned with understanding and measuring the success of B2C E-commerce systems. Organizations invest time and money developing and implementing B2C E-commerce systems with a hope to achieve a return on the money invested. It was felt important to understand and also be in a position to measure the extent to which a B2C E-commerce system has been successful. Considerable research was conducted in the past to develop measures of information system success. To the extent that web-based B2C web sites represent the user interface for web-based B2C “information systems,” it was contemplated to utilize some or all of the measures developed in past research, to assess the success of such B2C E-commerce systems.

**Methodology adopted:** Based on the review of previous literature, five separate potential “E-commerce system success” constructs were identified. A survey approach was adopted as the most appropriate method. A questionnaire was developed for measuring the five E-commerce system success constructs based on literature review. The questionnaire was divided into two sections. The first contained seven site specific questions, to familiarize respondents with the target web site. The second section contained a series of questions comprising an overall
site analysis. Collected data from the survey was subject to quantitative analysis for drawing conclusions regarding the issue.


Purpose: Organizations that work through the channel of internet have a strong requirement to restructure their strategies and business models. This research work focused on the E-commerce of virtual products, i.e. products that can be electronically sold, delivered or used. Its objective was to define a business model for selling software whose delivery or use takes places virtually. The research context was the software industry, more specifically software which is virtually delivered or used and as a result, the aim of the study was to develop and validate a business model for the electronic business of virtual products.

Methodology adopted: This work was exploratory in nature as it tried to understand how a given behavior occurs, through the confirmation, complementation and improvement of preliminary ideas. As regards the methodology, it was a multi method one, using a combination of survey and case studies. The objective of the survey was to know the ‘state of the art ’of the commercialization of software used or delivered in a virtual environment. The survey method was chosen for the initial stage as it allowed describing, comparing
or explaining knowledge, attitudes and behaviors involved in the study. The collected data was both primary and secondary in nature, and it was carried out by way of analyzing websites and also interviews via E-mail and telephone. The sample unit comprised of companies that sell virtual products, and the respondents were people involved with these activities. The questionnaire captured various data regarding the respondents and the companies. The population composed of companies that develop or sell software. The second stage of the research involved the case study method as it makes an in-depth study of different segments and areas related to a given project or process possible, so that a deeper understanding of its impacts and consequences can be obtained. Two cases were studied with the following techniques for data collection utilized a) interview: internal – with people involved in projects related to the cases studied, and external – with clients and suppliers; b) analysis of documents or sites; c) analysis of files.

F) Study Six: “Next Generation Shopping: Case Study Research on Future E-commerce Models” by Peter Leitner and Thomas Grechenig, Research Group for Industrial Software, Vienna University of Technology, Vienna, Austria

**Purpose:** Driven by the fast evolution of the internet, innovative technologies and web services, the user has changed from a passive information consumer to an active content distributor within the whole web sphere. Thus, a modern shop visitor can recommend products, leave comments, rate vendors or publish wish
lists. This recent phenomenon, called social commerce or social shopping, has lead to more customer satisfaction, loyalty and consequently more revenues for the vendor. Accordingly, there has been a strong demand for innovative E-commerce models and new shopping functionalities. This research work presented the results of an extended case study research on future B2C and C2C E-commerce models. As a main focus, the key features as well as current trends of social commerce were identified and analyzed in detail.

**Methodology adopted:** An overview of current literature as well as analysis of existing studies on trends coupled with expert opinions built the basis for the theoretical definition of the business model. Due to the lack of literature on future E-commerce models, especially on social commerce, the case study research method was selected to evaluate already existing models of the next generation. For the case study research, 100 future B2C and C2C E-commerce models were selected. Because of the small number of currently existing models in the field of social commerce their heterogeneity was significant. After the analysis, main findings and trends were documented. The selected models were significant to demonstrate some of the best practice examples of future E-commerce models.

**G) Study Seven:** “Employee Development Strategies in the B2C Banking Environment: Two Australian Case Studies” by Blount, Yvette, Swatman, Paula
M.C., and Castleman, Tanya. Deakin Business School. Deakin University, Melbourne Australia.

**Purpose:** The implementation of technology and, in particular, E-commerce technologies has had unforeseen consequences for the relationship between managers and employees. To be able to operate in an increasingly global and competitive environment, retail banks had to develop new ways of dealing with their employees. A lot of issues have forced a rethink in the way employees interact with customers and this, in turn, has pointed to some changes in human resource strategies. This study addressed the question of the level of employee capability and the qualities retail banks must develop to satisfy both, more sophisticated customers (who demand flexibility of interactions, responsiveness and convenience), as well as, the organization’s own needs (including expanded sales opportunities, cost containment or reduction and customer loyalty) when implementing E-commerce technologies.

**Methodology adopted:** The researcher selected two different banks for the case studies with a view of developing a rich understanding of the responses to these issues in different parts of the Australian banking sector. This approach falls within the definition of a multiple case study as advocated by Yin (1994) and undertaking two case studies gave the researcher the ability to consider the implications of the findings from different market and business strategy perspectives. It also allowed them to perform cross-case analysis and extend
existing theories. Interviews were conducted with bank personnel holding a variety of roles in the two banks. The data collected consisted of semi-structured interviews and analysis of documents relating to strategies, policies and procedures relevant to E-commerce implementation. The questions were designed to elicit in-depth responses. To include as many perspectives and experiences as possible, interview participants were selected at different levels of the organization and from various functional areas. This included human resources staff, branch staff, information systems staff, and senior managers as well as electronic banking specialists. The data so obtained were analyzed for arriving at meaningful conclusions regarding the study.


Purpose: The main purpose of the study was to explore and discuss the influence of product type on customer interaction in electronic commerce. The researchers had applied a product classification scheme built on product theory to characterize and classify these products. By classifying product types according to this scheme they focus certain aspects: e.g., in which situation the customer uses the product and, thus, experiences potential satisfaction. By applying product theory to the electronic commerce context, they were seen expanding this theory into a new
Knowledge about product characteristics' influence on customer interaction in various phases of electronic commerce enriches and specifies the existing product theory.

**Methodology adopted:** The researchers performed two qualitative, interpretive case studies, in distance selling companies in order to inductively explore how these companies' products (garments and music-CDs) influence customer interaction through several communication media. These case studies were performed within a research project that were running between the years 2000 and 2007. Several data collection methods were used to collect data about the studied companies and their customers: the way they communicate, their experiences and opinions of customer interaction, etc. As they have used a qualitative research approach, qualitative, open-ended interviews were performed with several actor groups within the studied organizations. They also conducted observations at the customer service departments, which were focused on customer interaction through the present communication media. In order to contrast their deep focus on a small amount of interviewees with a broader view of customer opinions, questionnaires were also used in both the case studies. Finally, the researchers also have examined texts in different documents; e.g., company publications, marketing documents, and policy documents as well as e-mails from customers. This was done in order to get a view of official statements from the companies as well as an understanding of customer initiated questions and complaints. Data
collected by different methods has been contrasted and compared during the process of data analysis. This method of triangulation has been used to get a truthful view of both the companies’ and the customers’ perspectives on customer communication.


Purpose: This study was a part of the larger project that investigated the impact of B2B E-commerce on access to global markets for developing country producers in South Africa, Bangladesh and Kenya. The main aim of research was to build up an empirical base for examining whether B2B E-commerce enables firms in developing countries to overcome the problems they face in trading on the international market.

Methodology adopted: The research was designed as a set of case studies complemented by key informant interviews. The starting point was a sampling frame consisting of established garment firms assembled for a study undertaken by The Institute for Development Studies, University of Nairobi in 2000. Twenty firms were selected on the basis of their known market reach and their likely technological know-how with respect to the use of data communication. Of the original sample of 20 firms, 12 agreed to participate in this study. The data
collection phase of the study involved a short survey and more in depth interviews designed to probe for explanations for the answers given to the structured survey questions. Data was also gathered using key informant interviews with respondents from Internet Service Providers, Government officials and others who were likely to be knowledgeable about the garment industry and/or the use of data communication and E-commerce. The sample for the study included medium and large-sized garment enterprises in Nairobi and nearby towns. Basic information was collected about the study firms and also data collected to provide a basic business profile, a profile of the use of ICTs in the company, and to establish the extent to which any form of B2B E-commerce was in use. An in depth interview guide was used to elicit information about the use of the Internet, whether firms had registered at websites, and the reasons for their use or non-use of B2B E-commerce.

J) **Study Ten**: “Technological Change and Power Redistribution: The Unintentional Consequences of Automobile E-commerce” by Dubravka Cecez-Kecmanovic, School of Information Systems, Technology and Management, University of New South Wales, Sydney, Australia and Marius Janson, University of Missouri, St. Louis, USA.

**Purpose**: This study explored how technological change brought about by the Internet and electronic commerce (E-commerce) impacts social conditions of
automobile trade and alters traditionally asymmetric power relations between the buyers and sellers. By focusing on the social dimensions of E-commerce, the researchers first aim was to understand why and how the changed automobile trade conditions affect trade practices and buyers’ and sellers’ social behavior. Second, they sought to explain the resulting effects on buyer-seller social relations, especially fairness of trade and power redistribution towards buyers.

**Methodology adopted:** The researchers conducted multiple interpretive case studies of sellers and buyers of one product type – automobile. Their choice of automobile sales was motivated by a) the importance and complexity of automobile purchase decisions with which most people have some experience and can relate to, b) the size and relevance of the automobile sales market and c) the growing presence and potential impacts of B2C E-commerce in such a market.

The empirical investigation, conducted from 2001 to 2003, involved nine automobile dealership cases and six automobile buyer cases in the country. These dealerships covered the entire range from low end to high end of the market. The investigation included visits to dealerships, observation of automobile sales process, and onsite semi-structured interviews with dealers, chief executives, and sales people. The interviews focused on sales practices and experiences before and after the use of Internet. The interviewees provided their interpretation of the changes emerging with E-commerce and the impacts on the industry. To make sense of their experiences and the meanings they assigned to changing practices.
the researchers also studied dealership websites and on-line interactions with buyers.

In addition to dealerships, the researchers specifically targeted E-commerce automobile buyers in order to gain access to their authentic experiences. They interviewed six E-commerce automobile buyers: half selected from the general population and half part-time graduate students. These interviews were conducted in person or by telephone. They asked the buyers to reflect on their experiences with purchasing an automobile in a traditional way by visiting dealerships versus on-line using the Internet. They also asked them to explain why they chose to search the Internet, visit dealers’ and manufactures’ websites, and consult third party websites. Of particular interest was buyers’ ability to find, interpret and meaningfully use information provided on various web sites. The researchers also prompted the buyers to reflect on their power position vis-à-vis the salespersons and their feelings regarding the purchasing process. The data analysis process – during and after data collection – aimed at gaining insight into changing social conditions and their impact on the behavior of actors as E-commerce gradually replaces traditional automobile trade processes.

Purpose: In today’s world the electronic commerce model has become a standard platform for streamlining business flows and broadening product outreach. An interesting case study in this perspective is the Kingdom of Saudi Arabia, especially given its emphasis on local, regional and religious traditions. Presently, with a tremendous growth rate in internet connectivity, the kingdom is actively moving towards large-scale adoption of E-commerce systems. This research investigates to identify factors that significantly affect the adoption of E-commerce in the kingdom.

Methodology adopted: Information gathering in the form of responses to a web-based survey was adopted as the primary medium of data collection. This approach was the obvious choice as the objective was to achieve a representative but random sample of internet users in the kingdom. Over 4000 responses were collected. The survey questions were meant to achieve feasible metrics that could properly gauge user responses to E-commerce adoption. Suitable conclusions were arrived at after analyzing the collected data.

L) Study Twelve: Barriers to E-commerce and competitive business models in developing countries: A case study by Nir Kshetri The University of North Carolina at Greensboro

Purpose: This study integrates and extends study on E-commerce in the developing world. They examine characteristics of E-business models that can be
successfully employed in developing countries by providing the case of an E-

dusiness model followed by a Nepal-based multiple international award winning
online provider. The theoretical contribution derived from this research is to
explain the ‘hows’ and ‘whys’ of E-commerce in developing countries and to
identify clear contexts and attendant mechanism. It attempts to gain an
understanding of E-commerce barriers in developing countries and illuminate
successful E-business models.

Methodology adopted: The researchers draw upon literature to offer a model of
E-commerce barriers in the developing world and illustrate a competitive business
model employed to overcome some of the barriers. In the remainder of the
sections, relevant literature on E-commerce in developing countries was reviewed
and then they provide a case study of a competitive business model employed by
Thamel.com, a Nepal-based E-commerce firm. This research uses a single-case
research design. It is then followed by a discussion of the case with the final
section providing for conclusions and implications.

M) Study Thirteen: How the Implementation of E-CRM enhances E-satisfaction
throughout transactional cycle? A study in UK.

Purpose: In today’s competitive global environment, organizations must do
everything to seek new customers, and more importantly, retain profitable, loyal
customers. Now, customers are seen demanding information via wireless, mobile,
PDA technologies and internet (E-CRM). E-CRM emerges from the internet and web technology to facilitate the implementation of CRM. Researchers have taken different approaches and focused on a variety of aspects in investigating E-satisfaction with the implementation of E-CRM. This research had the objective of filling in the gaps in the literature on the aspect of having a better understanding of how the implementation of E-CRM enhances E-satisfaction throughout the transactional cycle (Pre-Purchase. At-Purchase and Post-Purchase).

Methodology adopted: There are many frameworks of research designs and they can be classified into three traditional categories: exploratory, descriptive, and causal. This study applies these research designs to achieve its objectives. The researcher began with an exploratory study which provides the essential background information needed to continue further with a descriptive study. In turn, information obtained from a descriptive study helped the researcher to go ahead in designing a causal experiment. To achieve these objectives, the research design of this study was performed in two stages. Stage one dealt with an exploratory study, and stage two involved both descriptive and causal research. Once data was collected from respondents, it was analyzed using a statistical software package. SPSS. Then, correlation analysis and factor analysis was conducted to determine the existence of inter-relationships between variables and understand the strength and direction of the relationships in the model.
3.3 The Present Practices of Research

With all the above traditional methods of conducting research, action research has been amongst the latest methods of systematic inquiry in studies involving ICT and E-commerce adoption. Action research takes passivity out of research. Routine research sometimes is drab, uninteresting and a number crunching process, where we repose more faith in statistical analysis to prove our point rather than taking support of reality to do so. Action research pursues action (or change) and research (or understanding) at the same time. It uses a cyclical process alternating between action and research (A.H.Chachadi, 2007).

As an illustration, assume that we are investigating the psychology of hotel workers who are essentially teenagers. Now, this piece of research can be done entirely with secondary data where we can depend upon a number of studies that are available from the past. Instead, we can also generate primary data by asking a few useful probing questions, which tell us as to what their psychology is or how their psychological processes work. In an action research model, we go one step further and put some action in the whole research process. Researchers may prefer to be a part of a hotel and stay with hotel workers for six months to understand their psyche which is studied from very close quarters rather than depend upon the responses from the questionnaire which suffer from a number of inadequacies such as:

i) Lack of interest on the part of the respondent
ii) Inability of the respondent to understand the technical terms used or inability of research to use appropriate words instead of a few technical words of jargon.

iii) Over reliance on technical analysis of information which itself is faulty in the first place.

In action research modes, normally the researcher uses *two approaches*. **One**, he *becomes a part* of the chosen organization and actively *observes* how decisions are made. **Second**, he continuously *provides* managerial inputs to the firm in the area concerned to see whether the inputs given could substantially *alter* the performance of the organization. This effort takes some time, but it is observed that it yields very *conducive results*. The researcher ensures that constant inputs were provided to the select organization and over a period of time, its *performance earlier and after* the use of inputs were *compared*. Based on the results obtained numerous *conclusions* can be derived at and suitable recommendations can be offered to the select organization. This amply proves the point that action research is a *cyclical process* where action and research are a continuous cycle coming one after another.

# Literature Review on 'Action research' Method

* Definitions

The concept of action research emerged out of disillusionment with research contributing to the improvement of a practice, or resulting in social action. The
gap between research and action and between theory and practice was becoming a cause of concern for some social scientists.

According to Corey (1953), who has been a very committed pioneer in the use of action research in education, defines action research as "the process by which practitioners attempt to study their problems scientifically in order to guide, correct, and evaluate their decisions and actions."

According to Foshay and Goodson (1953), "cooperative action research is an approach to making what we do consistent with what we believe. It is an attempt to deduce what is necessary to improve a real situation through a systematic examination of the situation itself."

"Action research is usually described as cyclic, with action and critical reflection taking place in turn. The reflection is used to review the previous action and plan the next one." (Dick, 1997)

"Action research is a process of systematic reflection, enquiry and action carried out by individuals about their own professional practice" (Frost, 2002)

"Action research combines a substantive act with a research procedure; it is action disciplined by enquiry, a personal attempt at understanding while engaged in a process of improvement and reform." (Hopkins, 2002)
“Action research is a flexible, spiral process which allows action (Change, Improvement) and research (Understanding, Knowledge) to be achieved at the same time.” (Dick. 2002)

# Characteristics of Action Research

1) Action research is referred to variously as a term, process, enquiry, approach, flexible, spiral process and also cyclic.

2) Action research has a practical, problem solving emphasis

3) Action research is carried out by individuals, professionals and educators

4) It involves research which is systematic, critical reflection and action

5) Aims to improve existing practices

6) Action is undertaken to understand, evaluate and change

7) Research involves gathering and interpreting data on the topic thought of

8) Critical reflection involves reviewing actions undertaken and planning future actions.

# Models of Action Research

(A) Basic Model of Action Research (Kurt Lewin, 1946)

PLAN ... ACT ... OBSERVE ... REFLECT ... PLAN

a) Decide on a particular focus for research

b) Plan to implement an activity / series of activities / other interventions

c) Implement these activities / interventions
d) Observe the outcomes

e) Reflect on what happened and then plan a further series of activities, if necessary

(B) **Model 2 (Dick, 2002)**

a) Action leads to critical reflection and then perhaps, to further action

b) Action is followed by critical reflection {what worked? what did not work? what have we learned? How might we do it differently next time? and so on }

c) Reflection is followed by action {understanding achieved, conclusions drawn and plans developed .... all are tested in action }

d) While action research can often involve undertaking a single cycle of planning, acting, observing and reflecting, it can also lead to a more lengthy and substantial study within a given set-up. These need to have an extended time scale and scope of research.

PLAN 1 ... ACT 1 ... OBSERVE 1 ... REFLECT 1 ... PLAN 2

PLAN 2 ... ACT 2 ... OBSERVE 2 ... REFLECT 2 ... PLAN 3

PLAN 3 ... ACT 3 ... OBSERVE 3 ... REFLECT 3 ... PLAN 4 and so on

(C) **Model 3 .. 8 Stage Model (Micheal Bassey, 1998)**

*Stage 1: Defining the enquiry*

*Stage 2: Describing the situation*
Stage 3: Collecting and analyzing evaluative data

Stage 4: Reviewing the data and looking for contradictions

Stage 5: Tackling a contradiction by introducing some aspect of change

Stage 6: Monitoring the change

Stage 7: Analyzing evaluative data concerning the change

Stage 8: Reviewing the change and deciding what to do next

The entire framework is based on three central questions:

Question 1: What is happening in this situation of ours now? (Stages 1 - 4)

Question 2: What changes are we going to introduce? (Stage 5)

Question 3: What happens when we make these changes? (Stages 6 – 8)

(D) Model 4  (Denscombe's Action Research Model, 1998)

# Contains five elements namely:

Professional practice, critical reflection (Identify Problem or Evaluate Changes), research (Systematic or Rigorous Enquiry), strategic planning (Translate Findings into Action Plan) and action (Instigate Change).

# Framework begins with professional practice and reflecting critically on it.

# Such reflection may lead to identification of a particular problem or issue that requires research.

# When this enquiry is complete, findings from the research become the starting point for development of an action plan.
Strategic planning leads to instigating change (action), which impacts on professional practice. The cycle then begins again and a further round of critical reflection enables the researcher to evaluate changes made. At this point, conclusions may be drawn and the project may come to an end. However, it is also possible that, following the evaluation, some further research may be deemed necessary.

Practitioners do have a range of possible models from which to choose. The emphasis here is on 'choice' and not 'prescription'. Practitioners need to decide the action research framework which is likely to enable them achieve their aims and complete their studies successfully. This involves either selection from a range of models available or possibly developing one's own model to suit the situation.

### 3.4 Comparison of Various Research Methods Available

A thorough analysis of thirteen research articles for various methods used by other researchers in the area of E-commerce adoption (as described in sub section 3.2 in this thesis) reveals the following alternatives in terms of methodology to the researcher:

a) The study regarding insights into E-commerce adoption amongst small businesses can be investigated through analysis of secondary data sources, later followed by gathering information from a representative sample of organizations.
which stand to gain due to adoption of E-commerce or are already involved with E-commerce. Both qualitative and quantitative information can be gathered using a structured questionnaire. Qualitative research method, in the form of interviews, can be used to identify factors that are important and relevant to encourage willingness to adopt E-commerce. The factors form a basis for further quantitative study, in the form of cross-sectional field survey. The survey serves to assess the validity of the factors and provides further insights into the relationships amongst the factors.

b) The investigation can also include a case study in a select organization after following all the methodology as described in (a) above. In situations where survey data are available, case studies still may be beneficial because the approach is believed to add depth to the analysis. The complexities, contradictions, and causal relationships in a situation is more likely to be readily revealed through case studies. Case studies may complement statistical analysis by helping to refine hypotheses, select explanatory variables, and provide insights into how variable “x” affects variable “y.” The methodology can be made more concrete and convincing by performing action research in the selected organization and obtaining the results.

c) The study can be done purely through the survey method after a thorough review of literature. Based on the review the questionnaire can be developed for collecting and measuring data from a large number of owner-managers of SME’s.
The collected data can then be analyzed with suitable techniques and conclusions made.

d) Due to lack of sufficient literature on E-commerce adoption amongst SME’s, we can employ a pure case study research method wherein we select two organizations qualifying as SME in a bid to develop a rich understanding of the response on the issues of the study i.e. E-commerce adoption. This approach falls within the definition of a multiple case study as advocated by Yin (1994) and undertaking two case studies gives us the ability to consider the implications of our findings from different business strategy perspectives. It also gives an opportunity to perform cross-case analysis and look at the possibility of extending existing theories. Interviews can be conducted with personnel occupying various roles in these two organizations. Questions can be designed to elicit in-depth responses and include as many perspectives and experiences as possible. Resulting data can be analyzed to come to some meaningful conclusions.

3.5 Choice of Research Design for this Study

In making research design decisions, the researchers are normally guided by the nature of the problem and the desired result of the investigation, the context in which the study would take place and their own philosophical assumptions, methodological appropriateness, and the choice of various data-collection and analysis techniques.
From the various alternatives available to the researcher as described in sub-section 3.4 above, and after giving a thought to the pros and cons of each method, in the light of the present study, the researcher began with an exploratory study which provided the essential background information needed for continuing further with a descriptive study. In turn information obtained from a descriptive study was utilized for conducting action research in a select organization.

Accordingly the present study was performed in three distinct stages namely:

**Stage one: Exploratory Study**

There has been limited knowledge existing on issues regarding adoption of E-commerce amongst the SME’s especially in the Indian context. This stage involved a review of existing literature on the abovementioned area. The researcher also resorted to focus-group discussions to gain insights into the issue and develop the necessary understanding for coming out with the propositions for this study.

**Stage two: Data Collection through Survey and Analysis**

Based on an extensive review of literature and the outcome of the focus group discussions, the researcher developed a questionnaire consisting of two parts; Part A consisting of details of the organization and Part B consisting of responses to various issues related to adoption of E-commerce within the organization. The questionnaire was pre tested for further administration to respondents. Mailing of
questionnaires and telephonic interviews did not yield adequate responses. There were practical difficulties for the same, as the owner-managers were very reluctant or unwilling to share information telephonically. Initial contact was done in some cases to ascertain willingness of the respondents to participate in the proposed field survey, while in other cases 'cold calls' were helpful in obtaining data. Resulting data was analyzed using SPSS software version 15.0 for tests related to correlation and regression in a bid to determine the strength and direction of the relationships between variables in the model.

**Stage three: Action Research in a Select Organization**

To empirically test the results of the survey in stage two above, the researcher conducted action research in a select organization from amongst the sample members. Action research procedure endeavors to combine substantive act with a research procedure, an action disciplined by enquiry and a personal attempt at understanding while engaging in a process of improvement and reform (Hopkins, 2002). In the pursuit of introducing ICT-related change in the SME's, action research (AR) was found to be particularly suited to ICT-related organizational change, as it enables inquiry into and integration of the technical, economic, organizational, human, and cultural aspects of the intervention. The researcher has opted for the Denscombe's Action Research Model proposed in 1998 with some modifications to suit the present study. The action research process revolves around a cyclical and action-oriented design that includes a diagnostic phase.
planning phase, an action-taking phase, and an evaluation phase. Based on the process carried out in the organization, suitable conclusions were drawn and also in the process some areas for further research were identified. Data collected by different methods has been contrasted and compared during the entire data analysis. This method of triangulation has been used to get a truthful view of the respondents on aspects related to adoption of E-commerce in their organizations. The triangulation method is important for validation of results, since weaknesses in one data collection method gets compensated by the strengths of another method.

3.6 Overall Objectives of the Research and Hypotheses

The purpose of this research was essentially to describe and analyze the opportunities arising due to adoption of E-business strategies in the existing business especially in the SME sector and to find out its determinants and impact, as perceived by the owners of the organizations. Based on the literature review discussed in chapter 2, the study is undertaken with the following overall objectives:

1. To assess the awareness / knowledge levels of the concept of E-business amongst organizations.
2. To gather perceptions of organizations regarding utility of E-business as a tool for enhancing their business prospects.
3. To enumerate the opinions of organizations regarding implementing E-business initiatives and also the barriers to adoption of E-business.

4. To enumerate the stage of readiness of organizations for implementing E-business initiatives.

5. To critically examine the benefits an organization derives by implementing E-business initiatives and also the barriers in the process of implementation through the action research process.

# Hypotheses

In order to address the above overall objectives, the researcher formulated the following seven hypotheses:

**Hypothesis H1**: There is no relation between the nature of business of the firms and their awareness regarding E-commerce.

**Hypothesis H2**: There is no association between E-commerce awareness and the number of years in business by the firms.

**Hypothesis H3**: There is no association between the type of the firm and awareness regarding E-commerce.

**Hypothesis H4**: There is no relation between the number of technical personnel employed by a firm and the number of personal computers owned by the firm.
**Hypothesis H5**: Overall utility of E-business for compet
positively associated with aspects concerning competitiv
term business prospects.

**Hypothesis H6**: Overall perception regarding benefits due to E-business in firms
is positively associated with benefits enjoyed by the firm in terms of increased
revenue, operating costs, customer service and business process flow.

**Hypothesis H7**: Barriers to adoption of E-business on an overall basis is
positively associated with aspects concerning financial and business benefits,
knowledge & understanding of E-business, availability of skilled manpower, setup
costs and shift in mindset of employees.

### 3.7 Sampling Design

**a) Sampling Area**

North Karnataka area comprises of seven districts viz. Dharwad, Belgaum, Bijapur, Bagalkot, Gadag, Haveri and Uttara Kannada districts. Of all these, Dharwad and Belgaum districts are observed to be industrially active districts while the others have not shown significant developments on the industry front.

Hubli has been the hub in North Karnataka with all significant institutions like
NKSSIA (North Karnataka Small Scale Industries Association), NKMA (North Karnataka Management Association), CEDOK (Centre for Entrepreneurship Development Of Karnataka), SISI (Small Industries Service Institute), DIC
(District Industries Centre) and KCCI (Karnataka Chamber of Commerce and Industries). We also have industrial estates operating in and around Hubli namely Gokul Industrial Estate, Tarihal Industrial Estate, Belur Industrial Estate and Lakhamanahalli Industrial Estate. These industrial estates house a number of small and medium scale industries that cater to the local, regional as well as national markets. Many entrepreneurs from this area operate from Hubli and hence in the context of all the above the researcher has considered Hubli as the representative sample area for the study.

Also the researcher has chosen to undertake the study using action research which requires ample time to be devoted within the select organization. Hubli is chosen as the sample area considering the aspects of proximity of the researcher to Hubli and also paucity of time to cover the remaining areas.

b) Sampling Frame

As on 31.5.2001, Dharwad District had a total number of 10,720 small scale industries and 20 medium scale industries according to data furnished by the Department of Industries and Commerce, Dharwad District. Large majority of them were tiny industries and small service based enterprises, having much lower capital investment of Rs.1,00,000 and less. These were mainly self-employment oriented enterprises having owners working themselves or along with less than about five employees. Such units did not essentially constitute the target population for the study; as such units tending to use E-commerce in their business
was very limited. Such units were catering to the market needs and customers mostly belonged to the local area or nearby towns.

In order to meet the objectives, the present study designed a sampling frame based on the following broad criteria in the defined sample area:

1. Majority of the samples that are located in industrial estates/areas developed by state development agencies such as Karnataka State Small Industries Development Corporation (KSSIDC), and Karnataka Industrial Area Development Board (KIADB), are considered for target population.

2. Units having initial capital investment of Rs. 1,00,000 and above are considered.

3. The respondent units for study are spread across manufacturing, services and trading category but majority of them come from the manufacturing category.

4. Units totally sick and closed are excluded, because of difficulties in obtaining relevant data.

Considering the criteria indicated above, a sample frame was derived in consultation with North Karnataka Small Scale Industries Association (NKSSIA), Hubli and District Industries Centre (DIC) at Dharwad and also based on the data collected from KSSIDC and KIADB directories. Accordingly a total of 600 units were short listed as target population for the study.

c) Sample Size

Out of 600 units in the final sample frame, 10 per cent of population was considered to determine the sample size. The sample units were selected randomly.
resulting in sample size of 60 units. The selected respondents either belonged to manufacturing industries that manufactured a wide range of industrial products or consumer products, services sector and trading. It is important to recognize at this stage that the category of manufacturing industries are the predominant type of small and medium enterprises in North Karnataka Area.

3.8 Presentation at North Karnataka Management Association (NKMA), Hubli on the Research Area

Before designing, developing and finalizing the questionnaire for field survey, the researcher took an opportunity to present his research topic under the auspices of North Karnataka Management Association (NKMA) at Hubli which has a large number of small and medium enterprises as its members. The intention of the researcher was to place before the target audience the concept of utilizing E-commerce as a tool in profit making, and, in the process of the discussion elicit responses and gather information that aids in designing a suitable questionnaire to cover the objectives of the research study. The presentation at NKMA highlighted the following aspects:

- Glimpses of the power of the internet
- The meaning of E-commerce
- Triggers forcing organizations to look at E-commerce as an alternative strategy
- What can E-commerce do for business?
e) Stages companies need to travel before becoming a true nf

f) Rewards of successful implementation of E-commerce st

g) Some corporate illustrations or rewards derived from implementation e.

commerce strategy and developing an internet strategy.

Based on the deliberations and responses after the presentation, the researcher went ahead in designing a suitable survey instrument to be administered amongst the samples.

3.9 Measures used and Questionnaire Design

# Measures Used

This research study deals with concepts like technology adoption, utility, benefits, barriers to adoption and stages in adoption of E-business in small and medium enterprises.

In order to test the hypotheses measures were developed to relate various concepts stated above. Both dependent and independent variables were identified. The first key dependent variable was utility of E-commerce with a host of independent variables subscribing to the aspects of competitive advantage and long term business prospects. The second key dependent variable was usefulness/benefits of E-business with independent variables comprising of benefits enjoyed by the firm in terms of enhanced revenue, lower operating costs, better customer service and enhanced business flow. The third key dependent variable was barrier to adoption
of E-business with independent variables comprising financial and business benefits, knowledge & understanding, availability of skilled manpower, setup costs and shift in mindset of employees.

# Utility of E-commerce was categorized into seven broad areas i.e. competitive advantage, success in long term, acquiring a greater competitive edge, affecting the way business is done in future, more reliability on E-commerce, wait and watch policy, a feeling of fading effects of E-commerce in near future.

# Perceived Benefits due to E-commerce in Firms was categorized into eight areas i.e. revenue related, cost related, customer service related, supplier related, information flow related, brand and corporate image related, customer loyalty and retention related and business process related.

# Barriers to Adoption of E-commerce by Firms was categorized into eleven areas i.e. financial and business benefits related, level of knowledge and understanding of E-commerce, rules and regulations related, lack of awareness of computer technology, security and privacy related issues, workers qualification related, customer/supplier related, channel conflicts, internet setup costs, keeping pace with technology and problems related to mindset of employees.

Khatibi, Thyagarajan and Seetharaman (2003) in their study that analyzed the situation of E-commerce in Malaysia on the aspects of merits and factors that affect adoption of E-commerce, have opined that even though E-commerce has taken off at an unprecedented speed with the scale of business generated through
E-commerce multiplying exponentially. Malaysian E-commerce industry has not taken off as expected. They have examined the perceived benefits as well as barriers to E-commerce adoption based on primary data collected using a sample survey of Malaysian manufacturers, traders and service providers. They have reported that though the sample firms felt that E-commerce was beneficial to business in general, they were uncertain as to how it would benefit their actual business operations. The perceived benefits according to the study fell under the following categories: competitiveness, better image, efficient processes & better information system.

However despite the perceived benefits, Khatibi, Thyagarajan and Seetharaman (2003) have opined that E-commerce adoption was hindered by a number of constraints (barriers). Major barriers were thought to be:

a) The problems of keeping up and understanding the technology itself
b) Lack of trained manpower
c) Uncertainties with regard to its operations and regulations
d) High switching costs

In the present study, for all the information connected to the aspects related to attitude towards utility of E-commerce, perceived benefits and barriers to E-commerce adoption, the questionnaire used was a tested instrument administered by Khatibi, Thyagarajan and Seetharaman (2003). Scores for each measures of emphasis for the above three aspects and the overall score for each was computed
after the survey of respondents. Later the overall score and the individual scores for each measure were examined for any correlation, if any.

# Survey Instrument (Questionnaire)

In a bid to understand the owners-managers opinions towards utility of E-commerce as a tool for enhancing competitive ability and business prospects, a questionnaire was formulated, with multiple indicators, each one seeking self-reporting type responses on a Likert scale coded from 1 to 5 (1= Totally Disagree, 2= Disagree, 3=Neutral, 4=Agree and 5=Totally Agree). Similarly the perceived benefits offered by implementing E-commerce in firms, and barriers of E-commerce adoption in firms were measured by the Likert type scale.

The Questionnaire was developed in two major parts namely profile of the firm and details regarding various aspects of E-commerce amongst firms.

# Part 'A' consisted of eleven questions focusing on:

a) The details of the firm in terms of their name with full address and contact details

b) Constitution of the firm

c) Details of proprietors/partners

d) Number of years in business

e) Nature of business

f) Number of shifts/day (in case of manufacturing units)

g) Working hours and weekly off
h) Number of employees in the firm with details of technical personnel and type of workmen employed

i) Details of firms (if in export business) and

j) Population of personal computers in firms.

Questions were assorted depending on the type of data to be collected and consisted of open ended questions as well as closed ended questions with data collected on nominal, ordinal and interval scales.

# Part ‘B’ consisted of six questions focusing on:

a) Details regarding awareness of the concept of E-commerce

b) Sources contributing to the awareness/knowledge of E-commerce

c) Facilities/marketing practices present in the firms

d) Opinions regarding utility of E-commerce as a tool for enhancing competitive ability and business prospects

e) Perceived benefits according to the firms as a result of implementing E-commerce in firms

f) Barriers to E-commerce adoption by firms and stage of readiness of the firms regarding implementing E-commerce initiatives.

Questions in this section were also assorted consisting of closed ended questions with data collected on nominal and ordinal scales, multiple choice questions as well as on a five point ‘Likert Scale’ ranging from 1 for ‘Totally Disagree’ to 5 for ‘Totally Disagree’.
A Pilot study was conducted to test comprehensiveness and validity of the instrument with members in the pilot study comprising of small enterprise owner-managers, NKMA office bearers, representatives from District Industry Centre (DIC) and financial institutions/banks. The final questionnaire was designed based on the feedback from the pilot study. The full text of the final version of the questionnaire administered for data collection is provided in Appendix I.

3.10 Sources of Data Collection, Methods and Data Analysis

A) Data Collection Methods:

The instrument used in the study was intended to solicit the responses from the owner-managers of respondent units and arrive at answers to the questions. The researcher collected the data from the respondents through self-administration of the questionnaire. The follow-up was done through frequent visits and face-to-face interviews. As already indicated, the researcher personally visited the sample units for the above process.

Secondary data was collected from the office of the District Industries Centre, at Dharwad. Besides, various publications of Government of India such as Census of Small Scale Industries, Economic Survey, Bulletin of Reserve Bank of India, District Gazette, Karnataka Chamber of Commerce and Industry, Hubli and a host of related websites. These sources were utilized to collect relevant secondary data pertaining to macro-scenario of small and medium enterprises, definitions.
diffusion of technology and various aspects related to adoption of technology by small and medium enterprises.

**B) Data Analysis Methods:**

Data collected from structured questionnaires were analyzed to find out the *determinants* and *impact* as well as enumerate the *percolation levels* of E-commerce as a strategy of conducting business amongst SME’s. Also the data was used to analyze the problems of E-commerce *adaptability* to such segments of business. Since the researcher visited the respondent units personally for data collection, all the sixty units responded to the questionnaire resulting in 100% response rate. The response from these sixty respondents constituted the *primary data* for the current study. The quantitative aspects describe the results from a number of *cross-tabulations* for demographic variables and variables in Likert scale used in the survey. *Descriptive statistics* were used to arrive at frequencies of the variables studied. Hypotheses were tested using *Correlation Coefficients*, *Regression Analysis* and *Chi-Square Analysis*. *SPSS Version 15.0* was utilized for analyzing all hypotheses.

**3.11 Limitations of the Study**

i) The study area falls under North Karnataka which includes the seven districts falling under its purview. The sample of 60 units reflect multi-product category
units and at different life cycle stages. It is difficult to generalize the same to small and medium enterprises in the entire state or country.

ii) Hubli is chosen as a representative sample area in North Karnataka for this study due to reasons of high level of industrialization, presence of various supporting institutions like NKSSIA, DIC, CEDOK, SISI, NKMA, KCCI etc and also paucity of time and proximity of the researcher to the area, in light of the action research method to be conducted in a select organization. This may be considered as a limitation and hence this study could provide a backdrop against which further similar research can be undertaken in the remaining areas of North Karnataka.

3.12 Summary

In summary, the research methodology used was a combination of survey method and action research in a select organization. Seven working hypotheses were formulated to meet the objectives of the study. Hubli was chosen as the sample area from North Karnataka area. The sample frame consisted of 600 units spread across the study area. The sample size consisted of 60 Small and Medium Enterprises located mainly in industrial estates/areas in Hubli region. Data collection was through structured self-administered questionnaires with follow-ups done through personal visits by the researcher.
As the data was collected through personal visits, the response rate was 100%. The responses collected were analyzed using statistical techniques such as frequency distribution and cross tabulation. Hypotheses were tested using Pearson Correlation coefficient and Analysis of Regression. Action research methodology was employed in a select organization from amongst the samples, for assessing the impact and benefits of E-commerce deployment amongst small and medium enterprises.

The responses received from respondents have been analyzed and described in Chapter 5. Also a select organization was picked up from amongst the samples for further action research. Details of the findings of action research in the select organization is described in Chapter 6.

The forthcoming chapter 4 deals with the Socio-economic profile of North Karnataka.