CHAPTER-THREE

RESEARCH METHODOLOGY

3.1 Need for Research
3.2 Objectives and Scope of Research
3.3 Literature Survey
3.3.1 Conceptual Framework of Electronic Commerce
3.3.2 Business Value of Electronic Commerce
3.3.3 The Impact of Electronic Commerce
3.3.4 Survey Reports on Electronic Commerce
3.4 Methodology of Data Collection:
3.4.1 Present Models of Electronic Commerce
3.4.2 Case Studies of Electronic Commerce
3.4.3 Data Collection in Present Research:
   - Sampling Procedure
   - Administration of Questionnaire
   - Testing and Follow up
3.5 Methodology of data Analysis
3.5.1 Research Techniques in Electronic Commerce
3.5.2 Data Analysis in Present Research
3.6 Data Presentation and Discussion

References
3.1 Need for Research

Electronic commerce over the Internet is a new and fast-growing way of conducting business. Though only a few years old, it is rapidly developing into a major economic activity, and links up several companies with the global market in a way that geographical boundaries and location no longer pose hindrances to business transactions. The potential of this fast-growing form of transaction has become the focus of many governments, national statistical agencies, and international organisations and, in particular, business people who need to make well-informed decisions for their policies and investments on Electronic Commerce. In fact, Electronic Commerce is not something new but has existed for decades. Earlier forms of Electronic Commerce have been conducted through closed networks, e.g. internal networks (intranet), exclusive networks for use between a company and its business partners (extranets), mainly in the form of electronic data interchange (EDI) and electronic fund transfer (EFT) as well as private procurement networks. These networks allow for a high degree of security and reliability of business-to-business transactions. However, the high costs of development and maintenance of such networks have put them out of reach to many firms, in particular, small and medium-sized enterprises (SMEs). With the rapid developments in Internet, recent attention has been focused on Electronic Commerce conducted over the internet, and in particular, the extent of adoption of Electronic Commerce by SMEs and new companies made possible by the internet. This has given rise to the need for various measurement and methodological research issues.

The more need for research can be seen from the history of evolution of e-commerce as we seen that different stages have shown its importance that it took only four years to reach fifty million users. Further the three pillars of Electronic Commerce i.e., Electronic Information, Electronic Relationship, Electronic Transactions where research can be done. Apart from this there are other benefits like lowering purchasing cost, reduced inventory, lower cycle times, customer service, new sales opportunities, marketing costs, marketing communication, supplier and customer benefits, there are barriers like access to use and infrastructure, network convergence, local loop, security, certification, protection of privacy and personal data, consumer protection, taxation, paying electronically, there are different views and trust which can be customer-oriented view,
organisational oriented view, there are different application models and types of Electronic Commerce which help organisations in so many ways that needs research. The infrastructure of Electronic Commerce also plays an important role as to redesign the infrastructure of any organisation. The legal issues concerning of Electronic Commerce where to decide what law for what land in this global environment. The strategic challenges will collectively and individually contribute major changes in a way a company conduct its business. The importance, scope, features and components of business values also provide new agendas for need of research. The future of Electronic Commerce also predict that many countries are leading in this field to follow the mechanisms and technologies of Electronic Commerce specific to their business environment. All these aspects built an environment for need of research where scope is wide.

The idea is that there is a life cycle for research needs which follows the pattern of growth of e-commerce markets: at an initial stage there is need for information on the enabling factors and barriers to e-commerce; at a more mature stage one should look for the intensity of e-commerce use to enable policy makers to address imbalances; at a later stage one would be able to measure the impact of e-commerce on the economy and society. The three broad areas for indicators are:

1. **E-commerce Readiness** - Included here are issues of preparing the technical, commercial and social infrastructures that are necessary to support e-commerce. It is essential for each country to be able to construct a statistical picture of the state of readiness of each infrastructure element to engage with e-commerce.

2. **E-commerce Intensity** - These issues relate to the state of e-commerce usage, volume, value and nature of the transactions. The statistical requirement is to profile who is exploiting e-commerce possibilities and who is not, and to identify leading sectors and applications.

3. **E-commerce Impact** - These issues relate to additionality (i.e. e-commerce goes beyond substitution effects and creates new value added) and multiplier effects. Statistics
are needed to evaluate whether and to what extent e-commerce makes some kind of difference in terms of efficiency and/or the creation of new sources of wealth.

Researchers have been/are being conducted in areas such as the history of Electronic Commerce, pillars, benefits, barriers, views and trust, application models, infrastructure, legal issues, challenges and opportunities, impact on travel, retail, banking, finance but there is no research which has been conducted before to see the Impact of Electronic Commerce on Business Values empirically. Therefore an attempt has been made to fill this gap.
3.2 Objectives and Scope of Research

The main objective of this research is to study the Impact of Electronic Commerce on Business Value of Service Organisations. The other objectives that emerge from the main objective are is to see that:

- To what extent Electronic Commerce helped customers in collecting relevant information, customising products, differentiating product with that of competitors, opportunities for new products for product promotion.
- To what extent Electronic Commerce has been successful in using electronic catalog, added customers using new sales channel, added value in providing centralised information on all shopping aspects, understanding buyers behaviour online, supplemented existing distribution channel for new sales channel.
- To what extent Electronic Commerce helped in lowering the cost of distribution, reduced marketing, distribution, customer service costs as compared to traditional commerce, helped customers through quicker reporting for direct saving.
- To what extent Electronic Commerce helped in reducing time in delivering information, reduced time to distribute or receive a product, life cycle of some services, reduced overall time require to market your product services for time to market.
- To what extent Electronic Commerce enhanced customer service, built customer confidence and retention, providing insights on improvement areas in current products, feedback for the design of new product, influenced CRM (Customer Relationship management) as compared to traditional methods for customer service.
- To what extent Electronic Commerce helped in building brand image, successful as compared to non-electronic exercise of image building, presence of web page affirmed your brand image, differentiating your brand with that of competitors, relation to corporate image for brand image.
- To what extent Electronic Commerce helped company to experiment new product, services and processes, strategies for technologies, to adopt new technology according to customer’s feedback, organisational structure in terms of
flexibility and delegation, achieving goals for technology learning and organisational laboratory.

- To what extent Electronic Commerce personal relationships between supplier and customer, recording every event of customer, understanding the segment of customers to be targeted, strategies to allow its customers to send relevant information, analysing the buying pattern for customer relationship.

- To what extent Electronic Commerce helped for the new products to be created or innovated, create specific product based on needs, improving new product development, opportunity for mass customisation, features which matters most for new product capabilities.

- To what extent Electronic Commerce helped organisational structure for new business models to its customers, selling of existing products or services by adapting new business models, eliminating intermediaries, reaching the target customers, creating opportunities for customers through new business models.

Scope of research is limited to study the Impact of Electronic Commerce on Business Values empirically from the data collected through questionnaire and tested through various analysis techniques, which shows how Electronic Commerce can improve, transform or redefine current products, processes and business models. The research only deals with managerial aspects and not with any technical aspects of Electronic Commerce.
Chapter 3  
Research Methodology  

3.3 Literature Survey  

Researcher has gone through around 256 articles from various web sites, papers, various journals, magazines and books which shows that there is no research which have been conducted before on The Impact of Electronic Commerce on Business Values. The above references mainly deals with meaning and definitions, benefits, pillars, risks, trust, application, infrastructure, legal issues, challenges, future of Electronic Commerce, thus it is very much clear that there is no evidence related to research which we are conducting. There are articles on Impact of Electronic Commerce related to integrating electronic payment into the buying process, building a consumer marketplace, moving supply chains and products into the market space, the governance of electronic business, new intermediation, market, market structure, market behaviour, market performance, business models, market strategies and business value framework, prices, competition and competition policy, tax, trade policy, regulatory issues, employment issues, labour market policy, economy, ten ways electronic commerce affect the environment but not any study which shows the Impact of Electronic Commerce on Business Values.

Chapter 3  
Research Methodology


There are so many references, which have been repeated number of times for references, they are not mentioned again.
3.3.1 Conceptual Framework of Electronic Commerce

The term “e-commerce”, regardless of the word “commerce” built into it, has been attributed so many different meanings by different actors that the term cannot be used in a neutral way. For the purpose of this section the term “e-commerce” (in italics) will be used as a generic term. The purpose is to show that, in fact, most of the existing e-commerce definitions differ with respect to: (a) the activities or type of transactions included in the definition, and (b) the communication infrastructure on which these activities/transactions are carried on. The range of activities/transactions included in an e-commerce definition can be wider (e.g. include most of the different layers of economic activity such as collaborative design and engineering, commerce, transport, marketing, advertising, information services, settlements of accounts, government procurement, health, education, etc.) or narrower (e.g. only retailing or delivery occurring electronically). The communication infrastructure, in turn will be defined by two dimensions: applications and networks. It refers to all the possible applications (e.g. the Web, Electronic Data Interchange, Minitel, etc.) running over all the possible communication networks (e.g. open, closed, proprietary or non-proprietary networks).

Thus, existing e-commerce definitions can be seen as differing because of three key elements: (1) activities/transactions, (2) applications, (3) communication networks. For example some definition refer to only one activity (e.g. retailing or delivery occurring electronically), or to one activity occurring over a specific network (e.g. retailing occurring over open networks, or TCP/IP based networks), or, more narrowly, to one activity occurring over a particular application (e.g. Web or Internet retailing). In practice, by taking into account what type of activity over which network, one can think of different types of e-commerce definition. This also underlines that e-commerce is more than a technology or application; rather it denotes the application of information and communication technologies to the entire value chain of business processes conducted electronically. The interaction between “technology” and “business process” (or business activity) is key to understanding the impact that e-commerce is having on the nature of economic transactions, and in turn on the economy. At least one definition of e-commerce should reflect the issue of transformation of economic activities, or else e-
commerce would simply be the application of new information technologies to the commerce sector; also a definition should focus on certain technologies, otherwise e-commerce would not be different from electronic transactions that have existed for years, such as transactions carried out by fax, telephone, EDI etc. and would not justify the recent attention given to it by policy makers. It is the pervasiveness of electronic commerce all along the transactional structure, across the whole range of economic activities, and across the range of different economic actors that make it a unique application.

Fig 3.1: Showing E-Commerce and Broader Internet Application or Conceptual Framework

<table>
<thead>
<tr>
<th>Government</th>
<th>Business</th>
<th>Consumer</th>
</tr>
</thead>
<tbody>
<tr>
<td>G2G Eg-co-ordination</td>
<td>G2B Eg-information</td>
<td>G2C Eg-information</td>
</tr>
<tr>
<td>B2G Eg-procurement</td>
<td>B2B Eg-E-com</td>
<td>B2C Eg-E-com</td>
</tr>
<tr>
<td>C2G Eg-tax compliance</td>
<td>C2B Eg-price comparison</td>
<td>C2C Eg-auction market</td>
</tr>
</tbody>
</table>
3.3.2 Business Value of Electronic Commerce

Here we describe the components of business value an organisation can derive from using electronic commerce showing how it can improve, transform or redefine current products, processes or business models, its potential for competitive advantage, its effect on intermediation in an industry. This can be seen in a paper by Bloch, Pigneur, and Segev where they have shown business value of electronic commerce a gaining advantage.

3.3.2.a. Product Promotion. Through a direct, information-rich and interactive contact with customers, Electronic Commerce can enhance the promotion of products.

3.3.2.b. New Sales Channel. Thanks to their direct reach to customers and their bi-directional nature in communicating information, Electronic Commerce systems represent a new sales channel for existing products.

3.3.2.c. Direct Savings. By using a public shared infrastructure such as the Internet and digitally transmitting and reusing information, Electronic Commerce systems can lower the cost of delivering information to customers.

3.3.2.d. Time to Market. Due to their instantaneous nature, Electronic Commerce systems allow a reduction of the cycle time associated with producing and delivering information and services.

3.3.2.e. Customer Service. Through intelligence built into systems and the extended availability of intelligent support systems, Electronic Commerce systems can enhance customer service.

3.3.2.f. Brand or Corporate Image. Electronic Commerce systems will become one of the components of a brand or corporate image, especially while targeting technology-friendly customer segment.

3.3.2.g. Technology Learning and Experimenting. Rapid progress in the area of Electronic Commerce will force companies to adapt quickly and offer them an opportunity to experiment with new products, services and processes.

3.3.2.h. Customer Relationships. Electronic Commerce systems will allow for more personalized relationships between suppliers and their customers, due to their ability to collect information on customer needs and behavior patterns.

3.3.2.i. New Product Capabilities. The information-based nature of the Electronic Commerce processes allows for new products to be created or existing products to be customized in innovative way.

3.3.2.j. New Business Models. Changing industry structures and Electronic Commerce systems allow for new business models based on the wide availability of information and its direct distribution to end-customers.
Chapter 3  Research Methodology

3.3.3 Impact of Electronic Commerce

Electronic Commerce is sharing business information, maintaining business relationships, and conducting business transactions by means of telecommunications networks. Traditional Electronic Commerce, conducted with the use of information technologies centering on electronic data interchange (EDI) over proprietary value-added networks, is rapidly moving to the Internet. The Internet’s World Wide Web has become the prime driver of contemporary Electronic Commerce, which has been vastly broadened and redefined by the use of the new medium. The field of e-commerce as entire industry is in its infancy. Here we discuss several nodal areas of Electronic Commerce impact on several activities.

These Impacts areas are:
3.3.3.a. Integrating Electronic Payment into the Buying Process.
3.3.3.b. Building a Consumer Marketplace.
3.3.3.c. Moving Supply Chains and Products into the Market space.
3.3.3.d. The Governance of Electronic Business.
3.3.3.e. New Intermediation.
3.3.3.f. Market.
3.3.3.g. Market Structure.
3.3.3.h. Market Behaviour.
3.3.3.i. Market Performance.
3.3.3.j. Business Models.
3.3.3.k. Market Strategies and Business Value Framework.
3.3.3.l. Prices.
3.3.3.m. Competition and Competition Policy.
3.3.3.n. Tax, Trade Policy and Regulatory Issues.
3.3.3.o. Employment and Labour Market Policy
3.3.3.p. Economy
3.3.3.q. Ten Ways EC Affect the Environment.
3.3.3.r. Indian Scenario
3.3.3.a. Integrating Electronic Payment into the Buying Process.

Consumer-oriented E-commerce is significantly lagging behind its business-to-business segment and current estimates place it at less than 10 percent of the total volume. The settlement phase of transacting on the Web is often pointed to as one of the limiting factors. The consumer should be able to pay for a purchase on the Web easily and with a perception of security. Although the overall shopping experience, product perceptions, and customer service on the Web today lead to a dissatisfaction of potential customers. Jarvenpaa & Todd require attention of marketers and researchers; the problem of settlement is the one capable of a systemic solution. The most excitement is occasioned by the development of electronic cash, the informational equivalent of physical banknotes and coins. Electronic cash can offer such benefits as the anonymity of the buyer, global acceptance, and divisibility that can cost-effectively go beyond that of real cash in the case of so-called micropayments. Widespread use of electronic cash would have serious implications for the national banking systems and for the banks of issue, which would partly lose their seignorage profits and control of the quantity of money in circulation.

3.3.3.b. Building a Consumer Marketplace.

Some would argue that the main question of E-commerce today is how to convert Web surfers from browsers to consumers by creating an encompassing market space for information, services, and goods. The statistics of the phenomenal growth of the Internet use, with 29.2 million Web users in the United States as of the end of 1997 Commerce by numbers and with 27.8 million unique visitors during January 1998 to the top-ranked site Yahoo! ("Top 20 sites," all of this accomplished within some four years, have to be counterbalanced by the modest statistics of the actual consumer buying. Yet, rapid growth is apparent in this sector as well. The approximate $132 million spent by the consumers in 1995 according to Martin has reportedly grown into $1 billion spent during just the fourth quarter of 1997 according to Forrester Research Guglielmo, a figure that appears too high when placed in the context of other estimates. A large number of widely diverging, yet generally highly optimistic, forecasts of future growth exist Folley & Sutton. The statistics and, far more so, projections are debatable; yet the growth trend is not. The consumer marketplace encompasses auction sites, reverse markets, and digital retail outlets. As we have said before, the auction approach is a successful means to
Chapter 3

Research Methodology

capitalize on the ubiquitous accessibility of the Internet medium. Along with other roles, an auction intermediary facilitates price discovery. Such sites as On Sale, auctioning computer and electronics equipment, and eBay, an auctioneer of collectibles, are relatively limited-size U.S.-based virtual auction houses. The two sites are built on two different business models. On Sale, a public company by now is a dealership-type of marketplace, which takes an active role in the ownership and delivery of goods, and customer service. This is reflected in the much higher net revenue as the percentage of sales than that of eBay, which simply provides the sites as a form of a digital agora, accessible to sellers and buyers, and realizes a commission of 1.5 to 5 percent of an item's price. The success of both sites points up the variety of approaches that can be taken in the Web-based consumer market. Auction houses have a potential to coalesce into large and multifaceted marketplaces that take on additional intermediary responsibilities in lowering the risk of the transacting parties by certifying the quality of goods and facilitating logistics.

Reverse markets are also based on the inexpensive ubiquity of the Internet medium and place the consumer in the driver seat. By broadcasting the need over the Internet, the prospective buyer of a product, a service (or a job, though ceasing to be a consumer in this relationship) is able to increase the consumer's surplus by extracting more favorable offers than those available publicly. A number of facilitators of reverse markets provide "wanted" sites. Several approaches have been identified within the general business model of Web-based digital retailing at fixed prices (as opposed to creating marketplaces that include price discovery). These on-line retailing outlets have been classified by Hoffman, Novak & Chatterjee\(^5\) into (1) on-line storefronts or catalogs actually selling products or just establishing awareness of them, (2) content sites providing information and support, and (3) Web traffic control sites, such as malls and search engines. Westland & Au\(^6\) classify the digital retailing approaches into catalog sites, bundling outlets, and virtual-reality storefronts. The bundling and virtual reality approaches may be considered of particular promise in experimenting with Web retailing. Theoretical work indicates that the bundling of goods is attractive for the goods of low marginal cost, with uncorrelated demand, and of approximately equal consumer valuation, with information goods (such as software) being a prime example Bakos & Brynjolfsson\(^7\). Bundling is
Chapter 3 Research Methodology

seen also promising for such goods as flower arrangements and gifts, where the consumer can conveniently limit the extent of necessary decision-making and the vendor can substitute products at will. In a kiosk-based experiment, Westland and Au (1997-98) find that the additional time necessary to interact with a virtual-reality storefront does not result in a greater consumer spending.

Spiller and Lohse\textsuperscript{13} further classify empirically the catalog-type on-line sites actually available on the Web into five categories, summarized in Table. Note that several categories of digital retailers include on their sites what we call bonding features, which are expected to motivate repeated visits. Such features include product-related webzines, lotteries, and tips. These researchers find that digital retailing outlets offer limited product selection, few service features, and poor interfaces. As a confirmation of these perceptions, consumers find offering lists to be shallow and are also concerned about the performance and personal risks, such as payment-related security and privacy Jarvenpaa & Todd\textsuperscript{14}.

**Fig 3.2: Showing Empirical Classification of Catalog-Type Digital Retailing Strategies** (modified from Spiller & Lohse, 1997-98).

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Main Features</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superstore</td>
<td>Large Catalog Size Navigation Tools</td>
<td>L.L. Bean Online Sports</td>
</tr>
<tr>
<td></td>
<td>Bonding Features Extensive Information</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hand-Holding</td>
<td></td>
</tr>
<tr>
<td>Promotional Store</td>
<td>Limited Product Range Extensive Company Information Bonding Features Community-Oriented Information</td>
<td>AWEAR Cheyenne Outfitters</td>
</tr>
<tr>
<td>Plain Sales Catalog</td>
<td>Medium-Size Or Large Catalog Large Images And Thumbnails</td>
<td>Milano First Lady</td>
</tr>
<tr>
<td>One-Page Catalog</td>
<td>Limited Catalog Size Product-Browse</td>
<td>Alaska Mountaineering Close To You</td>
</tr>
<tr>
<td>Product Listing</td>
<td>Medium-Size Catalog Small Product Images Few Hierarchical Levels</td>
<td>Rocky Mountain Outfitters Dance Supplies</td>
</tr>
</tbody>
</table>

Digital retailing has low entry thresholds at its lower end. Claims are made that multinational corporations may find themselves challenged on the Web by small upstarts and it is suggested that they need to review their business models Quelch & Klein, 1996;
Chapter 3

Research Methodology

Ghosh. However, the cost to build an "aggressive" Web site, that is, a site that is interactive, transactional, and dynamic, is estimated at more than $1 million Commerce by numbers. It is to be expected that the usual advantages of scale, scope, and existing brand will translate into Web retailing advantages when consumer-oriented E-commerce matures.

In the case of digital products, such as software, music, or multimedia, the Internet plays the role of distribution medium. A number of firms, including Cyber media, Test-Drive, and Tuneup.com, market software over the Internet, for example. Worth watching is the future of renamed Egghead.com, which under competitive pressures has decided to move its software retailing business from the brick-and-mortar outlets of limited size to the Internet in September 1997, with encouraging initial results. The range of digital products will vastly expand with the growth of E-commerce, with many new products emerging, for example, as symbolic tokens replacing hard goods Choi, Stahl & Whinston.

The potential in the expansion of the Internet-based consumer marketplace can be seen in experimentation going beyond the facilitation of consumer search and order taking. Building demand for the products, customizing products to the individual requirements, and developing lasting relationships between the vendor and the customer are the long-term objectives of Web sites. Specifically, stimulating sites can build demand for products, regardless of the ultimate manner of purchase. The interactivity of the medium gives a vast opportunity to customize, and thus engage in one-to-one marketing at relatively low incremental costs. If it appears unlikely that one would purchase a pair of shoes over the Internet, it is far more likely that one would if offered a customized product, based on the measurements transmitted over the network, such as the services currently available in some brick-and-mortar outlets.

The sites can be used to build lasting relationships with individuals, and thus developing brands. Of particular importance at this stage of the development of consumer-oriented E-commerce are community-building features of Web sites. These features attract an individual to a community of "birds of a feather," along demographic, interest, or even affliction (that may be alleviated) lines. Community sites attract voluminous traffic by
3.3.3.c. Moving Supply Chains and Products into the Market space.

It is recognized that the networked infrastructure offers new opportunities for adding value by moving the stages of corporate value chains into the realm of information processing, saving money and time in the process Rayport & Sviokla\textsuperscript{18}. We are witnessing the virtualization of value-chain segments, and, in the future, perhaps also of an increasing number of products. Business processes can be moved into the virtual, informational value chains, be they paperless transaction processing or electronic prototyping. The development of Boeing 777 based on virtual prototyping is probably the best known example. Rapid prototyping and rapid manufacturing technologies move the electronic model of a product directly from the computer-aided design (CAD) file into the machine that builds up a final, physical, prototype – or the final product - layer by layer, or powdered particle by powdered particle Bylinsky\textsuperscript{19}. A virtual-reality based system for developing customized clothes, called Virtuosi, affords three-dimensional viewing and manipulation of fashion designs over the Web; voice-controlled mannequins demonstrate the clothes on the virtual runway in this experimental system Gray\textsuperscript{20}. Indeed, a computer hardware design can be sent over the Web, when field programmable gate arrays are used Mangione-Smith\textsuperscript{21}.

This virtualization of products and processes is only at its origins and we may expect very significant development and efficiencies to derive from it. As they move from the purely informational to the collaborative use, corporate intranets can serve as vehicles for these virtual elements of value chains. Corporate extranets, open to business partners, suppliers, and customers can become secured extensions of the Internet in the interorganizational market space networks.

What goods and services can be converted to information that can be moved around and traded over the electronic marketplace? Rayport and Sviokla offer an example of the answering machine (1995). Cash is another example of a good that can be virtualized (a special kind of good that it is), video-cassettes are another such good, retail services are already delivered over the Web instead of in physical stores, and many personal
computers may be converted to appropriate over-the-network services. After all, a network computer is just such an attempt.

3.3.3.d. The Governance of Electronic Business.

Our understanding of a firm as a monolith has been problematized by Coase\textsuperscript{22} milestone paper. Transaction cost economics that arose from this work helps us see the boundary of the firm as defined by the equilibrium between the advantages of the lower transaction costs of internal production on the one hand, and the lower agency costs (such as the costs of management) and economies of scale and scope of outside procurement on the other Williamson\textsuperscript{23}. In other words, the costs of conducting marketplace transactions, i.e., information seeking, negotiating the terms, and settlement, define to a large extent what a firm will buy, instead of making it. Since these coordination costs are lowered in E-commerce, a general agreement exists (following the analysis by Malone, Benjamin & Yates\textsuperscript{24} that more outsourcing - buying rather than making in-house - will take place. There is a considerable evidence that the use of information technologies is indeed associated with the emergence of small firms as the result of outsourcing of non-core activities Brynjolfsson et al\textsuperscript{25}. Going beyond the "boundaries-of-the-firm" analysis, the electronic market suggests that the development of interorganizational systems based on telecommunications networks will move the governance towards the market end of the spectrum, with increased transaction-oriented buying from multiple suppliers. Yet the "move-to-the-middle" hypothesis by Clemons, Reddi & Row\textsuperscript{26} postulates that the outsourcing will go only as far as long-term collaboration with a limited number of suppliers. Likewise, Bakos & Brynjolfsson argue that the consideration of coordination costs needs to be combined with the incentives for no contractible investments that suppliers need to make to maintain a relationship with a buyer. These relationship-specific investments have to be made to ensure, for example, the appropriate quality control, the implementation of information-sharing systems, and the modification of business processes. This consideration leads the authors to postulate the "move to the middle" as well. The evidence available at this time tends to support the second hypothesis. For example, a study of computerized loan-origination systems found no move to the market Hess & Kemerer\textsuperscript{27}. A study of the effects of the French Teletel system, whose Minitel terminals are a part of the landscape in that country (40 percent of
Chapter 3 Research Methodology

non-retired population has access) found stable customer-supplier relationships as a result Streeter et al\textsuperscript{28}. However, new E-commerce relies on tools that are radically different from, for example, the French Teletel (whose technology is outdated) and the developments surrounding the Internet (e.g., open-EDI that would foster a transactional approach to the marketplace) are certain to lead to further analyses of the issue.

Within the market governance, profound changes can be expected. For example, the global reach and the low access cost of the Internet can be expected to promote the growth of auction markets\textsuperscript{4}. Electronic auction companies that are able to tap into an enthusiastic user community are almost instantaneously successful. Reverse markets, where willing buyers seek out sellers, are expanding as well.

3.3.3.e. New intermediation.

An argument is being commonly advanced that the greater reliance on the open telecommunications networks for doing business will lead to disintermediation: the disappearing role of an intermediary, such as a dealer or a broker. Indeed, a perceptible pressure can be felt on the role of car dealers Armstrong\textsuperscript{29}, for example. Electronic commodity and stock exchanges are being created, which will squeeze out some intermediaries to the trade, as it has happened at the London Stock Exchange or at the Swiss Electronic Exchange. Removing intermediaries from a supply chain can result in significant economies, with much of the savings competed away and returned as a part of consumer surplus Benjamin & Wigand\textsuperscript{30}.

Powerful social and organizational barriers counteract many of these developments Lee & Clark\textsuperscript{31}. Beyond that, intermediaries do play an important economic role in business exchanges by limiting the risk of the trading parties, by creating economies of scale and scope, and by facilitating transactions. The latter role includes the assistance in the search for a trading partner, in negotiation (or price discovery in auction markets), and settlement. It may be even argued that the role of intermediaries will be reinforced in E-commerce Sarkar, Butler & Steinfield\textsuperscript{32}.

New types of electronic intermediaries (so-called cybermediaries) can become valuable. They can facilitate product search, evaluation, and distribution in the form of virtual malls or on-line auctioneers. Buyer search costs are an important factor in the market
behavior and in the efficiency of allocation Bakos and intermediation may be necessary for products of more complex description. New E-commerce has given rise to a new category of Web-based niche intermediaries, which are able to create a business model by reducing search costs in industry-specific marketplaces. Real bid has created a site (http://www.realbid.com) that brings together the buyers and sellers of commercial real estate Jones. The firm attracts to the site with e-mail notices the potential buyers identified with its growing database. The firm's offering consists in removing the need for the buyer to study multiple several-hundred page long proposals to find likely purchase candidates. In another industry, Cattle Offerings Worldwide posts on its site the pedigree and genetic traits of cattle embryos and lets cattle buyers bid on them. Industry segments with widely dispersed sellers and buyers, and complex offerings that lend them to simplification with a searchable database are promising targets for this intermediation.

Quality certification plays a crucial role in the success of the AUCNET, the electronic auction house for used cars in Japan (Lee, 1998). AUCNET is able to extract on the average higher prices in its electronic auctions than the traditional auction houses in that country are able to do. This can be accounted for by the avoidance of the need to transport the car to an auction, with the lower transaction costs and wider reach thus attracting better cars on the seller side, and the local availability of cars producing savings for buyers. The virtuous spiral attracts ever higher-quality cars, naturally commanding higher prices.

New intermediaries can provide packaging and enhancement of information-based goods, for example, by delivering customized targeted multimedia information packages, with use-based payments to the holders of intellectual property rights, and with the access to the authors as a premium service. Suppliers receive the efficiency of a single payment; customers save on search costs, and get a more focused and comprehensive product. Intermediaries can track the copyrights and licensing payments, for example, enforcing site-license agreements. If in the future persistent software copies will not need to be made for many products, which will be simply downloaded for each use, appropriate billing can be provided by an intermediary. Intermediaries can also handle support services and updating of information-based products. At the same time, those traditional
publishers and resellers of information-based products, which cease to provide value in the new constellation, may indeed be disintermediated.

The principal expected impacts of E-commerce on distribution channels have been summarized in Table. The table allocates the factor to the channel's actor where the impact may be expected to be felt most. For example, although the size of both the seller and the buyer is not directly transparent on the Internet, it is the partly opaque size of the seller that has the greatest effect on the course of a transaction. Notable is the price pressure on the sellers, which emerges from the reduced buyer search costs Bakos. All the channel impacts listed in the table require further study.

![Fig 3.3: Showing Expected Principal Channel Impacts of E-commerce](image)

<table>
<thead>
<tr>
<th>Sellers</th>
<th>Intermediaries</th>
<th>Buyers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partly Opaque Firm Size</td>
<td>By Pass Possibility</td>
<td>Possibility of Enacting Reverse Markets</td>
</tr>
<tr>
<td>Increased Price Competition</td>
<td>Traditional Ones May be Replaced by Cybermediaries</td>
<td>Reduced Search Costs</td>
</tr>
<tr>
<td>Price Discrimination Possible</td>
<td>Increased Role in Price Discovery Possible</td>
<td>Increased Risks</td>
</tr>
<tr>
<td>Rich Product Description May be Needed</td>
<td>May be Material as Third-Party Guarantors</td>
<td>Network Effect (Increased Benefit with Increased Number of Sellers)</td>
</tr>
<tr>
<td>Reduced Search Costs in Finding Buyers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observable and Measurable Buyer Behavior</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product Quality And Settlement Terms May Have to be Independently Certified</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goods Movement and Storage Costs May be Reduced</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network Effect (Increased Benefit With Increased Number of Buyers)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The revenue stream extracted by the new intermediary will depend on the value added by its activities; this value added may in turn be hypothesized to correlate with the level in
Chapter 3 Research Methodology

the framework of Table that the intermediary operates on, with higher-level products and services yielding higher margins.

3.3.3.f. Market

The recent advent of World Wide Web has changed the traditional marketing paradigm worldwide. The general notion of the current literatures available on the impact of e-commerce is converging towards accepting the market efficiency hypothesis. In the case of financial market, it is efficient if expectations in the markets are equal to the optimal forecast using all available information. In a non-financial market, an efficient market is created when it is easy for consumers to fully understand a product and when they have the ability to compare product prices in order to make optimized buying decisions. Again, the users' decision is a function of available information. Using this framework, KPMG (1999) shows that with e-commerce, cost associated with information will decrease because with Internet technology, consumers will be able to access information to identify products, prices, vendors and payment scheme. It is highly probable to create an efficient market for mass-produced consumer products under the assumptions of - consumers must have true intelligent agents, network trust and secure payment schemes. In short, market imperfection due to lack of access to market information is being reversed, i.e. Market participants are overloaded with information in an e-market environment.

3.3.3.g. Market Structure

The major dimensions of market structure are, competition and extent of concentration, barriers to entry, buyer and seller relationship and product differentiation. The first and obvious impact of this technology is the change in the size of market, i.e. with Internet; e-commerce is rapidly expanding into fast-moving, open global market with ever-increasing number of participants. The liberalisation of the telecommunications sector and innovations has greatly expanded the volume and capacity of communications (optic fiber, digital subscriber line technologies, satellites). As mentioned above, the Internet community will reach 10% of the world population in the early millennium and the rate of growth is exponential in nature.
Chapter 3

Research Methodology

The opening of the world market space online cause barriers to entry to lessen significantly both buyers and sellers. In the early stage of Internet - marketing, most transactions were custom-made, complex, expensive and the province of large firms. Today, with a small capital base, anyone or firm can become a "trader" and reach millions of consumers worldwide. On the supply side, business-to-business transactions have transformed from known parties to a complex web of commercial activities, which involve a vast number of individuals who may never meet. On the demand side, there is a critical mass of consumers participating in a global online marketplace.

The barriers to entry may not be that low, as it seems. Ease of access is a multi-dimensional construct, which include high-speed access (the bandwidth problem), ease of finding a service provider, the diffusion of the computer hardware/software modem bundle into the consumers' home. The secondary barriers are ease of use, price and risk including such as privacy and security.

Under the traditional marketing system, the buyer-relationship is frequently distorted by market imperfection particularly in terms of information flow. The bargaining position is determined by market power which is directly a function of market information. In terms of buyer and seller relationship, internet marketing results in a personalised relationship between suppliers and their customers, due to their ability to collect information on customer needs and behavioral patterns Bloch et.al. In the global information overload community, demand is scarce in comparison to supply Rayport and Sviokla). Hence there is a shift from supply side to demand side orientation. E marketing displaces, restructures and redefines the role of intermediaries (and hence creates a new form of intermediaries). The traditional intermediaries have to provide infrastructure such as sales network (physical places such as shops, specialised personnel etc.) and managing complexity of handling consumer requests. One of the major consequences of e-commerce is the "disintermediation" or displacement or bypassing the middlemen through the user's ability to connect directly to the source. It has been shown that it has a serious ramifications for middlemen employed as agents, commission agents, stockbrokers, insurance agents or travel agents. These intermediaries as well as many others could be possible phased out as e-commerce becomes more prevalent. These intermediaries will no longer be needed because the monopoly on information that they
Chapter 3 Research Methodology

currently hold will no longer is meaningful because the Internet will provide universal
access and connectivity.

Another new phenomenon in the market is the emergence of new "cybermediaries". The
real form, function and definition of the cybermediary is still ambiguous but the
circumstances that lead to their existence are clear. These circumstances are: (a) the end
user are able to connect directly to the source and hence results in disintermediation, (b)
the reversal in directionality of electronic communications - i.e. Movement of access
information has changed from "the center to user direction" to "end-user to the center
direction". Hence, consumers have stronger bargaining power in the market. (c) The
information overload creates new channels of knowledge diffusion and human
interactivity. OECD (1998) identifies this new "cybermediary" as navigational tools,
software that aids the user locating the information that is relevant to them. Examples of
these are Yahoo, Lycos, Magellan and other reference services that allow users to search
for Web documents in their databases. Mitra (1995) define this new breed of middlemen
as simply "organisation that perform the mediating tasks in the world of electronic
marketing". Forrester Research (1999) classifies these groups into three categories:
aggregators, auctions, and exchanges.

Competition in the e-market is no longer centers on the traditional 4Ps idiom but will be
more on technology standards. The e-commerce firm competes on technology standard.
For instance in the computer and multimedia industries, Novell has become a standard for
local area networks while Netscape is trying to build a platform for electronic commerce.
Second, firms increasingly compete on acquiring customer information. In fact in
customer websites, the platform is shaped around detailed customer information. Such
information is used to find new customers more efficiently, improve products and
services or tailor them to individual needs and build loyalty. With competition centers on
"information content or quality" instead of prices or quantities, problems of asymmetric
information and asymmetric access to the electronic link will become more prevalent.
3.3.3.h Market Behaviour

Structural characteristics of a market determine its behaviour. The low barriers to entry characteristic of the e-market or its openness has encouraged firms to allow their business partners and consumers unparalleled access to their inner workings, databases and personnel. This has led to a shift in the role consumers, who are increasingly implicated as partners in product design and creation. In short, in the e-market, product decision is made with a direct participation (on-line) from the customers.

Most literature cites reduction in transaction cost as one of the major events that reshapes how firms restructure and compete between and within themselves. Wigand and Benjamin\textsuperscript{38} utilizes the transaction cost theory to derive and explain how transaction costs are greatly reduced in e-marketing. Economic theory asserts that firms will choose transactions that economize on coordination costs. With information technology, firms enjoy lower cost of coordination. Matching buyers demand or specification is made easier with electronic communication. Under such a situation it is expected that firms will continue to find incentives to coordinate their activities electronically. Often, this coordination takes the form of single-source electronic sales channels (one supplier and many purchasers coordinated through hierarchical transactions) or electronic markets Malone et al.\textsuperscript{39} It has been estimated that distribution expenses constitute nearly 65% of the cost of consumer products. If in a networked economy, these distribution costs could be avoided. Hence, it is reasonable to assume that there could be substantial savings for consumers. Physical distribution costs will be minimized in two ways. Firstly, "close proximity" or direct connection of supplier and customer bypasses numerous unnecessary intermediaries, hence minimizing service charges to these institution. Secondly, cost of inventories are greatly reduced as the faster an input can be ordered and delivered, the less the need for a large inventory. Besides the ability to forecast demand more accurately allows suppliers to adopt "just in time" inventory system. The change in transaction cost in turn affects a firm cost structure of the value added chain.
3.3.3.3 Market Performance

The interactive online environment and intangible nature of many products sold online are likely to mean that e-commerce merchants will employ a variety of pricing schemes. The most common is differential pricing. For business to consumer segment, supplier can compile information about consumers' buying habit, which allow segmentation of the market and make it possible for supplier to charge different price to different consumers for the same product to reduce the consumer surplus.

The translation of lower transaction cost into lower prices is still not very evidently clear. Many observers predict that electronic commerce will result in very efficient competition that will cause prices to drop and the balance of power to shift from producers to consumers. This has only occurred for a few selected products such as commissions for online stock trading.

E-marketing results in the shifting of some marketing cost to the consumers. Some portion of the reduction in firms' cost can be attributed to the shifting of costs formerly borne by the firm to the customer in the form of self survive. For example, customers are now expected to learn about the product, answer their own customer-support question and pay for shipment of products.

There is evidence that firms and establishments adopting new organizational structures have stronger and more productive external linkages with their customers and their suppliers of inputs and services Canada40. The combination of streamlined business processes, flat organizational hierarchy and continuous training and skill acquisition constitutes a favorable environment for innovation and improved productivity.

3.3.3.j Business Models41

Internet commerce constitutes the logical extension of firms' business models and simply accentuates some of their characteristics. In others, Internet commerce can mean the adoption of new business models that replace or complement existing ones. In all cases, electronic commerce creates new opportunities and challenges for market participants and offers the possibility of new models for organising production and transacting business. E-commerce thus offers intermodality in conducting commercial transactions and complementarily in business models; it provides an evolving paradigm, which can be
adapted to the needs of different firms in different contexts. An example of potential business model "enforcement" concerns Dell and Compaq as suppliers of computer equipment to General Electric (GE) (Ghosh, 1998). GE is setting up a system of Internet bidding and expects to purchase almost entirely over a Web-based bidding system in five years. At present, Dell sells computers directly to customers and expects to handle half of its business over the Internet by the year 2000; Compaq, instead, sells through distributors. It appears likely that Dell's strategy is forcing competitors in the computer industry to develop Internet channels of their own. Early adopters are beginning to emerge in other industries, such as auto retailing (General Motors and Auto-By-Tel) and trade publishing (Cahners and VerticalNet). New intermediaries in personal financial services are likely to require the unbundling of retail banking's integrated business system. Some intermediaries will specialise in creating and managing customer relationships, others in developing new products, and still others in providing back-office processing services and support (McKinsey, 1997). Companies such as Compaq will have to weigh the importance of protecting existing relationships, which account for most of their current revenue, against the advantages of establishing future strategic positions and revenue streams. Although early adopters may be in a position to define new business models, in which case the impact on business-to-business relations could be large, the process is not so simple. It would be fatal for firms to try to adjust business models to technologies unless there is a clearly defined strategic rationale for doing so. Companies that stand to lose margin to others currently provide real value to customers in the form of merchandising skills (which Ingram Micro does not have but CompUSA does), logistics expertise (which CompUSA does not have but UPS does), and information management (which CNET can do better than Apple) (Ghosh, 1998). One interesting case concerns IBM, which in 1996 launched Informat, an electronic-content delivery initiative, and World Avenue, a cyberspace mall (Ghosh, 1998). IBM thought it could use its computer network to deliver content and challenge the physical distribution chain, but it soon realized that it lacked the editorial and circulation skills of publishers and the merchandising and advertising skills of retailers. As a result, both initiatives were abandoned in the following year. In the case of business-to-consumer electronic commerce, which has not yet reached critical mass, it may be very risky for a company to bypass distributors and to have to weigh the gain of a few Internet customers against the
loss of a large number of traditional ones. The degree to which producers are able to impose their desired channels depends in fact on various factors – e.g. institutional, social, subjective – and a variety of path dependencies. It would be interesting to know in which sectors early adopters are most likely to enforce their business models and where conflicts involving transaction channels are most likely to occur. It is possible that enforcement of new business models might be more frequent in industries where switching costs are low or where costs are lowered by adoption of information and communication technologies.

3.3.3.k Market Strategies and Business Value Framework
We presents a framework detailing the value of electronic commerce, especially the World-Wide-Web component (Web) of the Internet, for commercial organizations dealing with end-customers. Making money from direct sales is certainly the first way of getting value out of electronic commerce. Nevertheless, there are many others. The following table describes the components of that business value:

**Fig3.4: Showing the Organisation Source of Business Value**

<table>
<thead>
<tr>
<th>Improve It</th>
<th>Transform It</th>
<th>Redefine It</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Product Promotion.</td>
<td>- Technological and Organisation Learning</td>
<td>- New Product Capabilities</td>
</tr>
<tr>
<td>- New Sales Channel.</td>
<td>- Customer Service</td>
<td>- New Business Models</td>
</tr>
<tr>
<td>- Direct Saving.</td>
<td>- Time to Market.</td>
<td>- Direct Saving.</td>
</tr>
</tbody>
</table>

**The Components of the Business Value of Electronic Commerce**
Our three "super-categories", improving, transforming and redefining the organization measure the amount of change in the global business model of an organization and the impact in terms of business results. Transforming an organization requires more creativity, more work, an additional level of risk and a different timeline than simply improving it. Obviously, the expected rewards match the additional burden.
3.3.3. Product Promotion

Through a direct, information-rich and interactive contact with customers, electronic commerce can enhance the promotion of products.

The first use of electronic commerce is to provide product information to customers, through on-line electronic brochures or buying guides. This can be seen as an additional marketing channel, allowing to reach a maximum number of customers. The advantages of electronic commerce as a way to deliver product information is its availability anytime, anywhere, provided the customer has the right infrastructure (e.g. PC, modem, online service) to access this information. But using an electronic medium also allows for interactivity and customization. Different ways to customize the advertising content, based on the customer profile or input, are to change the content description (simple or complex), display only a range a products which are relevant to the particular customer, change the price (e.g. discount for club members), allow for new functionalities in some cases (e.g. coupon available only in certain conditions) or change the path used to navigate in the service.

For instance, an electronic supermarket could provide different graphical user interfaces for kids, teenagers or housewives, with a look appealing to each of these segments. The advertisements appearing on the pages would also be different, with toys for the kids, music for the teens and jewelry for the housewives. This is coherent with trends in marketing, such as micro-marketing or one-to-one marketing which try and target each consumer with a specific message, according to his needs and desires.

Another good example is Hewlett-Packard and its reference guide to buying a printer; the system asks the customer to identify his/her needs (e.g. price range, need for color, etc.) and presents a customized version of the catalog, selecting only the printer models which the stated needs. In the service industry, Bank of America enables the customization of its "home page" on the Web, allowing the customer to bundle all the information services the bank provides in one convenient, easy to access page.

In a world with products being increasingly harder to differentiate, shrinking life cycles, an abundance of traditional media messages and customers having too little time, electronic commerce offers an opportunity for new promotion strategies, enhancing the
branding of products. As such, the quality of the "advertisement" is the primary value in product promotion.

3.3.3.k.ii. New Sales Channel

Thanks to their direct reach to customers and their bi-directional nature in communicating information, electronic commerce systems represent a new sales channel for existing products.

Considering electronic commerce, and in particular the World-Wide-Web, as a sales channel makes sense for two kinds of products:

1. physical products, sometimes also sold in conventional stores, which can be advertised and/or ordered on-line, such as computer hardware or wine

2. products which can additionally be delivered over the electronic commerce medium, such as information or software.

Examples of the first type are the so-called electronic catalogs such as the Internet Shopping Network, selling all sorts of electronic and computer related goods, selling wine and food products. These catalogs offer information on the products, support on-line ordering and payment, and sometimes-online customer service.

Electronic commerce strategies are of primary value in markets where information is of significant added value to the products being bought, rather than in commodity markets. For instance, in the wine industry, information on the winery, the type and quality of the wine, or the food it goes well with are of significant value to customers, and usually hard to get through the traditional sales channel (e.g. supermarkets, liquor stores, etc.) Centralizing this information digitally is therefore of significant value for customers.

The right packaging of information supporting the buyer's decision can also be a significant advantage. For instance in the case of Peapod, an "online grocery" selling traditional supermarket products through a computer interface, the ability to store shopping lists, recall them and modifying them significantly decreases the time a customer needs to do his shopping, therefore adding to the perceived value for the service. Similarly, the ability of the shopping software to automatically propose a substitute item with a reduced-price or to offer a coupon adds value by reducing the final
bill. These features are only possible when all the information used in the purchase is digitally available and processed.

In the case of information products, the electronic commerce medium actually becomes the delivery medium. As such, an electronic newspaper does not use paper anymore and can be fully delivered digitally. In some cases, (for instance, a service reporting on the computer industry), there is actually no paper version of the service. In another case, a company selling software, currently sells more than 300 packages which can be delivered digitally and used literally minutes after buying them.

By extending the notion of selling "informated" products, we see new product categories emerging. For instance, referred to four ways of making money on the Web, the two last ones being new form of products:

- direct selling (i.e. selling products)
- content selling (i.e. selling information)
- advertising (i.e. giving out information such as news or directories for free, to drive traffic and sell it to advertisers)
- transaction & links (i.e. charging a fee for a transaction, such as selling an airline ticket on-line, or charging to link with a service provider, as in a yellow pages service).

3.3.3.k.iii. Direct Savings

By using a public shared infrastructure such as the Internet and digitally transmitting and reusing information, electronic commerce systems can lower the cost of delivering information to customers.

The third component of the business value of electronic commerce is in its opportunity to save on costs. By sharing a digital infrastructure such as the Internet compared to owning a physical one, marketing, distribution and customer service costs can be drastically reduced. The case of, for instance, Sun Microsystems' online support service on the Web, is widely reported for having saved Sun over $4 million.

By using automated systems and a digital transmission architecture, personnel, phone, postage, and printing costs can therefore be reduced. This is especially important in service industries, where the cost of customer service usually exceeds the product costs.
(e.g. for banks, credit card or telecommunications companies). Checking order status, getting a usage statement or a bill are examples of activities, which can be delivered much more cheaply using electronic commerce. In each case, the customer value is also higher, through a quicker reporting, or through the added information value (e.g. delivering not only a statement, but also historical statistics or graphics, adding advice to reduce some of these costs, etc.)

3.3.3.k.iv. Time to Market

Due to their instantaneous nature, electronic commerce systems allow a reduction of the cycle time associated with producing and delivering information and services.

In some markets or for some products, the ability to distribute or receive a product as soon as it's been created is of primary importance. This is obviously the case of information distribution. A company such as Newspage, for instance, distributes information on hundreds of topics using electronic mail or the Web, to make sure it reaches its targets (usually decision makers in corporations) as soon as it is available.

In the financial market, which very often leads the way in terms of complexity of the environment, some financial products (usually derivatives contracts) have return on investment in a matter of hours. Their life cycle is often not much longer. It's in this type of environment, which will increasingly become routine for other industries that the speed achieved by electronic commerce to quickly gather information on customer needs, assemble a product by adapting existing ones or assembling building blocks and distributing them will become critical. Linking network of companies, each doing part of that assembly work, is currently a growing research area.

3.3.3.k.v. Customer Service

Through intelligence built into systems and the extended availability of intelligent support systems, electronic commerce systems can enhance customer service.

We already mentioned the case of Silicon Graphics and Sun Microsystems using the Web to provide customer support. The ability to provide on-line answers to problems, through resolution guides, archives of commonly encountered problems, electronic mail interaction (and in the future audio and video support), and all that 24 hours a day, 365
days a year, builds customer confidence and retention. Monitoring how customers use this support information also provides insights on improvement areas in current products and the list of issues encountered with products can be a significant source of product feedback for the design of new products. As consumers start using these systems in growing numbers, industries other than software will take note of these opportunities and deliver online customer service. Today, the Wells Fargo and the Security First Network Bank are two examples of banks offering on-line statements and answering electronic mail queries on bank accounts.

Two likely developments in this area are

- products which diagnose themselves, and use an on-line connection to call a support specialist which can arrive on-site, either physically or electronically, with the full knowledge of the problem that needs fixing

- knowledge-based systems which assist customers in finding solutions for their problems.

Both have already been seen in specialized fields (such as high-end copiers from Xerox, mainframe computers from IBM or minicomputers assembly from Digital), but are likely to become accessible to a broader range of customers and for a wider range of products.

3.3.3.k.vi. Brand or Corporate Image

Electronic commerce systems will become one of the components of a brand or corporate image, especially while targeting technology-friendly customer segments.

This might be one of the most intangible aspects to measure, but building a brand or corporate image is of prime interest in some industries, those with commodity products or high competition. For instance, in the soft-drinks industry, Coca-Cola and Pepsi spend huge amounts of money to try to differentiate basically similar products (or to take a less controversial example, AT&T, MCI and Sprint in the telecommunications business). Others, such as Levi Strauss in the fashion industry compete with others in being seen as young, fashionable and "hip".

All of these brands use their Web presence as a way to affirm their corporate identity and their brand image, in addition to providing product information, etc.
Chapter 3Research Methodology

3.3.3.k.vii. Technology Learning and Organizational Laboratory

Rapid progress in the area of electronic commerce will force companies to adapt quickly and offer them an opportunity to experiment with new products, services and processes.

If what we mention in this section is true, it will have a large and durable impact on the strategies of most organizations. Therefore, it is critical that these organizations quickly become familiar with the technology. The learning curve of mastering such technologies, and understanding their power to reshape customer relationships, is steep and can't be achieved overnight. It is very often an iterative process, requiring organizations to try new offerings, and tweak them according to customer feedback.

In a similar fashion, new technologies require new organizational approaches. For instance, the structure of the group dealing with electronic commerce might have to be different from the one typically used in the organization, in order to be more flexible and responsive to the market, or new processes have to be put in place, for instance to deal with the authorization of publishing corporate information on the Internet. This type of corporate change needs to be planned and managed, and before getting it right, organizations might have to struggle with different experiments.

The value of both types of learning resides in the new capabilities the organization acquires, and the potential of using these capabilities in the future, as the market develops and customer expectations become clearer. The product and process innovation which appears in one corporate division is also positive, as it can be reused across divisions if success is achieved.

3.3.3.k.viii. Customer Relationships

Electronic commerce systems will allow for more personalized relationships between suppliers and their customers, due to their ability to collect information on customers needs and behavioral patterns.

According in today's world of overcapacity, in which demand, not supply, is scarce" there needs to be a shift from supply-side to demand-side thinking, and organizations need to "sense and respond" to customers' desires rather than simply make and sell products or services. The focus is therefore on establishing relationships with customers, based on
learning their needs and desires, proposing the right products and keeping these relations active throughout the years.

The role of technology in learning about customers is its ability to record every event in the relationship, such as customers asking for information about a product, buying one, requesting customer service, etc. Throughout all these interactions, either over the phone, in person or on-line, the needs of the customer are identified and will feed future marketing efforts. For example, if we use the example of the on-line travel agency, its ability to store and remember customer habits (e.g. always flies out of this specific airport, likes window seats and requests vegetarian meals) and particular data (e.g. frequent flyer numbers, preference for a particular rental car company, etc.) will establish a relation where the customer feels particularly comfortable in dealing with this particular travel agency.

All that data acquired about customers also allows provides a switching barrier, as customers would have to "teach" a competitor all that information. Moreover, a historical analysis of the data will reveal who are the most profitable customers (usually 20% of a company's customers generate 80% of the benefits) and products, therefore allowing to reduce the scope of products, to focus on the most profitable ones, and extend a product line by adding products likely to cater to the needs of these most profitable customers. Then, by understanding the segment of customers, which are most interesting, specific marketing efforts can be targeted to similar individuals, currently non-customers.

Becoming a trusted partner of a customer is key in maintaining these relationships. It can be achieved by providing him or her with valuable information. That pro-activity is likely to generate additional sales volume. Pro-activity is the ability to use the direct channel with the customer to inform him of specific offers, which would match his/her needs and buying patterns. For instance, early in the summer, you would propose special offers to a customer who's used to buy swimming suits through an on-line catalog. This could be done by an electronic mail sent to the customer's address, with a link to a specific page of the electronic catalog, and maybe a discount coupon to thank him for his loyalty.

Another example of such a strategy is currently used by Amazon, an electronic bookstore on the Web. Amazon allows its customers to program agents, which will send them
relevant information. Let's suppose you're looking for a book on technology and strategy. Amazon will provide you with a list of the existing books, but also offer you to keep your request "in mind", and send you information on titles published as they arrive. This information is sent through electronic mail and links with the online bookstore.

What electronic commerce brings as a lever to such strategies is the automation of the customer profile, his needs, buying patterns, etc. All that data can then be analyzed through computer applications and the right answer chosen. Therefore, personalized service strategies, which were before only achievable with a small number of customers suddenly become possible on a wide scale. For instance, in the past, the corner video-rental store owner might well have known your viewing preferences, and therefore advise you on new movies, but only through automated systems does this strategy stay feasible on a large scale. In this video example, a national chain could use that system to differentiate itself and increase customer retention by maintaining a global database of customer preferences. If you moved to a different city for instance, you would still be able to insert your membership card in a multimedia kiosk and get advice on which new rental choices better suit your taste.

On a more commercial level, CompuBooks, another bookstore on the Compuserve online service, sends customers an electronic mail message when they haven't visited their store for a while. The incentive to return is a few dollars of usage credit if they buy a book.

3.3.3.k.ix. New Product Capabilities

The information-based nature of the electronic commerce processes allows for new products to be created or existing products to be customized in innovative ways.

A large source of the business value electronic commerce can provide comes from changing the products themselves, in addition to the way they are advertised, ordered or delivered. This is mainly due to the potential of collecting information which will be used to customize products.

Mass customization has been used for some time now; it endeavors to create specific products for each customer, based on his or her exact needs. For instance, thanks to an information network and advanced production techniques, Motorola is able to gather
customer needs for a pager, transmit them to the manufacturing plant, manufacture a specific model (varying the form factor, color, features, etc.) and send it by overnight mail, all that in a few hours. Levi's, the jeans manufacturer, has brought similar techniques to the apparel industry, with the ability to custom produce a pair of jeans, based on specific customer requirements, thanks to an electronic network linking the retail shop (where the customer chooses the type of jeans, and her measurements are taken), the producers of the various parts of the jeans, the assembler and the shipping company. In both of these cases, the key is the ability to store customer preferences, use a flexible manufacturing technique to adapt a product to their particular needs and operate a network of suppliers which will join together to manufacture and deliver a product.

In the future, electronic commerce links between customers and suppliers will suppress the need for an infrastructure to gather customer data (a shop in our case) and will allow customers to do it from home, their office or on the road. This direct link also allows the supplier to gather very detailed data on customer profiles, their needs, patterns of buying, etc. Database marketing techniques can then be used to analyze this data, in order to improve new product development and target specific offers to certain customers. Gateway 2000 is a good example of a supplier custom-manufacturing personal computers, and offering product information which can be adapted to personal needs through their Web site.

Another opportunity in mass customization is to have the customer design part of the product himself. For instance, we could imagine a watch manufacturer with advanced production techniques, such as Swatch, providing its customers with computer-based tools allowing them to design part of the watch (e.g. the drawing on the background of the watch) and send these designs through a computer network to the watch manufacturing robot, before shipping the personalized watch to the customer. The ability to sell unique-design watches to customers at a retail-like price would be a great differentiating factor.

This creates a paradigm shift in the design of products, which is not perceived by every actor today. For instance, the Credit Card Network is a Web site, which basically lists different types of credit cards offered by US banks, both on-line and off-line. All of these
cards offer different features, such as interest rate, membership fees, credit limits, insurance, assistance programs, frequent flyer bonuses, etc. The customer is asked to look at the different offerings, and then choose the package which best conforms to his or her interests. It seems that the business model of this service could be changed, to take opportunity of customizing products. We would envision a service where the customer would be asked to check the features, which matter most to him/her (e.g. a frequent traveler paying his invoices in full every month might choose only frequent flyer bonuses and rental car insurance). A custom credit card package could then be designed especially for this customer, who would receive exactly the features he asks for, and no more, therefore avoiding paying fees for services he doesn't use. The interest rate or annual fee would be adjusted for each customer, based on the services that need to be provided and the expected revenue for the credit card company. This is similar to the Swatch example above, in the sense that the customer designs the product he wants to buy.

3.3.3.1. New Business Models

Changing industry structures and electronic commerce systems allow for new business models, based on the wide availability of information and its direct distribution to end-customers.

Going further than new ways of selling existing products or services and the opportunity for new ones, we also see new business models emerging. Key among these new business models are new forms of intermediaries, or information brokers. Although it is true that electronic commerce will disinter mediate some industries, by directly connecting buyers and sellers, we envision new opportunities for actors repackaging information. The early examples are currently the directory providers or the search engines, such as Yahoo & Lycos. Also, in the car industry, Dealernet offers comparisons between any type of car, with pictures, product specifications and third-party reviews.

3.3.3.1. Prices\footnote{43}

Electronic commerce is widely expected to improve efficiency due to reduced transaction and search costs, increased competition and more streamlined business processes. Greater efficiency may manifest itself in a number of ways, including lower prices, finer albeit more frequent price modifications and a narrower dispersion of prices for identical
products. Lower search costs may possibly also lead to Internet consumers being more sensitive to price changes. So far, however, the available empirical evidence is mixed. Some of the first studies found that prices of goods sold through the Internet were on average higher than their equivalent purchased through traditional retailers. A more recent study, however, found prices for books and CDs on average to be about 10 per cent lower on the Internet compared with traditional retailers in the United States.24 These studies also find that price dispersion is no lower online and that prices tend to change more frequently reflecting lower menu costs the costs a retailer incurs when changing a posted price in Internet markets. Evidence on demand sensitivity to price is also mixed, with some work suggesting a low and others a high price elasticity of demand. Taken together, these findings provide limited support to the prediction that at least B2C e-commerce raises competitive pressures and improves economic efficiency. Part of the reason is that certain reductions in cost are offset by higher overheads elsewhere. For example, distribution switches from high-density channels (warehouses to shopping centers) to lower density routes (factories to residential areas). Some of these additional costs, however, may also reflect added benefits to consumers, such as less time spent in shopping centers and thus higher prices need not be associated with lower efficiency. Another explanation is that e-commerce retailers may have a better view of their clients' preferences, that makes more direct marketing and mass customisation of products possible and could also lead to more finely differentiated and sophisticated price discrimination for products. If prices are based on understanding individual consumer valuation, there is no reason to expect prices to gravitate to a single value across retailers or customers. Moreover, a diversity of prices for broadly similar goods does not necessarily imply inefficiency. In this regard, the critical issue is whether price discrimination increases or decreases the size of the market. The greatest possibilities for e-commerce to reduce prices exist for goods and services which can be digitized, thereby allowing substantial economies in production and delivery costs, and for B2B e-commerce and B2B exchanges where opportunities exist for efficiency gains via lower procurement and inventory costs and better supply chain management. Many companies claim that putting their supply chains online has led, or will lead, to major cost savings. According to a Goldman Sachs (2000) study these gains range between 2 and 40 per cent of total input costs depending on the industry and could lead to an economy-wide price
reduction of almost 4 per cent, although such estimates depend on numerous assumptions and are inherently uncertain. Moreover, estimates of the impact of e-commerce on prices cannot adequately take into account other characteristics of e-commerce which businesses appreciate, such as increased information and choice.

3.3.3. Competition and Competition Policy

Persistence of price dispersion across Internet markets and the absence of noticeable price reductions has led to concerns that the cost structure of some Internet markets could ultimately result in less competitive outcomes. The scope for non-competitive behaviour is perhaps strongest among “digital” and knowledge intensive products. For such products, once the first copy of, for example, a software application is produced; the cost of a second copy is close to zero. Such a cost structure implies increasing economies of scale. The challenge to firms is to find a way to price their output so as to sell to a broad enough audience and thereby recoup the high initial per unit cost of production. One way to do this is to differentiate the underlying good or service so as to appeal to different market segments. Information services, for instance, are sometimes differentiated by offering different levels of quality such as degree of convenience, more timely and frequent updates, access to technical support, broader coverage and more sophisticated user interfaces. The risk, however, is that the scope to differentiate output is limited and leads to a situation whereby the firm with the largest production is able to undercut and ultimately force out of business its competitors. Closely related to increasing economies of scale, the Internet also appears to be a prime example for the existence of “network” externalities; each additional user of the network increases its value to other users. In these circumstances, firms in network industries have a strong incentive to expand their customer base and a strategic interest to do so as early as possible. Start-up companies may find it difficult to enter due to the large marketing costs needed to develop visibility and a brand name. It is still too early to know how big these barriers are and whether the Internet will favour, or not, contestable e-commerce markets. Low contestability could result in highly concentrated “winner-takes-all” scenarios, which could hinder innovation and competition and may thus require the attention of policy.

On the other hand, the Internet offers the ability to reduce barriers to entry and make markets more contestable in other parts of the economy. The open and interoperable standards of the Internet, could limit opportunities to dominate markets, by expanding the
size of the market. By exposing firms to global competition, the Internet might also expedite progress towards implementing product market reforms. As well, consumers could benefit from the development of more powerful “intelligent agents” which navigate the Internet and automate, for instance, price search and comparison across e-commerce sites. By reducing search costs and increasing the flow of information, the Internet might thus effectively shift power from producers to consumers and make it harder for firms to maintain higher prices.

3.3.3.n. Tax, Trade Policy and Regulatory Issues

The rapid growth and development of e-commerce begs a number of questions about taxation and tax policy. Concerns have been expressed that e-commerce could result in the erosion of tax bases. Consumption taxes are levied on the principle of taxation at the place of consumption and according to rates set in individual countries, or in individual states in the case of federal nations. E-commerce, however, has the potential to undermine the application of domestic and national tax rules. Under Value Added Tax (VAT) systems, for example, particularly in the case of business to consumer transactions, the supplier who is normally responsible for collecting consumption taxes may have limited means to prove the location of their customers. The supplier may also be beyond the fiscal jurisdiction of the fiscal authorities where consumption takes place. In practice, this issue appears more acute for products, which can be digitised and delivered online. Regarding potential tax loss related to physical products traded across borders, but ordered over the Internet, many countries have a de minimis relief for low value transactions, whereby when below the value threshold these products legitimately fall outside the tax net. Emerging issues here are the need to minimise distortion to competition and to find the right balance between the cost of collection and the amount of foregone taxes. Given the present size of e-commerce, serious erosion of the tax base is not in prospect. In the future, however, it may become more of an issue for tax authorities. The technology which underlies e-commerce also opens up a number of opportunities that tax authorities should seize to improve the efficiency of tax administration and to enhance taxpayer service (examples of C2G and B2G Internet applications). The Internet technology has the potential to greatly improve communication between tax authorities and taxpayers and to enhance access to information for tax authorities, so helping them to encourage voluntary compliance with
tax obligations. In particular, the Internet facilitates the electronic assessment, filing and collection of taxes. Overall, therefore, e-commerce should not only be seen as a threat to tax yields, but also a means to reduce the cost of complying with tax rules and enhance tax collection. E-commerce, especially for digital products, blurs the notion of geographical boundaries such as place of supply or residence. Since trade policy like tax policy is based on such distinctions, governments may find it difficult to determine jurisdiction and tariff revenue rights. Moreover, the laws and regulations a consumer relies on for protection at home may not apply in the merchant’s country. Indeed, in some quarters there are concerns that the scope for the Internet to transcend national boundaries could emasculate the ability of regulatory bodies to fulfill their objectives. There is thus a need to update regulatory frameworks and strengthen co-operation between regulatory bodies to achieve the goals of economic regulations, but without jeopardizing the efficiencies likely to be associated with the growth of e-commerce. The World Trade Organisation (WTO) has begun to address some of these issues. The approach adopted has been to consider e-commerce as another medium for exchange and thus subject to the same rules and regulations as conventional transactions; the principle of equivalent treatment. The WTO members in May 1998 agreed on a temporary moratorium against the imposition of customs duties on electronic transactions per se. Even without new duties, however, a potential barrier to the proliferation of international e-commerce is the uncertain application of existing customs duties. B2C e-commerce shoppers are rarely informed about duties they are liable to pay and vendors find it difficult to provide information on the myriad of customs regulations across countries. Often, therefore, the consumer is uncertain of the final cost and could encounter delivery delays as goods are held until customs clearance. The World Customs Organisation (WCO) has worked on these problems and has advocated procedures for simplified customs clearance, information technology requirements and guidelines for greater transparency.

3.3.3.0. Employment and Labour Market Policy

The development of e-commerce is likely to have both direct and indirect impacts on labour markets as well as the composition of employment. The widely expected rapid growth in e-commerce should boost the demand for jobs in e-businesses, but since the size of e-commerce in the short to medium term as a share of all activity is still likely to
be small, these new jobs should not be counted on to relieve existing labour market problems in some countries. The latter still needs to be addressed by appropriate policies \textit{vis-à-vis} labour markets. Although the direct employment consequences of e-commerce may not be large, it is likely to drive widespread changes in the labour market, shifting the composition of workers required to produce and deliver a product or service. For example, a retail sale via the Internet probably does not require the same intensity of sales staff, but it requires people with IT skills to develop and program software, operate and maintain computer servers and networks and people skilled in graphics design to keep the web site attractive and others to dispatch orders. In addition, firms will implement modifications to their production processes in order to exploit the potential of B2B and B2C commerce over the Internet. Certain jobs, especially those characterised by the transfer of information from one party to another such as travel agents, insurance and stockbrokers are likely to be redefined and become less common. Faster rates of innovation and diffusion may also be associated with more turnovers of jobs. In such an environment it is important that workers have the opportunity to learn new skills and that policies do not prevent the swift reallocation of labour to the changing needs of the economy. Otherwise, the new opportunities offered by the Internet may be missed or unnecessarily delayed.

\textbf{3.3.3. p. Economy}\textsuperscript{47}

E-Commerce over the Internet, as a new way of conducting business, has radically altered the global economy. Though only for three years, it affects large sectors of economies such as communications, finance and retail trade, education, health and government, we illustrate these changes by from the following viewpoints:

\textbf{3.3.3. p. a Economic Drivers}

\textbf{3.3.3. p. b Economic Efficiency}

\textbf{3.3.3. p. c Business Models, Sectoral Organisation and Market Structure}

\textbf{3.3.3. p. a. Economic Drivers of E-Commerce}

E-Commerce emerges to be the fastest growing business activity in many economies basically because it possesses the following economic drivers:
3.3.3.p.a.i E-Commerce Transforms the Market Place – It replaces the traditional intermediary functions and brings business community far closer to consumers than before. In addition, new products, either tangible or intangible, emerge in this new marketspace. It also brings great changes in work places in terms of knowledge diffusion and human interactivity. The current work place has become more opened, flexible and adaptable than before.

3.3.3.p.a.ii E-Commerce Catalyses the Economy Growth – It catalyses the speed of reforms of regulations, the establishment of electronic links in business, the globalisation of economic activities and the demand of high-skilled labor.

3.3.3.p.a.iii E-Commerce Shortens the Distance within the Economy – Not only for large businesses to large businesses, the linkages also extend down to small businesses and households and really reach the mass of the public. Access infrastructure will also shift from relatively expensive and difficult-to-use Personal Computers, to relatively cheaper and easy-to-use Televisions (Web TV) and Telephones (Palm).

3.3.3.p.a.iv Openness Serves as the Seeds of Fast Expansion of E-Commerce – The non-proprietary standardized infrastructure and platform for business has been the power to simulate the corporate community. It has induced many E-Commerce ventures granting business partners and consumers unparalleled access to the inner computer system of each other. Consumer has greater bargaining power in transaction because openness facilitates more rigorous flows of product information. This leads to a more efficient marketplace and accelerates the growth of E-Commerce.

3.3.3.p.a.v E-Commerce Changes the Relative Importance of Time - Many functions in the economy are a function of time. In the past, mass production is the fastest way to product in the lowest cost. Community tends to be geographically determined because time is a determinant of proximity. E-Commerce reduces the importance of time by speeding up production cycles, allowing firms to co-ordinate and enabling customers to conduct transactions around clock.
3.3.3p.b Economic Efficiency Brought by E-Commerce

E-Commerce, as mentioned in the former section, has greatly reduced the distance between business & business, and business & consumers. It leads to the emergence of a frictionless economy where transaction costs approach zero, barriers to entry and competition disappear, and markets clear instantly. This trend is mainly given rise by the expected elimination of intermediaries and transaction costs. The following are the possible sources of efficiency:

3.3.3.p.b.i Falling Cost of Information and Communication Technologies – E-Commerce runs on an infrastructure composed of computers, software and communication systems. Because the prices of the mentioned items have declined drastically, the infrastructure costs also drop by large and becomes widely available to the business community. Components like disk drives for data storage, printers and other peripherals have significantly declined in price. The overall price of mainframe and PCs also drops by a factor of three and five respectively from 1984 to 1994. New communication technologies like optical fiber, satellite digital subscribers lines all decline largely in price at least a factor of three from 1995 to 1996. This allows firms to switch to new technologies and largely cut their cost in data storage, analysis and transmission. Hence this can be interpreted as the source of cost saving and efficiency of firms. It also in turn makes the application of E-Commerce strategy more affordable.

3.3.3.p.b.ii Impact on Production Cost – A key element of the technological convergence (software, hardware and network system) is a shifting of the former trade-off of information (amount, customization, interactive) and its reach (exposure, coverage). The richer information reaches the general corporate community and individuals as a result. While the combined effects of ICT on costs, productivity and prices for electronic commerce are likely to be difficult to determine, it may be the sum of these technologies generates much greater utility than their individual parts, so that productivity impact will be clearer. E-Commerce is the key commercial application of this union.
3.3.3.p.b.iii Changing Firms' Cost Structure – The impact of E-Commerce on firms internal production and transaction costs falls into the following categories:

3.3.3.p.b.iii.1 Cost of Executing the Sale. Usually, E-Commerce involves a physical establishment of setting up and maintaining an E-Commerce web site, ranging from $349 (Jackson, 1998) for a E-Commerce in box, to about $ 8,000 for start up and $ 10,000 for yearly maintenance service, to hundred of millions dollars for a state-of-the-art site. Considering the global accessibility and 24 hours operations nature of the site, it is far less expensive than maintaining a physical one with this similar market power. Besides, by maintaining one store (one site) instead of thousands physical ones, the duplicate inventory costs are eliminated.

3.3.3.p.b.iii.2 Order Placement / Execution. E-Commerce helps business to transfer information to the customer. The information provided to customers in the web can even benefit the tradition transaction mode (off line). The better-informed customers are, the easier and less costly to serve and more inclined to make transactions when they come to stores. For example, Micron Computer sales persons spend only one tenth of their time to serve the customers who already visit it web site. E-Commerce also drastically reduces cost of attracting customers. Advertising via web is much cheaper than other media and more targeted. For example, MSN car point usually charges car dealers $ 200 /deal. But car dealers themselves usually spend $ 450 on traditional promotion media per car sold. Finally, electronic interface allows E-Commerce merchants to check that an order is internally consistent and that the order, receipt, and invoice match. GE reports one quarter of their orders have to be reworked because of errors. Cisco, on the other hand, can decrease its error rate in this aspect to 2%. This can mean a significant improvement of efficiency.

I. Customer Support / After Sales Services. Through E-Commerce, firms are able to move much of the support in visiting clients, staffing call centers and publishing documentation, which are necessary cost components in traditional customer services, to support on-line, so that the customer can access databases and smart manuals directly. For example, Fedex Internet site provides customer services like ordering pickup, generating bar code, and permitting customer-
tracking delivery. It costs about $7 to serve one customer via Internet versus $15-20 via phone. It also improves the efficiency of Fedex in customer services by reducing errors in phone customer services. The staffing efficiency and cost saving is also of utmost importance. For example, Amazon.com needs 614 customer support staff versus 27,200 in Barnes & Nobles in 1998. The former is the largest US E-bookseller and latter is the largest US physical book store.

II. **Purchase Orders / Procurement.** E-Commerce also brings tremendous value to the procurement process. Usually, via traditional channels, a typical purchase order cost $80-125. But EDI type systems can drastically cut 10-50% of the cost chiefly by eliminating errors and departmental document transfer. It also enhances and shortens the purchase cycle of firms. For example, MCI reports its PC purchase cycle is shortened from 4-6 weeks to 24 hours by EDI type of procurement system.

III. **Inventories.** A key factor of E-Commerce to reduce cost of inventories is improving the ability to forecast demand more accurately. The electronic commerce merchants, who offer a built-to-order computer, know exactly what consumers prefer and can adjust the product line accordingly. In addition, the links that E-Commerce provides along the supply-chain make it possible to pass this information on to partners, thereby lowering their costs in inventories. This practice, known as Collaborative Planning Forecasting Replenishment (CPFR), is estimated to lead to a reduction in overall inventories of $250 –350 billion, or about 20-25% in current US inventory level in 1998.

IV. **Distribution.** Distribution costs are largely lowered for digital products such as financial services, software, and travel. For example, it costs $8 to distribute an air ticket via traditional channels versus $1 via Internet. Bill payment costs $2.22-3.32 to distribute traditionally versus $0.13 via Internet. Even for tangible goods, E-Commerce methods can reduce administrative cost in distribution, trade and custom clearance by over 25% (WTO, 1998).
Chapter 3 Research Methodology

3.3.3 Changes in Business Models, Sectoral Organisation and Market Structure

E-Commerce gives rise to the new generation of business entities, known as Cyber-traders. They are usually consumer retail firms and have achieved remarkable success and high growth rates. Their contribution to total retail trade is still insignificant. However, they give rise to new business models and organisation & market structures to the economy. Ideas like "Inter-networked" enterprise, Web-based alliances have harnessed the power of market forces.

3.3.3.p.c.i Forcing Competitors to Comply to New Models – Internet applications and E-Commerce give more space for cyber traders to innovate and invent new business models which have the different revenue sources and competitive advantages focus from the traditional models. For example, Dell sells computers directly to customers and expects to handle half of its business over the Internet by 2002. It transfers the inventory and logistic costs to customers and hence achieves a phenomenal sales growth rate and net trade cycle (- 4 days of Dell vs 72 days of Compaq). Its competitive advantage over the traditional players is hence on its logistics and distribution. The competitors hence cannot compete with Dell in cost and have to comply to this new model. For example, HP starts its own Web site for direct selling. A counter example is Compaq, which still has not initiated direct sales via Internet. Its 4th quarter earning in 1998 hence drops to 15 cents / share (50%) and enters the negative territory in the 1st quarter in 1999.

3.3.3.p.c.ii From Proprietary to Open Networks – The Internet extends the benefits of EDI to all of a firms' suppliers, opens up certain proprietary relationships, extends relations between sectors, makes the electronic market accessible to smaller businesses and allows them to address international markets. This in turn lowers entry barriers and creates greater incentives for SMEs to enter the market, thereby generating competitive effects. The result is an expanding market, more transactions and more providers. Therefore, we witness the change in market structure.

3.3.3.q. Ten Ways EC Affect the Environment48

E-commerce promises to reshape our lives, transforming everything from the way we shop for daily necessities and pay our bills to how we save and invest our money, buy recordings, and plan our vacations. Product prices are more easily compared, and buyers
gain a great deal of power. In many industries, consumers will tell manufacturers what to produce and how much they are willing to pay not through the market, but directly via their computers. Like other dramatic shifts in commerce over the past few decades—the rise of shopping malls, the growth of fast food, the globalization of production—e-commerce will have significant environmental consequences. Many of these could be positive. For example, e-commerce has the potential to:

- foster more efficient methods of product delivery;
- reduce the need for certain materials, including wasteful products such as printed catalogues;
- reduce the number of shopping centers and their inefficient use of land;
- empower citizens to identify— and demand—products that are less toxic, more energy efficient, and longer lasting.
- prevent waste by vastly increasing the efficiency of the market for secondary (reused and recycled) materials.

In the networked economy that is almost upon us, the winners will be those who can take advantage of the benefits of e-commerce while avoiding the liabilities. By assessing the environmental variables at this early phase, we can be better informed about the trends to watch and the policies and practices that need to be put in place to ensure that e-commerce leads not to waste and inefficiency, but rather to an ecologically sustainable society.

3.3.3. q. a. "Mass Customization" for Eco-Efficiency

Thanks to the Internet and innovative production technologies, companies are beginning to manufacture products specifically designed for individual consumers. Mass customization could have profound environmental benefits. First, allowing manufacturers to more accurately match production to consumer demand potentially reduces the energy and construction waste associated with the warehousing of products. Second, it could cut down on excess or unwanted materials, increasing the likelihood that products will sell and reducing waste. Third, customized formulations of various products, such as pesticides and detergents, could encourage reductions in the associated environmental and health risks.
3.3.3.q.a.i. Just in Time

The product supply chain, made up of companies involved in the distribution of goods from manufacturing plants to retail outlets, comprises an enormous number of links. Companies able to accurately predict consumer demand at the retail level can reduce excess inventories by replenishing the items they sell with the right quantity at the right time to the right locations. In theory, this could decrease the space needed to store products before they are sold, thereby minimizing the environmental impacts of warehousing: the consumption of open spaces by warehouses; the materials used to build them; and the energy needed for heating, cooling, and lighting.

3.3.3.q.a ii Just Enough

Customization enables producers to manufacture only the quantity they can sell and consumers to order only the quantity they need, thus reducing product waste. One of the fastest-growing applications is in the college textbook business.

3.3.3.q.a iii Just for You

Through mass customization, manufacturers can formulate products specifically for individual customers: detergents that fit the cleaning needs of particular workplaces; pesticides that fit the insect population of specific localities, lawn care products that fit the nutritional needs of unique landscapes; and cosmetics and personal hygiene products formulated to avoid a particular allergen or exposure to a particular chemical or chemicals.

3.3.3.q.b. Marketing by Pixels Instead of Packages

Manufacturers invest large amounts of money in the design of packaging intended to attract the attention and whet the appetite of consumers in addition to protecting the product. The environmental costs of packaging are enormous. In the United States, packaging accounts for one-third of the municipal solid waste generated by consumers. Even if all this material were recycled, the energy and labor involved in collection, sorting, and processing would be a huge municipal expense. And some packages contain inks and dyes that make recycling expensive or difficult.
When products are sold via the Internet, the marketing functions of packaging -- catching the eye of shoppers, conveying product information quickly, make an impression through size become less significant. Instead, the computer image is what communicates a product's qualities and attracts the consumer's attention. Moreover, since the backbone of on-line shopping is shipping efficiency, e-commerce creates incentives to reduce the size and weight of product packaging. In addition to transmitting images of a product, the Web can provide much more information including audio and video clips than can be effectively incorporated into a catalogue, let alone a print ad. On the other hand, it may turn out that the image is not the most important part of a retailer's Web site or Internet ad. Instead, clear product descriptors easily picked up by search engines may be more valuable than graphic representations of color, shape, and texture. Consequently, the superior quality of on-line information may eventually render the glossiest of catalogues obsolete and maybe the biggest, brightest, and environmentally costly of product packages as well.

3.3.3.q. Dematerialization of Products

Many of the materials that fill our landfills -- from books and periodicals to stereos, video recorders, cameras, telephones, and answering machines are products designed to manipulate, store, and transmit information. Similarly, huge amounts of resources are devoted to (and consumed in) the vehicles that allow us to acquire information in person -- taking the car to different stores to comparison shop, for example. And many of our institutions, from the post office to the local bank, consume energy and materials by occupying structures that exist mainly to process information. As a technology for manipulating, storing, and transmitting information, the Internet can perform many of the same functions as these material objects, and in some cases much more quickly and conveniently. This substitution of bits and bytes for physical goods has been called "dematerialization." Dematerialization through e-commerce will increase the efficiency with which we assimilate and communicate information, entertain ourselves, and conduct financial transactions. It also has the potential to dramatically reduce the raw materials used in the production of goods, the energy consumed in manufacturing, and the solid waste generated by businesses and consumers. Although the technologies are still in their
infancy, a glimpse at several developments suggests that the long-term environmental impact may be tremendous.

3.3.3.q.c.i From Books to Bytes

Approximately 470,000 tons of bulky telephone books are discarded each year, yet only 10 percent are recycled. Not surprisingly, the Internet is beginning to displace a wide range of printed materials: magazines and newspapers; books and journals; dictionaries and encyclopedias.

3.3.3.q.c.ii. From CDs to MP3s

The music industry offers another example of how e-commerce can promote dematerialization. It is now possible for anyone with a fast Internet connection to download, at no cost and within minutes.

3.3.3.q.c.iii. From Snapshots to JPEGs

The family snapshot poses surprising environmental risks. The manufacture of film, processing chemicals, and photographic paper is a significant source of emissions of toxic chemicals such as methylene chloride, methanol, acetone, toluene, chromium, selenium, and methyl ethyl ketone (EPA, 1994). Photo processors generate ferrocyanide sludge and wastewater containing silver, as well as film chips and chemical recovery cartridges that also contain silver. Although the toxic constituents of photographic processing solutions have been reduced by 30 to 50 percent and silver recovery has increased in the last decade.

3.3.3.q.c.iv. From Checks to Clicks

Bills account for 60 percent of the first-class mail delivered by the U.S. Postal Service. The average household receives 10 to 12 recurring bills each month, for an annual total number of more than 15 billion bills (Walker, 1999). Financial transactions performed via the Web require far fewer material resources and none of the energy involved in moving information stored on paper to and from the home or office. It is estimated that electronic billing saves approximately 50 to 75 cents per bill in envelopes and postage, and another $1 in handling costs.
3.3.3.q.d. The De-Malling of America

The most immediate of these potential environmental effects will be in retail real estate. In the future, shopping and selling may no longer require a shop. Instead, Internet "real estate" -- a colorful banner on a popular browser program -- may become critical. As a result, demand for existing retail facilities could decline, reorganizing retail real estate industry "with a force equal to the explosive effect of the shopping center in this century.

3.3.3.q. e. Let Your Modem do the Driving

Compared with 1969, the average American now drives longer distances more often to go shopping, and 20 percent fewer passengers go along for the ride. The growth of suburbia, the emergence of "edge cities," and the lack of effective transit tying communities together have all contributed to making automobile dependency a fact of life. If e-commerce becomes a significant mode of shopping, this ecologically unsound trend may be stanched or reversed. In theory, the Internet could replace inefficient automobile trips (on average, only 1.74 persons ride per vehicle) with package deliveries by shipping companies (such as FedEx and UPS) that have the technical capability and economic incentive to maximize deliveries per mile. This outcome will depend, of course, on whether Internet shopping replaces or merely supplements trips to the store. In the short run, with e-commerce still a novelty for most people, a certain amount of redundancy is likely, and the total vehicle miles traveled could actually rise. Meanwhile, a number of obstacles unrelated to customer habits remain in the way of increased efficiency.

3.3.3.q.f. Closing the Loop On-Line

Packaging is the single largest category of municipal solid waste, accounting for one-third of its weight and half of its volume. Many countries around the world require businesses to take back and recycle their packaging, both to reduce the amount of material sent to landfills and incinerators and to encourage manufacturers to create less wasteful designs. Regulations requiring take-back are also being extended to products themselves, particularly those that are difficult or dangerous to dispose of, such as electronic equipment, fluorescent bulbs, and mercury-containing thermostats and switches.
Chapter 3 Research Methodology

Substantial obstacles to packaging and product take-back remain. In particular, the logistics of collecting and transporting material from the consumer to the manufacturer are complex and costly. The existing supply chain has been optimized for one-way delivery of goods through traditional retail outlets, not for a closed loop.

With the advent of e-commerce, however, third-party shippers have an incentive to devise cost-effective take-back systems, meanwhile expanding their market and increasing the efficiency of their vehicles. The trucks that transport products ordered over the Internet can make deliveries and pickups simultaneously in the same neighborhood, delivering goods and returning packaging or discarded products back to the original manufacturer or retailer. Moreover, to reduce the costs of home delivery and make Internet purchases competitive with store-bought products, companies may shift to reusable shipping containers to reduce the cost of corrugated boxes.

3.3.3.q.g. GreenBot.com

In surveys, people regularly claim that they would pay extra for environmentally friendly products, yet few of those products become consumer hits (Nixon, 1998). In large part, this is because price is such a strong determinant of market demand many consumers won't shell out extra cash for compact fluorescent bulbs, even if the savings in energy consumption and operating costs are significant.

Shopping for green products is not so easy. Savvy green consumers can read Consumer Reports and other literature to find the most energy-efficient appliance or the safest microwave, but this is laborious and impractical for day-to-day shopping. Moreover, studies have found that consumers are skeptical of claims made on the labels of green products.

E-commerce gives ecological comparison-shopping an entirely new dimension, both automating it and making it virtually transparent to the consumer. Computer search engines, called "bots" (short for robots), can potentially scour Web sites by key words, concepts, amounts, or virtually any criterion that can be defined by words or numbers: the cheapest available Furby doll, an air conditioner strong enough to cool a Texas ranch, or an antique Hasselblad camera in mint condition. Soon, a clever entrepreneur will no doubt create a search engine to scan for green products.
3.3.3.q.h. Materials Reuse Through On-Line Auctions

Thrift stores and yard sales have always been a better alternative for items otherwise destined for the dump. E-commerce has the potential to create a global yard sale, matching people cleaning out their attics in one part of the world with bargain-hunters everywhere.

3.3.3.q.i. Adding Information to Products for Environmental Efficiency

Companies are realizing that using information to facilitate or enhance a product's intended function can be very profitable. They are learning to do so by embedding information within a product, providing information on how to use a product more efficiently, or offering services that can eliminate the need for a product. This process has the potential to make products far more effective, efficient, safe, and long lasting, with all the attendant environmental and health benefits. It has become much more feasible with the expansion of e-commerce.

3.3.3.q.j. Global E-Commerce

In the last half of the twentieth century, reduced trade barriers, enhanced communication, and increased technology transfer have led to globalization of the economy. Procter and Gamble's Pringles potato crisps are sold in kiosks throughout Siberia. GM cars assembled in the United States contain parts made around the world. As e-commerce spreads, consumers will be able to more easily locate and purchase products fabricated and sold abroad. This increase in global commerce could have enormous environmental impacts, both positive and negative.

On the plus side, on-line consumers from the four corners of the globe will be able to disseminate information more quickly and widely than ever before, from warnings on environmentally unsound products or packages to news flashes on innovative green products.

3.3.3.r. Indian Scenario

The net breaks the artificial boundaries of geography thus making the global market an economic reality. The e-commerce will significantly influence the way a traditional business unit is organized. With the seamless gateways and networks (essentially portals) that connect them to the constituents now becoming technologically possible, companies
can focus on core operations. There will be portals for investment services, accounting services, taxation services and payroll services. All these will enhance the productivity and efficiency of management. The world will make transition of virtual organizations, virtual staff and virtual storage.

The impact of e-commerce is already visible in manufacture supply – chain as well linked financial services. The role of middlemen will diminish gradually. The manufacturing sectors will undergo substantial change with concept like just in time becoming real possibilities, thereby eliminating the need for stocking inventories and freeing cash. Bank will feel less of a need to maintain physical presence. Existing distribution channel like supermarket and shopping malls will be affected, the distribution of music and motion picture will witness a substantial change in the new millennium and the number of cinemas, video libraries and record shop will shrink. Customer will be able to order the music or motion picture of their choice on line without physically visiting a video or record-shop.

India is uniquely positioned and it has to start from the scratch. There is need to develop high speed, long distance backbone network that will interconnect the entire world. The existing business rule needs to undergo radical change and news business strategies have to be evolved. The Indian evidence Act. 1997 does not take cognizance of the electronic transaction. Reserve bank of India does not allow credit card information to be supplied over the Internet without a legally binding signature. The Govt of India has formulated certain guidelines to make e-commerce a reality.

At present, the Internet in India is growing at the rate of 10 percent per month. The info communication penetration in INDIA is 13 per 100 people as against the world average of 10. Out of 6,04,374 village only 267832 village have telephone service are very expensive. It many effect India’s participation in e-commerce. However, the Govt. of India has realized the importance of information power. Recently, one of the recommendation of task force on information technology has recommended for conversion of all STD / CO booth into info- kiosks. Expert say that Net user in India would increase to 25 million in the next 5 year.

It is time for India to restructure its legal, business and communication infrastructure. If it fails to do so, it will cost India heavily. A recent relevant example is Ludhiana in Punjab, which suffered heavy loss in business. Ludhiana is known for its export of hosiery and
sports goods. Recently, exporter noticed an inexplicable drop in sales. Further enquiries reveled that business is being lost to Pakistani exports across the border. The reason for this was neither quality nor price, but the exporter in Pakistani have put their product on the web. Increased convenience and communication has led to the loss of business to India.

India has to evolve a legal framework for the recognition of its global intellectual property rights patents copyrights, in order to global organisation to offer their products to the masses. N. Vital, Chief Vigilance Commissioner of India, listed six C’s that are required for e-business to grow in India. They are computer density, connectivity, content, cyber law, cost control and common sense.
3.3.4 Survey Reports

Following survey was conducted by two internationally renowned consultancy organisations in India in order to see the results of adapting Electronic Commerce. Surveys conducted by leading consultancies in the world also provide valuable insight in the research.

A. A Survey of Electronic Commerce in India (KPMG)

A survey of Electronic Commerce in India was conducted by KPMG in 1998. The survey outlines the developments in Electronic Commerce and highlights problems that are being encountered along with benefits realized. The survey sample consisted of 116 Indian Companies 69 of which had a minimum turnover of Rs. 1 billion, and 17 with an annual turnover of Rs 10 Billion. Respondents included CEOs, CFOs, CIOs and Heads of Marketing at the companies surveyed.

Survey Results

A.1 Electronic Commerce is very important to Business Strategy

It was found that nearly half the organisations surveyed gave importance to Electronic Commerce as a part of business strategy. Only 4% said that it was of no importance to their business strategy.

A.2 Improved Productivity, Improved Product Quality and Improved Customer Service are the Major Benefits Realised

The above benefits got more than 50% weightage in the ratings given by respondents while shortened supply chain and reduced costs got about 45% weightage. 57 % of organisations using Electronic Commerce reported significant benefit from it.

A.3 The Major Potential Benefits of Electronic Commerce are Improved Customer Service and Improved Productivity

Respondents believed the principal benefits of Electronic Commerce to be Improved customer service and Improved productivity. These two benefits were given much
higher weightage by respondents while the other benefits like Shortened Supply Chain and Reduced cost were given a similar lower weightage.

A.4 Companies are Held Back by Lack of Standard Payment Infrastructure and Trading Partner’s Technology

Although companies were keen to use Electronic Commerce to improve customer service and productivity, they believed they were being held back by the Lack of proper legal support for electronic transactions and the trading partner’s inability to setup and manage the required technical infrastructure.

A.5 Security is not an Insurmountable Problem

Respondents cited security as another major barrier to Electronic Commerce. However, security appears to be an overhyped concern as observed in KPMG’s survey of the European market. It was found that companies that take a pragmatic view are more successful in exploiting Electronic Commerce, and companies that had made sales via the Internet were less likely to see security as a problem.

A.6 Integration

Senior level support and Budget allocation were given due weightage as actions taken for integration of Electronic Commerce technologies with existing processes. Committing manpower and integration with operational activities got lower weightage.

A.7 Preferred Electronic Commerce Technologies

Email, WWW Access and a WWW Website were the most widespread technologies currently implemented. EDI and Extranet were the most favoured for initial implementation within 3 years while IVR, Extranet, Smart cards and Debit/ Credit cards were slated for initial implementation in five years.

A.8 IT Department and Executive Committee are the Biggest Sponsors

While the Executive Committee took the initiative in Funding (65% of organisations) and Championing (33% of organisations) the IT Department Championed (53% organisations), Developed (64% organisations) and Maintained (68% organisations) Electronic Commerce initiatives.
A.9 Most Favoured Technological Features to Implement Security

Respondents rated Network access controls (95% weightage), Through-the-system tests and audits (90% weightage) and Centralized network management (88% weightage) as the preferred features to implement security.

A.10 Most Organisations were not aware of their Transaction Volumes

Less than half of the respondents were able to provide details of the volume of transactions done electronically, while nearly half of these said that they had zero electronic transactions. It was found that the total annual value of transactions done electronically by respondents was about Rs. 123 million.

A.11 Trading Partners Viewed Favourably

Most of the organisations surveyed were favourable to their trading partners in terms of considering their concerns, having explicit role based agreements, quality of communications, long associations and levels of trust. While most organisations work closely with their business partners, many of these do not trade with them electronically. Hence it is evident that there is a large, unutilized potential for Business-to-Business implementation of Electronic Commerce in India.

B. A Survey of Electronic Commerce in India (IMRB)

Another survey was conducted by Indian Market Research Bureau based on case study (in-depth discussions with the CEO and/or CIO of 9-10 pioneering Indian organizations in the core sector, automobiles, consumer products, banking & finance, trading and Internet retailing.) and Survey based (Business and Households)

In the Survey involving business, two key respondents were identified as relevant opinion makers in an organization: CEO and CIO.

A self-filling structured questionnaire was sent to 400 CEOs from key vertical segments in top 6 cities of India. Of this only 36 replied.

A comprehensive semi-structured questionnaire was conducted on 318 CIOs from key vertical segments in top 6 cities of India. The organizations identified represent the top 4000-5000 organizations in India.
Chapter 3

The household survey was conducted amongst SEC A & B households in top 16 cities.

Survey Results

B.1 Electronic Commerce is Associated More with Accessing New Markets

Businesses associate Electronic Commerce more with accessing new markets, particularly international markets. It is closely associated with the Internet, new selling environment and a new method to acquire customers. More than 80% of the CIOs are of this opinion.

B.2 Electronic Commerce is Crucial Element in Strategy

40% of the CIOs say Electronic Commerce is a crucial or substantial part of their business strategy, while 58% of CEOs rated Electronic Commerce as a crucial part of their organization strategy.

B.3 Improved Customer Service is the reason to Adopt Electronic Commerce

Not shortened supply chain, but improved customer service, increased productivity/efficiency, access to international markets and cost reduction were the reasons stated by over half of the organizations to adopt Electronic Commerce.

B.4 Sales/Marketing is the Focus Area Amongst Business Functions

Over 50% of the CIOs and over 55% of CEOs say sales/marketing, operations, corporate and finance are the business functions likely to get impacted due to Electronic Commerce. Across various industry segments like general manufacturing, consumer products, media and IT companies, sales/marketing is the focused business function.

B.5 Electronic Commerce is Happening

About 15% of the organizations contacted in the CIOs survey and 34% of the organizations contacted in the CEO survey claim to be using Electronic Commerce. According to CIOs, accounting and customer support/after sales are the key areas where Electronic Commerce is being used. 51% of the organizations effect about
1000 to 99,999 Electronic Commerce transactions in a year. 22% say the rupee value of Electronic Commerce transaction is over Rs1, 000,000.

B.6 Not Many are Prepared

Only 20% of the organizations covered under CIO segment are saying they are trying to use Electronic Commerce at least to some extent. 80% of the industry is in the process of gearing up for the show. Banks want to wait and watch while sectors like IT and Courier/travel/transport are the forerunners. Currently, E-mail and Internet are the technologies used. Intranet, Extranet, EDI would be seen within two years time and ATM, EFT, Digital checks, Smart cards by next 5 years.

B.7 Industry Feels the Medium is Promising

Industry is optimistic about Electronic Commerce and sees a potential of around 10-12% of their yearly turnover coming from Electronic Commerce by the next two years and over 17% by the next five years. But the service industry, which is running high on this note, can change the dynamics for better.

B.8 Those Using IT Extensively will Take Up Electronic Commerce

Over 82% of MNCs believe themselves to be good/excellent users of IT as against (66%) of Indian private companies. Banking (67%) and IT companies (97%) believe themselves to be good/excellent users.

Faster execution (78%) and Better customer service (71%) are the two most perceived benefits of IT usage.

Finance, Corporate and Operations are amongst the heavy users of IT. Sales/marketing, servicing and distribution are amongst the medium users, whereas HRD/Administration. R&D and Production are amongst the light users.

Over 50% of those either using or likely to use Electronic Commerce are also amongst those who maintain IT spends have either paid much more than or are adequate to the investment made.
B.9 ERP, EDI and Internet

21% of the organizations surveyed have already implemented the technology and another 31% are planning to implement it in the next 1-2 years. They are mainly manufacturing companies.

23% of the organizations contacted have or are planning to deploy EDI. They are mainly Banks, IT, Courier, Travel and Shipping companies.

Internet is currently used for communication purpose only. Email messaging (78%), FTP (44%), Web site monitoring (48%). Amongst those having a web site, 84% use it for advertising while 38% say they are selling products and services through web site. Over 55% do not have a security feature or firewalls on their web site.

B.10 Lack of Skill Training Impedes Implementation of IT

Lack of skill/training within company (28%) and lack of funds (24%) are the factors impeding the implementation of IT in companies. Most of them are from traditional businesses like manufacturing, travel, transport, education etc. Banks complain about the lack of vision of the top management.

B.11 It's not the Business/Trading Partners

Lack of proper commercial and legal system for conducting business electronically (26%) is the main barrier for the adoption of Electronic Commerce. Security, lack of proper and secure payment structure, legal issues: clear fix on contracts, liabilities in the digital economy and trust and assurance are the main concerns.

B.12 Government should Promote Electronic Commerce

Spreading awareness and benefits of Electronic Commerce and its benefits, enacting cyber laws, developing a strong communication infrastructure are the key domestic roles for the government.

B.13 Internet is fine but what does Electronic Commerce mean for Households?

A small proportion of PC Owners (26%) and Non owners (15%) are aware of Electronic Commerce. Perception about Internet is rich with it being identified as a
source of information, communication, learning and entertainment but relatively few amongst both the segments feel that it is a source of purchasing products and services.

**B.14 Households are Shaky about Buying Over the Net**

A very high proportion amongst PC Owners (62%) and PC Non-owners (75%) said they would not like to buy through the net. The reasons are they are not sure of quality and delivery of products. They need to feel the products and bargain to buy them. Many do not understand this new method of buying and selling in a digital environment.

**B.15 Computers are not Bought for Browsing Internet**

Browsing the Internet and purchasing products through Internet are amongst the least important perceived benefits of owning a computer. Business, learning (self) & education for children were the main reasons to purchase a computer.
3.4 Methodology of Data Collection

The methodology of data collection has been taken from C.R Kothari a book on Research Methodology Methods and Techniques in which the research methodology, research problem, research design, sample design, measurement and scaling techniques, methods of data collection, processing and analysis of data, sampling fundamentals, testing of hypothesis, interpretation and report writing has been given.

For details please refer the book which is mentioned above.
3.4.1. Present Models of Electronic Commerce

Electronic commerce tends to mean different things to different people. Moreover, Electronic Commerce has so many difference components that there is clearly a need to categorize them systematically. Models or frameworks offer greater clarity in the study of many areas of research. In the study of Electronic Commerce, however, it is common to find the words 'model' or 'framework' used in an imprecise way or when referring only to internet-based Electronic Commerce.

There are a number of existing models, which make an attempt to provide a framework than can be used by others to define or understand the breadth and scope of Electronic Commerce.

Model 1- Zwass’s Hierarchical Framework

Zwass\textsuperscript{53} presented a very comprehensive hierarchical framework of Electronic Commerce, consisting of three meta-levels: infrastructure, services, and products and structures and seven functional levels, which range from wide-area telecommunications infrastructure to electronic marketplaces and electronic hierarchies.

<table>
<thead>
<tr>
<th>Meta - Level</th>
<th>Level</th>
<th>Function</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Products and Structures</td>
<td>7</td>
<td>Electronic Marketplaces and Electronic Hierarchies</td>
<td>Electronic Auctions, Brokerage, Dealership and Direct Search Markets. Inter-O rganizational Supply-Chain Management</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Products and Systems</td>
<td>Remote Consumer Services (Retailing, Banking, Stock Brokerage Infotainment-on Demand )Fee-Based Content Sites, Educational Offerings) Supplier- Customer Linkages On-Line Marketing Electronic Benefit Systems Intranet- and Extranet-Based Collaboration</td>
</tr>
<tr>
<td>Services</td>
<td>5</td>
<td>Enabling Service</td>
<td>Electronic Catalogs/ Directors, Smart Agents Elecon-Money, Smart-Card Systems Digital Authentication Services Digital Libraries, Copyright-Protection Services Traffic Auditing</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Secure Massaging</td>
<td>EDI, E-Mail, EFT</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>3</td>
<td>Hypermedia / Multimedia Object Management</td>
<td>World Wide Web with Java</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Public and Private Communication Utilities</td>
<td>Internet and Value-Added Networks (Vans)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Wide-Area Telecommunications Infrastructure</td>
<td>Guided- and Wireless-Media Networks</td>
</tr>
</tbody>
</table>

Fig 3.5: Showing the Hierarchical Framework of E-Commerce (Zwass1998)
This model clearly builds upon the work undertaken by the developers of the various "layered network protocols" architecture, or "architectures" which have been developed to explain the inter-connection of telecommunications networking, such as the OST Reference Model, or IBM's SNA model—which use similar" layering approach, where each layer has a clearly defined area of functionality. This separation of tasks means that a change at one layer does not normally affect the other layers, with significant positive implications for software developers. The use of a similar approach to analysing E-Commerce would have equivalent benefits in terms of separating out tasks and enabling solutions to be developed without impact on other E-Commerce activities. This disadvantage of this approach, however, is that there is less flexibility because of the sequence of the layers.

We believe that the components of Electronic Commerce are constantly changing over time and as particular technologies are pressed into service. The layering approach, which works very well for networking, where the functions and activities can be fully described and do not evolve outside the limits of the model, are thus less applicable to the very mutable functions and activities of E-Commerce, but is not itself the whole of this field of study. We do, however, believe that this model has much to offer to those who are investigating the technologies of Electronic Commerce.

**Model 2- Kalakota and Whinston's “Pillars” Framework**

Kalakota and Whinston have also developed a generic approach to approach to providing a framework for Electronic Commerce. Using a very different scheme from that taken by Zwass, they use the metaphor of "pillars" (public policy and technical standards), to support four infrastructures (network, multimedia content, messaging, and common business services) on top of which they place E-Commerce Application. These authors suggest that the elements of a framework for E-Commerce are a convergence of technical, policy and business concern. This model is simple to understand and visually attractive- but it lack theoretical depth and is not particularly useful for researchers endeavoring to incorporate into empirical research projects.
We believe that this model is useful for those who are approaching Electronic Commerce for the first time- but do not feel that it can be used as a foundation for more detailed analytical study.

**Fig 3.6: Showing Generic Framework for Electronic Commerce (Kalakota & Whinston 1996)**
Model 3- Riggins and Rhee's domain Matrix

Riggins and Rhee\textsuperscript{55} have used the Harvard matrix approach to identify a view of E-Commerce based upon type of relationship and internal / external focus. This descriptive framework takes as its axes the "location of the application user" and "type of relationship" thus essentially distinguishing between intranet-based application and those which use either an extranet or the public internet to provide access to the application concerned. Such a model is clearly useful to companies which wish to classify their trading partners into internal and external and, within these, into new and ongoing relationships-it categorizes which can be helpful in identifying relationships and technology needs.

Despite these useful characteristics, however, the model is limited in its identification of E-Commerce types being primarily focused upon relationships. It would be more difficult to use such a model in the development of, say, a government – sponsored virtual community.

<table>
<thead>
<tr>
<th>Location of Application User</th>
<th>Type of Relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>External</td>
<td>Improve Coordination with Existing Trading Partners</td>
</tr>
<tr>
<td>Internal</td>
<td>Improve Coordination with Internal Business Units</td>
</tr>
</tbody>
</table>

Cell 1: Technology Enhanced  
Cell 2: Information Exchange to Work with New Team Members  
Cell 3: Improve Coordination with Existing Trading Partners  
Cell 4: Market Creation to Reach New Customers

Fig 3.7: Showing Electronic Commerce Domain Matrix (Riggins & Rhee 1998)
Model 4- Clarke’s Five Phase process Model

Clarke describes a five-phase process model of Electronic Commerce designed to support the different phases of a business transaction. Clarke notes that in this model, it is: “difficult to have conventional tools of analytical research.” His model is an extension of an earlier, EDI-based model and is strongly focused on procurement (buying and selling) rather than on any of the other components of E-Commerce, which limits its general applicability.

Fig 3.8: Phases of Electronic Commerce (Clarke 1993)
Clark's model is well designed for analysing the issues involved in procurement – both in terms of the stages of the purchase and the activities involved in the transaction. It does not, however, offer especially useful insights into the emerging “cyber-services” sector and is not designed for such E-Commerce activities as virtual communities or E-health (except where these broad areas involve purchase and delivery of physical goods and services).

Model 5- Wigand's Typology

Wigand identifies a number of criteria, which can be used to define a typology of Electronic Commerce. The components of this typology range from an-way telescoping broadcasts via cable satellite television channels, through automated electronic markets, to electronic shopping on the internet market maker with a set-top box in the consumer's home. Wigand's Electronic Business on the basis of their electronic interactive capabilities and does not reflect the full range of Electronic Commerce virtual communities and offers only limited usefulness to those investigating the various aspects of health service offerings.
<table>
<thead>
<tr>
<th>Type of Electronic Commerce, by increasing electronic interactive capabilities</th>
<th>Buyers' deliberate choice/decision at time of transaction</th>
<th>Automatized buying transactions</th>
<th>Degree of interactivity</th>
<th>Buying choice/decision made by computer/software on behalf of buyer</th>
<th>Direct buying choice/decision made by human</th>
<th>Potential for full fledged electronic market</th>
<th>Role of market maker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teleshopping via television (e.g. QVC)</td>
<td>Yes</td>
<td>One-way only</td>
<td>Limited, one-way</td>
<td>No</td>
<td>Yes</td>
<td>High and successful but only partially electronic</td>
<td>High</td>
</tr>
<tr>
<td>Automated market (A) Simple, largely automated transactions (e.g. EFT, EDI, SWIFT, valued-added services)</td>
<td>Yes and No</td>
<td>Largely Yes</td>
<td>High</td>
<td>Largely Yes</td>
<td>No</td>
<td>Limited, only transaction and processing system</td>
<td>Small</td>
</tr>
<tr>
<td>Automated Market (B) Simple transactions with some human choice/decisions required (e.g. SABRE, APPOLLO, Stock market transactions)</td>
<td>Yes</td>
<td>One-way only</td>
<td>High</td>
<td>Generally no</td>
<td>Yes</td>
<td>High and successful</td>
<td>Medium</td>
</tr>
<tr>
<td>Mobile and wireless cellular phone/PCS-based application (e.g. construction industry)</td>
<td>Yes</td>
<td>No</td>
<td>High</td>
<td>No</td>
<td>Yes</td>
<td>High</td>
<td>Small</td>
</tr>
<tr>
<td>Electronic shopping (e.g. via Internet, WWW)</td>
<td>Yes</td>
<td>No</td>
<td>High</td>
<td>No</td>
<td>Yes</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Full-fledged electronic commerce utilizing electronic market maker with market-choice box (e.g. available in the future via 500 cable television systems, phone, maybe wireless, etc.)</td>
<td>Yes</td>
<td>Mainly one-way only</td>
<td>High</td>
<td>No</td>
<td>Yes</td>
<td>High</td>
<td>Very High</td>
</tr>
</tbody>
</table>

Fig 3.9: Showing An Electronic Commerce Typology (Wigand 1995)
The Electronic Commerce Component Model (ECCM)

It is clear that, while all these models are useful in specific circumstances, none is capable of providing an inclusive definition of E-Commerce types, activities and capabilities. Yet such an inclusive model is clearly required for effective analysis of the range of Electronic Commerce activities in both product and service terms.

We have, therefore, attempted to design a more comprehensive model, which will cater for the increasingly wide and varies types of E-Commerce available – a model which we call the Electronic Commerce Component Model. In this model we have included not only Internet- based E-Commerce, but also those primarily EDI- based business-to -business virtual communities sector of the E-Commerce “market-space”.

Zwass classified E-Commerce into 3 meta-level: infrastructure, services and products and structures. Kolkata and Winston stated that Electronic Commerce is supported by four infrastructures: network, multimedia content, messaging and commune business services. Adam et al\textsuperscript{9} stated that Electronic Commerce is an interdisciplinary field of technical, business and legal issues. Having considered their views, we derived our starting-point, i.e., the Electronic Commerce Component Model begins with the identification of the scope E-Commerce providing a “meta-view” of the Electronic Commerce world. We have identifies three components at the meta-view level- illustrated in Figure 3.10 – legal, services and infrastructure.

![Fig 3.10: The Meta-View of E-Commerce](image)
The following table identifies the objects, which might be contained within each component of the meta-view.

<table>
<thead>
<tr>
<th>Meta-view level Components</th>
<th>Objects within each component</th>
</tr>
</thead>
</table>
| Infrastructure (Technical)| • Telecommunications/ Network technologies (wireless/wire transmission)  
                            | • Multimedia application  
                            | • Internet/ intranet/ extranet  
                            | • Web page development (html, java, perl)  
                            | • Web page browser (Netscape, IE, lynx)  
                            | • Simulation  
                            | • Data mining/ warehousing  
                            | • Security of Information  
                            | • EDI  
                            | • Database management  
                            | • Client/server, web server maintenance  
                            | • Internet Service Provider  
                            | • Human Computer Interface  
                            | • Smart Card devices |
| Legal                     | • Internet payment Systems (EFTPOS, EFT)  
                            | • e-publishing  
                            | • Procurement (e-catalogues)  
                            | • Types of services (business-to-business, customer-to-business, intra-business)  
                            | • Information kiosks (library, airline, weather forecast)  
                            | • On-line Shopping  
                            | • On-line Education  
                            | • Other Internet Commerce activities |

Fig 3.11: Showing Composition of the ECCM

Despite its limitations, however, this model is dynamic allows for all the different types of people and activities involved in E-Commerce- and also caters for the inevitable change which time and technology will bring to the development of E-Commerce. The components can be easily added or deleted whenever necessary and the model’s flexibility makes it useful for both cross-sectional and longitudinal studies.

The drawbacks of Electronic Commerce Component Model primarily involve the difficulty of calculating the weights to be applied to each object. The level of subjectivity
involved is problematic into this process. Clearly, this aspect of the model will be our primary focuses as we refine and extent the concept over the next few months.

Electronic Commerce is affecting (and certainly will affect) the whole gamut of business and government activities. It is therefore essential that researchers and users have access to a model to represent the full range of E-Commerce activities.

While there is no doubt that information Technology is a major factor in the development of E-Commerce generally (and the ECCM specifically), other business disciplines such as accounting finance, law and management also provide an important part for the At present, research and practice in Electronic Commerce is tending to identify it as a separate area of study- but over the next few years, it will become more and more common to see instead a focus upon the E-Commerce aspects of the major business disciplines and the implications of E-Commerce for business reengineering.
3.4.2 Case Studies

There are some case studies, which highlight the benefits of Electronic Commerce in the organisation after they adopted this new technology. The studies are presented in the following framework. There is introduction to organisation, which follows the benefits accrued to the organisation. The organisations are:

A. Federal Express
B. Cisco Systems
C. Dell Computer Corporation
D. Boeing
E. Garden Escape
F. W.W. Grainger
G. General Electrical

A. Federal Express

A number of delivery and logistics companies, including Federal Express, the United Parcel Service (UPS), the U.S. Postal Service and others are using the Internet in key business processes. The example of Federal Express illustrates the role played by the Internet and private networks in improving efficiency and customer satisfaction.

Federal Express (FedEx) delivers 2.5 million packages daily to 211 countries around the world with an on-time delivery rate of 99 percent. Electronic commerce has been at the heart of FedEx’s operations for more than a decade. Back in the mid-1980s, the company rolled out a program called FedEx PowerShip® that gave its major customers a window into FedEx’s computer systems. Employees at shipping docks could place orders for package pick-up directly into their FedEx PowerShip terminals, automate the paperwork and track the status of their orders electronically.

Benefits

FedEx’s proprietary network forms the underpinning of the company’s electronic commerce today. The Internet extends the reach of the proprietary network, electronically connecting customers that had communicated with FedEx by phone, paperwork or not at all in the past. And, as more companies sell tangible goods over the Internet with the promise of quick delivery, FedEx benefits from increased business opportunities.

For competitive reasons, FedEx has not publicly shared the full extent of benefits it has realized from information technology and electronic networks, except to say that it has
enabled FedEx to continuously lower its cost to deliver each package. They point to some examples:

- **Avoided Costs**: If not for FedEx PowerShip®, FedEx would have had to hire an additional 20,000 employees to pick up packages, answer phone calls at the call centers and key in air bills. With PowerShip®, a good deal of the routine tasks are automated or transferred from FedEx to the customer. Couriers spend less time recording information at the customer’s site, and phone service representatives spend less time answering calls from customers who now place orders and track their own shipments online.

- **Lower Operating Costs**: Customers use FedEx InterNetShip® to track over 1 million packages per month (and the volume increases at double-digit percentage levels month to month). Approximately half of those calls would have gone to FedEx’s toll-free number instead.

- **Better Customer Service**: Customers still have a choice for how they interact with the company, whether by phone, fax or other means. Nearly 950,000 of them find it easier and more convenient to communicate with FedEx electronically.

**B. Cisco Systems**
Cisco Systems sold $6.4 billion worth of routers, switches and other network interconnect devices during its 1997 fiscal year. As its business forms the underpinning of the Internet and private networks, it is perhaps not surprising that Cisco should be a leader in using the Internet to make its business processes more effective. From employee self-service stock options, training seminars and work team collaboration to customer service and ordering, the company continually develops new applications for business processes that it feels can be better done online than otherwise. It avoids “mega” projects. New applications are generally created within three to six months.

Cisco’s Web site has evolved over several years, beginning with technical support for customers and evolving into the world’s largest Internet commerce site. Today, Cisco offers nearly a dozen Internet-based applications to both end-use customers and reseller partners.

**Benefits**
In total, Cisco estimates that putting its applications online has saved the company $363 million per year, or approximately 17.5 percent of total operating costs. With 70 percent of its technical support and customer service calls handled online, Cisco’s technical support productivity has increased by 200-300 percent per year, translating to roughly $125 million lower technical support staff costs. Customers download new software
Chapter 3

releases directly from Cisco’s site, saving the company $180 million in distribution, packaging and duplicating costs. Having product and pricing information on the Web and Web-based CD-ROMs saves Cisco an additional $50 million in printing and distributing catalogs and marketing materials to customers.

C. Dell Computer Corporation
Dell’s computer business was founded on concepts that bucked conventional wisdom. While the rest of the industry was building personal computers to stock, and selling them through value added resellers, distributors and retail stores, Dell was creating a new business model. Dell would build to order and sell the computers through its own sales force, mail order and telephone center. This way, distribution and retail markups common in the traditional channel would be avoided and Dell’s inventory carrying costs would be much lower.

As of December 1997, Dell was the second largest supplier of desktop PCs, with 9.7 percent of the market and a 10-15 percent price advantage versus its major competitors who distribute their products through the indirect channel. Dell saw the advantages of the Internet and began exploiting them before others in its industry.

Benefits

• **Additional Revenues:** Eighty percent of the consumers and half of the small businesses who purchased on Dell’s Web site had never purchased from Dell before. One out of four say they wouldn’t have purchased if it wasn’t for the Web site. And, their average purchase is higher than Dell’s typical customer.

• **Lower Sales/Marketing Costs:** Dell’s Web site gives enough product, pricing and technical support to help guide a customer through the purchasing process—information customers previously accessed by calling a telesales representative. As a result, Dell has been able to generate an increased sales volume to its consumer market with lower labor costs. Dell expects that its advertising costs should also be lower for its Internet customers, as 30 percent of these customers had not seen a Dell ad, yet still bought online.

• **Lower Service/Support Costs:** Dell saves several million dollars each year by having basic customer service and technical support functions available on the Internet. Each week, about 20,000 customers use the Web site to check their order status. Some percentage of these would have come into the call center, at a cost of $3-5 per call. If just 10 percent of these customers had called rather than using the online service, those 2,000
calls would have cost Dell $6,000-$10,000 per week. 30,000 software files are downloaded each week from Dell's site. Answering these requests by phone and then sending each customer the software by mail would cost $150,000 per week. Customers who access troubleshooting tips online save Dell a $15 call to a technical support person. If 2-3 percent of the 30,000-40,000 technical information queries the Web site receives each week had reached Dell’s technical support staff; it would have cost an additional $9,000-18,000 per week. One large customer in the auto industry reports saving $2 million in its own technical support “help desk” costs. Rather than calling up Dell’s telephone support center and usually holding for about 3-5 minutes, they go to Dell’s Web site for help.

• **Enhanced customer relationships:** perhaps the greatest potential Dell sees for the Internet is its ability to enhance the company’s relationship with its customers. Ultimately, one-tone marketing and tailored customer service can be used to shorten a customer’s repurchase cycle and allow them to sell more into corporate accounts. When a customer first boots up her computer, the computer introduces her to the “Dell Channel,” a customer service feature tailored specifically to that customer’s computer model and particular configuration. Dell believes that the ability to tailor customer service solutions and product offerings to individual customers will improve customer service and satisfaction and open up new selling possibilities.

**D. BOEING**

Boeing’s online strategy is to provide a single point of online access through which airlines and maintenance providers can “pull” the data needed to maintain and operate airplanes, regardless of whether the data is from the airframe builder, component supplier, engine manufacturer, or the airline itself. With data from all of the 300 key suppliers of airplane parts (and a growing base of data for the key engine manufacturers), Boeing’s goal is to provide its customers with one-stop shopping for online maintenance information.

**Benefits**

• **Increased productivity:** spending less time searching for information frees up engineers and maintenance technicians to focus on more productive activities. One U.S. airline saved $1 million when it gave 400 users access to Boeing’s REDARS program. Seeing the results of the initial implementation, the airline expanded the service to 2000 users. A European airline estimates that it will save $1.5 million from BOLD in the first year due to a nearly 4 percent boost in production and engineering staff productivity.

• **Reduced costs:** with information available online at the gate through PMA rather than back in the crew office, delays at the gate due to missing information can be reduced. The European airline mentioned above estimates that PMA will reduce delays by 5-10 percent on flights using newer Boeing aircraft.
• **Increased revenues:** every 3000 hours, an airline does a schedule C maintenance check which can keep an airline grounded for up to a week. Not having information readily available can extend the process. The longer the maintenance check, the less revenue opportunity. Through BOLD and PMA, the European airline estimates it will save 1-2 days/year for each aircraft, resulting in $3 million in incremental revenue.

**E. GARDEN ESCAPE**

Born of the World Wide Web, Garden Escape offers gardeners a selection of thousands of seeds, perennials, roses, bulbs, greenhouses, tools and other products from around the world from which to choose. Serious gardeners can use online software tools to design their ideal garden. Garden Escape has an online magazine, a chat room, and daily tips from the magazine’s editors. Questions about horticultural terms can be answered with the help of the online glossary, or by calling Garden Escape’s toll-free number. If the customer service representative does not know the answer, he will contact an expert who will send the customer a reply by e-mail. Although not required, about 150,000 people have registered with Garden Escape in order to benefit from extra member services. Members can save graphic layouts of gardens, create a personalized notebook to keep track of their favorite varieties, planting instructions, and any other important notes. A variety of other personalized services are also available, including a gift registry and important-date reminder, personal shopper, order status, and an out-of-stock reminder service. As the founders see it, the key to Garden Escape’s eventual success is its ability to leverage the unique advantages the Internet brings. If Garden Escape simply duplicated what people could get at their local nursery, the business would not be very compelling. Instead, the site has to offer customers a shopping experience they could not easily duplicate (or duplicate at all) through traditional sources.

Garden Escape founders started by taking an inventory of all the resources a gardener uses today: nurseries and seed catalogs for plants and tools, other retailers for specialty outdoor products; books and magazines for tips on the plants and flowers that flourish or perish in certain soil and climate conditions; clubs where hobbyist gardeners share suggestions with other enthusiasts; and the extensive array of catalogs, books and CD-ROMs that help with garden design. They provide published information from horticultural experts, and using the interactive features of the Internet, they create online environments for gardeners and horticultural experts to share ideas and gardening tips.
Automated customer service saves Garden Escape money and leads to new sales opportunities. Each time Garden Escape replies to a customer’s question, it stores both the question and answer in a database. That way, the knowledge base continues to expand and customer service staff (and customers in time) can search the database online and receive immediate answers. Garden Escape believes this will not only make customer service more efficient and effective, it also has the potential to generate revenues. About half of the company’s purchase orders are transmitted to its growers by e-mail or fax. The other halves are communicated over an extranet.

F.W.W. GRAINGER
Seventy years ago, William Wallace Grainger saw an opportunity to launch a business distributing electric motors. During the 1920s, factories were converting from one large, direct current motor powering their entire assembly line operation to multiple motors using alternating current. Using a simple 8-page wholesale catalog, the MotorBook, and postcards for direct mail, Grainger began receiving and filling customer orders. Through the years, more products were added to the MotorBook as customers needs grew for a quick and convenient supply of maintenance, repair and operating (MRO) supplies. Today, W.W. Grainger, Inc. is the leading distributor of MRO supplies and related information to the commercial, industrial, contractor and institutional markets in North America. The company is headquartered in Lincolnshire, Illinois, with operations throughout the United States and Canada, and in Mexico and Puerto Rico. In 1997, sales exceeded $4 billion. The company’s numerous business units focus on serving the diverse MRO needs of more than 1.3 million customers.

The company’s largest business unit, Grainger, operates through a network of national, regional, and zone distribution centers and 350 branches nationwide. Customers can place orders for MRO products via phone, fax, EDI or online over the Internet. Orders are available for same day pickup at the local Grainger branch, or next day delivery. Grainger also provides product and service solutions to customers through its 1,600 person sales force. The MotorBook, now known as the General Catalog, continues to be a primary marketing tool for the company. The 1997 edition of the catalog is over 4,000 pages in length and contains about 80,000 products.
A key element in the growth and success of the company has been the dedication to process improvements and information systems enhancements. Computer systems were first introduced at the branch level in the 1970s. A satellite communications network was implemented in 1989 linking each branch with a network control center, enabling the instantaneous transmittal of information between the branches and distribution centers. This enhancement allows customers to call the nearest branch for complete product availability and pricing information. Today, Grainger customer service agents can check the inventory on-hand in that branch as well as all the other branches and distribution centers across the United States. The customer's order is now handled with one phone call. Having this information online has boosted both the company's service level and asset utilization. In 1997, the company further improved its communications systems with the introduction of a land-based frame relay communications network. Frame relay is faster and more reliable than the satellite system it replaced.

In spring 1995, Grainger launched its Web site, giving small and medium-sized businesses the ability to search and order from its online catalog, check product availability and pricing, and set up rules for who in the company is authorized to make a purchase from the Web site. Customers can identify and select products, check pre-negotiated account prices and determine product availability without leaving their desk, making a phone call, or generating a single piece of paper. Not only does the site offer customers greater convenience, it also offers greater selection. Through its traditional paper catalog, Grainger has a standard product offering of about 80,000 products. Its Web site has a selection of nearly 200,000 products. In the future, Grainger plans to significantly expand its Internet product offering by partnering with other "best of class" suppliers. Revenues from the Web site have been growing 100 percent quarter over quarter. More than 30 percent of Grainger's online sales are to new customers or incremental sales to existing Grainger customers. Because the virtual branch is open 7 days a week, 24 hours a day, customers who would not otherwise be able to order from a Grainger are now able to do so. In fact, more than 50 percent of all orders are placed after 5 PM and before 7 AM when the local branch is closed.

The Internet, intranet, extranet and private networks will allow GiSO employees to continue to leverage information in the execution of their jobs. This leverage and the
elimination of redundant activities in the supply chain have enabled GiSO to grow at more than three times the rate of Grainger’s traditional distribution business over the last two years.

G. General Electric
General Electric’s material costs increased 16 percent between 1982 and 1992, while GE’s pricing remained flat and then started to decline. In response to these cost increases, GE began an all-out effort to improve its purchasing. The company analyzed its procurement process and discovered that its purchasing was inefficient, involved too many transactions and did not leverage GE’s overall volumes to get the best price. More than one-quarter of its invoices (1.25 million invoices) had to be reworked because the purchase order, receipt and invoice did not match. Since the review, GE has taken a number of steps to improve its purchasing, the most recent of which involve the Internet. Factories at GE’s lighting division used to send hundreds of requisitions for quotations (RFQs) to the corporate sourcing department each day for low-value machine parts. For each requisition, the accompanying blueprints had to be requested from storage, retrieved from the vault, transported on site, photocopied, folded, attached to paper requisition forms with quote sheets, stuffed into envelopes and mailed out. This process took at least 7 days and was so complex and time-intensive that the sourcing department normally only sent out bid packages to two or three suppliers at a time.

In 1996, GE Lighting piloted the company’s first online procurement system, TPN Post, an extranet developed by GE Information Services. Now, the sourcing department receives the requisitions electronically from its internal customers and can send off a bid package to suppliers around the world via the Internet. The system automatically pulls the correct drawings and attaches them to the electronic requisition forms. Within 2 hours from the time sourcing started the process, suppliers are notified of incoming RFQs by email, fax or EDI and are given 7 days to prepare a bid and send it back out over the Internet to GE Lighting. A bid can be awarded the same day GE receives and evaluates it.

As a result of implementing TPN, GE has realized a number of benefits:

• 60 percent of the staff involved in procurement have been redeployed. The sourcing department has at least 6-8 additional days a month to concentrate on strategic activities rather than the paperwork, photocopying and envelope stuffing it had to do when the
process was manual.

- Labor costs involved in procurement declined by 30 percent. At the same time, materials costs declined 5-20 percent due to the ability to reach a wider base of suppliers online.

- It used to take 18-23 days to identify suppliers, prepare a request for bid, negotiate a price and award the contract to a supplier. It now takes 9-11 days.

- With the transaction handled electronically from beginning to end, invoices are automatically reconciled with purchase orders, reflecting any modifications that happen along the way.

- Procurement departments across the world to share information about their best suppliers. In February 1997, GE Lighting found seven new suppliers via the Internet, including one that charged 20 percent less than the next-highest bid.

GE reports that TPN benefits extend beyond its own walls. A computer reseller, Hartford Computer Group, reports that since joining TPN, it has increased exposure across the different GE business units—so much so that its business with the company has grown by over 250 percent. At the same time, TPN has introduced Hartford Computer Group to other potential customers. As of October 1997, eight divisions of General Electric use TPN for some of their procurement. The company bought more than $1 billion worth of goods and supplies via the Internet during the year. By 2000, the company aims to have all 12 of its business units purchasing its nonproduction and maintenance, repair and operations materials (MRO) via the Internet, for a total of $5 billion. GE estimates that streamlining these purchases alone could save the company between $500-$700 million annually.
3.4.3 Data Collection in Present Research

3.4.3.1 Sampling Procedure
3.4.3.2 Administration of Questionnaire
3.4.3.3 Testing and Follow Up

3.4.3.1 Sampling Procedure
Nearly every survey uses some form of sampling. It simply means taking part of some population to represent the whole population. The main reason for sampling is economy. To survey every individual in a population using enumeration is ordinarily much too expensive in terms of time, money and personnel. There's really no need to survey every individual. Only a small fraction of the entire population usually represents the group as a whole with enough accuracy to base decisions on the results with confidence. While sampling is extremely practical and economical, it has to be done correctly or it will introduce bias or error in the results. The sample must be selected properly, or it won't represent the whole. It has to be large enough to meet the requirements for reliability - but not too large, or it will waste resources.

The researcher typically has several options regarding the basic sampling design:

**Random** - Every sample unit in the population has an equal chance of being selected. The sample represents the population well. The probability of sampling error can validly be computed statistically.

**Stratified** - The proportion of various types of sample units in the sample is controlled by selecting a series of subsamples of specified sizes.

**Clustered** - A series of physical or geographic areas are selected then a specific number of sample units are selected proportionally from each "cluster".

**Convinience** - Some sample have a greater chance of being selected than others. The sample's representation of the population is inferior. It's invalid to compute the probability of sampling error.

**Unstratified** - The proportions of various types of sample units will be approximately the same in the sample as they are in the entire population.

**Unclustered** - Respondents are selected randomly (or by convenience) regardless of their physical or geographical location.

Regardless of the basic sampling design the researcher must decide how the respondents will be selected.
Chapter 3  

In our survey respondents were asked to rank the impact of Electronic Commerce on the ten Business Value Components by sending e-mails with attached questionnaire or by post companies mentioned in Business Today Sept 7, 1999, Corporate Banks mentioned in Business Today Dec 6, 1999, Indian B2B and B2C sites, Bangalore based IT companies, Indian Top 50 IT Companies, University Research Centres of Electronic Commerce. Details of these sources have been prescribed in Appendix IV.

3.4.3.b Administration of Questionnaire

The survey questionnaire employed in this study was adapted from a paper on the Road of Electronic Commerce – a Business Value Framework, Gaining Competitive Advantage and Some Research Issues by Michael Bloch, Yves Pigneur and Arie Segev, March 1996. The paper proposed a framework consisting of ten components of the business values of EC showing how they can improve, transform or redefine current products, processes or business models.

From these ten components of business value respondents were asked to rank the extent to which these components were applicable the organisation they represent one having the minimum and five maximum impact, (NA if not applicable). Each component had five questions. In this way there were fifty questions of the ten components. Respondents were also asked to mention their annual turnover, percentage of annual IT spending, percentage of EC spending and the type of organisation they represent.

3.4.3.c Testing and Follow Up

To collect the data from the respondents we have adapted two methods. Firstly by sending e-mails with attached questionnaire and secondly by posting to the companies. After getting questionnaire filled from the 17 respondents, minor modifications were made. Three items were deleted and four new were added. Thereafter 1523 e-mails with attached questionnaire were sent, 88 questionnaires were sent by courier. The response to first time and subsequent mails sent is as follows:

E-mails sent ...1523.
First time responded...31.
Reminders e-mails sent ...1502.
Responded ...77.
Questionnaire posted...88.
Responded...27.

It may please noted here that the response rate was the highest from those respondents who were associated with A.M.U in one way or the other else industry in general hardly has shown any interest in the response activity.

After receiving feedback from respondents a note of thanks has also been forwarded as they took time and pain for our research work.
3.5 Methodology of Data Analysis

The present study is based on the objectives as mentioned in the previous section. In order to achieve the objectives of the study, purposive sampling technique was used. To get the primary data, questionnaire was designed which was partly structured in the light of the objectives of the study.

The collected primary data have been processed and analysed using MS Excel in the form of tables and graphs. To start with overall mean of various scores was taken. The mean was, and then was compared with the mean of different Components of Business Values. The comparison could have resulted in difference between population mean and the mean of specific segment of population. In order to know that this difference was statistically significant or not, popular test such as ‘Z’ and ‘F’ tests were applied. These tests were applied using MS Excel. The calculated figures of comparatives mean were then compared with the ones given in the table. Significantly different means (if any) were reported.

At the end of thesis, on page number 217-218 a master chart shows the values of all the results of ‘Z’ test and ‘F’ test.
3.5.1 Research Techniques in Electronic Commerce

This section provides a brief overview of each of the three major research techniques.

3.5.1.a Conventional Scientific Research

3.5.1.b. Interpretivist Research

3.5.1.c Engineering Research

3.5.1.a Conventional Scientific Research

Conventional scientific approaches to research were developed over several centuries in the context of what are now referred to as 'the physical sciences'. It has been co-opted by 'the social sciences', which can be loosely depicted as being those whose domains of study include agents that exercise free will, or at least appear to do so. Some information systems research is close to the realm of the physical sciences; but most of it sits squarely within the social sciences. Conventional science adopts the assumption that there is a real world, comprising objects and processes. This real world cannot be directly understood by humans, nor 'captured' into human artefacts. However it can be observed. On the basis of observation of the real world, humans form theories as to how it came to be the way it is, and how and why the processes take place. In an applied discipline such as Information Systems, it is common to depend on theories borrowed from 'reference disciplines.

Theories should ideally be expressed in deductive form, such that a set of axioms or postulates, operated on by conventional deductive logic, lead to inferences.

In summary, conventional science consists of extracting new hypotheses from an existing theory, testing them, and adding the results to the pool of knowledge. It presupposes the existence of:

- a body of theory;
- an explicit theoretical framework to guide research;
- a defined research question;
- explicit refutable hypotheses; and
- a research method that applies well-defined research techniques in order to enable hypotheses to be tested.
3.5.1.b. Interpretivist Research

Conventional science is based on 'rational positivist' thought. This includes the presumptions that there is a 'real world', that data can be gathered by observing it, and that those data are factual, truthful and unambiguous. The 'post-positivist', 'interpretivist' philosophy, on the other hand, asserts that these assumptions are unwarranted, that 'facts' and 'truth' are a chimera, that 'objective' observation is impossible, and that the act of observation-and-interpretation is dependent on the perspective adopted by the observer.

Interpretivists criticise even the physical scientists for the narrowness of their assumptions. Their criticisms strike home particularly strongly in the social sciences, where the objects of study are influenced by so many factors, and are extremely difficult to isolate and control in experimental laboratory settings.

The interpretivist approach confronts the difficulties presented by the nature of the research domain, and in particular:

- the intangibility of many of the factors and relationships.
- the inherent involvement of the researcher within the research domain.
- the dependence of outcomes on the researcher's perspective.
- the selection and definition of the research domain.
- the selection and rendition of existing theory.
- the definition of the research question.
- the design of the research framework.
- the selection, definition and operationalisation of variables.
- the measurement of variables.

This leads to a requirement that multiple interpretations of the same phenomena must be allowed for, and that no truth is attainable.

3.5.1.c Engineering Research

Within the information systems segment of the computer science and engineering discipline, the research that is most directly relevant to electronic commerce is of an
engineering rather than a scientific orientation, and is essentially concerned with technology, including artefacts, techniques and combinations of both of them.

Information systems research undertaken within this tradition tends to be applied or problem solving in its orientation. It is of two broad types:

- the application, testing, stretching and breaking of information technology; and
- the conceptualisation, prototyping, construction, demonstration and application of new technology.
3.5.2 Data Analysis in Present Research

After collecting data on a five point scale (1) minimum and (5) maximum each answer was assigned a weight. The average of all the weights given by the respondents was taken. This was done for the entire sample followed by each subsection or group for example the mean of entire population was compared with the mean across different organisation, annual Turn Over, percentage of IT spending, percentage of EC spending.

In order to ensure that the results are statistically valid ANOVA test was applied.

For sample size within various sub group Z test was used when the number of respondents in a particular group were above 30 and where less than 30 we used F test

Tests of Hypotheses

Statisticians have developed several tests of hypotheses (also known as tests of significance) for the purpose of testing of hypotheses which can be classified as: (a) Parametric tests or standard tests of hypotheses, (b) Non Parametric tests or distribution-free test of hypotheses.

Parametric tests usually assume certain properties of the parent population from which we draw samples. Assumptions like observations come from a normal population, sample size is large, assumptions about the population parameters like mean, variance, etc., must hold good before parametric tests can be used. But they’re situations when researcher cannot or does not want to make such assumptions. In such situations we use statistical methods for testing hypotheses, which are called non-parametric tests because such tests do not depend on any assumption about the parameters of the parent population. Besides, most non-parametric tests assume only nominal or ordinal data; whereas parametric tests require measurement equivalent to at least an interval scale. As a result, non-parametric tests need more observations than parametric tests to achieve the same size of Type-I and Type-II errors.

Important Tests

1- Z- Test
2- T-Test
3- \(X^2\) Test
4- F-Test
Chapter 3

1- **Z-test** is based on the normal probability distribution and is used for judging the significance of several statistical measures, particularly the mean. Z-test is generally used for comparing the mean of a sample to some hypothesised mean for the population in case of a large sample, or when population variance is known. Besides this test may be used for judging the significance of median, mode, coefficient of correlation and several other measures.

2- **T-test** is based on t-distribution and is considered an appropriate test for judging the significance of a sample mean or for judging the significance of difference between the means of two samples in case of small sample(s) when population variance is not known. It can also be used for judging the significance of the coefficients of simple and partial correlations. It may be noted that t-test applies only in case of small samples(s) when population variance is not known.

3- **X^2 test** is based on chi-square distribution and as a parametric test is used for comparing a sample variance to a theoretical population variance. X^2 test is also used as test of goodness of fit and also as a test of independence in which case it is a non parametric test.

4- **F-test** is based on distribution and is also used to compare the variance of the two independent samples. This test is also used in the context of analysis of variance (ANOVA) for judging the significance of more than two sample means at one and the same time. It is also used for judging the significance of multiple correlation coefficients. Test static, F is calculated and compared with its probable value (to be seen in the F-ratio tables for different degrees of freedom for greater and smaller variances as specified level of significance) for accepting or rejecting the null hypotheses.

We have assumed that the difference between the mean of population and that of each subgroup of respondents is due to chance and has nothing to do with the number of respondents of sample size.

In other words, had there been an equal number of respondents in each group of subgroup or more than our present sample size i.e. 135 we would have obtained same mean. This is our null hypothesis $H_0$. Alternate hypothesis of comparing population mean across various subgroups is that there is significant difference between sample mean and that of the mean across various groups.

We have tested the significance level at 5% in both the cases. The findings would have been more appropriately discussed and analysed at various level of significance.
3.6 Data Presentation and Discussion

The data collected from 135 respondents is shown in the form of tables showing total mean and maximum Impact of Electronic Commerce on Business Value components with reference to weightage of all the sectors of service organisation and also with reference to Annual Group Turnover, % of IT spending and % of Electronic Commerce spending comparing it with the mean population.

The same table is presented in the form of pie graph in order to give clear view of comparison with the mean population showing the maximum Impact of Electronic Commerce on Business Value Components.

After graph in the subsequent section we have discussed the hypotheses, which has been tested statistically by applying F and Z test comparing it with the given values within the acceptable limits, and conclude that this difference is due to chance only.
References of Chapter 3

6. Top 20 sites. (1998). Inter@active Week, February 9, Pg 16.
8. Guglielmo, C. (1998). The Mezzanine May be losed for Merchants, Inter@active Week, February 9, Pg 44.


41 http://www.brint.com, (last visited on Nov 14, 1999)


Chapter 3  

Research Methodology

2000).


