Chapter-1 Introduction

Commerce is a communicative transaction between two parties playing very familiar roles: buyer and seller. For commerce to occur, somebody must do the selling, and somebody must do the buying, and these two some bodies must share a basic understanding of how the transaction is generally supposed to flow. E-commerce web sites can't simply make products available to be bought (surface it, they will buy...); these sites must hold up their part of role-playing the commerce transaction. Most people have an understanding of commerce based on their experience as shoppers and buyers, and they bring this experience with them when they start shopping online. In order to meet the user's needs, then, we must understand the typical user's experience of traditional commerce. Most problems with commerce sites are due to misunderstandings on the part of the site creators about how users understand the structure and elements of typical commerce transactions. Users have formed schemas to understand commerce, but commerce sites routinely ignore these schemas. Considering the newness of the internet and World Wide Web, it's safe to say that nearly everyone who has purchased online gained their understanding of commerce offline. "Dirt-side" commerce transactions have structural, schematic, and semantic orders that don't fully map to the different medium of the web, and it's this gap in mapping that causes the problems users experience trying to shop online, whether the problems stem directly from usability flaws or unmet expectations.

Electronic commerce, commonly known as e-commerce or E-commerce, consists of the buying and selling of products or services over electronic systems such as the Internet and other computer networks. The amount of trade conducted electronically has grown dramatically since the spread of the Internet. A wide variety of commerce is conducted in this way, spurring and drawing on innovations in electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), automated inventory management systems, and automated data collection systems. Modern electronic commerce typically uses the World Wide Web at least at some point in the transaction's lifecycle, although it can encompass a wider range of technologies such as e-mail as well. A small percentage of electronic commerce is conducted entirely electronically for "virtual" items such as access to premium content on a website, but most electronic commerce involves the transportation of physical items in some way. Online retailers are sometimes known as e-tailors and online retail is
known as e-tail. E-commerce or electronic commerce is generally considered to be the sales aspect of e-business.

E-commerce (electronic commerce or EC) is the buying and selling of goods and services on the Internet, especially the World Wide Web. In practice, this term and a newer term, e-business, are often used interchangeably. For online retail selling, the term e-tailing is sometimes used.

**E-Commerce Can Be Divided Into**

- E-tailing or "virtual storefronts" on Web sites with online catalogs, sometimes gathered into a "virtual mall"
- The gathering and use of demographic data through Web contacts
- Electronic Data Interchange (EDI), the business-to-business exchange of data
- e-mail and fax and their use as media for reaching prospects and established customers (for example, with newsletters)
- Business-to-business buying and selling
- The security of business transactions

In Short

**USING SCHEMES TO IMPROVE THE E-COMMERCE EXPERIENCE**

Most commerce sites fail in one (or both) of two ways: first, they may fail to adhere to the user's schema for commerce; and second, they may violate the schema. The cause of the schema failure or violation may be bad site design, bad information architecture, badly designed commerce engine, rushed implementation, unfamiliarity with the audience...whatever the cause, I believe the blame can usually be assigned to somebody not understanding what the user expects from a commerce transaction. The most elemental rule for designing a quality site understands your audience. The most common type of problem with E-commerce sites is failing to adhere to the typical user's commerce schema; interestingly, many of these problems also end up being user interface and usability problems. While these problems vary in severity and scope, keep in mind that ANY deviation from the user's expectations will disturb the user; disconcert the user enough and they may decide that they were lied to. And, as Jakob Nielsen remarked on his 31 January 1999 Spotlight, "On the Web, credibility and trust are everything because your company exists
as nothing but glowing pixels on the user's screen. Lie to a user even once and you have lost that customer forever."

Violations of the schema are potentially the most disturbing problem for E-commerce users. These violations go beyond just improperly handling some expectation, they jarringly confront the user with an unexpected and threatening event. Two unfortunately common violations are the requirement to register in order to use the commerce site, and any ambiguous error within the actual ordering flow. Registration is a major sore point with commerce sites. Users do not expect to authenticate themselves before they are ready to purchase. If a user cannot flag a product for later reference -- for example, adding the product to a shopping cart or wish list -- without registering and/or logging, the typical user will be frustrated and will possibly get angry: this authentication barrier occurs at a point in the shopping experience that doesn't reasonably require authentication. If the user is not at the point where they are ready to lay down their money, experience tells them that there is no reason to prove their identity. Ambiguous errors within the ordering flow are perhaps even more annoying. Commerce sites routinely fail during the final order submission: the user clicks on the submit button, and boom -- they receive a message that says there is a problem, but they don't receive the information essential to them, which is a.) The order was processed, and b.) Their credit card was charged correctly. Online transactions are entirely mediated by technology, so a failure of technology at the critical point of purchase leaves users in a feedback vacuum.

**Electronic commerce is commonly known as E-commerce or e-commerce.**

It is a business or industry in which buying and selling of services, products or goods is done on electronic systems on computer networks, specifically on the Internet. E-commerce works on technologies such as [electronic data interchange](https://en.wikipedia.org/wiki/Electronic_data_interchange) (EDI), [Internet marketing](https://en.wikipedia.org/wiki/Internet_marketing), [mobile commerce](https://en.wikipedia.org/wiki/Mobile_commerce), [electronic funds transfer](https://en.wikipedia.org/wiki/Electronic_funds_transfer), [supply chain management](https://en.wikipedia.org/wiki/Supply_chain_management), [online transaction processing](https://en.wikipedia.org/wiki/Online_transaction_processing), [inventory management systems](https://en.wikipedia.org/wiki/Inventory_management_system), and [automated data collection](https://en.wikipedia.org/wiki/Automated_data_collection) systems. Today electronic commerce typically uses the internet for making transaction’s, although other technologies such as telegrams and telephones are also used but they are not as effective as internet.
Business (the selling and buying of products) has been a significant stimulus for survival of people. Since the start it is written in history and past. The previous decade has seen the rise of another sort of trade called e-Trade, the purchasing and offering of products through human-machine collaboration over the Internet. The mass reception of the Internet has made an ideal model transformation in the way organizations work today.

The e-Commerce can be characterized as a present day business system that addresses the needs of associations, dealers, and purchasers to cut costs H-m/r enhancing the nature of products and administrations and expanding the velocity of administration conveyance, by utilizing Internet^ It contrasts from the conventional electronic business (e-Commerce) in the way that it empowers the exchanging of products, cash and data electronically from machine to machine

Customary physical exchanging of merchandise and money is getting to be progressively disliked and more organizations are hopping on the e-Commerce fleeting trend. Today, the line between c- Commerce and electronic trade is getting to be more smeared as more organizations begin and proceed to coordinate the Internet and e-Commerce innovations into their business forms.

Business is carried out electronically and there is no more a requirement for physical coin or merchandise to lead business.

There are several ways of looking e-Commerce:

1. as a business process. E-Commerce means activities that support commerce electronically by networked connections. For example, business processes like manufacturing and inventory and business-to-business processes like supply chain management are managed by the same networks as consumer processes
2. from an interface view. e- Commerce meant information and transaction exchanges: business-to-business (B2B) business-to-consumer (B2C), consumer-to-consumer (C2C), and business-to-government (R2G).
3. from a communications perspective. It is the ability to deliver products, services, information, or payments via networks like the Internet.
4. E-Commerce is an electronic environment that allows sellers to buy and sell products, services, and information on the Internet products may be physical like cars, or services like news or consulting.
5. As a strut-tun; c-Commerce deals with various media: data text, Web pages. Internet telephony, and Internet desktop video.

6. As a market e-Commerce is a worldwide network. A local store can open a Web store online and find the world at its doorstep-customers, suppliers, competitors, and payment services. Of course, and advertising presence is essential.

One example of e-business it SAP—the world's leading provider of business software solutions, addressing needs of small and mid-size businesses as well as enterprise-scale suite solutions for global organizations. SAP has customer with an interest in integrating the major factors of the business, but such customers are brick and mortar businesses that want to integrate information within their divisions and applications. Further elaboration on e-business brings up value-chain concept and supply-chain management, which is covered later in the chapter. In contrast, selling goods and services on the retail level with and one. Anywhere, via the Internet. It includes new business opportunities that result in greater efficiency and more effective exchange of goods and services. The crux of the exchange is transactions—blocks of information exchanged between an e-merchant and a customer via corporate Website. An example of e-Commerce is www.crulchfield.com or www.airuxMixom.com each e-firm uses a Website to sell goods and services via the Internet. One reason why it is difficult to understand electronic commerce is the speed with which it has grown. It happened so quickly and in so many that even experts cannot compare it to anything from the past. Its impact has already exceeded that of radio in the 1920s, television in the 1950s, and personal computers in the 1980s. Every indicator points to a profound long-term impact on the world economy.

Unlike the traditional ways of doing business, EC has broken grounding several ways:

1. Companies share information with competitors.
2. Suppliers share information with buyers.
3. Corporate procurement is no longer determined solely on price.
4. Financial transactions occur with the involvement of banks.

Nowhere is EC changing the rules more profoundly and rapidly than in the banking industry. The surge of online banking calls into question the role of banks: Businesses and consumers now have more choices about how and where to pay bills. See
wsvw.uvacreditunion.org for a look at bask online banking services. They include money transfer from one account to another, looking up past history of deposits and withdrawals, and loan inquiries. Many larger banks like www.wachovia.com provide an image of the front and back of any check you may have written.

Cost savings, opportunism, and threats drive action and innovation in the most conservative companies. These factors have influenced how companies reposition themselves to take advantage of opportunities that include establishing new service delivery-channels and MM markets for existing services. Leveraging the power of the Web means a shift from static pages to dynamic applications. For example, Web services that give merchants real-time access to bank card payment information rather than waiting for hard-copy bank statements are already available. J J Morgan has already replaced hardware codes with digital certificates that verify the identity of the sender, place a seal on a message, and provide proof that a transaction has occurred. The service saves the company at least SI million in the process.

Electronic Commerce (e-Commerce) is a term popularized by the advent of commercial services on the Internet. e-Commerce is however, only one part of the overall sphere of c-Commerce. The commercial use of the Internet is perhaps typified other types of transactions use other technologies. Electronic Markets (F.Ms) are in use in a number of trade segments with an emphasis on search facilities and Electronic Data Interchange (EDI) is used for regular and standardized transactions between organizations. The mainstream of e-Commerce consists of these three areas; these are represented as a diagram in Figure I.I and outlined in a little more detail below:

Electronic Markets

Electronic Data Interchange (EDI)

Internet Commerce

Fig. I.I The three categories of e-Commerce
1. **Electronic Markets**—An electronic market is the use of information and communications technology to present a range of offering available in a market segment so that the purchaser can compare the prices (and other attributes) of the offerings and make a purchase decision. The usual example of an electronic market is an airline booking system.

2. **Electronic Data Interchange (EDI)**—EDI provides a standardized system for coding trade transactions so that they can be communicated directly from one computer system to another without the need for printed orders and invoices and the delays and errors implicit in paper handling. EDI is used by organizations that make large number of regular transactions. One sector where EDI is extensively used is the large supermarket chains which use EDI for transactions with their suppliers.

3. **Internet Commerce**—Information and communications technologies can also be used to advertise and make once-off sales of a wide range of goods and services. This type of e-commerce is typified by the commercial use of the Internet The Internet can, for example, be used for the purchase of books that are then delivered by post or the booking of tickets that can be picked up by the clients when they arrive at the event. It is to be noted that the Internet is not the only technology used for this type of service and this is not the only use of the Internet in e-Commerce.

The digital age and the digital revolution affect everyone. Like the telephone and the fax machine, PCs and printers have become essential ingredients in doing business; as have e-mail. Web storefronts, and integrated digital communications. The much talked-about "digital convergence" will drive all these pieces of hardware into one digital platform, whether it is a computer connected to the Internet or a computer interacting with other computers, because such connectivity will prove to be more efficient and effective. The case of Amazon.com versus Barnes & Noble, in which Barnes & Noble sued Amazon for billing itself as the largest bookstore, demonstrates that the very definition of "store" must be reevaluated.

Any way you look at it, e-Commerce has become a mature industry and is still growing. As soon as you click onto the Net, some attractive banner advertisement invites you lo its Website and tries to sell you products or services. Areas (hat are growing by leaps and bounds are financial services entertainment, travel, medicine, and retailing. Even Uncle Sam wants e-Commerce. The Office of Management and Budget (OMB) projects the federal government will spend nearly $
65 billion on technology and Web service in fiscal 2006. Thai is a 40 percent increase from just two years ago. Most of the federal agencies that make up the Homeland Security Department proposed technology infrastructure spending increases for fiscal 2006 the federal government has become a "click-and-mortar" enterprise, from customer interfaces to supply chain.

**Advantages to Customers**

1. **More Choices**—Provides customers with more gags. Case in point, before making any buy, client can concentrate on about all the significant brands and peculiarities of anything. It likewise furnishes buyers with less lavish items and administrations by permitting them to shop in numerous places and lead brisk correlations.

2. **Permits customers to collaborate with different purchasers and electronic groups and trades thoughts and also think about encounters.**

3. **24-Hour Arrest**—online business never rest rather than block and mortar organizations e-Commerce permits individuals to complete organizations without the obstructions of time or separation. One can log on to the Internet anytime of time, be it day or night and buy or offer anything one longings at a solitary click of the mouse.

4. **Diminished Prices**—Costs of items are lessened since silages along the quality chain are diminished. Case in point, mediators can be killed by the organization specifically offering to customer inside a circulating through a retail location.

5. **(Mucker Delivery**—allows brisk conveyance of items and administrations (at times) particularly with digitized items. 6. **Shoppers can get raking and itemized data in seconds, rather titan in days or weeks.**

6. **Makes it possible to take part in virtual barters.**

7. **Worldwide Marketplace**—Consumers can shop anyplace in the world. Currently, as per the World Trade Organization (WTO) there curve no custom obligations put on items purchased and exchanged comprehensively electronically. This likewise gives wide determination of items and administrations to products & services.

**Advantages to Businesses**

1. **Expanded Potential Market Share**—The Internet empowers organizations to have entry lo global markets subsequently expanding their piece of the pie. Organizations can likewise accomplish greater matters in profit making of scale
2. Low Barriers to Entries—anyone can start up an organization on the Internet. Startup expenses are a great deal lower for organizations since there is less requirement for cash for capital.

3. Minimal effort Advertising—Advertising on the Internet costs short of what publicizing on print or TV relying upon the intricacies and degree of the commercial. An organization can at present use a ton on publicizing on the Internet if the organization enlists an outside gathering to make their notices however promoting on the Internet itself is less expensive subsequent to there is less cost connected with it regarding printing and restricted tech vision spots.

4. Key Benefit—the vital profit of making a business e-commerce empowered" is that it aides decrease the conveyance lime, work expense and the expense acquired in the accompanying ranges:
   1. Record readiness
   2. Problem discovery and adjustment
   3. Compromise
   4. Mail arrangement
   5. Phone calling
   6. Information entrance
   7. Extra minutes (overtime)
   8. Supervision of expenses

**Advantages to Society**

1. Enables people in Third world countries and rural areas to enjoy products and services which otherwise arc not available to them.
2. Facilitates delivery of public services at a reduced cost, increases reactiveness, and/or improves quality.
3. Enables more individuals to work at home, and to do less traveling for shopping, resulting in less traffic on the roads and lower air pollution.
4. Allows some merchandise to be sold at lower prices since organization may not need a physical place and full inventory.

The sales aspect of e-business is is generally considered to be Electronic commerce. It also includes the exchange of data to accommodate the financing and payment aspects of business transactions. This is cost effective and efficient way of communicating within and outside the organization. E-commerce has now become one of the most effective and useful ways of
conducting business. It is a Market where the company may or may not have a physical presence but it shows its presence on World Wide Web.

E-Commerce has grown at a very fast speed over the past five years and it is expected to grow at a very much faster rate in coming years. We can see the boundaries between "conventional" and "electronic" commerce have become increasingly blurred because of more and more business is shifting to E-Commerce. E-Commerce is faster, cheaper and more convenient than the traditional methods of bartering goods and services.

It is very difficult to create a successful online store without the knowledge of ecommerce principles and what ecommerce is supposed to do for your online business. Researching and understanding the guidelines required to properly implement an e-business plan is a crucial part to becoming successful with online store building and making it run successfully.

To understand better we can divide E-commerce into following subsections:

- Electronic data interchange, the business-to-business exchange of data
- Buying or selling on websites and/or online marketplaces
- Virtual stores on websites with online catalogs
- The gathering and use of demographic data through web contacts and social media
- E-mail and fax and their use as media for reaching prospective and established customers (for example, with newsletters and keeping constant contact)

With the growth of internet around the world the E-commerce business emerged with the faster speed. Today most of the business is done online. Few years before when people had fear about online buying because of its major drawbacks like advance payment, purchasing just by watching a product online, time taken to reach the product and damages in transit. But now scenario is changing as many companies have come up with protection against fears and drawbacks of ecommerce. In spite of that biggest concerns of online stores are online payment security especially credit card/debit card security because it is the most used method of online payment.

As per Gartner counseling, universal misfortunes from online misrepresentation, especially among the biggest online retailers, added up to Us$1.64 billion in 2002 from an aggregate of
Us$91 billion in online deals income. This is double the sum it was in 2001 (i.e. Us$700 million from Us$61.8 billion in online deals income).

… In the Headlines…

"… Ebay's 22- hour crash in June cost the organization more than $5 million in returned closeout expenses…"

"ESPN, which lost its dream baseball website for three days starting July 11, surrendered that it will need to repay some of its 260,000 online players, who pay $30 each to play in the group…"

"Forrester puts the normal expense of site downtime at about $8,000 every hour."

"As per The Nilson Report, Global Credit, Debit, and Prepaid Card Fraud Losses Reach $11.27 Billion in 2012."

This is on the grounds that everybody is fit for building accident confirmation or assault evidence web stores. Indeed most secured web stores or E-Commerce exercises are under assault of programmers who are occupied in discovering provisos. So business houses and organizations need to put a great deal in keeping their framework secure for smooth working and keeping themselves from risks of E-trade.

The Nature of E-business Testing

It is clear from above explanations that the expense of a failure in an e- business framework is imposing. E-business testing incorporates testing high esteem, high hazard, and elite business basic frameworks. The testing methodology ought to be composed in such a way, to the point that it covers are sorts of risks to keep away from or minimize the expense of failures. The complex nature of e-trade applications likewise includes risks on the grounds that all the exercises like purchasing, offering, store exchange and so forth are included in single exchange and this unpredictability in creating a thorough risk. It is extremely hard to precisely pinpoint where the risk of failure exists. Which application fizzled? Where did it come up short? What's more when did it come up short? E- Business testing means testing the every single part at each level and web applications for potential risks and failures, alongside the e- trade "site" in general.

A bug in Web server, exchange server or database framework, may be missed or overlooked which may bring about failure of entire framework. So the center of testing may be on the webpage all in all or on the code particularly composed for the web application. Sadly, a subtle bug, an infection in a third- party segment may cause a genuine failure. This failure may prompt misfortune in income, awful attention, lost notoriety, client certainty and loss of time and cash.
Issue Statement

With such a large number of distinctive reasons because of which an e-business site can fizzle so the methodology of conceptualizing a rundown of test thoughts, particularly for testing an e-trade site, gets to be amazingly confused. It is possible without breaking a sweat if one has profound information of the risks.

• An analyzer ought to be acquainted with the application under test, and he ought to have information of the distinctive ways the application has fizzled in the past or the diverse ways it can fizzle later on.

• An analyzer ought to have a structure in his brain where issue exist or emerge. Thought era is a movement that works all the more gainfully and creates better comes about about when there is a system on which thoughts can be based on. The system can be from beginning to end so analyzer concentrates on all focuses, which give educates and move thoughts the brains of the analyzers. The schema can be a framework that holds conceivable failure modes for an application. This skeleton for thought era for keeping E-Commerce sheltered from risks could be a "scientific categorization of failures and risks." This theory gives a rundown of potential failure modes in an e-business site and a scientific classification of failures.

Arrangement Approach

The analyzer needs to discover new test thoughts and go past cutoff of its blind sides. In this proposition we will give straightforward approach that will help analyzer to discover new thoughts to check. This method to identify bugs and problems is the result of 48 months of broad and extensive research on searching, discovering, examining and arranging e-trade related failure and risks. Conclusively it is found and recorded from different top level classes and slips determined from those classifications. Likewise it incorporates blunders and oversights in planning e-Commerce/e-trade at various stage. Furthermore samples from e-trade imperfections distributed time to time to gather final results.

A list has been made and by using that one could pick a category of interest (such as accessibility or software redesign), read descriptions of different types of problems that you will find within that category identifying a few issues that are required to test e-commerce application. Based on feedback to the authors of Testing Computer Software(Kaner et al.), I believe that many testers
will be able to use this list to identify potential problems that they would otherwise have missed. I intend the outline to serve similar functions to the appendix in Testing Computer Software (TCS):

- Help testers to generate new ideas;
- Help tester go through a set of tests for thoroughness and coverage;
- Help testers and other colleagues to identify risks during discussions of prioritizing the testing effort.

**Organization of the Thesis**

E-Commerce Software is comprised of a few sub frameworks. These sub frameworks are intended for particular clients and their business needs. These subsystems are architected in a decoupled way importance any of these sub frameworks can be supplanted without breaking a sweat on the off chance that a dealer has a legacy framework that they need to proceed with.

“Browser - based Testing” provides an overview of the concept of threats arising from different browsers while dealing with various ecommerce sites. It includes applying frisk analysis as a software testing technique.

Products, software’s or process is subject to many types of failure modes and each one has different effects and different consequences. “Failure Modes and Effects Analysis (FMEA)” identifies the potential risk and tries to associate it with the product to takes the concept of risk analysis a step further and provides an overview of the methodology of FMEA . It also includes a action plan for potentially high level of risks. It also contains a detailed literature survey on the application of FMEA from a software perspective. Failure Modes and Effects Analysis (FMEA) tracks and evaluate the results of the action plan. It also confirms the results and identifies the reasons why a company has to use FMEA process.

Taxonomy broadly means classification. “Taxonomies” provides an insight into the world of taxonomies. It takes the reader through different defect taxonomies/ bug taxonomies built by others and try to analyze their objectives vis-à-vis the objectives of this thesis.

“The e-commerce bug taxonomy” defines the structure, types, content and objectives of the e-commerce bug taxonomy, this is the main theme or central feature of this thesis. It is an essential point requiring resolution or resolving an outcome.

“E-commerce testing and shopping carts” contains a discussion basically deals with e-commerce portal like banking, insurance etc. and shopping portals like ebay, amazon, snapdeal etc. It has
also been discussed on how e-commerce testing differs from traditional testing. Overview of the different types of “shopping carts” has also been done for evaluation purpose.

"Part disappointments” contains the rundown of disappointment classifications and disappointment modes that are focused around segment disappointments or non-subjective disappointments, for example, program failure, database server disappointment, web server disappointment, memory spills and so on.

“Qualitative failures” contains the list of failure categories and failure modes that are due to the non-fulfilment of a qualitative attribute such as reliability, functionality, usability etc.
Organization of the Thesis

Chapter 2

E-Commerce Software is comprised of a few sub frameworks. These sub frameworks are intended for particular clients and their business needs. These subsystems are architected in a decoupled way importance any of these sub frameworks can be supplanted without breaking a sweat on the off chance that a dealer has a legacy framework that they need to proceed with.

Chapter 3

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Chapter 4

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Chapter 5
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Chapter 6
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Chapter 8
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Chapter 9
“Qualitative failures” contains the list of failure categories and failure modes that are due to the non-fulfilment of a qualitative attribute such as reliability, functionality, usability etc.