

# Expert System Based E-Commerce Model and It's Functioning

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**Abstract:** Economists say that survival of businesses in the 21<sup>st</sup> century will depend upon an understanding of and the capability to use current and emerging information technology. One of the buzzword E-Commerce is already accepted and implemented by many of the businesses. The success of the businesses using E-Commerce applications is largely dependant on the online customers purchasing products or using services from the web stores. Online customer searching for any products or services on the Internet gets lots of result from search engine. Online customer may gets confused, which product or service is the best option for them. In this paper, Expert System (ES) based E-commerce model is given, which provides greater convenience to the customer purchasing products from the web stores. Along with the model, the suggestions are given for development and implementation of the ES based E-commerce applications. This paper also includes discussion on major problem faced by E-commerce applications.

## I. E-COMMERCE BASED APPLICATIONS FOR THE BUSINESSES

The 21<sup>st</sup> century is the era of information and communication technology. In this competitive era, only street business is not sufficient to maximize the business profit. Today's most familiar word the Internet is based on Information and Communication Technology, using which now it is possible for the businesses to sell or buy products and to provide services 24 hours a day, 7 days a week and 365 days a year to their consumers. This is possible only because of the electronic business (E-Business) concepts, more widely known as electronic commerce (E-Commerce).

In general, E-commerce is the process of buying and selling of goods and services across the Internet [1]. It is one of the ways to exchanging the information between individuals and companies by combining a range of processes, such as electronic mail, electronic data interchange (EDI), Electronic Fund Transfer (EFT), World Wide Web and other Internet based applications [2]. The development of E-Commerce based applications is largely responsible because of the success of some of the today's best known web sites like Amazon.com, Baazee.com, eBay.com, Yahoo.com, Indiatimes.com, Sify.com and many more. Also, compare to traditional retailing, customer prefer online shopping because of greater convenience, no crowds, saves time and lower prizes of the products.

In last five years, the number of the Internet users increases rapidly, which is also one of the reason behind the development of E-Commerce applications. The Table no.1 shows the Internet usage and population statistics up to December 2005 published by the [www.internetworldstats.com](http://www.internetworldstats.com). The statistics shows 182% of growth in the Internet users. As number of the Internet user increases, more number of users can be diverted into actual buyers on the Internet based web stores by offering various schemes.

An E-Commerce applications can be divided into three major categories: B2B (Business to Business), B2C (Business to Customer) and C2C (Customer to Customer) [3].

TABLE 1: WORLD INTERNET USERS STATISTICS

World Regions	Population (2006 est.)	Internet User	Usage Growth 2000-2005
Africa	915,210,928	22,737,500	403.7 %
Asia	3,667,774,066	364,270,713	218.7 %
Europe	807,289,020	290,121,957	176.1 %
Middle East	190,084,161	18,203,500	454.2 %
North America	331,473,276	225,801,428	108.9 %
Latin America/ Caribbean	553,908,632	79,033,597	337.4 %
Oceania/ Australia	33,956,977	17,690,762	132.2 %
WORLD TOTAL	6,499,697,060	1,018,057,389	182.0 %

B2B web portal provides links between different businesses or different parts of businesses. B2B covers the business transactions along the various interactions occur between producer of raw material, retailers, distributors and consumers including manufacturers. B2C type of web portals provides the facility to the businesses to sell products or to provide services directly to the customer. The Amazon.com and Indiatimes.com are well known examples of B2C category. C2C types of applications provides platform for the customers for selling and buying products from one another. Major technical components that are required for successfully working of E-Commerce applications are client or PC workstation, transaction server, web server, database server, database, network connecting devices like router and switch, Internet communication line and many more [4].

## II. ADVANTAGES OF USING E-COMMERCE APPLICATIONS

For Customer, followings are some of the advantages of using E-commerce applications.

- The greatest advantage of E-commerce applications is that it provides convenience of shopping from any place and at any time.
- By sitting at one place, customer can compare the features and price of products from various web stores. By doing such comparison customer can save traveling time, and can get best price offered by web store.
- Customer can get product review from other buyers who bought the same product earlier in which customer is interested. For example, www.amazon.com provides book reviews made by the buyers for their newer customer.
- On web store customer can make his own decision. In real businesses salesman may provide wrong or improper information.
- Since customer can directly purchase from the producer by avoiding intermediaries, which ultimately reduce cost of product or service for the customer.

For Businesses, offering E-commerce applications, followings are some of the advantages.

- The greatest advantage for the businesses is that they don't require big show room. They just need greater web space, which is very cheaper compare to actual showroom cost. Businesses can keep their products at the warehouse.
- Businesses can handle more number of customers simultaneously as customers are not actually coming to the store.
- Businesses have enough time before giving answer to the customer's query.
- Businesses can purchase products from customer put up for sale at cheaper rate and once again re-selling of the same product can be done after minor modifications by the business.
- Businesses can automates their business transactions and flow of information between various businesses related entities.

### **III. PROBLEMS WITH E-COMMERCE APPLICATIONS**

The newer technologies always have some advantages along with some disadvantages. Now a day networked based applications are also suffering from various types of cyber crimes. E-commerce applications are also sufferings from some severe problems. Some of the loopholes that might be dangerous for E-commerce applications as well as its users are given below.

- Credit card abuse and Personal information leakage issues are probably the biggest disadvantage for the customer as well as businesses using E-commerce applications.
- The difficulty of providing secure payment transactions has been one of the major obstacles for the businesses providing the E-commerce applications. For making secure payment, the cryptography technology is getting more efficient, but still many of the customers are hesitating to send their credit card numbers over the internet for purchasing goods. Such a fear in mind of customer is only because of increasing number of cyber crime cases.
- Lack of personal touch is one of the factors, which requires in some of the cases before purchasing products.
- Age identification problem is especially important when the goods or services on the web store are forbidden for the minors. For examples Alcoholic Drinks, Lotteries, Adult Movies, etc are prohibited for the children. The legal issues for the owner of the web stores may arise.
- Taxes calculations, Re-selling of intellectual property, safety of downloadable content, Authenticity of content and Integrity of Server machine are also the key problems faced by E-Commerce applications.
- Employees handling the E-commerce applications must understand the importance of security issues. Responding to computer security incidents are not a simple matter. So, to tackle incidents, training must be given about the newer technologies related to system security for handling miscellaneous event occurs with the online businesses transactions. Lot of money and time is required for such training, which may reduce the profit of business.

### **IV. COMMON MISTAKES MADE BY BUSINESSES OFFERING E-COMMERCE APPLICATIONS**

To design simple web site can be easy, but while designing web site offering E-Commerce applications several aspects related to information security and presentation of product information must be consider. Web store offering E-Commerce applications made following common mistakes:

- For answering customer's queries, almost all the web stores provide contact information about the web storeowner or business. Even after providing contact information over the web store, many of the businesses are not taking care about the timely reply of customer's queries.
- By not updating critical information on web site, like change in telephone number, change in office address, creates bad impression in user's mind.
- Online user manual in the form of PDF files may create problem for the customer with poor bandwidth of Internet facility.
- Many of the web stores do not take care about changing the color of Visited Links.
- Some of the web stores use textual content as a background image may also reduce the visibility of customer.

By taking enough care about above listed loopholes, businesses can attract more umber of customer to their web stores.

## V. EXPERT SYSTEM BASED E-COMMERCE MODEL

It is the characteristics of Expert System (ES) that it provides the exact solution of the end users problems.

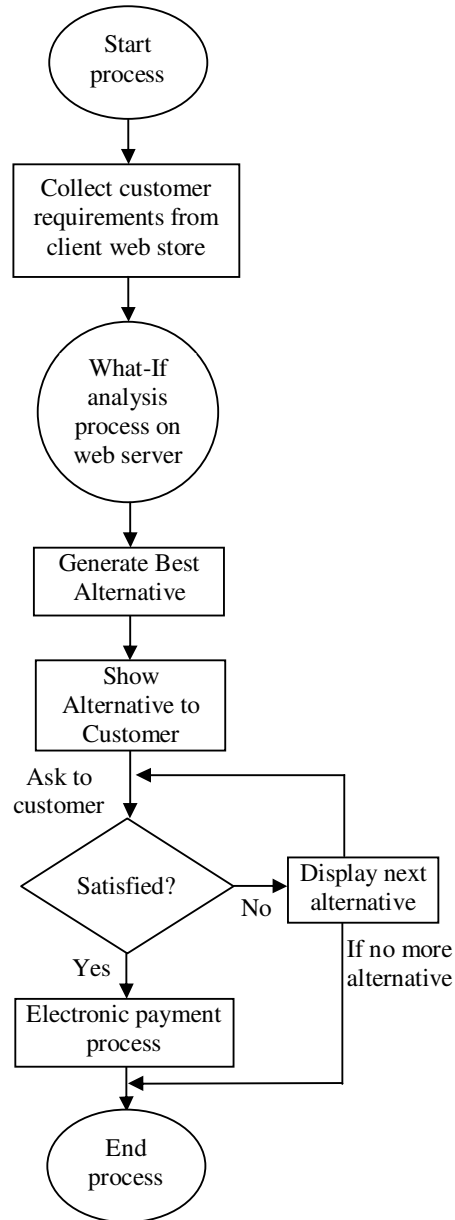


Figure 1 Flow of information in ES Based E-commerce Model

By combining data, sophisticated analytical models and user-friendly software, expert system can generate best alternatives for structured problems of end user. Expert system offers best alternative from the available resources which user can accept according to his convenience and requirement fulfillment. The flow of information between customer purchasing online from web store and business activities on the web store is given in figure no. 1. The basic objective of ES based E-Commerce Model is to help the customer purchasing goods from the Web stores on the Internet. The basic idea behind the model is to simplify the presentation of products and at one time show information about only one product. This model is based on the concept that “keep it simple as possible you can” while representing the information to the customer. The flow of information in the model is given below.

Process start when the customer opens the web store main page. The client web page collects the basic information regarding the product or service needed by the customer. The basic information may include price range, quality of product, size, color, quantity and other physical properties of products. Such collected information is passing on to the What-If analysis module on the server. After analyzing the requirements collected from the customer, an available relevant product list on the web store is generated. From this generated list, identify most relevant product needed by customer and display only one product at a time. If customer is satisfied with the displayed product then electronic payment process can be done and at the end of successful transaction process can be ended. If customer is not satisfied with the alternative shown to him/her then show next alternative to the customer, and repeat the process until either customer is satisfied or end of the alternatives list.

While displaying first alternative to the customers shows them that, the displayed product is the best relevant product for them. While displaying second alternative, show them that this is the second best relevant product for them, and this process can be continue until the process end.

## **VI. IMPLEMENTATION ISSUES FOR THE ES BASED E-COMMERCE MODEL**

Before starting the E-Commerce based applications, following points must be taken into consideration by businesses.

- **Hosting service provider:** Identify secure and reliable hosting service provider. Check the up-time guarantee provided by the service provider. Analyze the physical infrastructure where your E-Commerce store will be hosted. Also, check the backup and data recovery system provided by the hosting service provider.
- **Shopping cart:** Choose a shopping cart that is easy to manage and provides maximum customization of your E-Commerce store. Check a shopping cart for its capability to perform important functions like the inventory management, catalog management and store design & layout. Go for a shopping cart that gives simple and easy management with minimum investment.
- **Payment Gateways:** The businesses have to take care that, a payment gateway should provide faster processing and should be secure enough to every possible security attack happens in transferring credit card details.
- **Shipping Carrier:** The scope of distribution of products - globally or locally besides the cost per transaction and the reliability may be important criteria.

Web store home page is the first impression that online businesses make in the mind of their web customers. Whether the category of business is B2B, B2C or C2C, businesses should make every effort to present the information to the visitors with attractive, easy to use page and that gives customers quickly access to the information needed by them. While designing and implementing ES based E-Commerce web store, following point should also be taken into consideration.

- Do not overburden web page with heavy images. One of the reasons for slow loading websites could be the large file size of a web page.
- Write a programming code that occupies least memory and offers manageable compromise to the display. The web store must be tested periodically. Frequently test web store for its average download time.
- **Security Objectives:** The system and data must available for the user all the time with integrity and confidentiality.
- Throughout the designing and implementation process follow software and hardware standards, wherever it can be used. Display information regarding the standards followed by E-commerce applications on the main page of web store. This will attract

the customer, as they have more faith in the web stores following some well known standards like SSL for transmission.

- RFC 2196: Request for comment (RFC) 2196 is the most recent update of RFC 1244 [5]. The RFC 2196 provides guidance to system and network administrators in how to deal with issues such as risk management, establishment of security policies and basic architecture for protecting the network environment.

## **VII. LIMITATION OF ES BASED E-COMMERCE APPLICATIONS**

This model works more efficiently when online customer surfing the web store provides more specification about the product they want. As specification is more, the numbers of alternatives generated are less. If customer gives a little information about the products, model gives poor performance, as the numbers of alternatives are more.

## **VIII. CONCLUSION**

Some of the technology used by E-Commerce applications is relatively novel. It is fact that there are no such things that can provide us absolutely secure environment over the Internet. So it is the responsibility of researchers and businesses to make sure that E-commerce applications using Internet facility become safe. The developer or implementer must provide some solid security so that businesses and customer can make trust in to the E-commerce applications. This model can be one of the efforts in the direction of improving convenience to the customer and businesses.

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