

The Design of an Electronic Commercial Shoe Store for a Small-Scale Business

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- 2. Select A Suitable technology for the design of the electronic store.**
- 3. Design and Implimentation of the Electronic store.**
- 4. Verification and Security procedure for the online Store.**
- 5. Discussion of the project e-store in positives and negatives ways.**

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Bibliography:

1. **BLANCHARD, Benjamin S. a John BLYLER. System engineering management. Fifth edition. Hoboken, New Jersey: Wiley, 2016. ISBN 9781119047827.**
2. **CHAFFEY, Dave. Digital business and e-commerce management: strategy, implementation and practice. Sixth edition. Harlow: Pearson, 2015. ISBN 978-0-273-78654-2.**
3. **KOCHAN, Stephen G. Objective-C 2.0: výukový kurz programování pro Mac OS X a iPhone. Brno: Computer Press, 2010. ISBN 978-80-251-2654-7.**
4. **JEFFRIES, Ron. Extreme programming adventures in C#. Washington: Microsoft Press, 2004. Microsoft professional editions. ISBN 07-356-1949-2.**
5. **SCHILDT, Herbert. Java 8: výukový kurs. Brno: Computer Press, 2016. ISBN 978-80-251-4665-1.**

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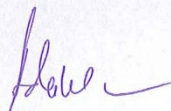
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ABSTRACT

Electronic Commerce is process of doing business through computer networks. A person sitting on his chair in front of a computer can access all the facilities of the Internet to buy or sell the products. Unlike traditional commerce that is carried out physically with effort of a person to go & get products, ecommerce has made it easier for human to reduce physical work and to save time. E-Commerce which was started in early 1990's has taken a great leap in the world of computers, but the fact that has hindered the growth of e-commerce is security. Security is the challenge facing e-commerce today & there is still a lot of advancement made in the field of security.

The main advantage of e-commerce over traditional commerce is the user can browse online shops, compare prices and order merchandise sitting at home on their PC. For increasing the use of e-commerce in developing countries the B2B e-commerce is implemented for improving access to global markets for firms in developing countries. For a developing country advancement in the field of e-commerce is essential. The research strategy shows the importance of the e-commerce in developing countries for business applications.

The business-to-consumer aspect of e-commerce is the most visible part of the commercial use of the Web. The main purpose of an e-commerce site is to sell products and services online.

This aim of this project is to develop an online e-commerce site for selling shoes. It provides the user with a catalog of various shoes available for purchase in the store in order to facilitate the online purchase.

The system is implemented through a three-tier approach, with a back-end database, Microsoft Internet Information Services (IIS), ASP.NET and a web browser as a front-end client. To develop an e-commerce site, a number of technologies must be studied and understood. These include layered architecture, server-side scripting technology and client application techniques, such as ASP.NET, programming language (such as C #, VB.NET), relational databases (e.g. MySQL, Access).

This project is aimed to developing a basic website that provides an application shopping cart for consumer spending and also to know the technologies used to develop the application. This project will discuss each of the underlying technologies to create and implement an e-commerce site.

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I hereby declare that the print version of my Master's thesis and the electronic version of my thesis deposited in the IS/STAG system are identical.

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INTRODUCTION

Ecommerce is recognized as an accepted used business paradigm. More business settings are developing websites that provide functionality for conducting business transactions over the internet. I conclude that the process of shopping on the internet is becoming a common place.

The main objective of this project is to develop an e-commerce store where you can buy any product (cars, electronics, clothing, computers, accessories, appliances, watches) over the Internet. However, for execution purposes, this project will deal with an online Shoe Store.

An online store is a website or an application through which goods or services are sold over the internet. Selected items can be collected in a shopping cart online.

During the checkout of products, the product in the shopping cart will be presented as an order. At this point, more information will be needed to complete the transaction. Generally, the buyer will ask you to fill out or select a shipping address, a shipping option, billing address and payment information such as credit card, credit card verification code, credit card number. An email notice is sent to the buyer as soon as the order is placed.

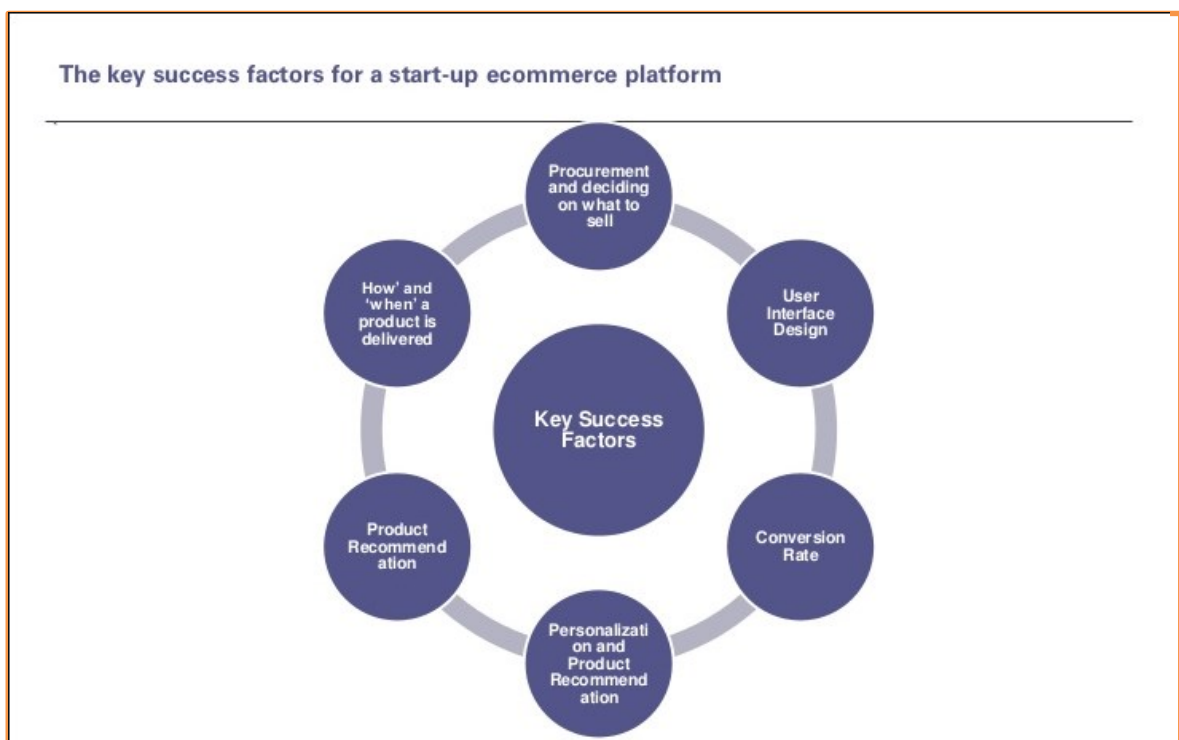


Figure 1: Key Success factor [23]

LITERATURE REVIEW

E-commerce applications support the trading or facilitation of trading of products and services using computer network such as the internet or online social network.

New advance technologies are impacting a wide range of People commercial behaviors, People have started to upgrade their buying habit according to Research Center survey for united state adult. Research shows 80% of people make online purchase, 54% order online using a mobile phone while 18% made a purchase by click or following a link via email or social media websites.

A lot of people have joined the world of E-commerce while many still prefer to going to stores to buy goods. About 65% of people prefer to buy from store to buying online. Substantial number of people says that price are far more important, considering whether there purchase is made online or physical store.

In our world today, 24% of the world shows that none of the purchase they make in a week involve cash and even 39% shows that they don't worry about having cash on hand since they have various payment option. Some percentage of low income and older people are likely to rely on cash as mode of payment.

I. THEORY

1 E-COMMERCE DESIGN TECHNOLOGY AND ARCHITECTURE

To design a website, you must first design the relational database. Databases are often customized to fit a specific application. No two custom applications are the same, and therefore, no two databases are similar.

Guidelines (generally in terms of what not to do instead of what to do) are provided in making design decisions, but the options ultimately rest on the designer. The design concept can be divided into the process model and the data model.

The data model focuses on how the data is connected to each other and how it is processed and stored within the system and what data should be stored in the database.

While the process model keeps track of what actually happens during a bidding process and also deals with how the data is processed. The data model is used for the design of relational tables.

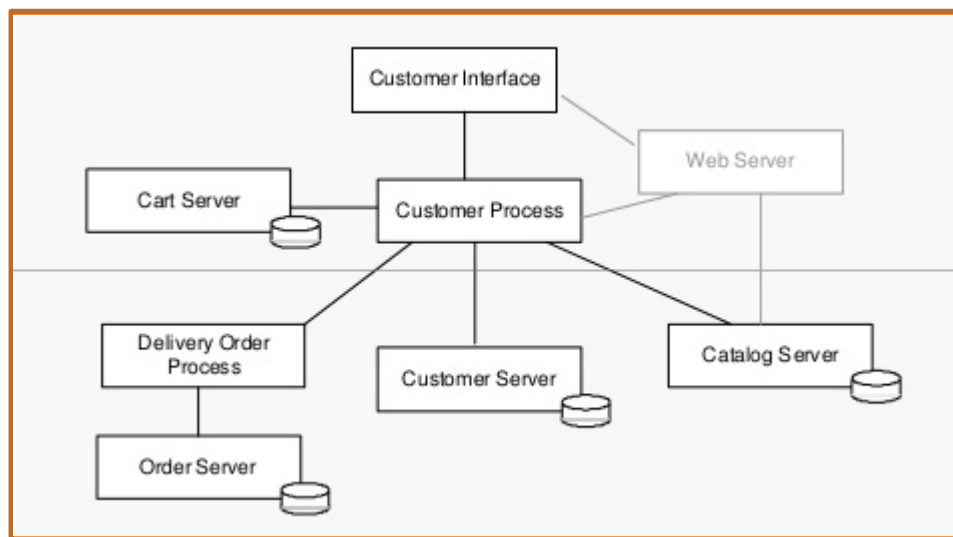


Figure 2: E-Commerce Architecture – Static Description [25]

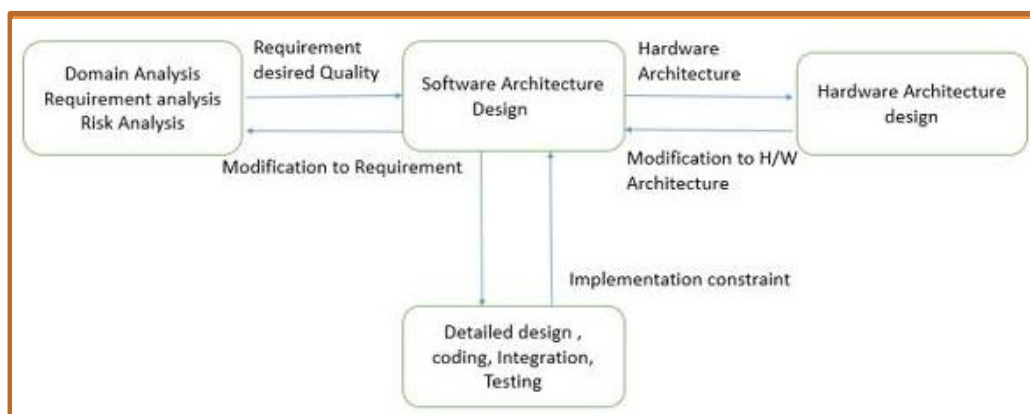


Figure 3: Architecture of the Design [25]

1.1 Data Model

Data models define how the data is connected to each other and how they are processed and stored within the system. The first step in designing a database is to develop an entity relationship diagram (ERD). The ERD is a blue print that can be derived from a relational database. Figure 4 shows the ERD disk for the project which will later show the transformation of the ERD to relational.

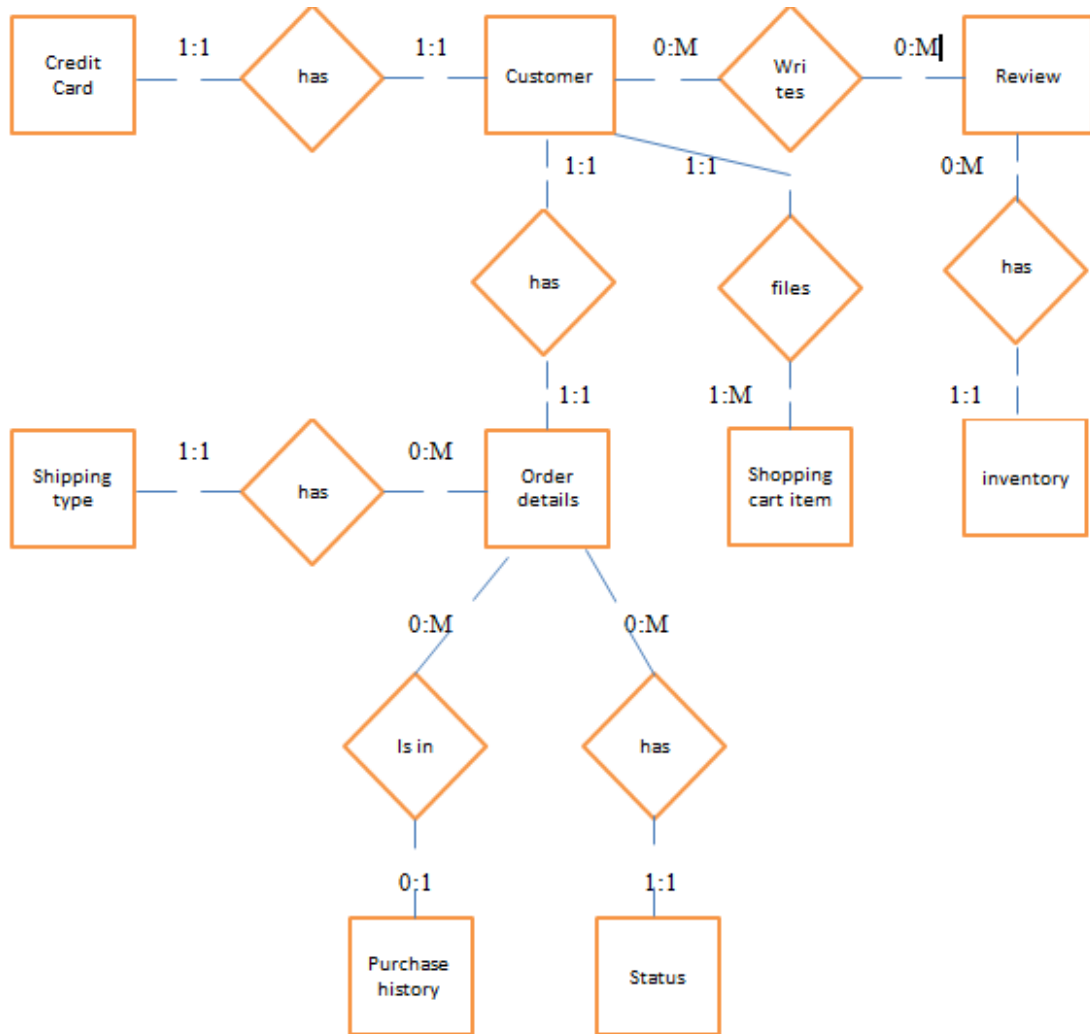


Figure 4: Entity Relationship Diagram (ERD) [27]

Entity A exactly matches a record in the entity B, and each record in B exactly matches a record in A. One to many means that each record in A matches zero or more records in each record in B and B records matches exactly one A. If there is a one to many relationship between two entities, then these entities are represented as associated entities. In the relational database model, each entity will be transformed into a table as shown below

1.2 Design of the Database

In this section, the basic structure of the tables that form the basis of the Database for this project are shown together with information about primary and foreign keys.

BUYER DETAILS

SNO	NAME	TYPE	DESCRIPTION
1	User_ID	Varchar	Primary key for Customer identification
2	Password	Varchar	Security for Customer
3	First_name	Varchar	
4	Last_Name	Varchar	
5	Address	Varchar	
6	City	Varchar	
7	ZipCode	Integer	
8	State	Varchar	
9	Phone_number	Varchar	
10	Email_address	Varchar	

SHOES

SNO	NAME	TYPE	DESCRIPTION
1	<u>InventoryID</u>	Integer	Primary key for Inventory Identification, Size of a shoe
2	Shoe_Name	Varchar	
3	Maker	Varchar	
5	Product_ID	Integer	
6	Price	Double	

STATE_TAX

SNO	NAME	TYPE	DESCRIPTION
1	State_Name	Varchar	Primary key for State Identification
2	Sales_Tax_Rate	Double	Sales tax for each state

SHOPPING_CART_ITEM

SNO	NAME	TYPE	DESCRIPTION
1	Shopping_CartID	Integer	Primary key for Shopping Cart Identification
2	InventoryID	Varchar	Foreign key to Inventory
3	Price	Double	
4	Date	Date	
5	UserID	Varchar	Foreign key to buyer
6	Quantity	Integer	

ORDER_DETAIL

SNO	NAME	TYPE	DESCRIPTION
1	OrderID	Integer	Primary key for Order identification
1	UserID	Char	Foreign key to customer
2	Receiver's Name	Char	If order is to be sent to other address rather than to the customer, we need that address
3	Address	Char	
4	City	Char	

5	Zip	Integer	
6	State	Char	Foreign key to State Tax
7	Type of Shipping	Char	Foreign key to Shipping Type
8	Date of Purchase	Date	

SHIPPING_TYPE

SNO	NAME	TYPE	DESCRIPTION
1	Type of Shipping	Varchar	Primary key to define type of shipping
2	Price	Double	
3	Approximate days for delivery	Integer	

CREDIT_CARD_DETAILS

SNO	NAME	TYPE	DESCRIPTION
1	Credit_Username	Varchar	Primary key for Customer Identification
2	Credit Card Number	Varchar	
3	Card Type	Varchar	Master Card, Visa, Discover
4	CVV Number	Integer	Number present on the back of the card for extra security
5	Expiry Date	Date	
6	UserID	Varchar	Foreign key to Customer

SHOES_REVIEW

SNO	NAME	TYPE	DESCRIPTION
1	InventoryID	Varchar	Size of the shoe on which the review is written
2	Reviews	Varchar	Review on the shoe
3	Rating	Varchar	Rating given to the hoe in a scale of 5
4	Review Date	Date	
5	User Name	Varchar	Name of the user providing the review

1.3 Process Model

A process model tells us how data is processed and how data flows from one table to another to gather the required information. This model consists of the functional decomposition diagram and the data flow diagram.

Functional Decomposition Diagram

A decomposition diagram shows a top-down functional decomposition of a system and exposes the structure of the system. The objective of functional decomposition is to break a system step by step, starting with the main function of a system and continue with the intermediate levels up to the level of elementary functions. The diagram is the starting point for more detailed process diagrams, such as data flow diagrams (DFDs). Figure 5 shows the functional decomposition diagram for this project.

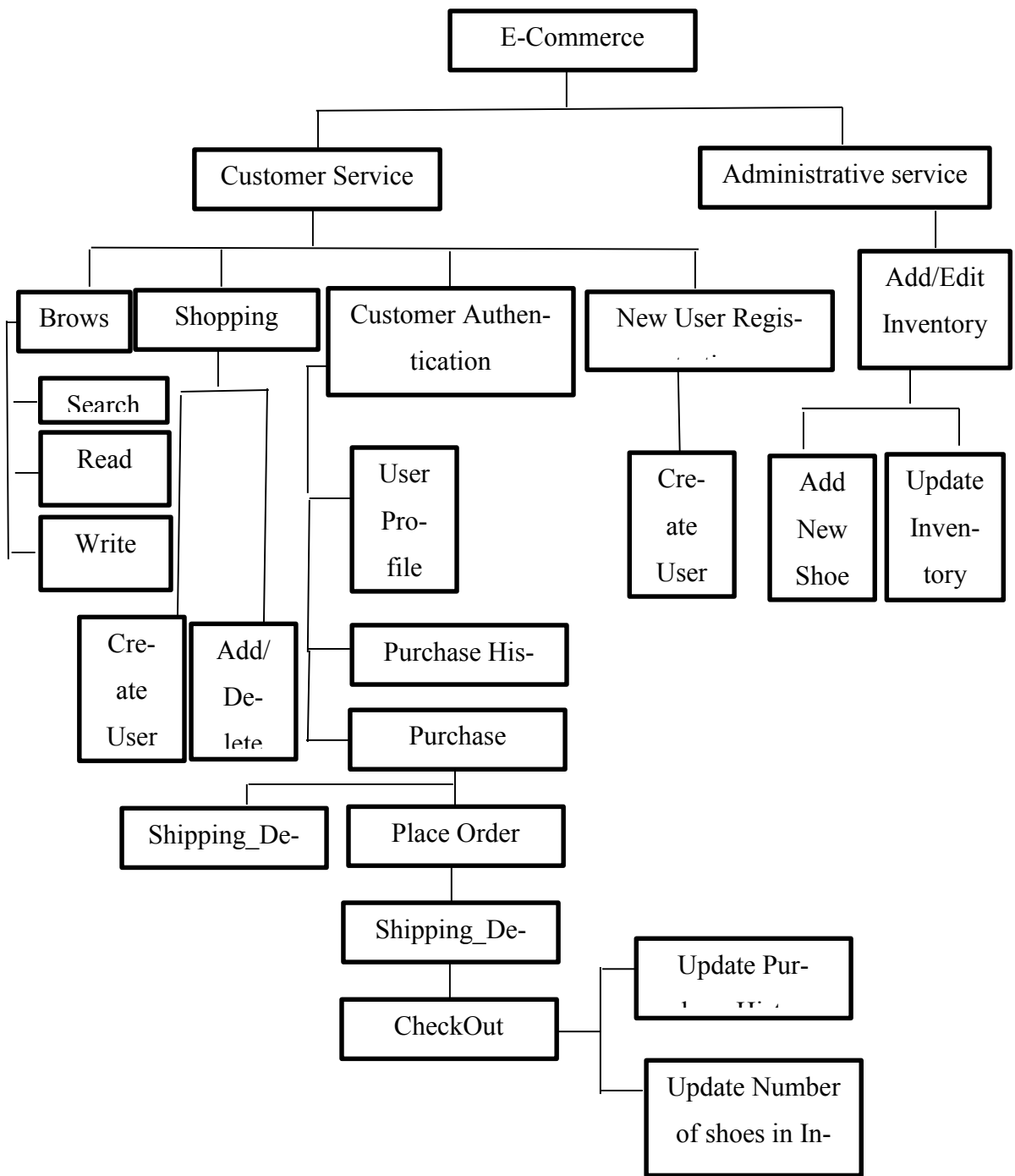


Figure 5: functional decomposition diagram [29]

1.3.1 Data Flow Diagram

Data flow diagrams show the flow of data from external entities in the system, and from one process to another within the system. There are four symbols for the development of a DFD:

- i. Rectangles representing external entities, which are the data sources or destinations.
- ii. Ellipses representing processes, which take the data as input, validate and process it and output it.
- iii. Arrows representing the data streams, which can be electronic data or physical objects.

Open boxes or a disk symbol representing store data, including electronic stores such as databases or XML files, and physical stores such as filing cabinets or paper piles.

Customer-Browse Context DFD

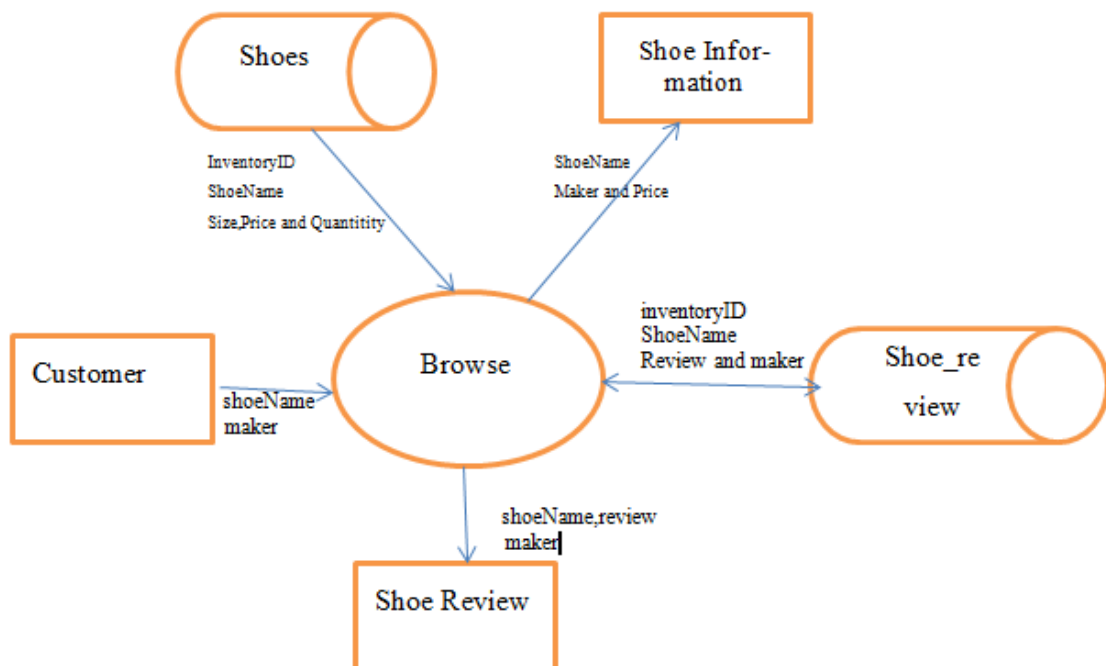


Figure 6: Customer Browse Context [30]

Customer-Browse Context DFD

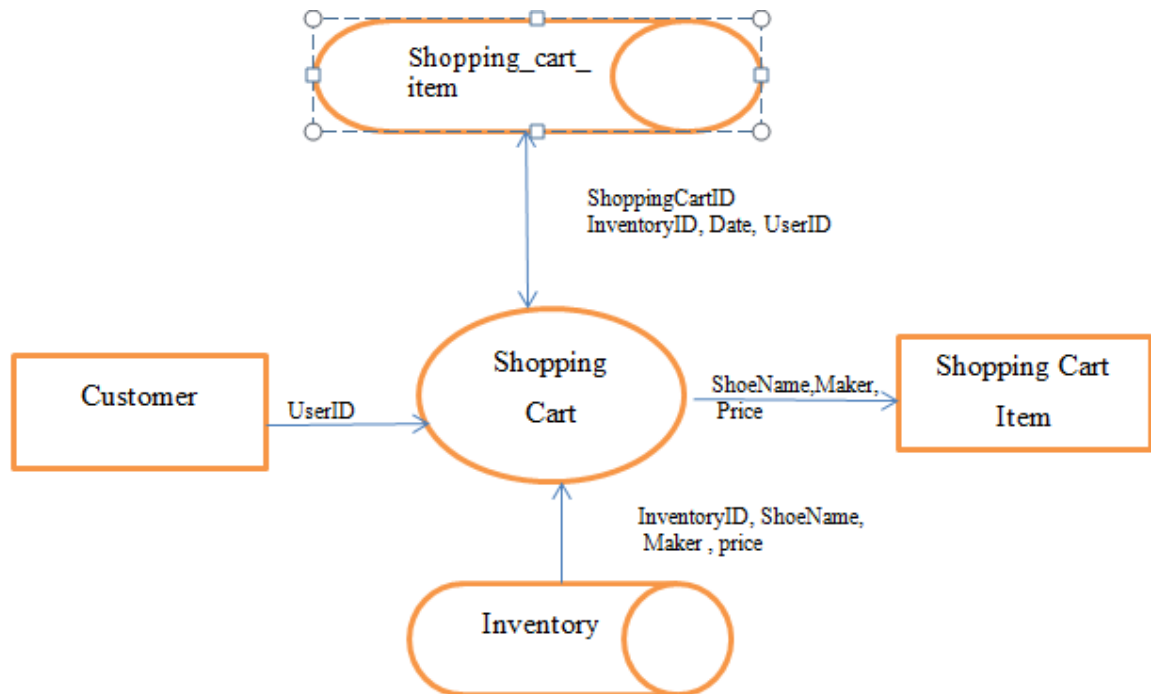


Figure 7: Customer - Shopping Cart DFD []

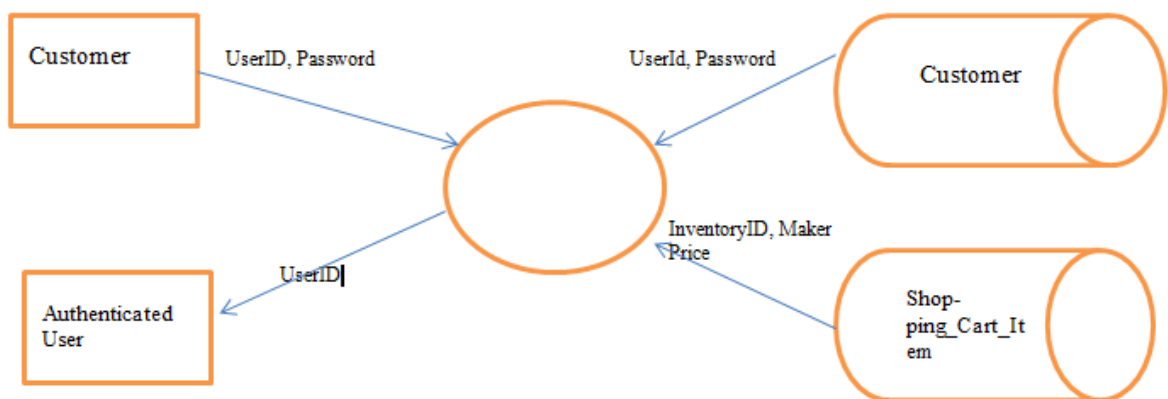


Figure 8: Customer-Authentication Context DFD [31]

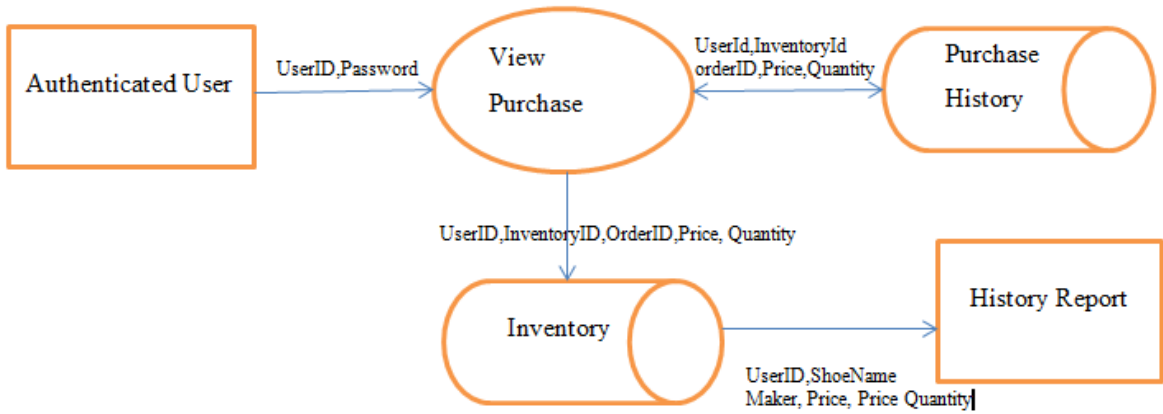


Figure 9: Customer –Authentication-PurchaseHistory DFD [32]

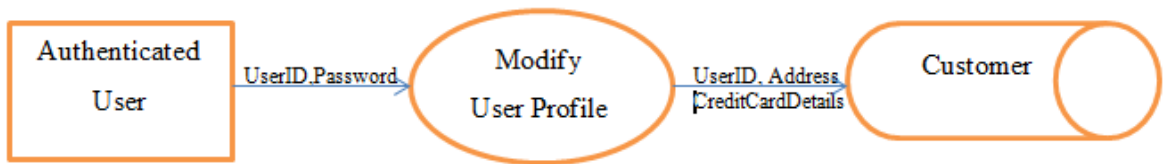


Figure 10: Customer –Authentication-UserProfile DFD

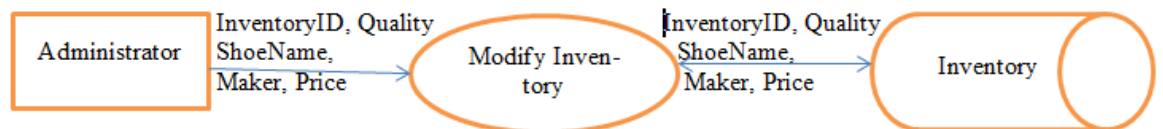
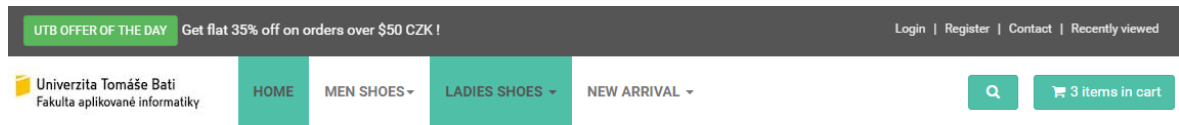




Figure 11: Customer – New User Registration DFD

1.4 User Interface design

Before implementing the current design, some designs were built user interface display user interaction with the system to search for Shoes, create a shopping cart and buy shoes. The user interface design closely our functional decomposition diagram (Figure 2). Figures 9-13 shows the initial web page designs.



Shoes Details				
Shoe Type	Maker	Quantity Available	Price	Add To Cart

Figure 12: Display of Shoes Present in Store



A search form for shoes in a store. It features a search bar at the top with the text "Search". Below it are three input fields labeled "Size:", "Shoe Name:", and "Maker:". At the bottom right of the form is a blue "Submit" button.

Figure 13: Searching for Shoes in the Store



A shopping cart interface. At the top, it says "Shopping Cart". Below this is a table with four columns: "Shoe_Type", "Quantity", "Price", and "Remove". The table has five rows, with the first row containing the column headers and the remaining four rows being empty. At the bottom right of the cart area is a blue "Place Order" button.

Shoe_Type	Quantity	Price	Remove

Figure 14: Shopping Cart for the User

Registration

User ID*

Password*

Confirm Password*

First Name*

Last Name*

Address*

City*

Zip*

State*

Email*

Phone Number*

Figure 15: Registration of New Users

The image shows a user authentication interface within a light blue border. At the top center is a white rectangular button with a thin blue border labeled "Login". Below it, the text "Incorrect Password" is displayed in red. Underneath, there are two input fields: "User Name:" followed by a white box with a blue border, and "Password:" followed by another white box with a blue border. Below the input fields, there are two blue underlined links: "New User" on the left and "Forget Password" on the right. At the bottom center is a blue button with a white border and a drop shadow, labeled "Enter".

Figure 16: Authentication of User

II. ANALYSIS

2 IMPLEMENTATION TECHNIQUES

Internet Information Service (IIS) is a services that depends on Internet for Windows machines. Is a part of the Option Pack for windows. IIS versions 6.0 and includes the FTP server (a standard software for transferring computer files between machines with different operating systems), SMTP (Simple Mail Transfer Protocol, is the de facto standard for the transmission of electronic mail via the Internet) and HTTP / HTTPS (is the safe version of HTTP, the communication of the World Wide Web protocol) [12]. Features:

The web server itself is not able to directly execute the server-side processing, but can delegate the task of ISAPI (IIS) programming interface in the application server. Microsoft provides a number of them, including ASP and ASP.NET page. Compatibility: Internet Information Server is designed to run on Windows Server operating systems. A limited version that supports a web site and a limited number of connections also comes with Windows10. Microsoft has also changed the server account that runs in IIS. In IIS versions earlier than 6.0, all functions performed in the system account, which allows you to run wild exploits in the system. 6.0 In many of the processes they have been with an account of network services that have less privileges. In particular, this means if there was a vulnerability in that property, it would not necessarily endangered throughout the system.

2.1 Asp.Net

ASP.NET is a web development platform, which provides a programming model, a comprehensive software infrastructure and various services required to build up robust web applications for PC, as well as mobile devices. ASP.NET works on top of the HTTP protocol, and uses the HTTP commands and policies to set a browser-to-server bilateral communication and cooperation.

ASP.NET is a part of Microsoft .Net platform. ASP.NET applications are compiled codes, written using the extensible and reusable components or objects present in .Net framework. These codes can use the entire hierarchy of classes in .Net framework. The ASP.NET application codes can be written in any of the following languages: C# Visual Basic, Net Jscript, J#

ASP.NET is used to produce interactive, data-driven web applications over the internet. It consists of a large number of controls such as text boxes, buttons, and labels for assembling, configuring, and manipulating code to create HTML pages.

2.2 Authentication in ASP.NET

Authentication is the process of obtaining identification credentials such as name and password from a user and validating those credentials against some authority. If the credentials are valid, the entity that submitted the credentials is considered an authenticated identity. Once an identity has been authenticated, the authorization process determines whether that identity has access to a given resource. ASP.NET implements authentication through authentication providers, the code modules that contain the code necessary to authenticate the requestor's credentials. The topics in this section describe the authentication providers built into ASP.NET.

Window Authentication Provider, Provides information on how to use Windows authentication in conjunction with Microsoft Internet Information Services (IIS) authentication to secure ASP.NET applications.

Form Authentication Provider, Provides information on how to create an application-specific login form and perform authentication using your own code. A convenient way to work with forms authentication is to use ASP.NET membership and ASP.NET login controls, which together provide a way to collect user credentials, authenticate them, and manage them, using little or no code.

2.3 MySQL Database

MySQL is used as the backend database in this project. MySQL is an open-source database management system.

MySQL is a relational database management system. A table is called relation because it is an accumulation of objects of the same type.

2.4 Integrating IIS and ASP.NET

IIS 7 and above takes ASP.NET further by integrating the ASP.NET runtime extensibility model with the core server. This allows developers to fully extend IIS server with the richness of ASP.NET 2.0 and the .NET Framework, instead of using the less capable IIS C++ APIs. Existing ASP.NET applications also immediately benefit from tighter integration by using existing ASP.NET features like Forms authentication, roles, and output caching for all content. While IIS provides the improved ASP.NET integration by default, there is a

choice: IIS supports both the new and the old ASP.NET integration modes that can be used side by side on the same server.

2.5 Integrating Website and Database

To accommodate for various features that you might want in an online store, Define clear goals for what the database to achieve and why you want to carry it out.

Customers ordering a need for the e-commerce website to get information about products and services from a supplier questions, select the items you want to buy and send the payment information. Suppliers must be able to keep track of preferences and customer requirements and process orders. With a base of well-organized data it is essential for the development and the maintenance of an electronic commerce site.

2.6 Web Based Application Development

Web application development is the process and practice of developing web applications. Below are web development Technologies.

Ajax, ASP, ASP.NET, Action Script, CSS, ColdFusion, CGI HTML, Java, JavaScript, JSP, Visual LANSA, Lasso, Node.js, OSGI, Perl, PHP, PSGI, Python Ruby,CMS.

Tools for web development varies according to program language, In the case of ASP.NET, a developer can use Microsoft Visual Studio to write code. But, as with most other programming languages text editor is most recommended. Notepad++ is an example, there are other tools free and paid tools

2.7 Database Connectivity

A database connection is the means by which a database server and its client software communicate with each other. The term is used whether or not the client and the server are on different machines. The client uses a database connection to send commands to and receive replies from the server. A database is stored as a file or a set of files on magnetic disk or tape, optical disk, or some other secondary storage device. The information in these files may be broken down into records, each of which consists of one or more fields. Fields are the basic units of data storage, and each field typically contains information pertaining to one aspect or attribute of the entity described by the database. Records are also organized into tables that include information about relationships between its various fields. Although

database is applied loosely to any collection of information in computer files, a database in the strict sense provides cross-referencing capabilities.

Connections are built by supplying an underlying driver or provider with a connection string, which is used to address a specific database or server and to provide instance and user authentication credentials (for example, Server=sql_box;Database=Common;User ID=uid;Pwd=password;).

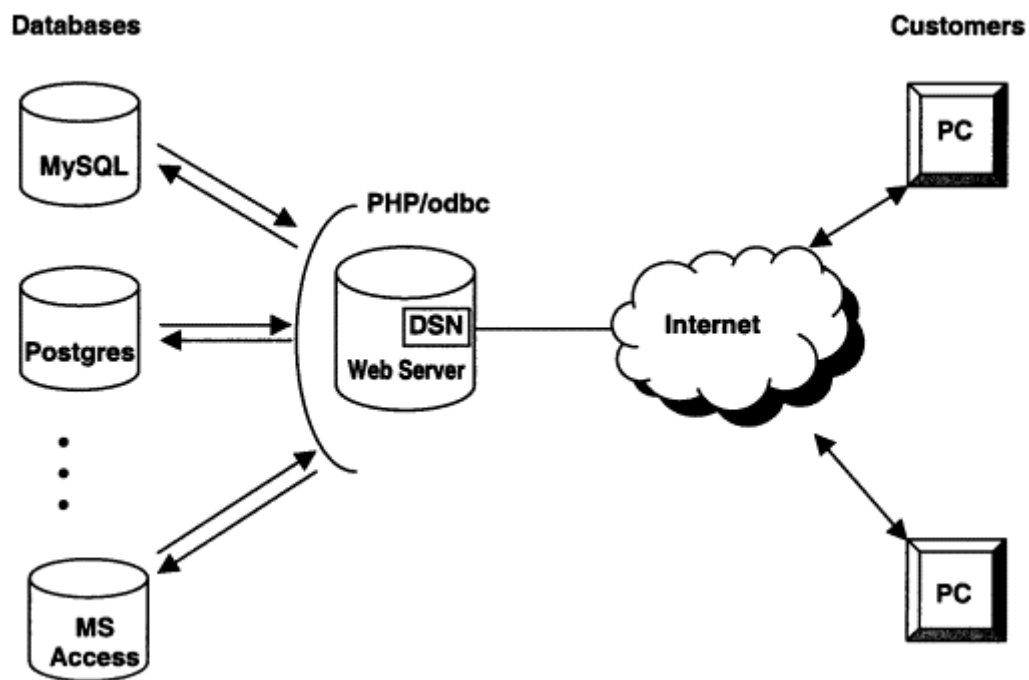


Figure 17: The Conceptual Model

3 THE SHOPPING CART APPLICATION

The objective of this application is to provide the user an online website where they can buy shoes from the comfort of their home. A shopping cart is used for the purpose. The user can select the desired shoes, place them in the shopping cart and purchase them using a Credit Card. The user's order will be shipped according to the type of shipping selected at the time of placing the order.

Website consists of the following web pages:

- AddShoes.aspx
- ShoeDetails.aspx
- ShoeReview.aspx
- Shoes.aspx
- ChangePassword.aspx
- CheckOut.aspx
- FinalOrder.aspx
- Footer.ascx
- ForgotPassword.aspx
- LogOff.aspx
- Menu.ascx
- Order.aspx
- PurchaseHistory.aspx
- Registration.aspx
- Search.aspx
- ShoppingCart.aspx
- UserDetails.aspx

Below figures show some screenshots taken from running the application. All the functionalities are explained accordingly. When the user types the web address in the browser, the main page of the application is displayed which has the list of the top four popular shoes available in the store, as shown below, Figure 18.

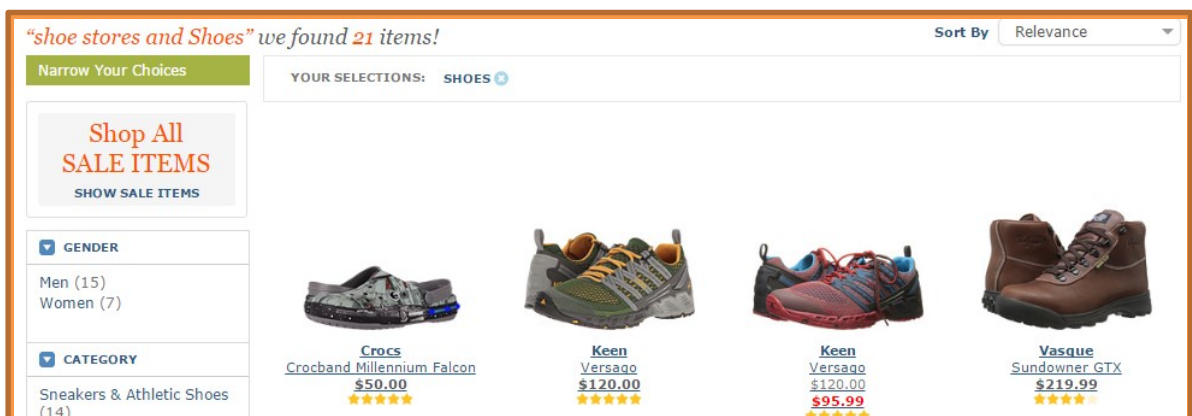


Figure 18: Popular Shoes Available

3.1 Search for Shoes

Shoes can be searched based on the Maker or product ID. When searching for shoes by product ID or Name “e.g. Adidas”, as shown in Figure 19.

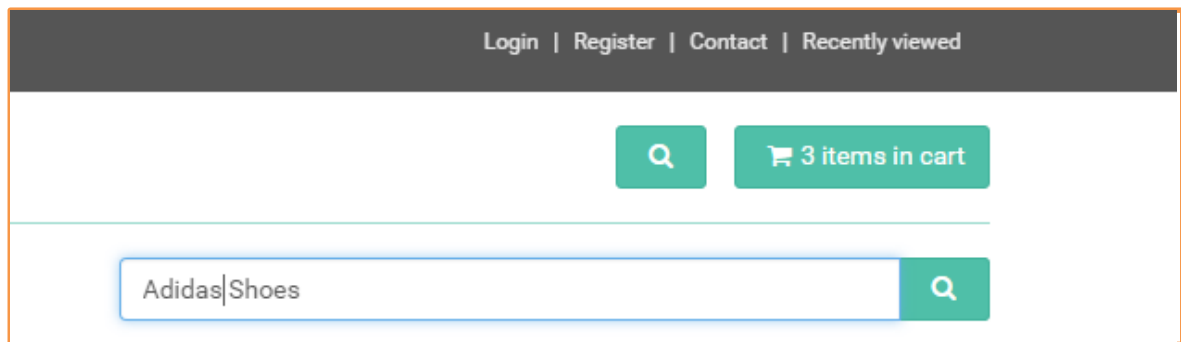


Figure 19: Shoe Search

3.2 Registration Of New User

The “*” beside the label indicates the required field for successful registration on the shoe Store website. If the required value is not entered, a warning message is displayed. If a user with same UserID already exists a message is also displayed. Clicking on Reset will clear all the fields and Submit will submit the information for the registration. Upon successful completion, the user is directed to the Shoes website page. As shown in Figure 15 Above.

3.3 User Details

On clicking “User Details”, the detailed profile information of the user who is currently logged in are displayed.

Here the users can change their profile except for the UserID and these details will be reflected in the database only when the Update button is clicked. If the user has placed any order previously, those details can be viewed by clicking on the Purchase History button.

3.4 Shopping Cart

When “Add to Cart” is clicked for any shoe, it is added to the shopping cart illustrated in Figure 20 Below. If that particular shoe is already present in the shopping cart, the quantity is increased by 1 and the price is changed accordingly; if not, a new entry is made into the

table. All the information in the shopping cart is stored in “shopping_cart_items” table. Adding a shoe into the shopping cart does not decrease the quantity of shoes in the Shoes table. It is decreased only after an order is placed for the shoe. So, placing the shoe in the shopping cart does not guarantee the availability of the shoe at the time of placing the order.

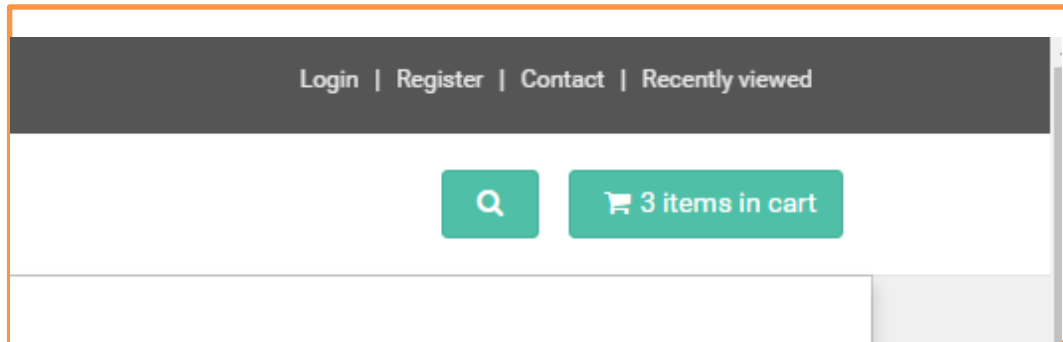


Figure 20: Shopping Cart

3.5 Place Order

When “Place an Order” button is clicked which is located on the bottom of the shopping cart, the application will ask the user to login if he has not already done so.



Product	Quantity	Unit price	Discount	Total
 White Blouse Armani	2	\$123.00	\$0.00	\$246.00
 Black Blouse Armani	1	\$200.00	\$0.00	\$200.00
Total				\$446.00

Figure 21: Place Order

3.6 Order Shipping Address

Shipping is the process of transporting an item, usually through the mail. Shipping is a very basic, common way of getting an item from one place to another, or from one person to another. While shipping address is the address (location) you would like the merchandise to be delivered to. Shipping address is normally located at the checkout module of an e-

commerce web application. Most Ecommerce stores prefer to ship to the billing address due to online scam.

Shipping agencies and Post office are the agent that are responsible for the shipment of goods from one location to another. The most common well known shippers are FedEx, Dhl, Ups, TNT and Postal Services.

The price of the shipment depends on the distance of the buyer from the store. The shipping and billing address are different in the sense that billing address is the address on who the invoice will be generated. In most cases billing address always match the address on the buyer credit card.

Address		Delivery Method	Payment Method	Order Review	
Firstname	ENIOLA	Lastname	ONI		
Company		Street	nám. T. G. Masaryka 5555		
Company	ZLIN	ZIP	76001	State	Country
Telephone	774591511	Email	onieniola123@gmail.com		

Figure 22: Shipping Address

3.7 Order Delivery Method

Order delivery or parcel delivery is the delivery of shipping containers, parcels, or high value mail as single shipments. The service is provided by most postal systems, express mail, private package delivery services, and less than truckload shipping carriers

Same-day delivery for local parcels (such as documents) has long been available by local courier. Rail and air transport made same-day delivery feasible over longer distances; for example, packages shipped in the early morning can be delivered (at relatively high cost) anywhere in Europe. Retail goods were seldom sold with shipping any faster than overnight.

Packaging needs to be designed for the potential hazards which may be encountered in parcel delivery systems. The major carriers have a packaging engineering staff which provides packaging guidelines and sometimes package design and package testing services.

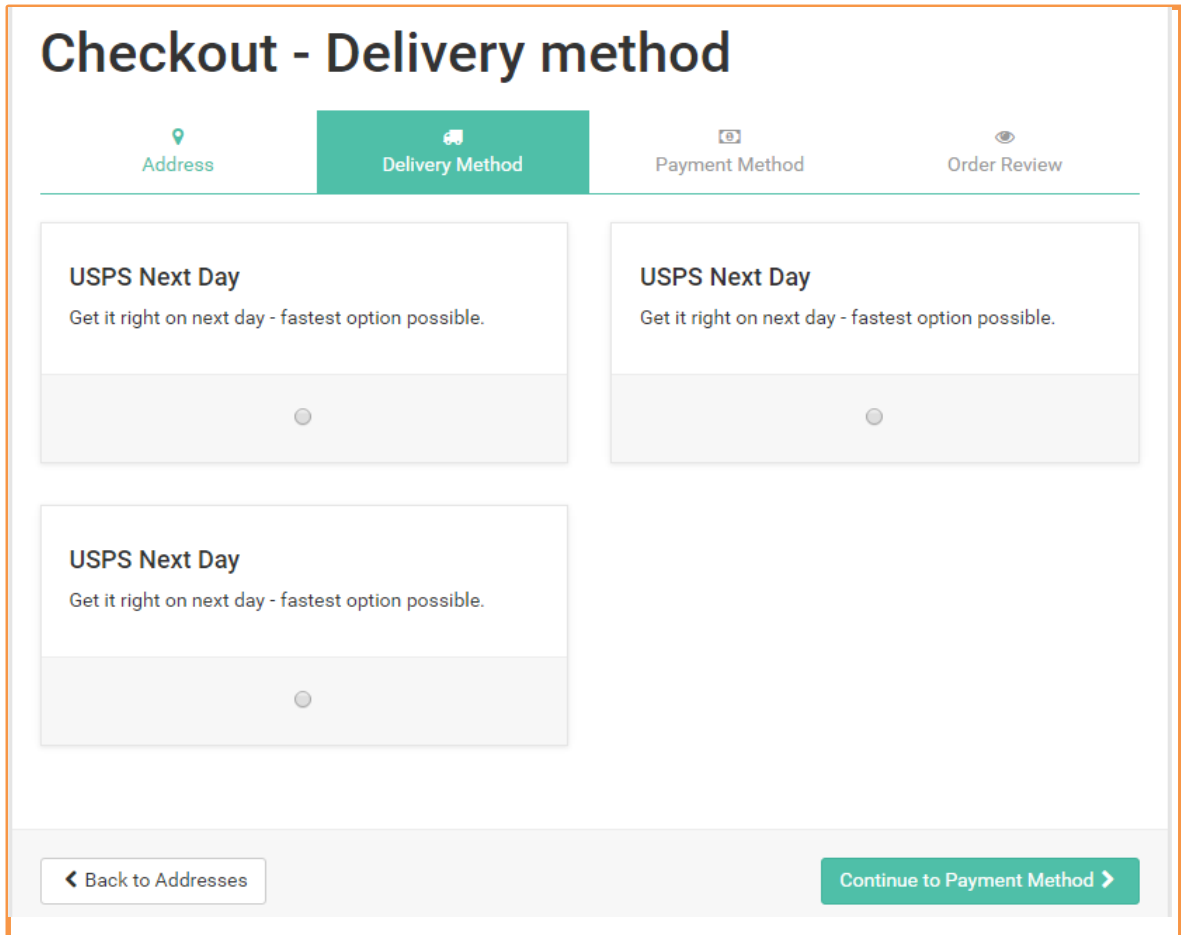


Figure 23: Delivery Interface

3.8 Checkout Payment Method

An e-commerce payment system facilitates the acceptance of electronic payment for online transactions. Also known as a sample of Electronic Data Interchange (EDI), e-commerce payment systems have become increasingly popular due to the widespread use of the internet-based shopping and banking.

Over the years, credit cards have become one of the most common forms of payment for e-commerce transactions. In Europe almost 90% of online retail transactions were made with this payment type, it would be difficult for an online retailer to operate without supporting credit and debit cards due to their widespread use. Increased security measures include use of the card verification number (CVN) which detects fraud by comparing the verification number printed on the signature strip on the back of the card with the information

on file with the cardholder's issuing bank. Also online merchants have to comply with stringent rules stipulated by the credit and debit card issuers (Visa and MasterCard) this means that merchants must have security protocol and procedures in place to ensure transactions are more secure. This can also include having a certificate from an authorized certification authority (CA) who provides PKI (Public-Key infrastructure) for securing credit and debit card transactions.

Methods of online payment - Credit cards constitute a popular method of online payment but can be expensive for the merchant to accept because of transaction fees primarily. Debit cards constitute an excellent alternative with similar security but usually much cheaper charges. Besides card-based payments, alternative payment methods have emerged and sometimes even claimed market leadership. Wallets like PayPal and Alipay are playing major roles in the ecosystem. Bitcoin payment processors are a cheaper alternative for accepting payments online which also offer better protection from fraud.

Net banking- It does not involve any sort of physical card. It is used by customers who have accounts enabled with Internet banking. Instead of entering card details on the purchaser's site, in this system the payment gateway allows one to specify which bank they wish to pay from. Then the user is redirected to the bank's website, where one can authenticate oneself and then approve the payment. Typically there will also be some form of two-factor authentication. It is typically seen as being safer than using credit cards, with the result that nearly all merchant accounts in Europe offer it as an option. A very similar system, known as iDEAL, is popular in the Netherlands.

PayPal - PayPal is a global e-commerce business allowing payments and money transfers to be made through the Internet. Online money transfers serve as electronic alternatives to paying with traditional paper methods, such as cheques and money orders. It is subject to the US economic sanction list and other rules and interventions required by US laws or government. PayPal is an acquirer, a performing payment processing for online vendors, auction sites, and other commercial users, for which it charges a fee. It may also charge a fee for receiving money, proportional to the amount received. The fees depend on the currency used, the payment option used, the country of the sender, the country of the recipient, the amount sent and the recipient's account type. In addition, eBay purchases made by credit card through PayPal may incur extra fees if the buyer and seller use different currencies. On October 3, 2002, PayPal became a wholly owned subsidiary of eBay. Its corporate headquarters are in San Jose, California, United States at eBay's North First Street satellite office

campus. The company also has significant operations in Omaha, Scottsdale, Charlotte and Austin in the United States; Chennai in India; Dublin in Ireland; Berlin in Germany; and Tel Aviv in Israel. From July 2007, PayPal has operated across the European Union as a Luxembourg-based bank

Paymentwall, an e-commerce solutions providing company launched in 2010, offers a wide range of online payment methods that its clients can integrate on their website.

Google Wallet was launched in 2011, serving a similar function as PayPal to facilitate payments and transfer money online. It also features a security that has not been cracked to date and the ability to send payments as attachments via email

In developing countries the banked population is very less, especially in tier II and tier III cities. Taking the example of India, there are more mobile phone users than there are people with active bank accounts. Telecom operators, in such geographies, have started offering mobile money wallets which allows adding funds easily through their existing mobile subscription number, by visiting physical recharge points close to their homes and offices and converting their cash into mobile wallet currency. This can be used for online transaction and ecommerce purchases. Many payment options such as Airtel Money in Nigeria and M-Pesa in Kenya, ATW are being accepted as alternate payment options on various ecommerce websites.

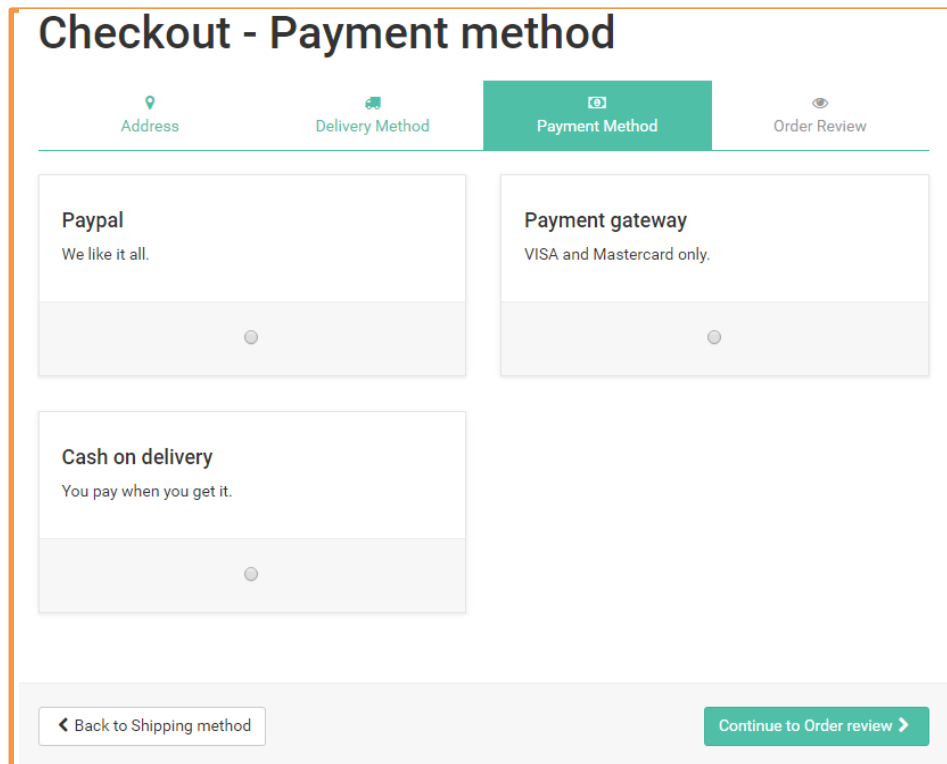


Figure 24: Check - Payment Interface

3.9 Order review

This is an over view the total order purchased also this enable buyer to see if there are no change in the specified order, during the order review, there is an options that will enables buyer to edit and add more product.

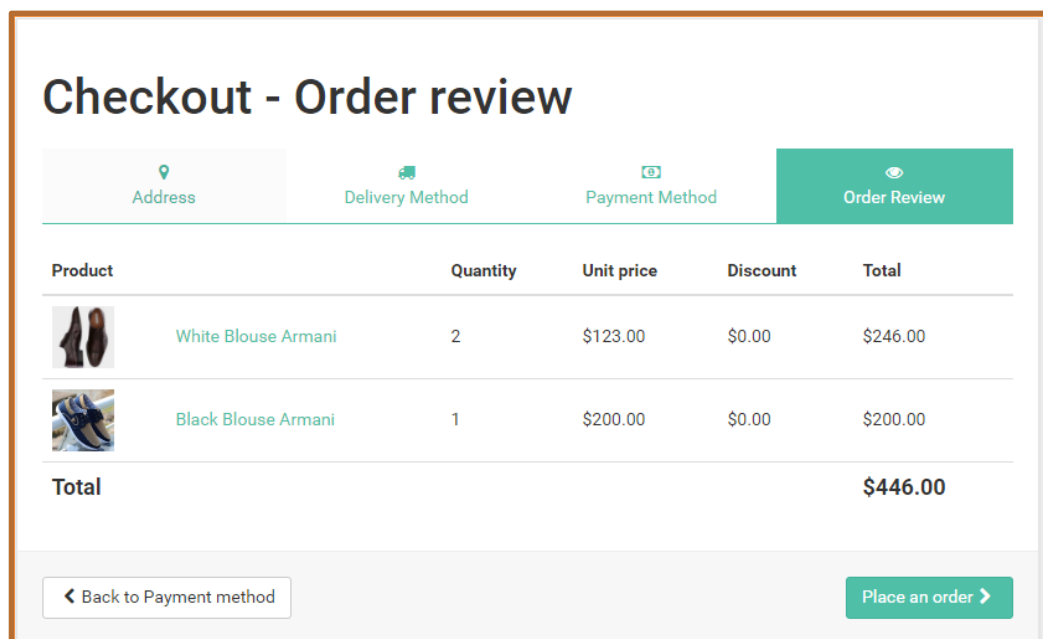


Figure 25: Order review Interface

4 THE STORE BACKEND

The back end is the "heart" of e-commerce system.

It is, first of all, the point of origin and operation and maintenance of all data that can be viewed in the online shop (items with their attributes, category structure, promotional banners, etc.)... Using the form of back-end you can define, in addition, promotional campaigns, details on sales, presence (open and visible site) in a given country, and more.

The back end is also the engine management of orders from the moment they are captured by front-end. It is this component that communicates with Logistics to generate pick lists, handles any partial orders, charges the customer's credit card at time of shipment, manage any returns and so on.

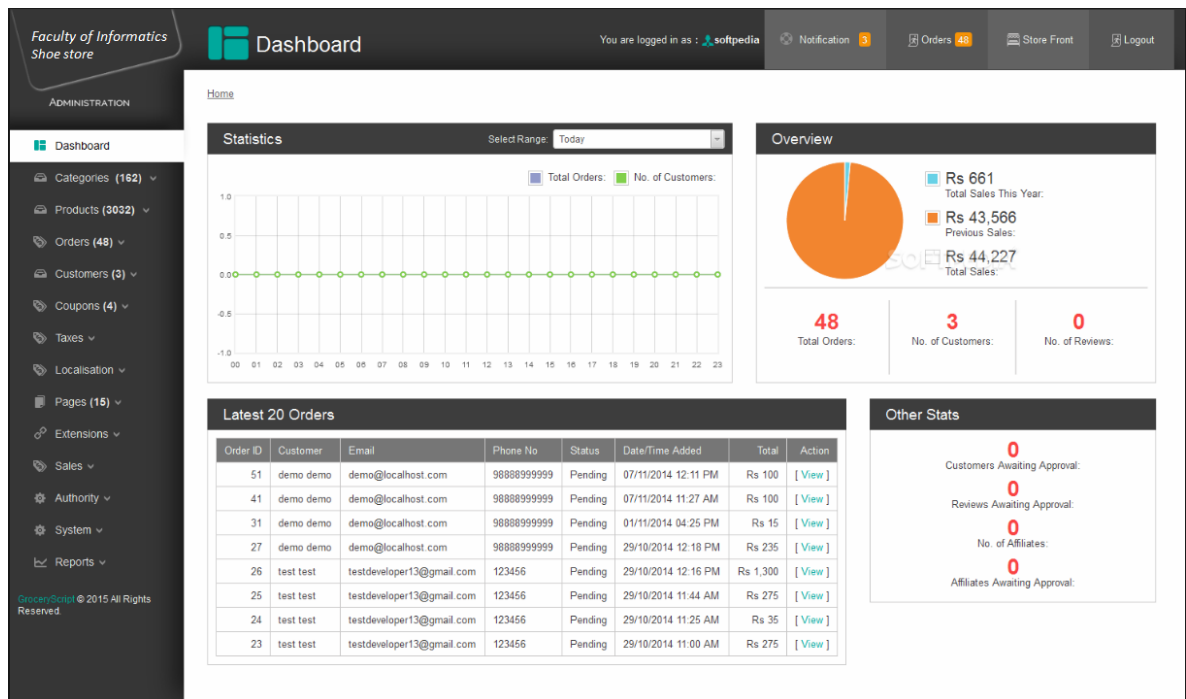


Figure 26: Back-end Over View [32]

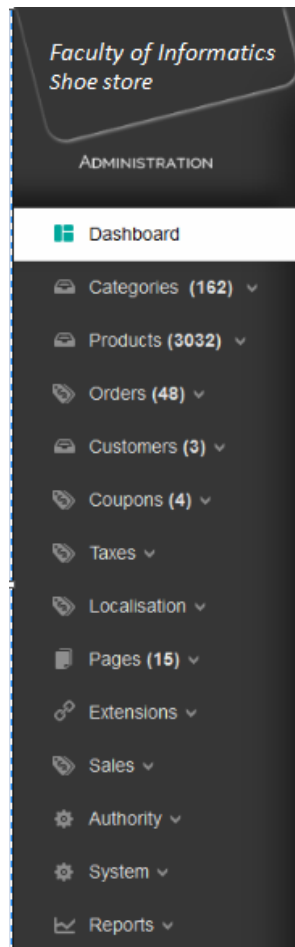


Figure 27: Administrator Control Unit [33]

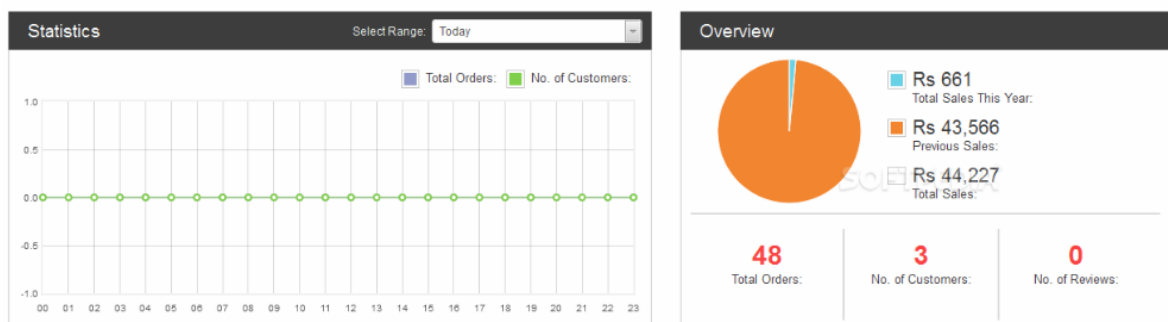


Figure 28: Statistics of Item Ordered [34]

Latest 20 Orders							
Order ID	Customer	Email	Phone No	Status	Date/Time Added	Total	Action
51	demo demo	demo@localhost.com	98888999999	Pending	07/11/2014 12:11 PM	Rs 100	[View]
41	demo demo	demo@localhost.com	98888999999	Pending	07/11/2014 11:27 AM	Rs 100	[View]
31	demo demo	demo@localhost.com	98888999999	Pending	01/11/2014 04:25 PM	Rs 15	[View]
27	demo demo	demo@localhost.com	98888999999	Pending	29/10/2014 12:18 PM	Rs 235	[View]
26	test test	testdeveloper13@gmail.com	123456	Pending	29/10/2014 12:16 PM	Rs 1,300	[View]
25	test test	testdeveloper13@gmail.com	123456	Pending	29/10/2014 11:44 AM	Rs 275	[View]
24	test test	testdeveloper13@gmail.com	123456	Pending	29/10/2014 11:25 AM	Rs 35	[View]
23	test test	testdeveloper13@gmail.com	123456	Pending	29/10/2014 11:00 AM	Rs 275	[View]

Figure 29: Ordered Item Overview [35]

The following features implemented in the back-end (unless otherwise specified, the data described below can be imported from external sources):

- Managing the list of nations that make the site accessible
- Manage catalog items
 - Definition of one or more catalogs
 - Multi-level hierarchy of categories
 - Basic data products: code, name, brief description, long description (multi-language), internal cost
 - Association-product categories (a product can belong to multiple categories)
 - Definition of attributes and attribute groups: size, color, season, line, fit, leg line, occasion. The definition of the attributes is totally free and flexible, as you can create a virtually unlimited number of attributes with the desired characteristics. Each element thus defined can then be used as a filter criterion in the front-end.
 - Defining cross-sell and up-sell
- Manage price lists multi-country and multi-currency
- Inventory
- Definition of promotions (eventually related to coupon codes to be inserted at checkout), with validity period
- Definition and management of the firm. For each country you can define different product groups and different discounts
- Imaging, with the possibility of automatic processing and with multiple images for each product and flexible size/resolution

- Banner management / media
- Order management process (unattended)
 - New order from front-end
 - Order confirmation notice to the client (multi language)
 - Fraud evaluation
 - Payment authorization (full amount)
 - Generation (export) pick-list
 - Import packing list
 - Import shipment confirmation
 - Invoice generation (single or multiple, depending on the presence of a tax representative in the country of destination of goods) - multi language
 - Communication for dispatch to the customer order (multi language)
 - Updated stock information, and push towards the front-end
 - Send update information stock (T-Log) to any external systems
 - Settlement / capture (credit card charge apply)
 - Generation, if necessary, to confirm opening for RMA logistics / business systems
 - Import QC results upon receipt of a Return (accepted, declined)
 - Refund to the customer upon acceptance of a Return
 - Enter accounting information, both synthetic and analytical.
- Order management functionality (interactive mode)
 - List View orders
 - Finding one or more orders on the basis of various criteria
 - Viewing details of an order (customer data, ordered items, articles actually shipped, payment logs, returns, adjustment, feedback from users back office, e-mail sent to the customer)
 - Creating and managing requests authorization (RMA)
 - Creating adjustment (refund to the customer) and the related credit notes
 - Re-send an email to the customer previously generated, or sending a new message based on a specific template
 - Print invoices
- Business Intelligence and Reporting engine (with features of exports in various formats including Excel and PDF)

- Order List
- Sales list and shipments (with detail items)
- Invoices / Credit Notes
- VAT register (if necessary)
- Product Catalog with quantities in stock
- Price lists for product / country
- Profitability and margins

The whole platform infrastructure (back-end, front-end, database server) can be hosted “in the cloud”.

4.1 Module Manager

Module Manager is an extension that changes the way your Module manager works. It adds a multitude of functions, like:

- Menu Item
- Homepage
- Date range
- User Group Levels
- Languages
- Templates
- URLs
- Operating Systems
- Browsers
- Components
- Content Page Types
- Categories
- Articles
- Tags
- ...and more

4.2 Plugin Manager

The plugin manager is accessed from the back-end administrator panel. It is used to edit an installed plugin's details and options. The Plugin Manager allows to enable and disable plugins and to edit a plugin's details and options. It is also useful for quickly enabling/disabling multiple plugins at once. Figure 30 Shows Architecture of Plugin Engine. If plugin updates are available, the Plugin Manager will automatically display a notification within the Updates menu point. Clicking on this menu point opens to an overview of all possible updates for your installed plugins. Plugins can be updated directly from the Plugin Manager. After starting an update, the system will check whether or not the update was successful and notify you of the update status. The plugin detail page will appear several places throughout the plugin manager (i.e. when opening a plugin in a category or the Installed listing. Depending on the status, the detail page can appear different for each plugin.

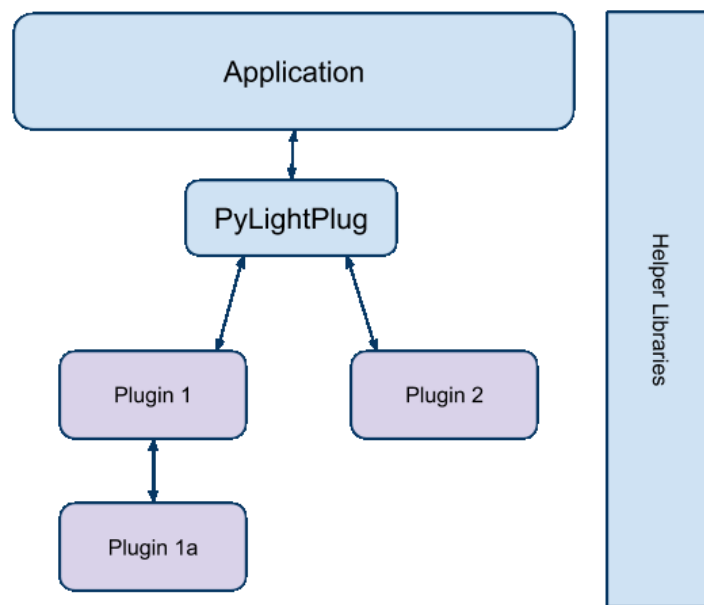


Figure 30: Plugin Engine [36]

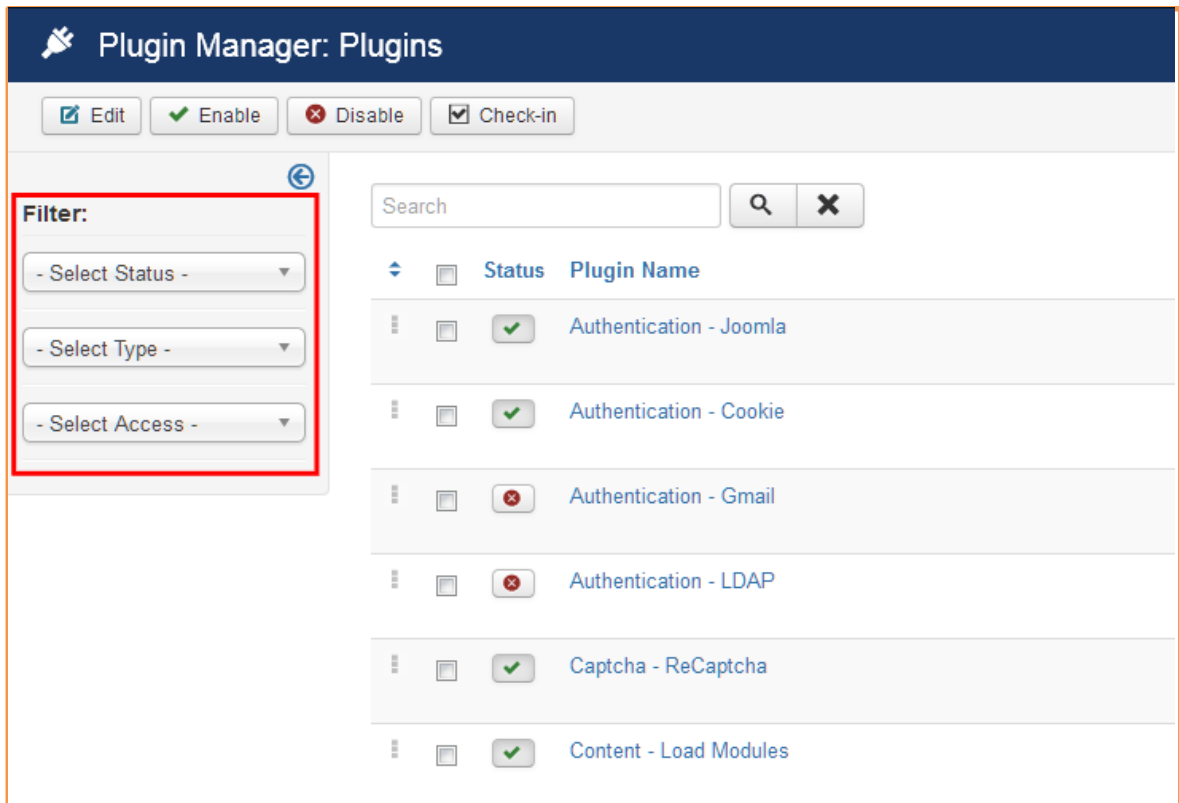


Figure 31: Plugin Manager Interface Search filter [37]

4.3 Template Manager

A template is a type of extension that changes the way your site looks. There are two types of templates used by the CMS: Front-end Templates and Back-end Templates. The Front-end Template controls the way your website is presented to the user viewing the website's content. The Back-end Template controls the way your website's administrative tasks are presented for controlling management functions by an Administrator. These would include common tasks such as: user, menu, article, category, module, component, plugin and template management.

Template overrides override the core 'layout views' of Components, Modules and the files of /layout/.

To Access the Template Manager.

Log in to the Administrator (Backend), Click on: Extensions → Templates.

There are two methods available for accessing the Template Manager: Customize Template. The Customize Template interface allows for editing the actual code found in the template files, creating template overrides and template file manipulation.

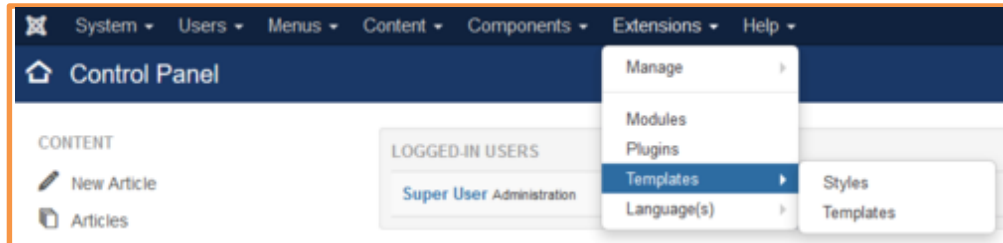


Figure 32: Template Access [38]

Following are the simple steps to edit the Template Manager in Joomla.

Step (1) – Click Extensions → Template Manager as shown below.

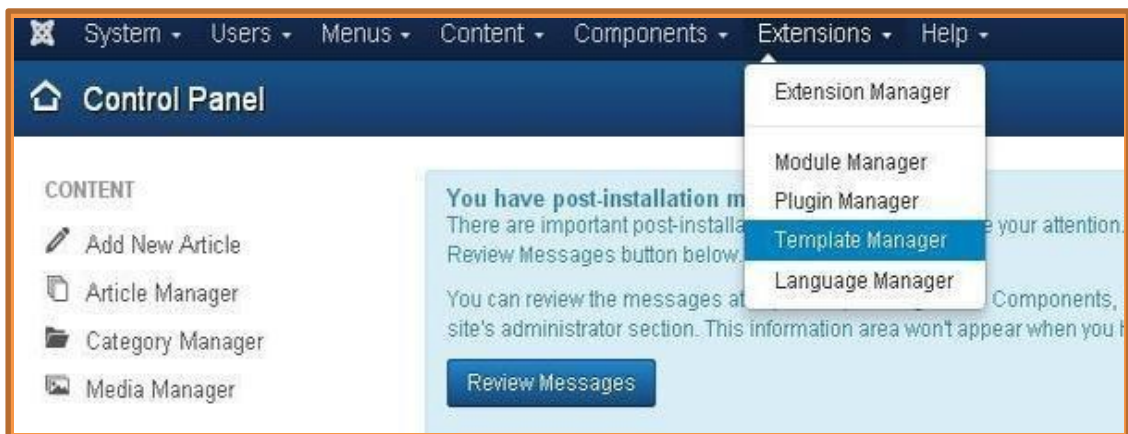


Figure 33: Template Access [39]

Step (2) – Template Manager: Styles page get displayed as shown below. Here, you can click directly on any of the templates listed in Template column.

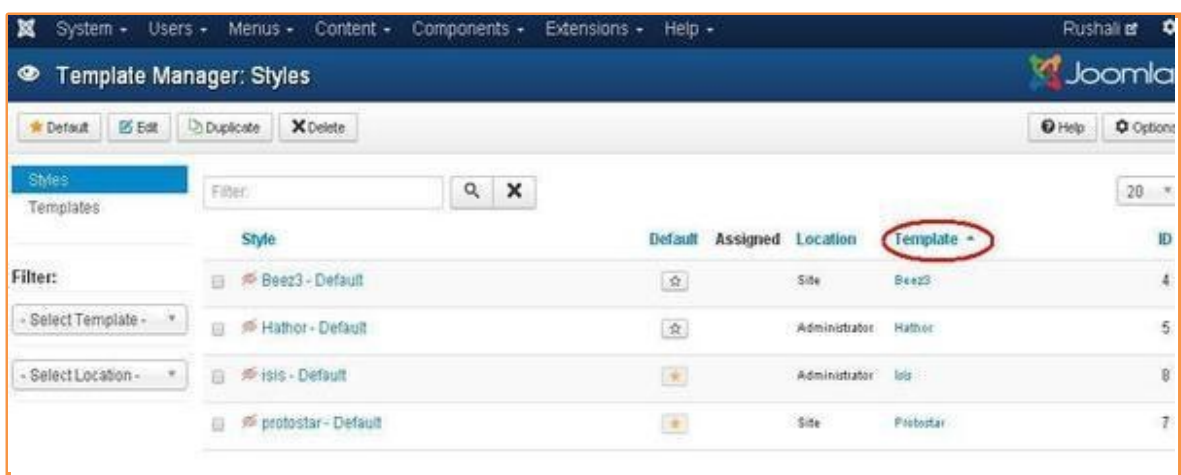


Figure 34: Template Access [40]

Step (3) – after clicking on any one of the above templates you will get the screen as shown below. In the Editor tab, template files are listed on the left side of the page as seen in the screenshot below

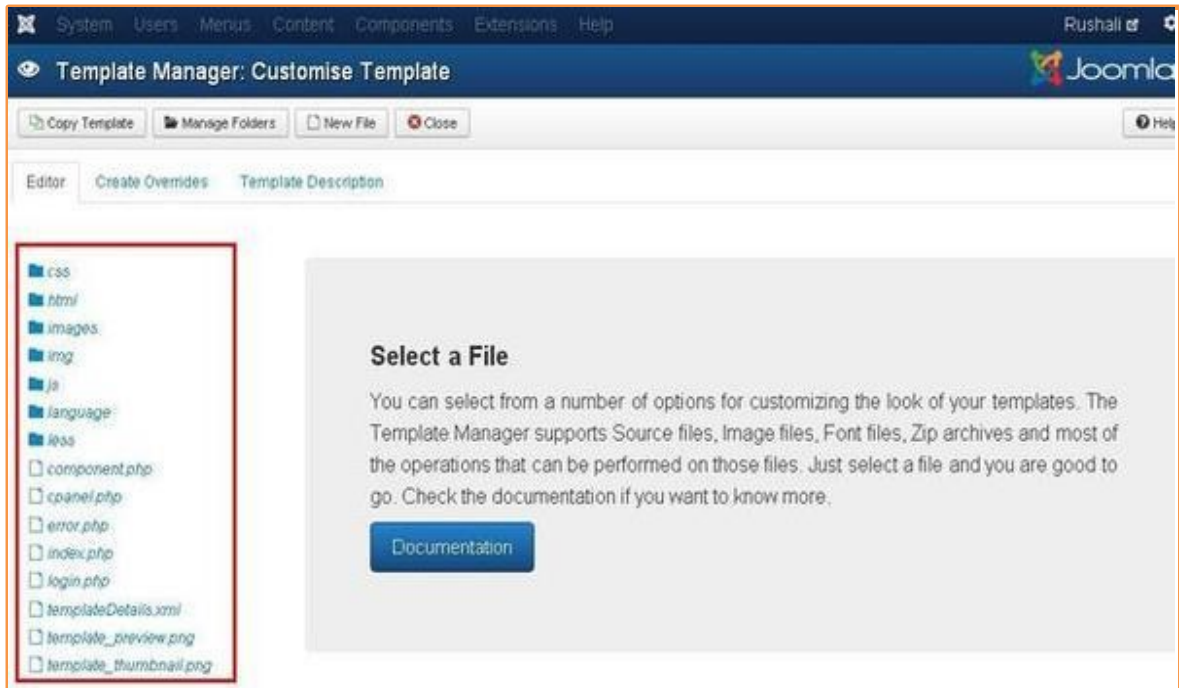
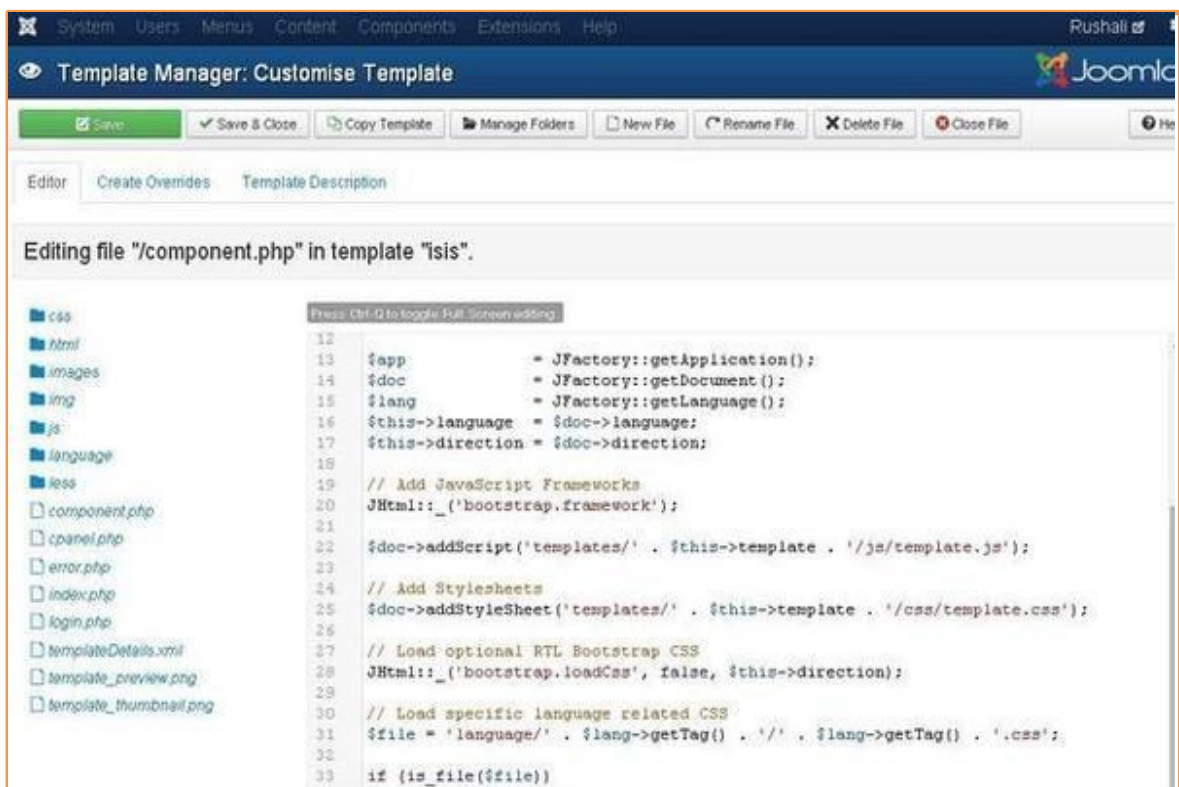


Figure 35: Template Access [41]

Step (4) – Select any of the files by clicking on it for editing.



5 VERIFICATION AND SECURITY PROCEDURE FOR ONLINE STORE

In this day and age, there are a lot of people who enjoy the online shopping experience. Looking for items you want or need has never been easier, and paying through a credit card or even Bitcoin to get goods delivered to your door is as convenient as it gets. However, most websites will require their customers to verify their identity sooner or later, which is a rather annoying process.

The tremendous increase in online transactions has been accompanied by an equal rise in the number and type of attacks against the security of online payment systems. Some of these attacks have utilized vulnerabilities that have been published in reusable third-party components utilized by websites, such as shopping cart software. Other attacks have used vulnerabilities that are common in any web application, such as SQL injection or cross-site scripting. This article discusses these vulnerabilities with examples, either from the set of known vulnerabilities, or those discovered during the author's penetration testing assignments. The different types of vulnerabilities discussed here are SQL injection, cross-site scripting, information disclosure, path disclosure, price manipulation, and buffer overflows.

Successful exploitation of these vulnerabilities can lead to a wide range of results. Information and path disclosure vulnerabilities will typically act as initial stages leading to further exploitation. SQL injection or price manipulation attacks could cripple the website, compromise confidentiality, and in worst cases cause the e-commerce business to shut down completely.

The convenience factor associated with online shopping from the comfort of your own home is unmatched. Browsing the internet for things you may or may not need, and having them delivered to your doorstep from anywhere in the world is an unprecedented feeling. And many people seem to be enjoying this experience above anything else.

The growth of E-commerce business has skyrocketed over the last few years, and the momentum continues to swing upwards in 2017 as well. Online transactions have become an integral part of our lives these days, thanks to the growing acceptance of E-commerce as a convenient alternative to the traditional shopping experience. E-commerce has given an all new dimension to entrepreneurship in the form of webpreneurs. No doubt, it is an exciting time to explore the E-commerce market. One has to keep it in mind that the E-commerce industry is one of the most lucrative targets for cybercriminals. The online retail industry has

had its fair shares of incidents involving security breaches. News of the recent eBay hack is a stark reminder of the vulnerabilities associated with online businesses.

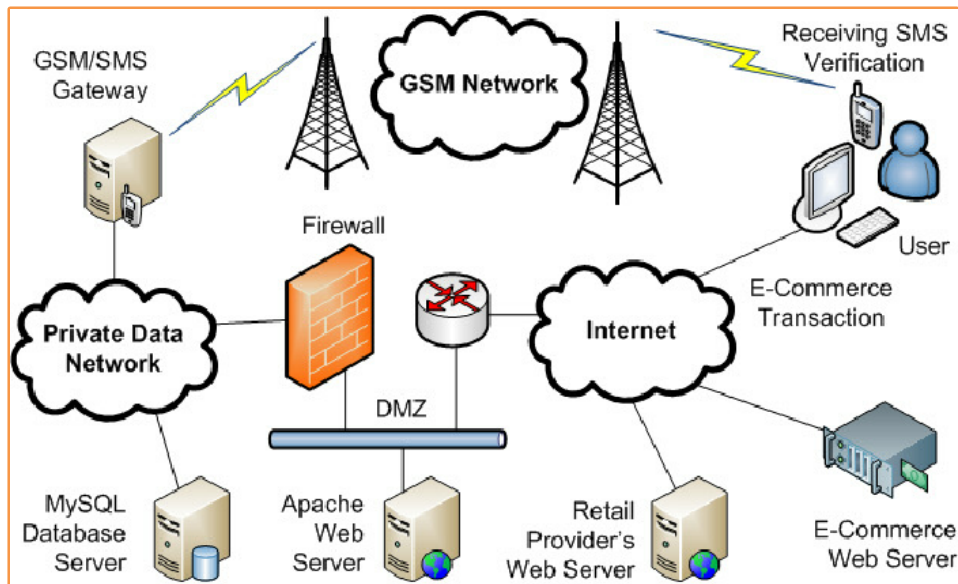


Figure 36: Configuration for E-Commerce Transactional Verification Applications [42]

5.1 Vulnerabilities – Background

There are a number of reasons why security vulnerabilities arise in shopping cart and online payment systems. The reasons are not exclusive to these systems, but their impact becomes much greater simply because of the wide exposure that an online website has, and because of the financial nature of the transactions.

One of the main reasons for such vulnerabilities is the fact that web application developers are often not very well versed with secure programming techniques. As a result, security of the application is not necessarily one of the design goals. This is exacerbated by the rush to meet deadlines in the fast-moving e-commerce world. Even one day's delay in publishing a brand new feature on your website could allow a competitor to steal a march over you. We've typically found this in cases where e-commerce sites need to add functionality rapidly to deal with a sudden change in the business environment or simply to stay ahead of the competition. In such a scenario, the attitude is to get the functionality online; security can always be taken care of later. Another reason why security vulnerabilities appear is because of the inherent complexity in most online systems. Nowadays, users are placing very demanding requirements on their e-commerce providers, and this requires complex designs and programming logic.

5.2 SQL Injection

SQL injection refers to the insertion of SQL meta-characters in user input, such that the attacker's queries are executed by the back-end database. Typically, attackers will first determine if a site is vulnerable to such an attack by sending in the single-quote (') character. The results from an SQL injection attack on a vulnerable site may range from a detailed error message, which discloses the back-end technology being used, or allowing the attacker to access restricted areas of the site because he manipulated the query to an always-true Boolean value, or it may even allow the execution of operating system commands.

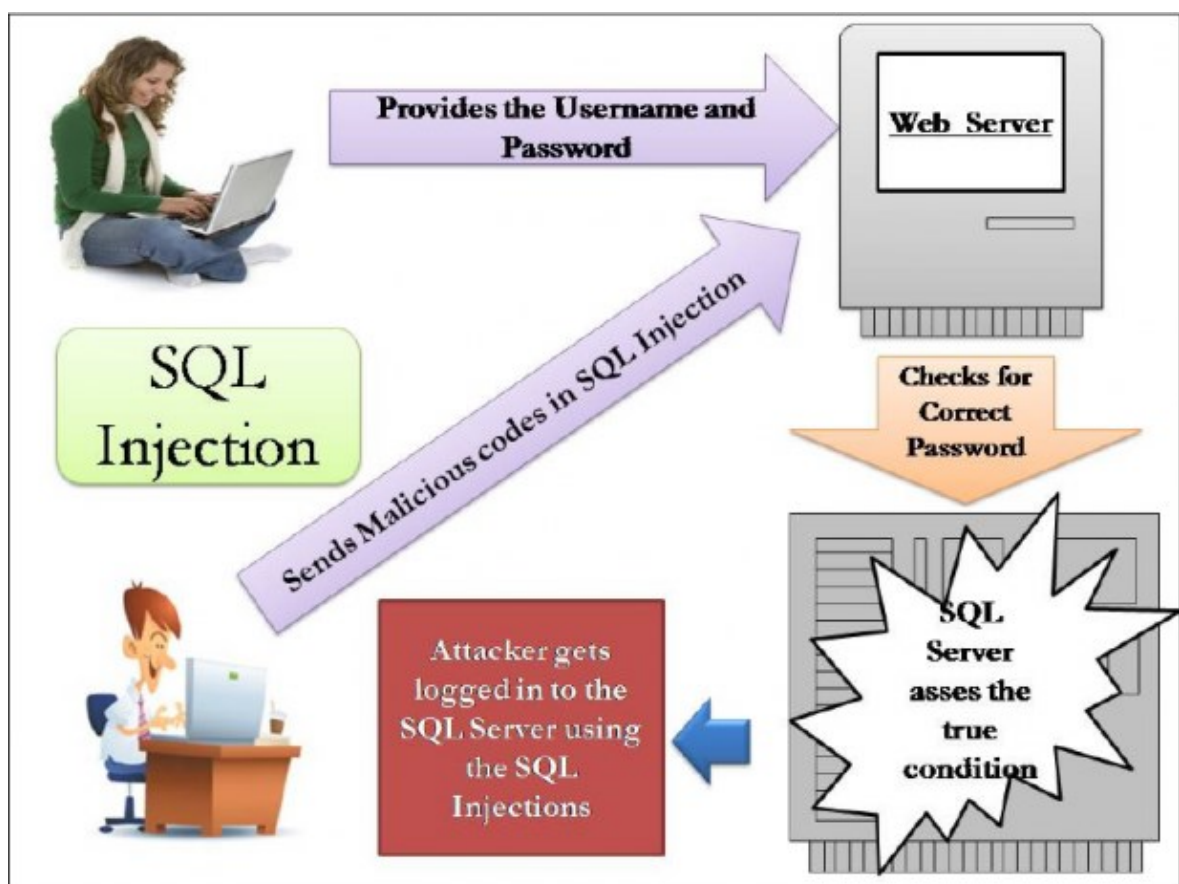


Figure 37: SQL Injection Process [43]

SQL injection techniques differ depending on the type of database being used. For instance, SQL injection on an Oracle database is done primarily using the UNION keyword and is much more difficult than on the MS SQL Server, where multiple queries can be executed by separating them with the semi-colon. In its default configuration, MS SQL server runs with Local System privileges and has the 'xp_cmdshell' extended procedure, which allows execution of operating system commands.

SQL injection vulnerabilities have also been discovered in shopping cart software such as the VP-ASP Shopping Cart, IGeneric Free Shopping Cart, Web Merchant Services Storefront Shopping Cart, etc. Of these, the vulnerability in the Storefront Shopping Cart occurred in its login.asp page, and could potentially allow the attacker to execute malicious database queries, without needing to authenticate to the web site.

5.3 Price Manipulation

This is a vulnerability that is almost completely unique to online shopping carts and payment gateways. In the most common occurrence of this vulnerability, the total payable price of the purchased goods is stored in a hidden HTML field of a dynamically generated web page. An attacker can use a web application proxy such as Achilles to simply modify the amount that is payable, when this information flows from the user's browser to the web server. Shown below is a snapshot of just such a vulnerability that was discovered in one of the author's penetration testing assignments.

The final payable price (currency=Rs&amount=879.00) can be manipulated by the attacker to a value of his choice. This information is eventually sent to the payment gateway with whom the online merchant has partnered. If the volume of transactions is very high, the price manipulation may go completely unnoticed, or may be discovered too late. Repeated attacks of this nature could potentially cripple the viability of the online merchant.

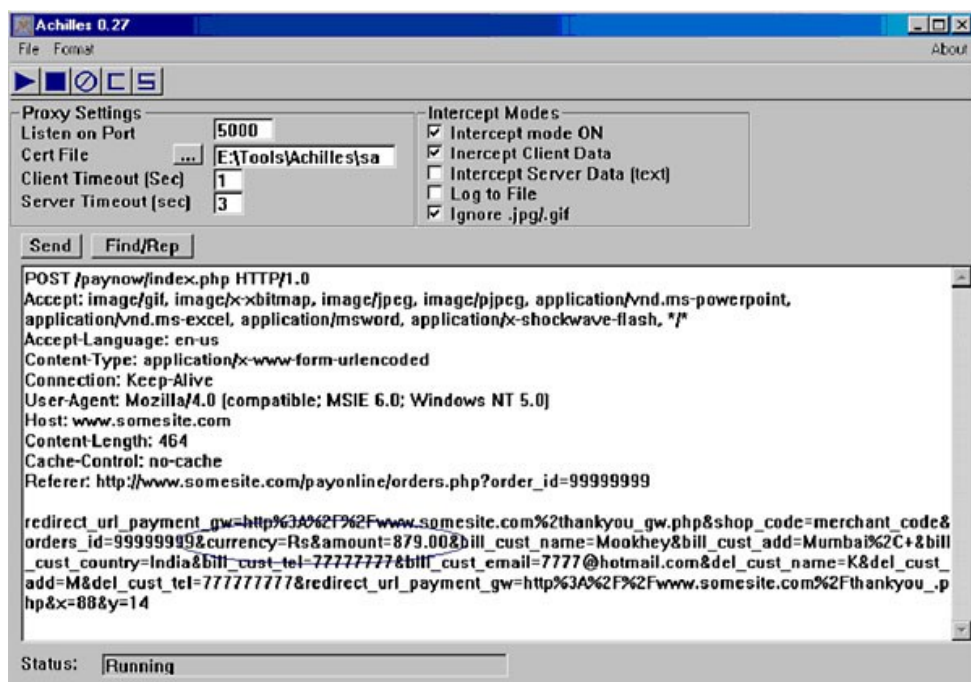


Figure 38: Price Manipulation Software [44]

Similar vulnerabilities have also been found in third-party software such as in the 3D3 ShopFactory Shopping Cart, where price and item-related information was stored in client-side cookies, which could easily be manipulated by an attacker. Similarly, Smartwin Technology's CyberOffice Shopping Cart 2.0 could be attacked by downloading the order form locally, and resubmitting it to the target server with the hidden form fields modified to arbitrary values

5.4 Online Shopping –Great, As Long As No Document Are Needed

Year over year, online shopping is on the rise, as people spend more and more of their funds to buy things online, rather than go to a physical store. There are a few simple reasons for that, with the most important reason being the fact you will immediately know whether the item you want is in stock or not. Some people enjoy shopping at a physical location but are put off by the human interaction associated with this process. In-store salespeople and even the cashier can make or break a shopping experience, and in most cases, friendliness or a kind word is nowhere to be found. This is a direct result of how our society has evolved over the past decade, with true human interaction taking a backseat to consumerism.

While checking off your shopping list by browsing the online stores, there is no element of human interaction required. Everything can be done at the customer's pace, without having to worry about what anyone else thinks. Especially when it comes to shopping with family members, such trips can prove to be quite a hassle in a physical environment.

Last but not least, there is no such thing as having to wait in line while shopping online. Once a customer fills up their basket with all of the items needed, they can simply check out and pay for their order. Everything else will be taken care of by the retailer or merchant, and goods will be sent on their way accordingly. Or that would be the traditional story, assuming the site you are shopping at will not ask the customer to verify their identity. While it is no secret that credit card fraud is a real plague for e-commerce websites, the legitimate first-time customers can be put off by these verification requests. After all, a third party you don't know personally wants a copy of very sensitive personal information, and the customer has to trust them in making sure this information is not abused.

5.5 Outdated Verification Process Will Hamper Online Shopping Growth

Whenever an online retailer or merchant asks a customer to verify their identity, the same reason is given every time. Either this request is a result of a random security check or the order has been flagged for a potential fraud risk. Needless to say, in most cases, neither of these stories are true, as the retailer or merchant just wants to see whether or not they can obtain a copy of very personal information for unknown reasons.

Granted, credit cards – the most commonly accepted online payment method – were never designed to be used over the internet. A credit card is a very insecure payment method, as the card number, expiry date and CVV code are all clearly visible on the card itself. Even when using a credit card to make a purchase at a physical location, customers are entrusting the cashier with their credit card data. Not exactly the safest form of payment, either online or offline, but society has gotten accustomed to relying on this payment method.

Should your online order become the subject of such a verification procedure, most websites will ask the customer to send a copy of the front – and sometimes back – of their credit card. Once again, credit card information is clearly visible on the card itself, and complying with this request will give the merchant or retailer full details of your preferred payment method, with the option to abuse it.

Not all of these inquiries are of malicious intent, but there have been numerous stories of customers who see mysterious charges on their credit card after submitting verification documents to a website they ordered from. Most retailers will let you blank out part of the digits on the front of the card, as well as the CVV code on the back, for security purposes, though. But it is a security risk to keep in mind regardless.

On top of that, customers will need to submit a scan of their government issued ID or passport. It goes without saying that providing this document is a strange request, as a copy of an ID or passport can be used to steal a customer's identity. And identity theft is on the rise as well, making it even more worrisome when a website asks for this critical piece of personal information.

5.6 Using Blockchain Technology for Verification and Rating System

Regardless of how you look at the verification procedures associated with online shopping, things will need to change sooner rather than later. Every time a merchant or retailer

gets a hold of a copy of personal and financial information, the door is wide open for misuse, abuse and potential fraud of either money or identity.

Bitcoin's underlying blockchain technology can play an important role in changing the verification procedure associated with online shopping and other online procedures. Not only is the blockchain more transparent than any other form of technology being used right now. Not just in the form of transactions and financial data, but it also opens up a lot of technological innovation opportunities.

Many people see the blockchain as a public ledger for Bitcoin transactions, but the technology itself can be used for nearly any type of service in the world. Possibilities range from stopping counterfeit products from entering the market to transferring digital ownership, and even online ID verification and reputation systems.

Rather than relying on customers submitting a scan of their ID/passport and credit card, blockchain technology can be used to create a form of "online user verification", which is automatically submitted at the time of payment. This online identity would not be visible for everyone to see, as only the owner of this identification decides who data is being shared with. And because the information is stored on the decentralized ledger that is the blockchain, the merchant or retailer will never have access to sensitive details either.

On top of that, blockchain technology can introduce a rating system for online payments. In doing so, both the customer and retailer can see the other's reputation, and base their decision to either buy and not buy on that reputation score. Imagine this system similar to how eBay feedback and reputation works, but on a scale that goes beyond one single platform and becomes usable on the entire Internet. All of your online actions will influence your online reputation, which is visible for everyone to see.

5.7 Best Practice on how to Secure an Online Store - Countermeasures

The most important point is to build security into the web application at the design stage itself. In fact, one of the key activities during the design phase should be a detailed risk assessment exercise. Here, the team must identify the key information assets that the web application will be dealing with. These could include configuration information, user transaction details, session IDs, credit card numbers, etc. Each of these information assets needs to be classified in terms of sensitivity. Depending upon the tentative architecture chosen, the developers along with security experts must analyze the threats, impact, vulnerabilities and

threat probabilities for the system. Once these risks are listed out, system countermeasures must be designed and if necessary the architecture itself may be modified. Countermeasures should also include strict input validation routines, a 3-tier modular architecture, use of open-source cryptographic standards, and other secure coding practices.

There's every reason in the world to shop online. The bargains are there. The selection is mind-boggling. The shopping is secure. Shipping is fast. Even returns are pretty easy, with the right e-tailers. Shopping has never been easier or more convenient for consumers.

But what about the bad guys who lay in wait? IID's Third Quarter eCrime Report for 2016 indicates that use of phishing attacks (where thieves attempt to swindle you out of your sign-in credentials and even credit card info by pretending to be a real website, or even an online bank) is down, as much as eight percent since the second quarter and 11 percent since the third quarter of last year. That's great news—except the same report says sites with malware (malicious code aimed at compromising your privacy) has increased by 89 percent since the second quarter. Best Practice on how to secure an online store listed below.

- **Secure Socket Layer (SSL):** It is the most commonly used protocol and is widely used across the industry. It meets following security requirements – Authentication, Encryption Integrity and Non-reputability. "https://" is to be used for HTTP urls with SSL, where as "http://" is to be used for HTTP urls without SSL.
- **Secure Hypertext Transfer Protocol (SHTTP):** SHTTP extends the HTTP internet protocol with public key encryption, authentication and digital signature over the internet. Secure HTTP supports multiple security mechanism providing security to end users. SHTTP works by negotiating encryption scheme types used between client and server.
- **Server Security:** Use firewalls and proxy servers Every packet going from the firms computer to the internet or voice versa will be checked “Security” against ”attack” such as viruses, unauthorized access of hackers, trojan horse can be provided.
- **Message Privacy:** A key requirement for E-commerce it assures that the communication between trading parties are not revealed to other, therefore unauthorized party cannot read or understand the message.
- **Message integrity:** Another key requirement for e-commerce it assures that the communication between trading parties are not alerted by an enemy.

- **Authentication:** Assures that the “sender” of the message is actually the person he/she claims. Paper message The term “authentication” determines the user of the computer is actually who he/she claims. The term “authentication of the receiver”: allows the sender to be sure that the party he/she intend to get the message is the one who is receives it.
- **Authorization:** Ensures that the trading party has the authority of transaction It prevents the risks that employees transactions create economic damage
- **Choose a Secure eCommerce Platform,** As they say, "Get the basics right, the rest would fall into place." The first step towards building a secure E-commerce website is to use a secure platform. There are so many open source and proprietary E-commerce platforms available choosing the best one for you can be difficult. However, more than two third of all active E-commerce sites are using either Magento or WordPress WooCommerce. Why? Mainly because of their Sophisticated Security Features There are other factors as well, but what makes them stand apart is the extensive security. PrestaShop can be yet another choice with a proven security framework. No matter which platform you decide to use, ensure that, your server maintains PCI compliance requirements. Run PCI scans on your server to validate whether you are compliant or not. Also, make sure that you are running the latest version of the software. Whenever there is a new patch available, make sure to get it installed immediately.
- **Implement SSL Certificates,** SSL is the de facto standard when it comes to securing online transactions. SSL certificate authenticates the identity of users and encrypts data while at store and transit. Implementing SSL is essential for E-commerce websites to establish secure connectivity between the end-user systems and your website.

For tech-savvy buyers, the padlock icon with HTTPS in the address bar is an essential prerequisite for providing their personal details and credit card information. If the consumers believe that a vendor is doing everything possible to secure their transactions, they are more likely to do business with them.
- **Consider Two Factor Authentication,** Stolen or compromised user credentials are a common cause of web security breaches. There are multiple 'phishing' ways to steal or guess valid user credentials and compromise the security of your online store. That

is where the need for a proven user authentication mechanism arises. It is a foundation for securing your online store from hacking attempts.

Many E-commerce sites are implementing two-factor authentication (2FA) to add an extra layer of security to their online stores. Two-factor authentication is a security process in which a valid user needs to provide two means of identification one is typically the username/password combo, while the second one is usually a code generated in real-time and sent to a verified phone owned by the user. Hackers might crack the password, but they cannot steal this code, which usually expires after a short duration.

- Use a Virtual Private Network, When you are dealing with financial transactions, it is important to be extremely careful while using public networks. Data transferred over public networks are vulnerable to being intercepted by malicious users. A VPN service can come handy in such a situation. It connects you to a secure offsite server via an encrypted connection, which prevents a third-party from inserting itself between you and the server.

If you are concerned about the costs involved with a traditional VPN service, then you can probably opt for SSL-based VPN which comes way cheaper. OpenVPN is a popular choice, which offers an open-source community-based edition that you can use for free.

An E-commerce business is much more than just running a successful website. As an E-commerce business owner, you must ensure that all the customer data are being handled in a safe and secure manner. E-commerce security can be a tricky subject, but it is your responsibility to protect your website from being hacked and sensitive customer data from being stolen.

6 POSITIVE AND NEGATIVE EFFECT OF E-STORE PROJECT

E-commerce is business activity carried out electronically on the Internet rather than at a physical location. Through websites, some businesses do business with other businesses, an e-commerce model known as B2B. Other businesses sell to consumers online, in a B2C e-commerce model. The advent of e-commerce has had both positive and negative effects.

Also, E-commerce can be a great way for a small businesses to increase their sales and widen their reach. It's also convenient for consumers, who can buy at their convenience, without having to leave their homes or spend the day fighting queues at the shopping mall to pick up the best deals. However, e-commerce also has negative effects on both consumers and retailers that must be kept in mind before launching an online shop.

Here are some tips on become a smarter online shopper:

Do Your Research - Before making a purchase, research more about the company whether it's through a review site or checking on social media. Brands who value their customers are more likely to be engaged online because they understand the importance of being transparent. Does their website look trustworthy? What payment gateways do they except? What have others said about their service? Reduce your risk and protect your money by learning more about the brand first.

Read Online Reviews - Discover what others have to say about the product or service you are about to purchase. A lot of consumers leave honest reviews about a product (i.e. true to size, came as depicted, etc.) or a service (excellent customer service, was satisfied, was disappointed, etc.) that can help influence your decision to click and buy.

Read the Fine Print - Always know what the return and refund policy is before buying. Some companies offer a year return policy - others can range in the 14-30 day return window. Some may only offer exchange. Save yourself the frustration and discover what your risks are when purchasing.

Look for Online Deals - Online shopping gives you the ability to cross-compare prices across multiple websites so you can get the best deal. Look into different coupon sites and see discount codes other consumers have to share. If you really like a brand, stay connected with them and subscribe to their newsletters as they may offer you exclusive promotions for your loyalty.

6.1 Negative Effects of E-Store

The internet has allowed retailers to connect with potential customers and express their brand in entirely new ways, and physical stores have become a part of their communication and sales strategy instead of being their only or primary way to reach consumers.

Time and money are precious. When we shop, we want to save as much as possible of both. However, as environmentally-aware consumers we are increasingly assessing the amount of greenhouse gases that are emitted when we buy shoes, books or household appliances. But what is actually more damaging for the environment – online shopping or shopping locally? Below are the negative effects of E-Store.

- **Privacy** - It is easy to collect a lot of personal information from a consumer using an e-commerce website, sometimes too easy. Since all online transactions are recorded, it's relatively easy to create an online profile of the buyer, and use that to send targeted advertisements. However, many will agree that this is an intrusion on a consumer's right to privacy, and it's something that is heavily regulated on many countries.

This means small businesses aiming to establish an online presence using e-commerce need to be aware of the legislation that applies, as mistakes can be costly both in terms of fines and customer trust.

- **Security** - Another negative effect of e-commerce is its effect on consumers' security. Online transactions are inherently more insecure than those conducted in person because there's no way to guarantee that the person making the payment is the actual owner of the credit card used. At the same time, when the customer inputs the payment information they risk a third party intercepting it if the website doesn't comply with the adequate security measures, giving rise to credit card fraud and identity theft. Merchants need to be aware of the risks electronic transactions carry, and work towards securing the systems to the highest standards.
- **Price Wars** - Merchants used to selling at their shop may often find selling online an extremely competitive marketplace. Their products are displayed alongside competitive offers, often from different countries or bigger retailers with access to better wholesale prices. This can affect the retailer negatively, as they cannot sell as much as they expected to actually make a profit, or the consumer's when online stores

cut corners in order to become more competitive or products are purchased from illegitimate retailers because they had the best price.

- Returns And Complaints - Selling online means usually a higher return rate on products than when the purchase was conducted in person. This is due partly to the fact that customers haven't seen the goods in person prior to purchase, but also to the fact that many online shoppers buy things on impulse, and by the time they receive them at their home they have changed their mind and make use of favourable return policies. While a big retailer would have no problem accommodating this, it can be highly disruptive for a small business with limited stock management.
- Waiting - If you're an impatient person, waiting for your product to be delivered can be a pain. There is a lack of instant gratification and even possibilities of delay when it comes to receiving your items.
- Shipping Rates - Though some companies offer free flat rate shipping, it still may come at a cost. For instance, a shoe store may offer free shipping but at a minimum of a \$50 purchase.

6.2 Positive Effects of E-store

In our past, shopping was treated as a big outing where our great grandfather has to collect all family members and hook them up in a big car to go the nearest general shopping mall, where they could buy all items say from candy to car. But in this 21st century the growth of internet has changed our way of life, these days nothing is hard, we can do everything online say like watching movies, reading books, paying bills, shopping online, etc.,. These days online shopping is becoming very popular and has become the best choice for many people who do shopping regularly. In this article I am going to explain some of positive aspects of online shopping which I have experienced in my life. Let's see them now.

- Energy Consumption - One positive effect of the emergence of e-commerce is that it may save energy. Consumers who shop online rather than drive to stores use less fuel and their cars emit less pollution. Also, because e-commerce reduces the need for warehouse space to house goods near retail stores, these warehouses use less energy.
- Cost Reduction - E-commerce can reduce costs for consumers when companies cut down on middlemen involved in distributing goods, warehouse space to store the goods and personnel expenses. E-commerce also enables companies to manage their inventory better. To be competitive, businesses are likely to pass down at least some of these savings to consumers.

- Time Saver - You no longer have to get in your car and have to drive to the mall to shop. There are no lines and you can come back to your cart whenever you want.
- Online Deals and Promotions - Before you checkout, you can scour the Internet for online coupon codes or special discounts. Many companies send coupons to their customers who have opted into their email marketing campaigns, delivering them with the latest product or service information and what current promotions they are currently holding.
- We can go through their guarantees, warranties, and other information's relating to the product online which helps us to decide whether the product is worthy buying. We can also read their privacy statements to know how the personal information of consumers will be used. This will furthermore helps us in recognizing the companies products whether they are real or fake.
- With one online shopping mall we could buy all types of items ranging from kitchen equipments to beauty items, from garden equipments to outdoor equipments, from clothing to jewellery items, etc,. We need not have to search many companies online, each online shopping malls will have thousands of categories inside them itself.
- This shopping helps us in keeping our friends and family together all the time, by sending special gifts on behalf of us that ranges from flowers to perfumes, from chocolate to jewellery items, etc, on their special occasions even if we are far away from them.
- We can access many product say from pin to car from different manufacturers in one place which helps us to choose the best one among many products. So companies offer product reviews where the customers post their review about the product which helps us to analyze the product.

7 CREATE YOUR OWN ONLINE STORE – AN IN-DEPTH GUIDE FOR BEGINNERS

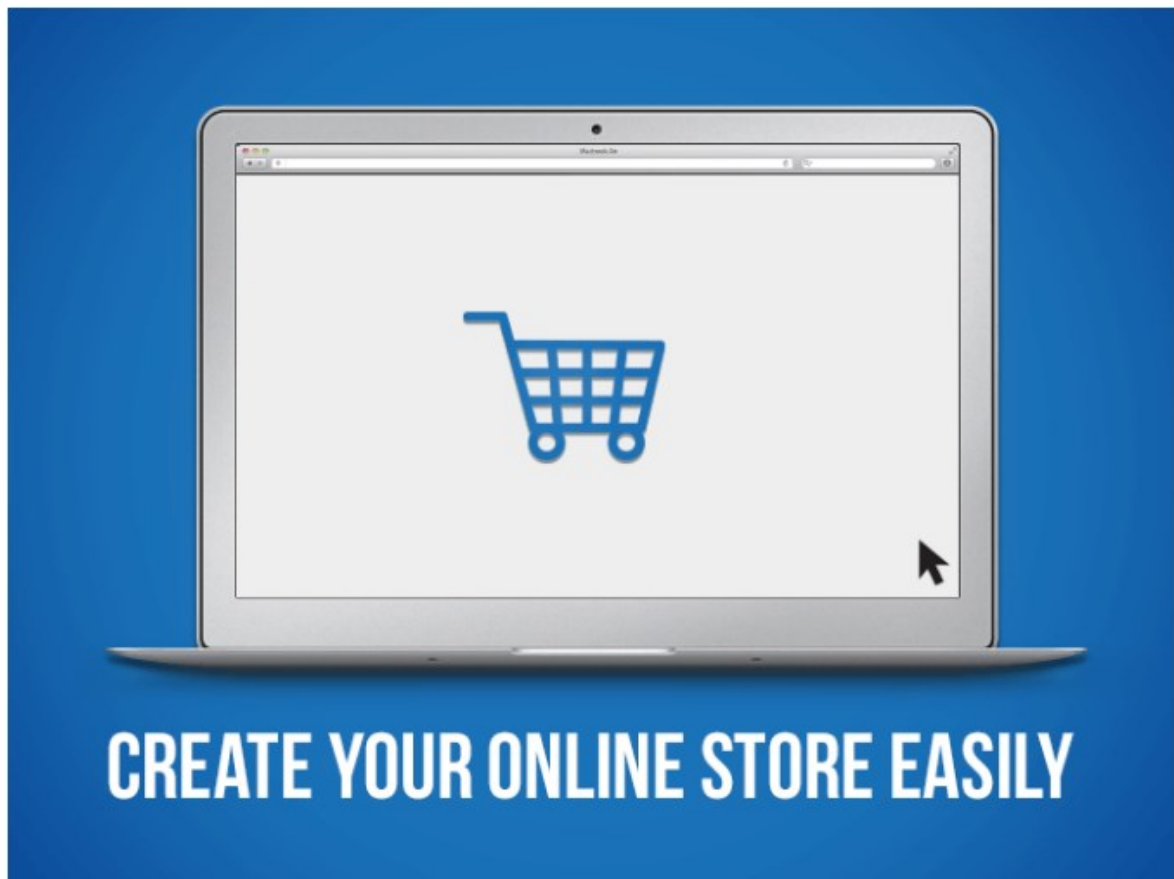


Figure 39: Online Store for Beginners [45]

Do you want to start a small or medium-sized online store? In that case, this guide is for you. We want to give you a head start on all things ecommerce. Once we're done, you should know all the basics and what to look out for in the future. In particular, we'll focus on the technical requirements that an online store should meet.

For years now, online commerce revenue has known only one direction: up. Just take a look at the black line on the chart – that's the sum of all ecommerce sales in Europe. The blue line above it shows all retail sales in the Europe. And while retail still has an advantage over ecommerce, Statista predicts that this advantage will shrink, favoring Ecommerce in the long run.

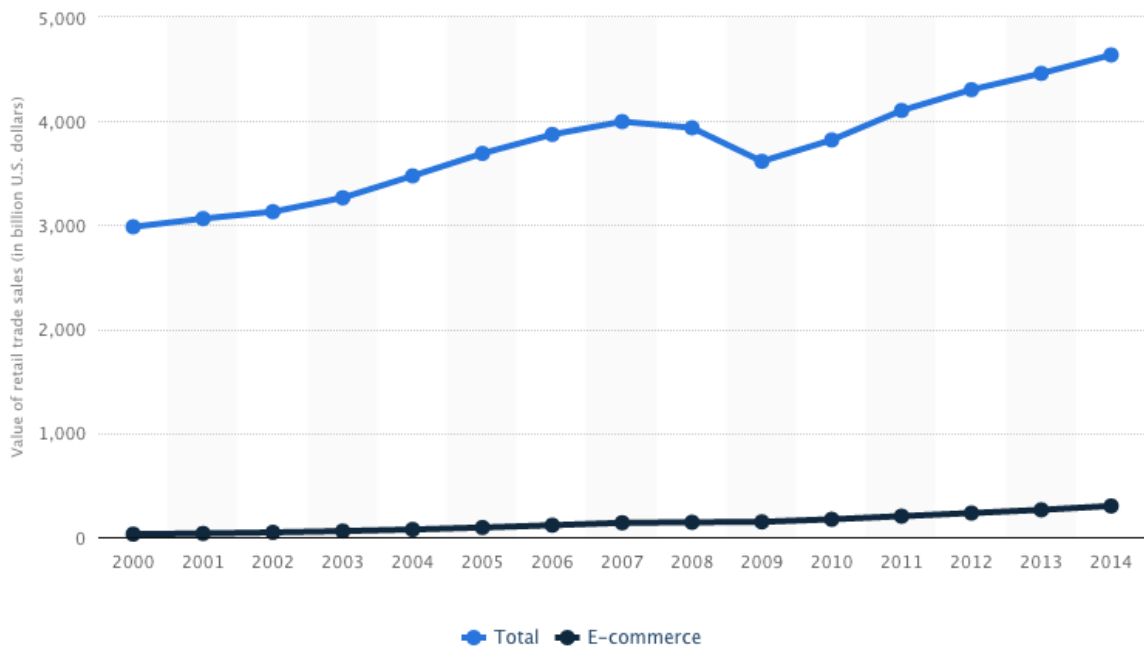


Figure 40: Retails Sales in Europe [46]

And that makes perfect sense, too – after all, every new generation grows up knowing the Internet and seeing online purchases as completely normal. By the way – you’re on a good track if you’re catering to English-speaking markets: Nobody spends more money online than people in the USA and the UK.



Figure 41: Estimate of Shoppers Around the world [47]

And it doesn't matter whether you already run a brick-and-mortar business or whether you're starting from scratch. If you want to plan your own online store, put that plan into action, and see your store succeed, then I want this ecommerce guide to help you do just that.

7.1 Why Even Create an Online Store of Your Own?

That's a fair question when you consider the many, many places online where people can buy things: Amazon Marketplace, eBay, and Etsy all offer platforms where anyone can sell their goods. And that might not be a bad idea for starters, either: You can use their visitor numbers to your own advantage without investing into advertising.

There is a problem, though: Depending on the products you're selling, the brokerage fees you have to pay the platform may be anywhere from 5% to 20%, and over time, that's a lot of money. You also don't have access to customer data, so you can't invest into the customer relationship afterwards (e.g. through an email newsletter).

By running your own online store, such fees will no longer be an issue for you. Instead, you have to keep payment provider and hosting costs (e.g. PayPal) in mind. But ultimately, this will cost you less than staying on a marketplace platform. Obviously, you can try and run both strategies at once and try and shift customers from the platform to your own store over time.

In the long run, a website and online store of your own are, by far, the best way of creating brand recognition and winning over steady customers.

7.2 The Online Store System Requirement Checklist

Complexity and budget:

Complexity	easy	medium	difficult
Time frame to completion	3-7 days	1-3 weeks	Several weeks or even months
Budget (rough estimate)	\$7.50 to 30 per month	ca. \$15 to 200 per month	Creation (single expense): \$2,000 to \$20,000; plus \$20 to \$350 per month
Hosting	Included (Cloud)	Included (Cloud)	Installation on your own webstorage
Examples	Weebly , Jimdo , Wix	Shopify , BigCommerce , Volusion	Magento , PrestaShop , WooCommerce

This is a fundamental decision. How much time and how what amount of resources are you willing to put into this project? We put the providers into three categories:

There are some differences here: A simple shop like the one offered by Jimdo is easy to set up in no time. Anyone who knows their way around the Internet should be able to figure out how the interface works in just a few hours. Often times, a weekend is plenty sufficient to get an online store up and running.

The shop systems of medium complexity offer a much wider array of features. Integration and payment methods, however useful, require a steeper learning curve and a higher budget though. Unlike the simpler systems, these will allow you to manage much larger stores, and you have better marketing options, too (such as cross-selling, price search engines, etc.).

Complex online stores such as Prestashop or Magento in particular are a project of a completely different magnitude. Beginners without technical skills will most likely not be able set something like this up because these open source systems have to be installed and configured by hand. You also need web storage of your own. The less complex shop systems don't have those requirements – the providers host the shops in their own cloud infrastructures. How long this setup procedure lasts can vary greatly, and it depends mainly on the contractors you choose and how much you want to customize the design and the code.

Some Other Shop Features You Might Find Useful:

Criterion	Options
Which payment methods do you want to offer?	PayPal Credit card Direct debit Money transfer/money order Invoice Cash on delivery Installment payments
Shipping options	Interfaces with shipping companies such as DHL or UPS Pricing according to regions and countries Drop-shipping
Accounting options	Create invoices or integrate with accounting software (such as Xero) Different VAT rates
Automatic import and export of goods	Manage large product portfolios too large for manual maintenance (e.g. more than 100 products)
Customer accounts	Can customers sign up in order to speed up the checkout process?
Marketing features	SEO (URL structure, etc.) Cross-selling Integration of price search engines Coupons Email marketing (newsletters and 'abandoned shopping cart' emails) Blog feature for content marketing
Domain name / email addresses	Are the domain name and email accounts included?
Internationalization	How many languages and currencies are supported?
Security features	SSL encryption Automatic backups Guaranteed website availability (SLA)
Support	Email support Telephone support Live chat Availability

7.3 The Overview of Various Shop Systems

Here's a brief introduction of the ones I thought were the most interesting:



Shopify – The 800-Pound Gorilla of Ecommerce.

Shopify allows both beginners and real pros to create a professional online store that should barely leave a wish unfulfilled. Why? Beginners can set up an online store without any programming skills and advanced users will be able to alter everything due to the very flexible “Liquid” framework. Included are professional features such as cart abandonment emails that can be set up very easily.

Even if your business grows really rapidly, chances are that you will have no reason to move it to another platform – unless you want to run a truly global store. Shopify doesn't support multilingual web stores. Other than that, it gives you all the necessary tools you need to start smoothly and then set your path to rapid growth.

You can try Shopify 14 days for free to test it (no credit card needed). The cheapest entry level plan is “Lite” for US \$9 monthly. You can use it to sell goods on an existing website or social media profile. The other plans offer a complete store with additional features such as telephone support, better statistics and template modifications.



Weebly – Makes Selling Easy, Extremely Easy

If you already have a website made with Weebly and you don't want to struggle with a complicated setup process or source code, then you should consider taking a closer look at their built-in e-commerce solution. The online shop works as easy as the rest of the website editor.

Weebly Starter allows you to sell up to 10 products. That's not much, but it's a start; if you don't need ALL the bells and whistles, it should do the job. If you want to sell more products and need features like vouchers, then you have to pick their "Business" plan. Weebly is made for beginners that want an easy solution. Because of this, you won't find advanced features, like dozens of international payment gateways or customer accounts. Weebly brings out regular updates that provide more features and help you to create a better online shop.



Ecwid – the Addon That Turns Your Existing Site into a Store

Ecwid is a particularly attractive option if you already own a website that doesn't have an e-commerce feature. It includes an impressive range of functions, such as a massive number of integrated payment gateways for credit card payments, PayPal, and even voucher codes for special promotional offers. You can also sell both physical and digital goods. Varying VAT rates between different states are no problem here either. The only drawback with Ecwid is that there is no real easy way for Google to index your product pages.

7.4 Legal Requirement for Online Store

In order to run an online store, you need to register a business. The simplest form of business is the sole proprietorship, also known as sole trader. You need to be 18 years of age to do so.

Privacy Policy: This document explains how the user's data that is being collected on your website will be used. However, in general you should cover the following information:

- What information you gather and how you share it;
- The process the customer can follow to review and make changes to the information you have on them; and
- The policy's effective date and a description of any changes since then.

Terms and Conditions: The terms and conditions are made for your customers. It explains what they must or must not do in order to use your service.

This would usually cover clauses such as:

- Definition of key words
- Customer rights and responsibilities;
- Proper or expected usage of the website;
- Intellectual property protection;
- Accountability for actions, behavior, and conduct;
- Payment details;
- Disclaimers and warranties;
- Exclusion or Limitation of Liability; and
- User notification upon modification of terms.

Returns and Refunds Policy: This is another document that can vary widely within each US state. It's very important to have a Returns and Refunds policy as not having one will oblige you to accept full refunds within 30 days for all your customers from California, for example.

7.5 Generating Traffic – How to Get Customer into Your Virtual Store

The best online store isn't worth a thing if it doesn't attract any customers. Luckily, there are several ways to get customers to come and take a look.

Free traffic: Free sounds good, right? There are several ways to benefit from free traffic. Let's divide them into SEO, social media, and email marketing.

Search engine optimization for ecommerce: SEO is a long process. It can take months to find those particular search terms that really generate visits. Once you've reached those front-row positions, you'll typically stay at the top for a while, but it also depends on what your competition does for their own SEO and how knowledgeable they are on the subject.

Please note: Investing in SEO is particularly beneficial when there are already a lot of online search queries by people who want to buy a product you're offering. Now let's assume you're trying to sell MacBooks. That search term is used thousands of times a day on Google (according to the Google Keyword Planner, the actual number is around 10,000 times per day).

Now, you can get a piece of that pie by using SEO. Landing on the first Google results page when people search "macbook" will, however, most likely be out of the question – the competition is just too strong. Instead, you could optimize for a search term such as

“macbook air 13 inch review”. The term is only searched around 20 times per day, but the competition isn’t as tight there, either. You could do this for your blog, for instance.

Social media – ideal for “shiny objects” : You can get the most out of Facebook, Twitter, YouTube, Instagram, and Pinterest if your product is cool. Products that people buy in an impulsive moment – a funny t-shirt, an interesting video documentary, a stylish clothes rack, or a backpack with an integrated power bank. You know, things the customers don’t even know they want to buy yet. Things that are shared and, as a result, spread by word of mouth. In order for this strategy to work, you usually need a large number of invested followers and fans.

Newsletters – turn prospects into customers: For senders with a smaller number of subscribers, there are a few free newsletter providers. These are excellent for beginners. A newsletter is especially useful if you want to animate visitors to return to your store, or if you want to turn a previous customer into a repeat customer. You can get a prospect’s email address by offering a rebate coupon, for instance. If you offer a product that requires some explanation, you can also try a free PDF guide or an eBook. By getting their email address, you will be able to send out auto responder emails to your customers, meaning an automatic sequence of predetermined emails that animates the recipient to return to your website.

Paid traffic: The easiest and fastest way (for people who have money): Two services come to mind for this strategy: AdWords and Facebook ads. As mentioned above, you need to know what kind of product you’re trying to sell. The cool product is better suited for Facebook. As an added convenience, it’s very easy to pinpoint your target audience. For example, you can offer t-shirts for special interest groups (such as people who fly drones in their leisure time) and then market them to that particular interest group, too.

Google AdWords is more about search volumes and click prices. At the end of the day, it’s your return on investment that counts, and it should, ideally, be positive. That’s why you need to do some data analysis. Too many people throw their money at paid traffic ads without knowing whether they’ll get any success out of it. If in doubt, consult a professional.

CONCLUSION

In general, today's businesses must always strive to create the next best thing that consumers will want because consumers continue to desire their products, services etc. to continuously be better, faster, and cheaper. In this world of new technology, businesses need to accommodate to the new types of consumer needs and trends because it will prove to be vital to their business' success and survival. E-commerce is continuously progressing and is becoming more and more important to businesses as technology continues to advance and is something that should be taken advantage of and implemented. From the inception of the Internet and e-commerce, the possibilities have become endless for both businesses and consumers. Creating more opportunities for profit and advancements for businesses, while creating more options for consumers. However, just like anything else, e-commerce has its disadvantages including consumer uncertainties, but is nothing that cannot be resolved or avoided by good decision-making and business practices. There are several factors and variables that need to be considered and decided upon when starting an e-commerce business. Some of these include: types of e-commerce, marketing strategies, and countless more. If the correct methods and practices are followed, a business will prosper in an e-commerce setting with much success and profitability.

The Internet has become a major resource in modern business, thus electronic shopping has gained significance not only from the entrepreneur's but also from the customer's point of view. For the entrepreneur, electronic shopping generates new business opportunities and for the customer, it makes comparative shopping possible. As per a survey, most consumers of online stores are impulsive and usually make a decision to stay on a site within the first few seconds. "Website design is like a shop interior. If the shop looks poor or like hundreds of other shops the customer is most likely to skip to the other site".

In this project, the user is provided with an e-commerce web site that can be used to buy shoes online. To implement this as a web application we used ASP.NET as the Technology. ASP.NET has several advantages such as enhanced performance.

Scalability, built- in security and simplicity. To build any web application using ASP.NET we need a programming language such as C#, VB.NET, J# and so on. For the client browser to connect to the ASP.NET engine we used Microsoft's Internet Information Services (IIS) as the Web Server. ASP.NET uses ADO.NET to interact with the database as

it provides in- memory caching that eliminates the need to contact the database server frequently and it can easily deploy and maintain an ASP.NET application. MySQL was used as back-end database since it is one of the most popular open source databases, and it provides fast data access, easy installation and simplicity.

A good shopping cart design must be accompanied with user-friendly shopping cart application logic. It should be convenient for the customer to view the contents of their cart and to be able to remove or add items to their cart. The shopping cart application described in this project provides a number of features that are designed to make the customer more comfortable.

This project helps in understanding the creation of an interactive web page and the technologies used to implement it. The design of the project which includes Data Model and Process Model illustrates how the database is built with different tables, how the data is accessed and processed from the tables. The building of the project has given me a precise knowledge about how ASP.NET is used to develop a website, how it connects to the database to access the data and how the data and web pages are modified to provide the user with a shopping cart application.

BIBLIOGRAPHY

- [1] Chen, L. (2000). Enticing Online Consumers: A Technology Acceptance Perspective Research- in-Progress. ACM Proceedings, SIGCPR.
- [2] Diwakar, H., Marathe, M. (2000). The architecture of a one-stop web-window shop. December, ACM SIGecom Exchanges, Volume 2 Issue 1.[online] Available at http://sigecom.org/exchanges/volume_2/2.1-Marathe.pdf
- [3] Morrison, M., Morrison, J., and Keys, A. (2002). Integrating Web Sites and Databases. Communications of the ACM, September, Volume 45, Issue 9.[online] Available at: <https://cacm.acm.org/magazines/2002/9/20784-integrating-web-sites-and-databases/abstract>
- [4] Kubilus, N. J. (2000). Designing an e-commerce site for users. September 2000, Crossroads, Volume 7 Issue 1. [online] Available at: <http://dl.acm.org/citation.cfm?id=351099>
- [5] Norman, D.A. The Design of Everyday Things. Doubleday, New York, 1994. [online]. Available at: <http://cc.droolcup.com/wp-content/uploads/2015/07/The-Design-of-Everyday-Things-Revised-and-Expanded-Edition.pdf>
- [6] Tilson, R., Dong, J., Martin, S., Kieke, E. (1998). A comparison of two current e-commerce sites. September, Proceedings of the 16th annual international conference on Computer documentation.[online]. Available at: <http://isedj.org/6/7/Gabriel.txt>
- [7] Anderson, R., Francis, B., Homer, A., Howard, R., Sussman, D. and Watson. (2001) Professional ASP.NET. Wrox Press Ltd. [online]. Available at <http://eu.wiley.com/WileyCDA/WileyTitle/productCd-0764543962.html>
- [8] Brown, S., Burdick, R., Falkner, J., Galbraith, B., Johnson, R., Kim, L., Kochmer, C., Kristmundsson, T. and Li S (2001). Professional JSP. Wrox Press Ltd. [online]. Available at: http://www.academia.edu/7311460/Online_Transactions_Using_Asp.net_and_Ado.net
- [9] Walther, S. (1998) Active Server Pages. SAMS Net. [online]. Available at. <ftp://www.mans.edu.eg/Learn/Asp.Net2008/Sams.ASP.NET.3.5.Unleashed.Jan.2008.pdf>

- [10] Wagner, R., Daniels, K., Griffin, G., Haddad, C. and Nasr, J. (1997) JavaScript Unleashed. SAMS Net.[online]. Available at <https://www.blog-ger.com/blogin.g?blogspotURL=http://dominicryker.blogspot.cz/2016/03/pdf-javascript-unleashed-by-richard.html>
- [11] Wiley, Y. M. J. & Sons. (1997) Creating the Virtual Store: Taking Your Web Site from Browsing to Buying [online]. Available at: http://www.academia.edu/7179788/online_shopping_system_documentatio_by_siomn_diodio_ambundo?s=t
- [12] Mitchell, S. (2004, February 04). Protecting Files with ASP.NET. Retrieved April 19, 2017, from <http://aspnet.4guysfromrolla.com/articles/020404-1.aspx> for relationship between IIS and ASP.NET.
- [13] Services. (2017, February 16). Retrieved April 19, 2017, from http://www.x-cart.com/articles/design_development.html for Online Customer Behavior
- [14] Schoenbaum, R. (2004, January 14). How ASP.NET Web Pages are Processed on the Web Server. Retrieved April 19, 2017, from <http://aspnet.4guysfromrolla.com/articles/011404-1.aspx> for relation between IIS And ASP.NET.
- [15] (n.d.). Data Flow Diagram (DFD)s: An Agile Introduction Retrieved April 19, 2017, from <http://www.agilemodeling.com/artifacts/dataFlowDiagram.htm> for definition of Data Flow Diagram.
- [16] Anirudh Chari, Management Consultant, Entrepreneur, Start-up Strategist Follow. (2011, November 08). An Introduction to E-Commerce Market in India. Retrieved April 19, 2017, from <https://www.slideshare.net/anirudhchari/an-introduction-to-ecommerce-market-in-india> for Key Success factor
- [17] Henry Muccini, Associate Professor in Software Engineering Follow. (2012, October 22). Software Architecture: Introduction. Retrieved April 19, 2017, from <https://www.slideshare.net/henry.muccini/software-architecture-introduction> for E-Commerce Architecture – Static Description
- [18] Entity–relationship model. (2017, April 18). Retrieved April 19, 2017, from https://en.wikipedia.org/wiki/Entity%E2%80%93relationship_model for Entity Relationship Diagram (ERD)

- [19] TOGAF: Functional Decomposition Diagram. (n.d.). Retrieved April 19, 2017, from http://wiki.glitchdata.com/index.php?title=TOGAF%3A_Functional_Decomposition_Diagram for functional decomposition diagram
- [20] Website Development Tutorials. (n.d.). Retrieved April 19, 2017, from <http://editorialzone.blogspot.cz/2010/09/data-flow-diagrams-of-online-shopping.html> for Customer-Authentication Context DFD
- [21] Grocery Store Download. (2015, December 23). Retrieved April 19, 2017, from <http://webscripts.softpedia.com/script/E-Commerce/Complete-StoreSolutions/Grocery-Script-84575.html> for Back-end Over View
- [22] Han, Ka Ching, and David Tien. "A MULTI-TENANT PLATFORM FOR SMS INTEGRATED SERVICES." https://www.researchgate.net/publication/259005618_A_Multi-Tenant_Platform_for_SMS_Integrated_Services. N.p., n.d. Web. for Configuration for E-Comm-erce
- [23] Clarke-Salt, J. (2012, June 18). SQL Injection Attacks and Defense. Retrieved April 19, 2017, from <https://www.elsevier.com/books/sql-injection-attacks-and-defense/clarke-salt/978-1-59749-963-7> for SQL Injection Process
- [24] Achilles Download. (2014, April 24). Retrieved April 19, 2017, from <http://www.softpedia.com/get/Internet/Servers/Proxy-Servers/Achilles.shtml> for Price Manipulation Software

LIST OF ABBREVIATIONS

E-Commerce	Electronic Commerce
E-Shop	Electronic Store
IIS	Internet Information Services
ERD	Entity Relationship Diagram
FTP	File Transfer Protocol
SMTP	Simple Mail Transfer Protocol
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol Secure
ISAPI	Internet Server Application Programming Interface
ASP	Active Server Pages
HTML	Hypertext Markup Language
CSS	Cascading Style Sheets
JSP	JavaServer Pages
OSGI	Open Service Gateway Initiative
PHP	PHP Hypertext Preprocessor
PSGI	Perl Web Server Gateway Interface
EDI	Electronic Data Interchange
CVN	Card Verification Number
CA	Certificate Authority
PKI	Public-Key Infrastructure

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APPENDICES

Questions and Answer on Ecommerce: Sheet 1-3

APPENDIX P I: SHEET 1-3

Question1: How should merchants promote their ecommerce sites?

There are lots of ways this can be done, but for any business there are two no-brainers. The first is to promote the site to all existing customers - if they don't know that you sell online, they will go elsewhere. If they use your site and like it, they will probably tell their friends. So "Order online at" and your web address should be on every piece of literature and advertising that a company produces. The second is to register with search engines. It may take a little time, but it's often free and can produce good results. Just remember that your site will register more effectively if the pages are generated in HTML, rather than being dynamically generated from a database. In our customer's experience this can affect traffic to your site by around 50%.

What are the key things to turn browsers into buyers?

In short, remove the reasons why people might not buy. Make your ecommerce site oriented towards sales rather than marketing. When prospects are at the site, the marketing process is complete. So, show them the products immediately – don't hide them behind acres of marketing copy. Provide full terms and conditions – it seems more professional plus protects you. Give your contact details, including a telephone number. Explain your guarantee and returns policy. A rock solid guarantee goes a long way to persuading people to buy. Finally, explain your security, encryption and privacy policies.

What one thing can impress buyers?

Make the site fast. Use graphics effectively, not for the sake of it. Make the checkout process as easy as possible. Again, ensure that the site is not dynamically database driven unless this is absolutely essential – nothing is faster than doling out straight HTML.

How much will ecommerce software cost?

The answer varies according to the sophistication and volume of the site. However, professional ecommerce software is available for under £1,000, even under £500, and you can rent Web space capable of running such software for under £200 per annum.

What security risk does ecommerce involve?

Less than people think. In fact, the security risks run by web merchants are similar to those of mail-order companies. It is sensible for merchants to put anti-fraud policies in place such as phoning to confirm orders that are a particularly high value or that come from parts of the world more prone to fraud.

Should I manage my store through a browser interface?

At the moment, the most hyped topic around is that of the Application Service Provider or ASP. The theory is that everything can be done through a browser interface. Browsers are great, but don't believe all that you hear. If you have to use your ecommerce site a lot – like processing orders, changing products and prices and so on, you will find it slicker and quicker via a local PC, and you won't be reliant on your internet connection.

Should vendors maintain their own sites?

Some companies supplying ecommerce solutions keep all site maintenance under their direct control. This means that if you want to change a price, you have to go through the supplier. While this provides the service provider with a revenue stream, it can infuriate you, the vendor. The best way is to have a way of directly updating your site.

Is ecommerce profitable?

Absolutely yes! Selling online can be done on a small (under £1000) or large budget equally successfully and we have users to prove it. As with all business expansion do your research, get advice from trusted sources, decide what you can afford to spend to test the waters and then jump!