

Designing an Integrated, Secured and Intelligent E-Commerce Platform for Online Shopping

Chiagunye Tochukwu, Nwachukwu-Nwokefor K.C and Igbajar Abraham,
Computer Engineering Department, Michael Okpara University of Agriculture, Umudike.

Abstract: The paper presents a logical development of an integrated, secured and intelligent e-commerce platform for a more secured online transaction. The system is implemented using a 3-tier approach, with a backend database, a middle tier of Php-MySQL platform and a web browser as the front end client. Some of the applicable technologies include multi-tiered architecture, server and client side scripting techniques, Php programming, and relational database (such as MySQL). An e-payment system using shopping cart (smart card) with in-built security system to protect buyers from exposing their pin codes to fraudsters was used for transaction. The system made use of encryption techniques to hide the vital information concerning the shopping cart in use, so as to avoid un-authorized access to the shopping cart information. The access control is divided into users, database administrators and control panel. The database administrator end upload and update products, delete products, view payment and view customer on the platform while users access the online purchase platform by viewing product, checking shopping cart balance, placing order and making payment using shopping cart. Control panel create, fund shopping cart and create administrator password.

Keyword: Shopping Cart, Administrator, Encryption, Secured, Integrated, Database.

I. INTRODUCTION

Internet has been one of the most frequently used means of exchanging information among people in the recent past. It may be used for keeping in touch, business transaction, research proceedings, shopping, entertainment, global social infrastructural exchange. Electronic data transmission breaks the distance barrier in global market.

Nowadays, there is a lot of business going on exclusively online. Paperless billing, for example, might become a regular practice for banks and other institutions, market inclusive.

Because of its ubiquitous presence in every area of human activity especially today and in the future, it is vital that everyone has the ability to access the Internet.

Furthermore, everyone should be able to browse the same websites and have the opportunity for equal user experience in the Internet. In other words, the Internet should be usable by everyone.

E-commerce represents the direction of future trade development to internet service. Promotion of e-commerce will bring great benefits to the society and the economy. For example, e-commerce improves the speed and quality of services of transaction, promotes the globalization of markets, and cuts down cost. For these reasons, this paper aimed at developing an online shopping website for selling of goods and services to people globally. The website is designed for people who prefer online shopping of daily necessities and it covers the entire process from product management, classification and querying, to the shopping cart, and user order processing.

The system includes both a front-end portal for customers and a back-end management system used by administrators to manage the website in the background. Php was used as the framework for the project to facilitate software development, maintenance and upgrading.

II. LITERATURE REVIEW

Firms across the globe have adopted e-commerce (EC) in their operations and have reaped benefits thereof. While firms in technologically developed countries like US and UK has deployed EC to its advantage,

whereas firms in developing countries like Nigeria failed to follow suit. Though it has been widely acknowledged by the researchers that the adoption of EC by businesses in developing countries is an important economic indicator of growth; many firms in Nigeria still have not realized the potential benefits of EC. The increasing importance of e-commerce is apparent in the study conducted by researchers at the GVU (Graphics, Visualization, and Usability) Center at the Georgia Institute of Technology. In their summary of the findings from the eighth survey, the researchers report that “e-commerce is taking off both in terms of the number of users shopping as well as the total amount people are spending via Internet based transactions”. Over three quarters of the 10,000 respondents report having purchased items online. The most cited reason for using the web for personal shopping was convenience (65%), followed by availability of vendor information (60%), no pressure from sales person (55%) and time saving (53%). The result from the survey brought about the need for E-commerce as an alternative to the traditional (offline) way of doing business.

III. SYSTEM DESIGN

The complete system contains four sub-systems and sixteen modules. At the customers sub-system, user can view the products, check shopping cart balance, place order and make payment. At database administrator sub-system, the admin can add, delete product, assign price to the products etc. At control panel sub-system, creates admin password, create shopping cart and fund the shopping cart.

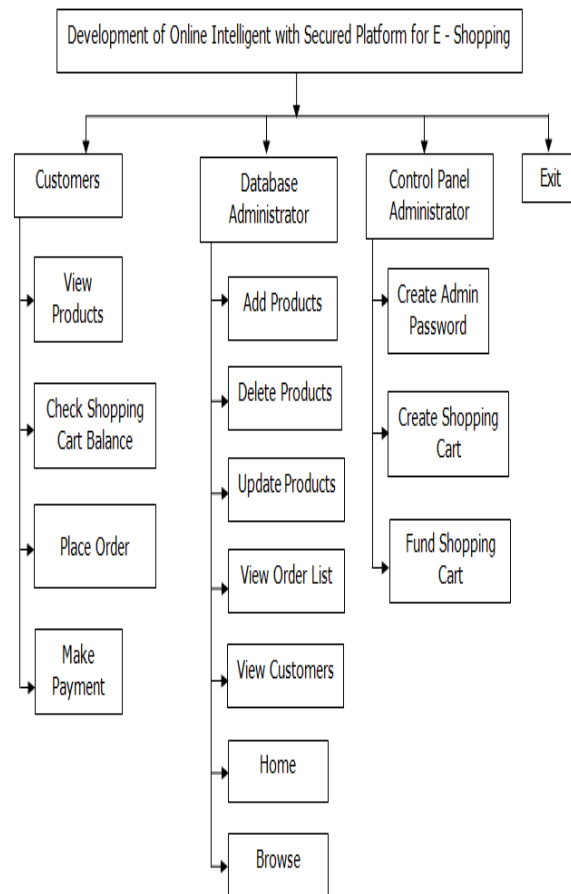


Figure-1: Block Diagram for the E – Shopping

Database Design

Different modules were designed using MySQL database. The database table is shown below:

E-cart

The e-cart table was used to create the electronic shopping cart; it consists of seven field names and their types, with the cart number used as the primary key in order to uniquely identify it.

Table 1: E-Cart

Field	Type	Null	Key	Default
Firstname	Varchar(30)	YES		(NULL)
Lastname	Varchar(30)	YES		(NULL)
Cartnumber	Varchar(60)	NO	PRI	
Signature	Varchar(30)	YES		(NULL)

Expdate	date	YES		(NULL)
Pin	Int(8)	YES		(NULL)
Amount	double	YES		(NULL)

Admin Table

The admin table was used to create administrator table, it consists of two field name with two data types, while the username is the primary key.

Table 2: Tbl_Admin

Field	Type	Null	Key	Default
Username	Varchar(20)	NO	PRI	
Password	Varchar(30)	YES		(NULL)

Order Table

Order table was used to create, making order (purchase) table, it consist of seven field names with their data types.

Table 3: Tbl_Order

Field	Type	Null	Key	Default
sn	int(6)	NO	PRI	(NULL)
id	int(6)	YES		(NULL)
user	Varchar(30)	YES		(NULL)
dates	date	YES		(NULL)
status	Varchar(20)	YES		(NULL)
price	double	YES		(NULL)
product	Varchar(30)	YES		(NULL)

Contro Panel Table

The control panel table was created to control the admin password, it consist of two field names with their data types.

Table 4: Tbl_Cpanel

Field	Type	Null	Key	Default
Username	Varchar(20)	NO	PRI	
Password	Varchar(30)	YES		(NULL)

Payment Table

The payment table was created for customers to make payment, it consist of six field name with their data types

Table 5: tbl_payment

Field	Type	Null	Key	Default
sn	Int(7)	NO	PRI	(NULL)
id	Int(7)	YES		(NULL)
user	Varchar(25)	YES		(NULL)
items	Int(7)	YES		(NULL)
amount	double	YES		(NULL)
dates	date	YES		(NULL)

Overall Data Flow Diagram of the Proposed System

The flow chart of figure 2 below shows the detailed diagram of the proposed system with three predefined procedure and their decision boxes.

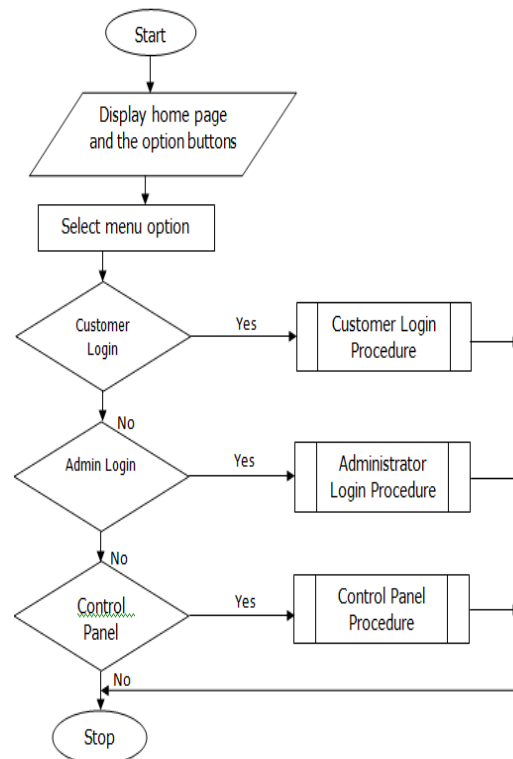


Fig. 2: Overall Dataflow Diagram

In figure 3, customers sign up to do initial registration. They have to sign in and verification of their shopping cart account done before purchases can be allowed to be made else you re-enter.

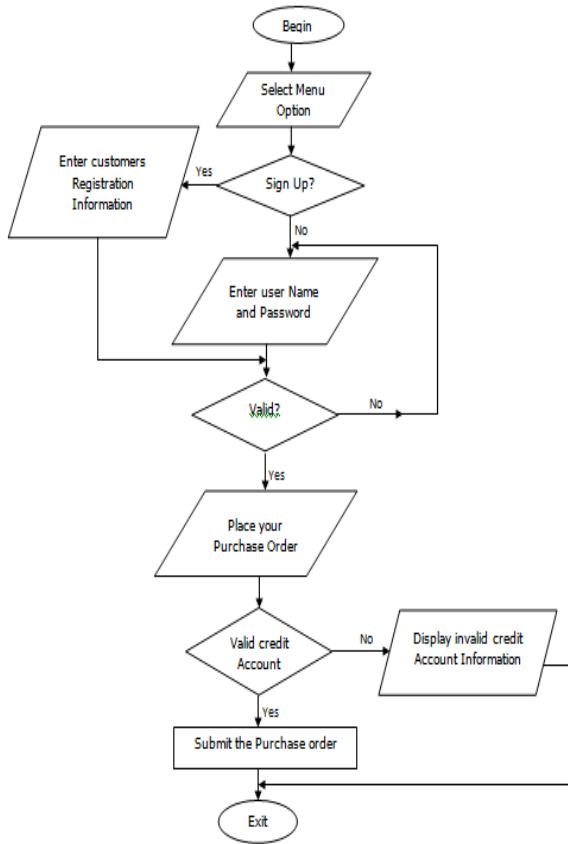


Fig. 3: Customer Login Process

Figure 4 is the flow chart where the admin can decide to add or update product, view product order etc.

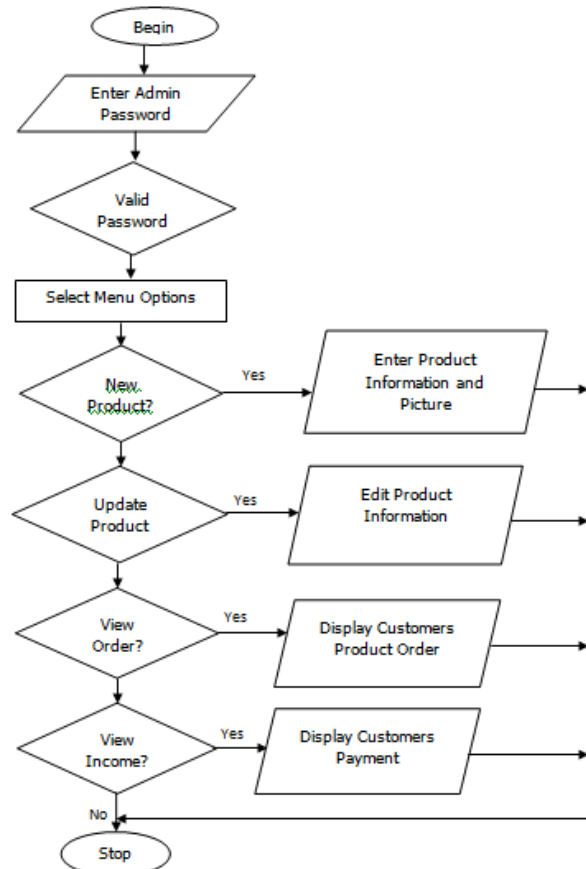


Fig. 4: Administrator Login Process

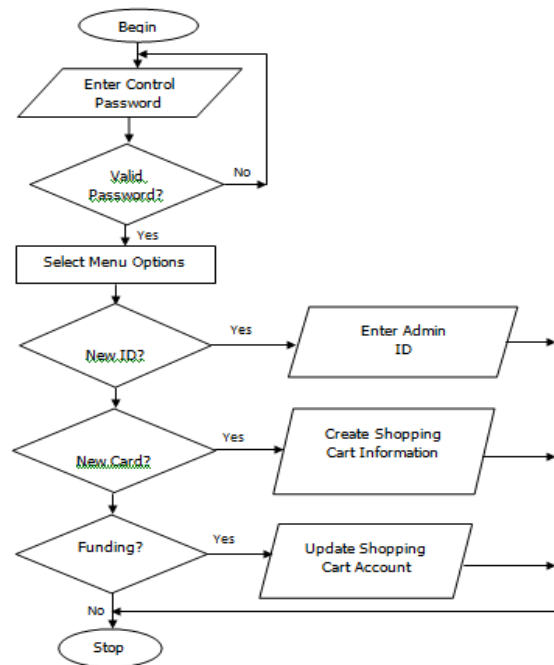


Fig. 5: Control Panel Process

Figure 5 is the flow chart for the control panel, here, the control panel can decide whether to create admin password, create shopping cart or fund the shopping cart as desired by the customer.

Cart Algorithm

// Cart tree growing process

// Cart (Classification and Regression Trees)

Choose a split among all the possible splits at each node so that the resulting child nodes are the “purest”.

Each split depends on the value of only one product variable.

If X is a nominal categorical variable of I categories, there are $2^{I-1}-1$ possible splits for this purchase.

If X is an ordinal categorical or continuous variable with K different values, there are K-1 different splits on X.

A tree is grown starting from the root node by repeatedly using the following steps on each node. At each node t do the following:

1. Find each buyer's best split.
For each continuous and ordinal product, sort its values from the smallest to the largest and for each nominal product, examine each possible subset of categories to find the best split.
2. Select and execute the 'best' of the node's splits s^*
Among the best splits found in step 1, choose the one that maximizes the splitting criterion.
3. Stop splitting on a node when:
 - All cases in a node have identical values of the dependent variable.
 - All cases in a node have identical values for each product.
 - The current tree depth reaches the user-specified maximum limit value.

- The size of a resulting child node is less than the user specified minimum value, and
- The improvement $\Delta I(s^*, t) - \max(\Delta I(s, t))$ is smaller than the user-specified minimum improvement.

Program Code

```
<?php
$server="localhost";
$user="Idumuesah";
$pass="Igbajar";
$db="tutorials";
// connect to mysql
mysql_connect($server, $user, $pass) or
die("Sorry, can't connect to the mysql.");
// select the db
mysql_select_db($db) or die("Sorry, can't select
the database.");
?>
Database code
<?php
session_start();
require("includes/connection.php");
if(isset($_GET['page'])){
    $pages=array("products", "cart");
    if(in_array($_GET['page'], $pages)) {
        $_page=$_GET['page'];
    }else{
        $_page="products";
    }
}else{
    $_page="products";
}
?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML
1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-
transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
    <meta http-equiv="Content-Type"
content="text/html; charset=utf-8" />
    <link rel="stylesheet" href="css/reset.css" />
```

```
<link rel="stylesheet" href="css/style.css" />
<title>Shopping Cart</title>
</head>
<body>
  <div id="container">
    <div id="main">
      <?php require($_page.".php"); ?>
    </div><!--end of main-->
    <div id="sidebar">
    </div><!--end of sidebar-->
  </div><!--end container-->
</body>
</html>
```

User Interface Design

Before implementing the actual design of the project, a few user interface designs were constructed to visualize the user interaction with the system as they browse for books, create a shopping cart and purchase books. The user interface design will closely follow our functional decomposition. Figures 6 – 10 show the initial designs of the web pages.

Figure 6 above is a typical website. To make a purchase, the customer need to login with his/her username and password.

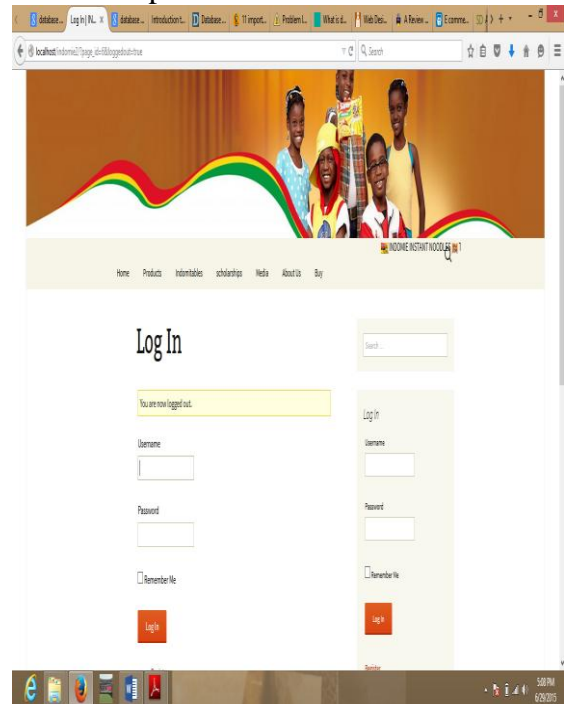


Figure 7. Login Page

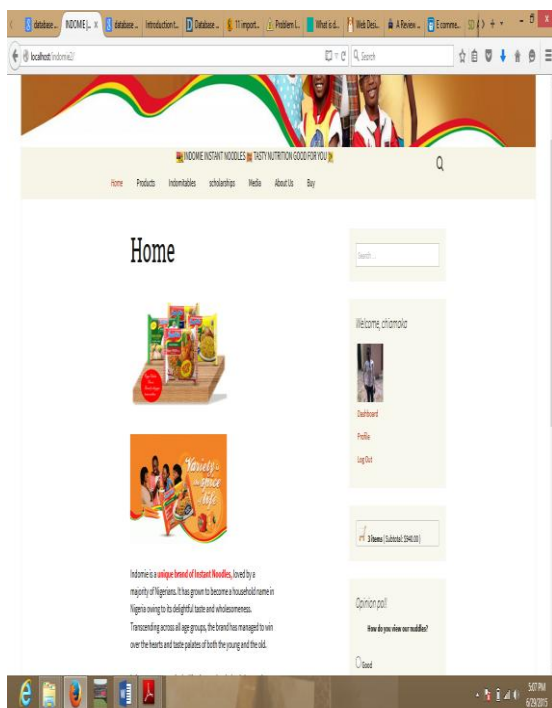


Figure 6: Initial Web Page

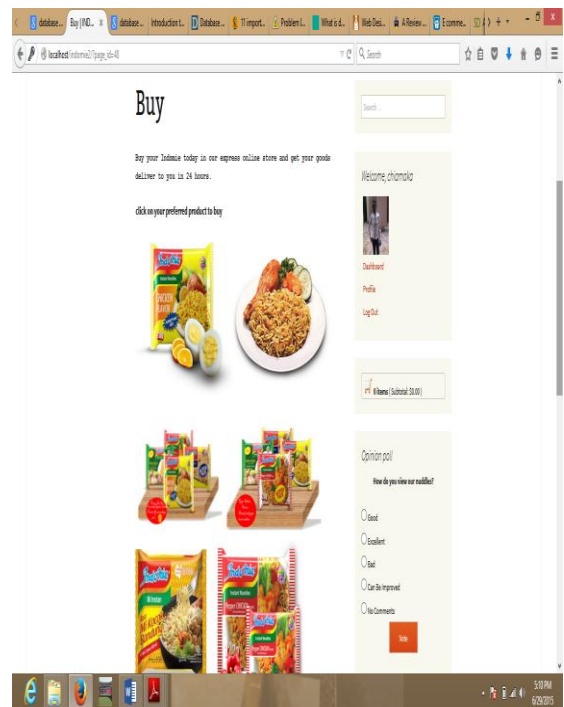


Figure 8: Display of Some Available Item

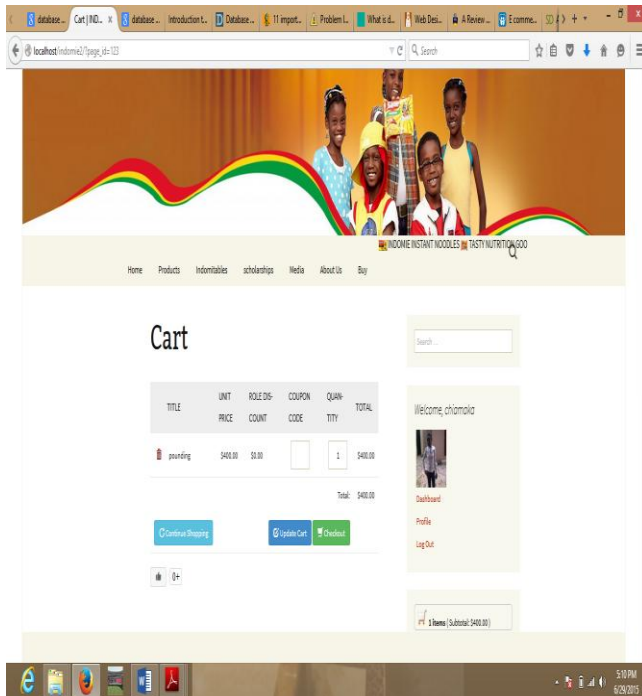


Fig.9. Authentication page

Figure 9 above shows the edit shopping cart page. After proceeding to checkout the user should enter the billing details to process his order request.

For this he/she should enter his Credit Card details correctly. Figure 10 below is the page for checking out.

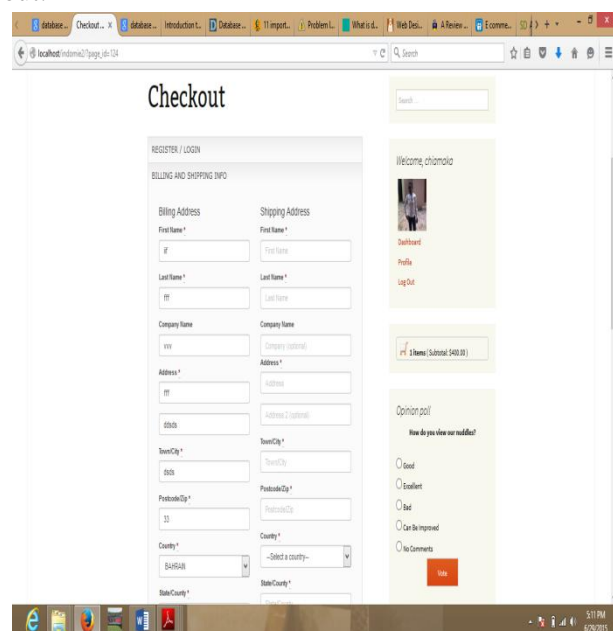


Figure-10: Checkout Page

CONCLUSION

The top on the key problem area facing SMEs generally in Nigeria is inability to market their products. Some of the SMEs are located in a rural area where access to good road is not available. The only means of reaching out to both government and potential buyers is by showcasing their products on an e-commerce platform. This will help create awareness and bring to the notice of government the existence of such productions in a particular locality, which is capable of attracting development to the area. So, the integrated e-commerce platform developed is nice, commendable and will create web presence for all SMEs in Nigeria. The benefits are so numerous and will bring about economic growth of any nation.

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