

A NOVEL APPROACH FOR EMBEDDED & IoT PRODUCTS DISTRIBUTION

A PROJECT REPORT

*Submitted in partial fulfillment for the award of the degree of
Bachelor of Technology
in
Computer Science and Engineering*

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**SCHOOL OF ENGINEERING AND TECHNOLOGY
SRI PADMAVATI MAHILA VISVAVIDYALAYAM**

Tirupati.

April 2020



Department of Computer Science and Engineering

DECLARATION BY THE CANDIDATE

We hereby declare that the project entitled "**A Novel Approach for Embedded & IoT Products Distribution**" submitted by us to the Department of Computer Science and Engineering, School of Engineering and Technology, Sri Padmavati Mahila Visvavidyalayam, Tirupati in partial fulfillment of the requirements for the award of the degree of **Bachelor of Technology in Computer Science and Engineering** is a record of bonafide work carried out by us under the supervision of **Mr.K.VenkataGurunatha Naidu, M.tech.,(Ph.D), Assistant Professor, Department of CSE.** We further declare that the work reported in this project has not been submitted and will not be submitted, either in part or in full, for the award of any other degree or diploma of this university or of any other institute or university.

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BONAFIDE CERTIFICATE

This is to certify that the project report entitled "**A Novel Approach for Embedded & IoT Products Distribution**" submitted by C.Bhavana (1671008), S.Deepika (1671013), K.Pallavi (1671050), G.S.Sushma Sree (1671090) , School of Engineering and Technology, Sri Padmavati Mahila Visvavidyalayam, Tirupati in partial fulfillment of the requirement for the award of the degree of **B.Tech in Computer Science and Engineering** is a record of bonafide work carried out by them under my guidance. The project fulfills the requirements as per the regulations of this University and in my opinion meets the necessary standards for submission. The contents of this report have not been submitted and will not be submitted either in part or in full, for the award of any other degree or diploma and the same is certified.

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ABSTRACT

In the present times, Embedded software has found the immediate application in telecommunications, defense instruments, railroad networks, consumer electronics, electronic payments, Internet of Things applications. Embedded systems created many ripples in the scientific world with its innovation of autonomous robots that could be for personal use. Looking for its diversity of applications and also potential for production of highly innovative products. Embedded systems can be considered as a primary technology of the future. The growth and direction of these Embedded products in the market, and the challenges associated with increasing in the complexity of the Embedded applications that demand more powerful, lower cost hardware and better connectivity. The demand for embedded products is increasing gradually, so an ecommerce website for such products plays a major role in the hardware and software development industry.

Keywords: Ecommerce, embedded products, embed, online-shopping

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Chapter 1

INTRODUCTION

1.1 General Introduction

Embedded Products

Embedded systems are the computer based systems that are part of larger systems and they perform some of the requirements of these systems. Examples of such systems are auto mobile control systems, industrial processes control systems, mobile phones, or sensor controllers. Embedded systems cover a large number of computer systems from ultra small computer-based devices to large systems monitoring and also controlling the complex processes. The overwhelming no.of computer systems belongs to embedded systems: 99% of all computing units belong to embedded systems today.

Example: Aurdino, Raspberry Pi, Sensors



Fig1: Embedded Products

Internet of Things (IoT) and its applications

The term Internet of things (IoT) has become very famous in the present era of digital communication and networking. IoT refers to the network interfacing and communication of physical objects, devices and peripherals. These are used to communicate and exchange information between each other without depending on human or computer interaction.

This advanced communication between equipment of IoT has taken device automation and building management systems to level which used to be just a dream only a few years back. Home appliances which could be controlled over a network are called smart appliances. Now you can control your appliances remotely over internet, switching them on or off by tapping the screen of your phone. All this became possible with internet of things only (IoT).

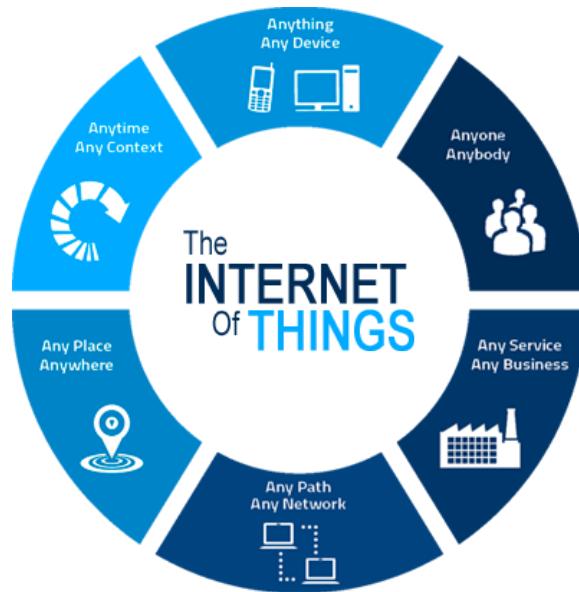


Fig2: Internet of things

Applications of IoT:

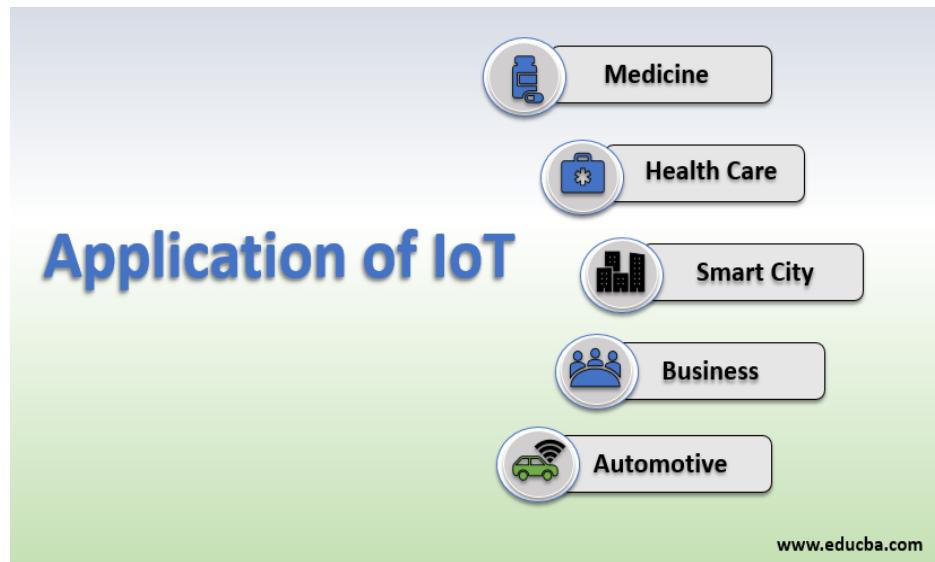


Fig3: Applications of IoT

Ecommerce:

E-commerce or Electronic commerce is defined as buying and selling of products and services by businesses or consumers through an electronic mode or portal. E-commerce is widely considered as buying and selling of products over the internet (e-business), but any transaction done through electronic means like online payment that can be considered as E-commerce.



Fig.1: E-Commerce transaction Cycle

Fig4. Ecommerce transaction cycle

Web designing

Web Applications are dynamic web sites. Web applications are combined with server side programming and providing the functionalities such as interacting with the users/clients, connecting to the back-end databases, and generating results to the browsers.

Examples:

Web Applications are Online Banking, Social Networking, Online Reservations System, E-Commerce or Shopping Cart Apps, Interactive Games, Online Training System, Online Voting, Blogs, Online Forums, Content Management Systems, etc..

1.2 Problem Statement

To design and develop a Web application/ Ecommerce website which exclusively provide the vast varieties of embedded products like Arduino, Raspberry Pi, Sensors and IoT based home automation systems.

1.3 Objectives of the proposed work

The main objectives of our proposed work are:

- ✓ To study the existing trends on ecommerce.
- ✓ To study the technologies required to design website.
- ✓ To design the template for the ecommerce website for embedded products.
- ✓ To connect the website with databases.
- ✓ To provide the security for online payment processes.
- ✓ To monitor the sales and growth of the website and keep updated.
- ✓ Evaluate the complete website.

1.4 Report Organization

Project Title: “A NOVEL APPROACH FOR EMBEDDED & IoT PRODUCTS DISTRIBUTION”

Objective: The objective of our project A NOVEL APPROACH FOR EMBEDDED & IoT PRODUCTS DISTRIBUTION is to design and develop a Web application/ Ecommerce website which exclusively provide the vast varieties of embedded products like Arduino, Raspberry Pi, Sensors and IoT based home automation systems, which will be very useful for students, startups and incubation centers.

Hardware Requirements : Processor: Intel core i5 (or above), RAM: 4.0GB (or above), Hard disk storage: 500GB (or above), Platform used: Windows 7/8/10

Software Requirements: Server: WAMP Server, Database server: MySQL, PHP server connection

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Chapter 2

LITERATURE SURVEY

2.1 Survey of the Existing Models/Work

[1] As we all know, internet and e-commerce are entirely committed towards every developed country. But we think it can be accomplished and can make a remarkable benefit to developing countries also if an ideal business purpose can be made. Clearly it is discussed that E-commerce is a revolution & turning point in online business practices and can make a huge contribution to the economy and also indicated that currently, e-commerce organizations have increasingly become a fundamental component of business strategy and a strong catalyst for economic development. A huge amount of research works has been done on e-Commerce which is basically on online shopping. A large group of researchers has found out and also pointed out the necessity and possibilities of Online Shopping. On the other hand, limitation of ecommerce is found and at the same time, they provided essential suggestion and came to a prediction to make Online Shopping more useful for the consumers. But the contribution of traditional marketing is also inescapable but compare to online shopping it is less effective we think. So on this basis, distinguish between online marketing & traditional marketing. Though most of the people of India especially the rural people are not enough capable of operating internet to run the online business. For that reason, they need to be dependent on traditional marketing.

Table 1: Distinguish between e-marketing & traditional marketing

E- Marketing	Traditional Marketing
Interactive advertisement. Example: website, social networking site, Google ads, banner ads, video marketing.	Contact from one side. Example: Print media (Newspaper), Broadcast Media (TV & radio ads), telemarketing.
E-marketing methods less expensive	Traditional marketing methods more expensive
Reach out maximum people	Limited audiences
Instant Comparable	Less opportunity
Save a lot of time	Need a lot of time
Less interaction	Interaction with people can make good relationship.

Fig6: Differences between e-marketing and traditional marketing

E-commerce websites are always changing. The global Internet usage is also growing considerably. Most of the e-commerce websites are in English. Most information on the website is presented by elements such as color, images, logos, shapes, frame, links, banner, buttons, animation, splash windows, and white spaces. It is important that e-commerce website designers consider the local culture when designing the website to reflect the Writing style, language option, navigation models, history, ethics, security and trust, gender, public policy, advertisement, awareness, human interaction, procedural compatibility, corporate structure, and prior e commerce experience can also influence the e-

commerce website user's view. All of these features and cultural aspects are very important factors for successful ecommerce websites.

The use of these website features to design an ecommerce website may be suitable to some local cultural groups but may not be appropriate by other global viewers. For the website design characteristics, the research includes color usage, page layout, site content, and the nature of website interactions. These characteristics were used to determine whether there was any indication of cultural influence among the selected

[2] E-commerce provides an easy way to sell products to a large customer base. When users land on an e-commerce site, they expect to find what they are looking for quickly and easily. Also, users are not sure about the brands or the actual products they want to purchase. E-commerce or Electronic commerce means buying and selling of products and services by businesses or consumers through an electronic mode or portal. E-commerce is widely considered the buying and selling of products over the internet, but any transaction done through electronic measures can be considered as e-commerce. E-commerce is subdivided into threeB2B (Trade India), B2C (Amazon, Flipkart) and consumer to consumer or C2C (eBay) E-Commerce in India has a long way since its early days. The market reaching its maturity and new giants are entering in the market space. In the present dynamic situation E-Commerce market in the B2C space is growing its demand, trust and services day by day. A considerable shift from traditional/physical market to e-market can be seen easily.

[3] Types of e-commerce websites

There are many types of e-commerce, but the most common are as follows:

	Business (organization)	Customer (individual)
Business (organization)	B2B (e.g TPN)	B2C (e.g Amazon)
Customer (individual)	C2B (e.g Priceline)	C2C (e.g eBay)

Fig7: Types of e-commerce websites

- B2B (Business-to-Business): B2B involves trade dealings between businesses where sale of merchandise is made to an interim purchaser (Pandey and Agarwal, 2014). B2B e-commerce deals with interactions between and among businesses. About 80% of e-commerce is in this category (Gupta, 2014). One example of B2B is a business transaction between a manufacturer and a wholesaler, or between a wholesaler and a retailer.
- B2C (Business-to-Consumer): In this model the trade is conducted directly between company and consumers via a website (Dan, 2014). In the B2C

model, businesses or organizations trade goods or services to customers over the Internet for consumers' own use.

- C2C (Consumer-to-Consumer): This is the fastest-growing type of e-commerce. Businesses simply provide a platform to advertise the product, and buyers can buy the product directly from the seller (Pandey and Agarwal, 2014). In the C2C model, businesses facilitate the setting where consumers buy and sell goods and services directly to each other.
- C2B (Consumer-to-Business): In a C2B model, customers sell goods and services to businesses, and the corporations purchase the products and services (Nemat, 2011). Consumers provide the value, and the businesses consume that value.

[4] A standardized description method for heterogeneous demand should include but not limited to the information shown in the following table

Components of an e-commerce website:

Table 7 Information of standardized description.

Item	Parameter
Name	Supplier
	Brand
	Commodity
	Category
Quality	Available time
	Quality level
Quantity	Size
	Packaging
Time	Date manufactured
	Order time
	Delivery time
	Life cycle
Place	Production place
	Destination
Mode	Payment method
	Delivery method
Credit	Supplier
	Commodity
Special requirement	Speed
	Sales volume
	Price
	Credit
Specified	

Fig8: Information on standard description

[5] The demand for intuitively usable interactive e-commerce applications is increasing exponentially, to reduce the time required for learning how to use a system and to increase usability for heterogeneous user groups. There is a need for behavior study to make end user's life easier. There are seven principles of user interface design considered during designing the case for HCI Design pattern.

These design principles are

1. Tolerance
2. Simplicity
3. Visibility
4. Affordance
5. Consistency
6. Structure
7. Feedback

[6] **There are two main categories of coding, scripting and programming for creating Web Applications:**

I. Client Side Scripting / Coding - Client Side Scripting is the type of code that is executed or interpreted by the browsers.

Client Side Scripting is generally viewable by the any visitor to a site (from the view menu click on "View Source" to view the source code).

Below are some common Client Side Scripting technologies:

- HTML (HyperText Markup Language)
- CSS (Cascading Style Sheets)

- JavaScript
- Ajax (Asynchronous JavaScript and XML)
- jQuery (JavaScript Framework Library – It is commonly used in Ajax development)
- MooTools (JavaScript Framework Library – It is commonly used in Ajax development)
- Dojo Toolkit (JavaScript Framework Library – It is commonly used in Ajax development)

II. Server Side Scripting / Coding - Server Side Coding is the type of code that is executed or interpreted by the web server.

Server Side Scripting is not viewable or accessible by the any visitor or general public.

Below are the common Server Side Scripting technologies:

- PHP (It is very common Server Side Scripting language - Linux / Unix based Open Source - free redistribution, usually combines with MySQL database)
- Zend Framework (It is PHP's Object Oriented Web Application Framework)
- ASP (Microsoft Web Server (IIS) Scripting language)
- ASP.NET (Microsoft's Web Application Framework - successor of ASP)
- ColdFusion (Adobe's Web Application Framework)
- Ruby on Rails (It is Ruby programming's Web Application Framework - free redistribution)
- Perl (It is general purpose high-level programming language and Server Side Scripting Language - free redistribution - lost its popularity to PHP)
- Python (It is general purpose high-level programming language and Server Side Scripting language - free redistribution)

[7] Website Development is like house building, before house building process, we ask to an architect about plan, building permit, oversee a survey of geological and license from city. All things must have to be see in the website development requirement, designing, documentation, appropriate server and programming language

Various Steps consider in Website Development Process:

1. Analysis
2. Specification
3. Design & Development
4. Content Writing
5. Coding
6. Testing& Security
7. Promotion
8. Maintenance & Update

2.2 Summary of the Literature Survey

In this Literature Survey, we studied about the Ecommerce website development, trends in the online shopping websites, differences between traditional and online shopping types of ecommerce business websites, structure and components of an online shopping website, technologies used for the design of website.

2.3 Gaps identified in the existing systems

- Traditional shopping: the products may not be genuine
- Available at Metropolitan cities: time taking
- Amazon: limited varieties
- Other websites such as Hacktronics, Sunrom, Kits ‘n’ spares, Robosoft Systems, Vega Robo Kit, Nex-Robotics : Shipment to remote areas not possible and less user friendly.

Chapter 3

OVERVIEW OF THE PROPOSED WORK

3.1 Introduction

Our project aim is to develop a Web application which exclusively provides the vast varieties of Embedded products like Arduino, Raspberry Pi, Sensors and many more. Generally, the Embedded products are available only in metropolitan cities, which makes difficult for everyone to go and purchase with lots of effort and time. To overcome this problem, our Website allows the users to purchase the products through online with less price and faster access. We will associate with the OEMs (Original Equipment Manufacturer) and sell the products to the customers in an effective manner like door delivery. This would be very helpful for incubation-centers, start-ups and for the students to develop their academic projects.

The website enhances many innovations by the use of Embedded products. The website can be improved using the Internet of Things, Artificial Intelligence such that the application is more responsive to the customers.

3.2 Framework, Architecture or Module for the Proposed System is:

I. Admin module

Admin panel is used to providing the Admin for managing website, customer, orders and products. Admin panel includes the

i. Dashboard

Admin dashboard includes

- Sales Report
- RSS feed for New Orders
- Tax Report
- Best Viewed Products Report
- Best Purchased Products Report
- Total Sales Invoiced
- Total Sales Refunded
- Best Customers Report by the Number and Total of Orders

ii. View/Add Categories

Admins can view, edit, add and delete the categories.

iii. View/Add Products

Admins can view, edit, add and delete the products.

iv. Customers Management Module

Customer accounts management module maintain the information about all the customers like address, contact number, their previous product choices etc. This information is to be very useful for successful ecommerce market.

v. Orders Management Module

- View, edit, create and fulfill to the orders from the admin panel
- Create one or multiple invoices, shipments and credit memos per order to allow for the split fulfillment
- Print the invoices and packing slips
- Email Notifications of Orders

II. Customer Module

The Customer module is used for managing customers, registration, account management. Customer module includes

i. Home Module

Home module is the main page, neatly designed page, here login option is provided to login and also new signup option is provided for the new user to signup.

ii. My Account Module

INFORMATION TO BE MAINTAINED FOR CUSTOMER ACCOUNT MANAGEMENT:

- Order status and history
- Re-orders from account
- Recently ordered items
- Address Book
- Default Billing and Shipping addresses
- Wishlist with ability to add comments
- Email or Send RSS feed of Wishlist
- Product Reviews submitted

iii. Customer Registration Module

Customer Registration module deals with the registration of New Customers i.e., the details of the customer like name, email address, password, etc. when registration is successful and customer is allowed to logged in the website then that he/she can access the most of the features available in the website.

iv. Categories Module

Product Catalog Management is a system that manages an online product catalog of a company's products and services and allows users to quickly search and finding the relevant products and options. Large Machines product catalog and the search capabilities to help the sales teams, customers, and end-users quickly find relevant product information online.

The system will maintain information of all the categories of the products
Following information is maintained:

- Category ID
- Category name

v. Product Module

The system will maintains the information about various products of the store.

Following information is maintained:

- Product ID
- Category ID
- Product name
- Product description
- Price
- Image/Thumbnail

E-shop flexible engine allows you to set up the category structures and the product pages to suite your business. During the built-in functionality for up-sell, cross-sell and related items increase the average value of your orders.

- Multiple images per product
- Stock availability
- Product Reviews
- Product Ratings
- Related Products
- Quantity Discounts
- Package Configuration

vi. Search Module

Search module is to let your customers search for the products they are looking for.

vii. Cart Module

Cart module is used for managing orders, invoice, shipment, cancelling order, printing orders invoice.

viii. Checkout module

Checkout module is used for providing your customers a smooth experience to place orders.

ix. Shipping and Payment module

Shipping and Payment module for managing shipping methods and payment methods to place order.

Payment Methods

Online Payment Methods:

Online Bank Transfer

Credit Card

Debit Card

Cash Card

Mobile Payment (BHIM)

Offline Payment Methods

Cash on Delivery

INFORMATION TO BE MAINTAINED FOR PAYMENT MODULE :

- Configurable to authorize and charge, or authorize only and on creation of invoices
- Integrated with multiple PayPal gateways
- Saved Credit Card method for off-line payments
- Accept Checks/Money Orders
- Accept Purchase Orders

x. Review and rating module

Review and rating module for letting your customer to write the review and rate the products they purchased so this may help other customer to make decision whether to buy or not to buy.

xi. Contact module

Contact module consists of information related to the website communication numbers or email addresses.

3.3 Proposed System Model (UML Diagrams)

DATA FLOW DIAGRAM

Data Flow Diagrams show the flow of data from the external entities into the system, and from one process to another within the system. There are four symbols for drawing a Data Flow Diagram[DFD]:

- I. Rectangles representing external entities, which are sources or destinations of data.
- II. Ellipses representing processes, which take data as input, validate and process it and output it.
- III. Arrows representing the data flows, which can be either, electronic data or physical items.
- IV. Open-ended rectangles/a Disk symbol representing the data stores, with the electronic stores such as databases or XML files and physical stores such as filing cabinets or stacks of paper.

Figures below are the Data Flow Diagrams for the current system. Each and every process within the system is first shown as a Context Level DFD and later as a Detailed DFD. The Context Level Diagram provides a conceptual view of the process and its surrounding input, output and data stores. The Detailed Data flow diagramprovides a more detailed and comprehensive view of the interaction among the sub-processes within the system.

CONTEXT LEVEL DIAGRAM



Fig9: Context level diagram

First Level DFD

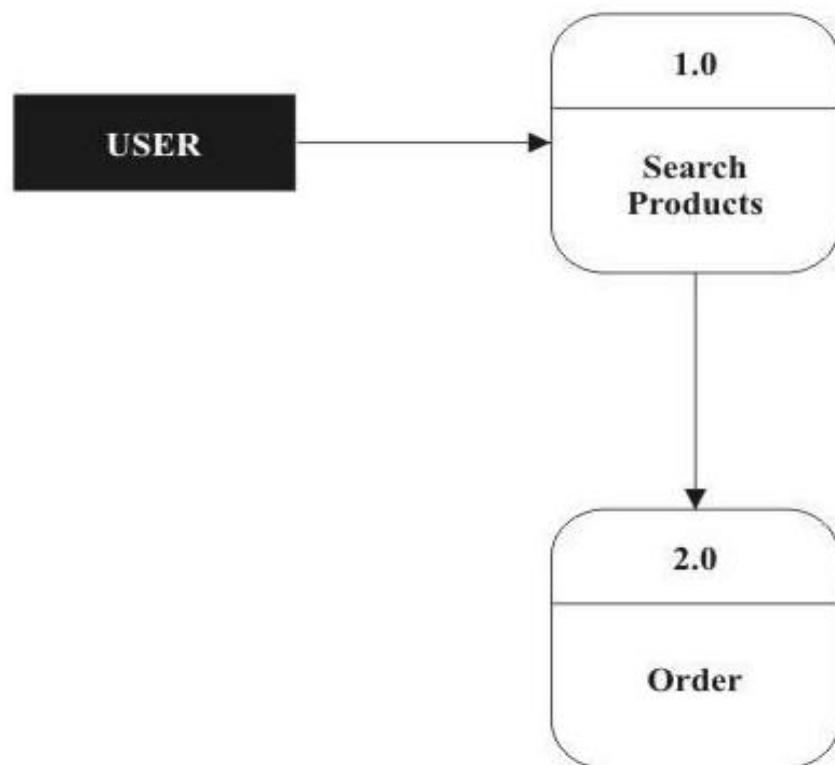


Fig10: First level DFD

SECOND LEVEL DFD

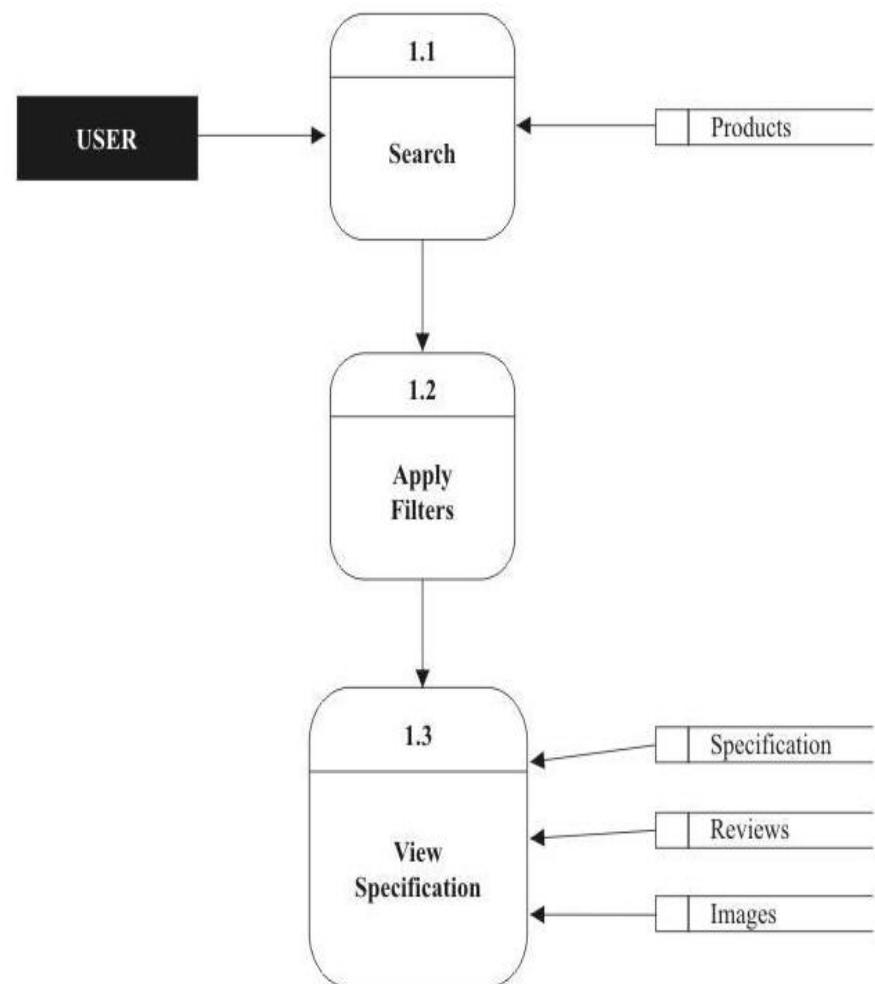


Fig11: Second level DFD

UML Modeling Diagrams:

Modeling a system can be made in different ways, depending on the nature of the system that is created. This paper will try to make modeling for online system using UML diagrams, which are standard diagrams accepted around the world for modeling different systems (software). Starting from the simplest diagram which is Use Case diagram to the most complex, we will make graphical representation of all the diagrams in terms of accessing online systems.

A. Use case diagram

Use case diagrams commonly referred to as behavioral diagrams that describe a set of actions (Use Cases) that some systems can or should do in cooperation with one or more external users of the system (actors). Each use case must provide an observable result and valuable for actors or other stakeholders of the system. Use case diagram consists of 4 items:

Actor – in the use case diagram is an entity that performs a role in a given system. This can be a person, organization or an external system.

A use case- is a feature or an action within the system.

System- used to define the field of use case and drawn in the form of a rectangle. This is an optional but useful element when dealing with large systems.

Package- is another optional element that is extremely useful in complex diagrams.

The following is a use case diagram of a system for online access.

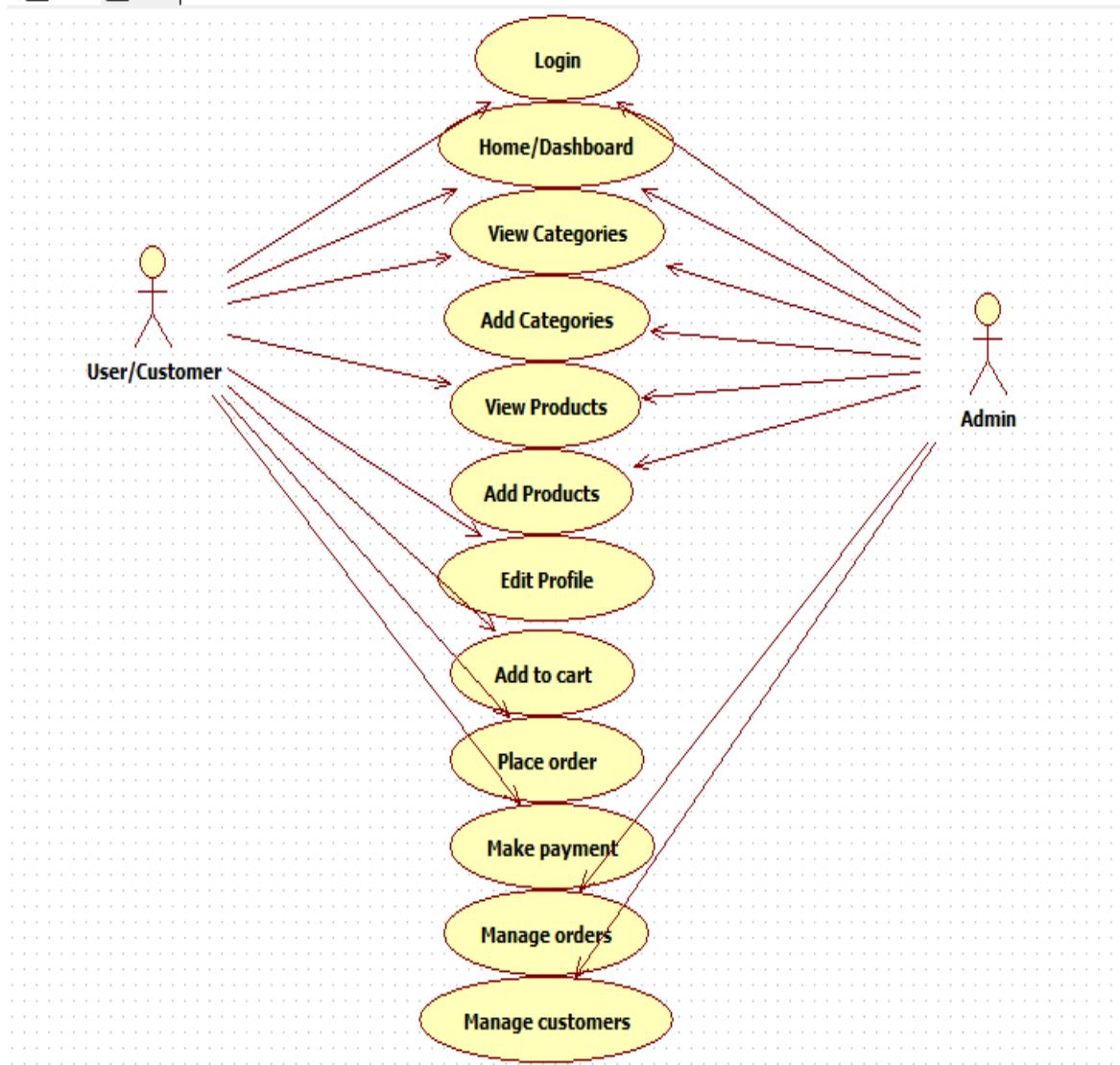


Fig12 . Usecase diagram for e-commerce website

B. Class diagram

A class diagram is similar to the family tree. A class diagram consists of a set of classes and interfaces reflecting the main entities in the field of business system that is modeled, and the relationship between these classes and interfaces. Classes and interfaces of the diagram represent the tree family members and relations between classes are analogous to the relationship between family

members. They are used to describe the types of objects in a system and relations. They shape the structure of classes and contents using design elements such as classes, packages and objects. They are used in most cases when it comes to design object-oriented software. Used to describe the system classes and its relations between them.

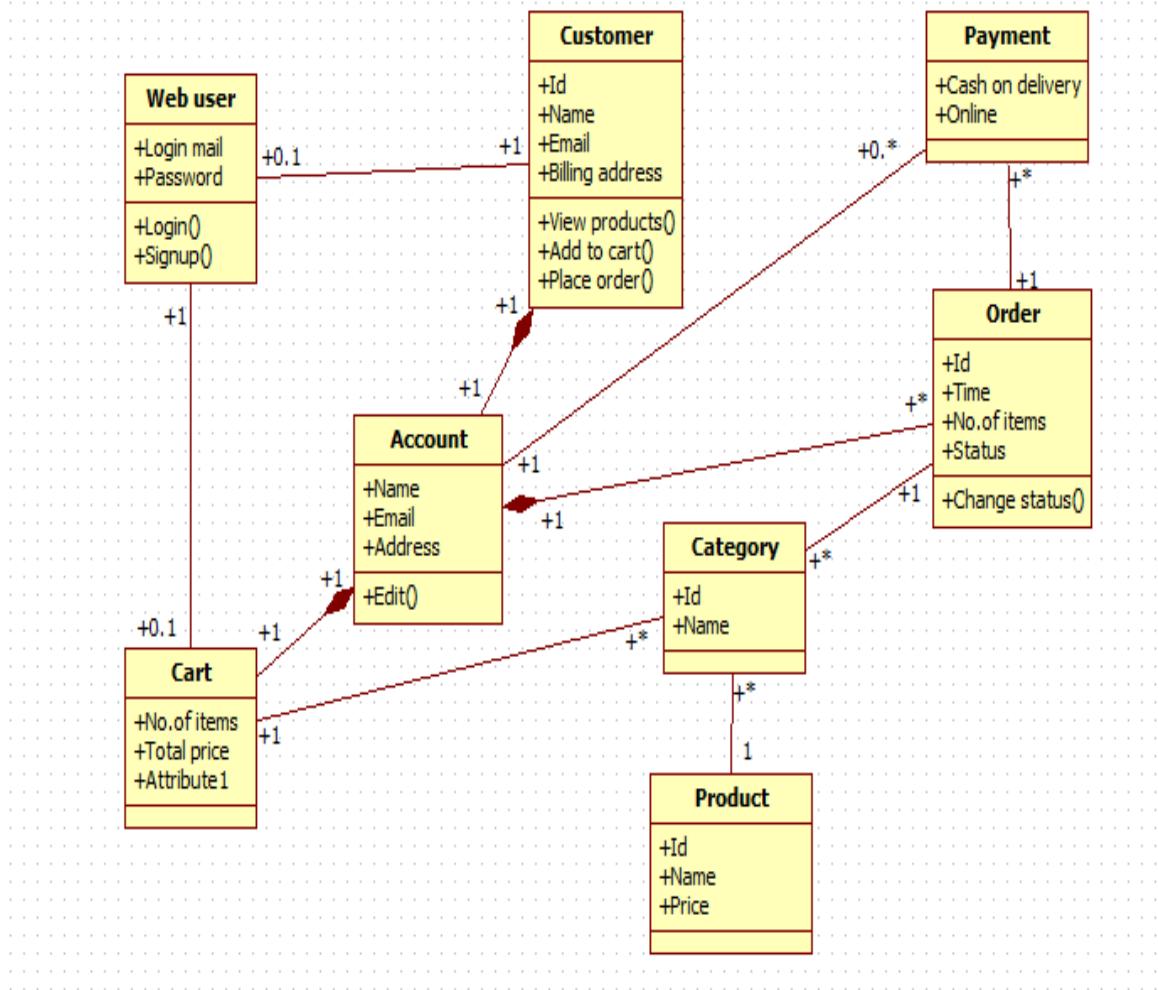


Fig13: Class diagram for ecommerce website

C. Activity diagram

The logical place to start UML diagrams is based on the activity diagrams. Activity diagrams show the flow of control and representing a presentation in the form of diagrams, keeping a hierarchy of activities. Activities are capable of action - which cross state into another state automatically after the action has finished. Activity diagram describes how activities are coordinated to provide a service, the events necessary to achieve an action, as the events in a use case associated with one another, as a collection of instances of coordinated to create a workflow for organization.

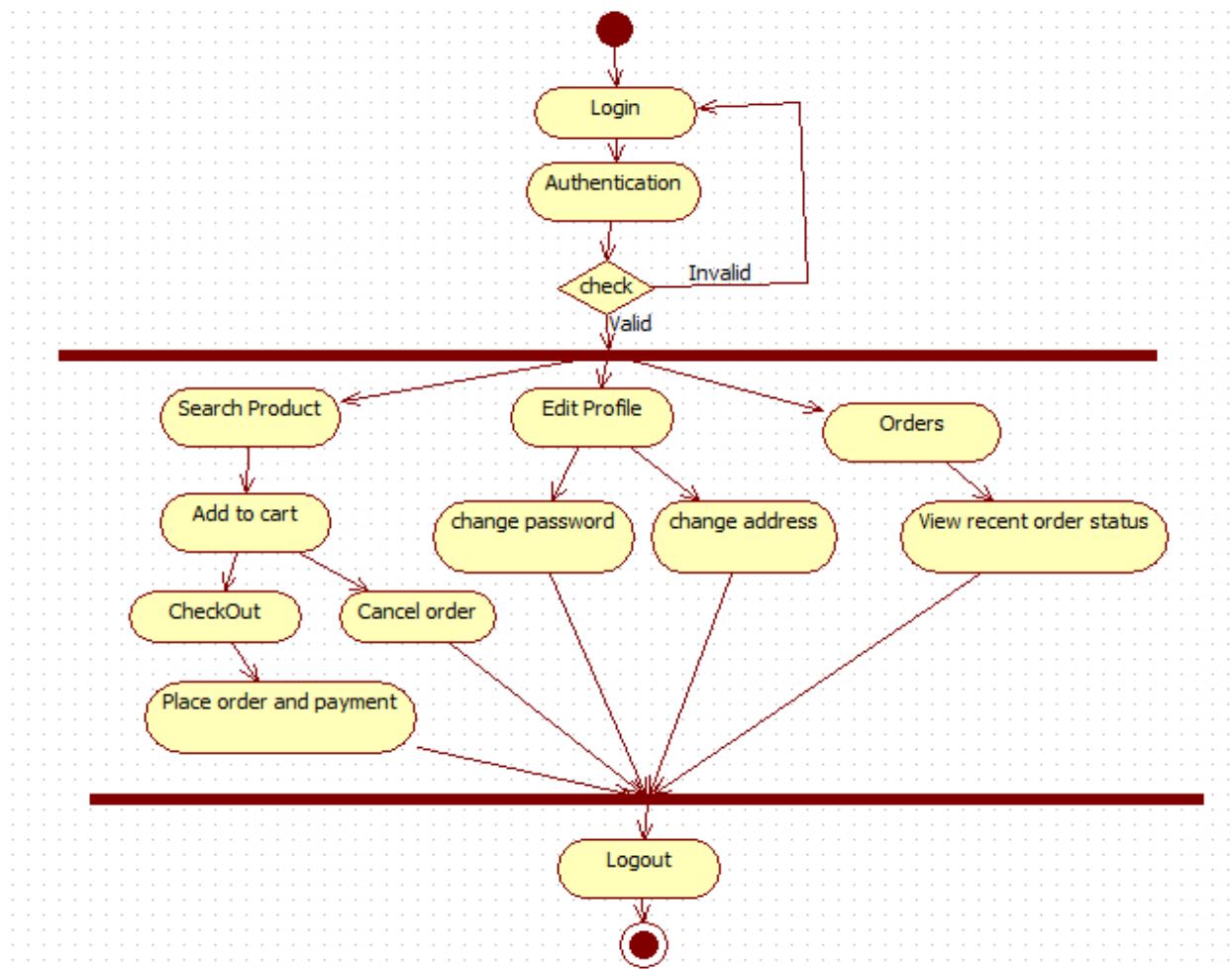


Fig14a . Activity diagram for e-commerce website (user)

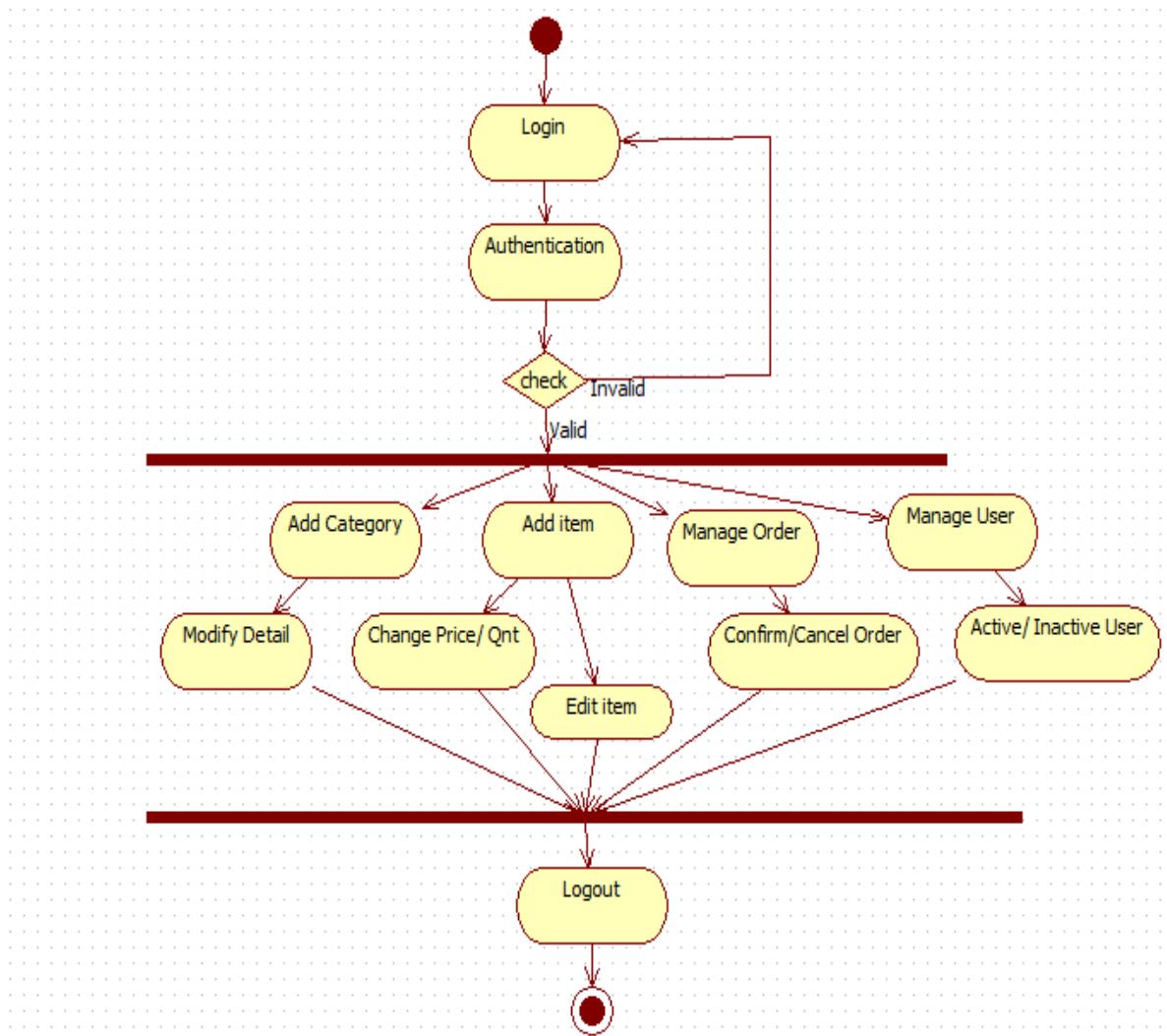


Fig14b: Activity diagram for e-commerce website (admin)

D. Sequential diagram

Sequence diagram describes the sequence of actions that appear in the system. Calling the methods in each object, and the directions in which the call (Invocation) is shown in the diagram appear sequential. Sequence diagram is two-dimensional in nature. On the horizontal axis shows the life of the facility which represents while on the vertical axis represents the sequence of creation or call for these objects.

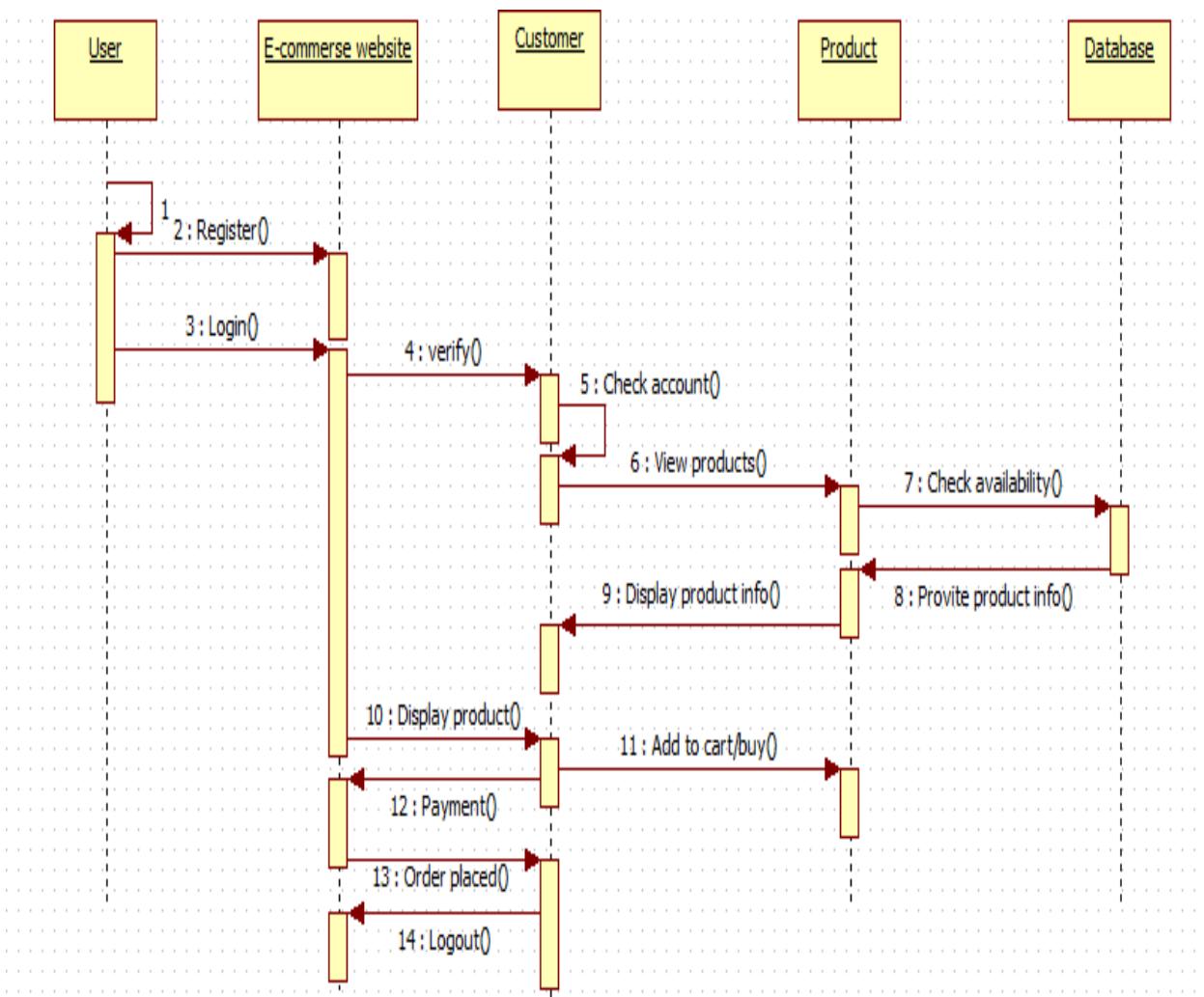


Fig15. Sequential diagram for e-commerce website

E. State diagram

All diagrams mentioned so far are static diagrams, which mean they help in visualized what elements of the complete system should be, but does not show anything for the following of any event that an item of system can have. Structural elements are used to describe static diagrams. During coding, it is necessary to understand the details of the object class status and transitions in different intervals during any event or action. The state diagrams (also called as graph state diagrams) are used to help developers better understand any complex or unusual function and flow of specialized business areas of the system. In short, the state diagrams identify the dynamic behavior of the whole system, or a sub-system, or even a single object in a system. This is done with the help of behavioral elements. It is important to note that having a state diagram for your application is not an obligation, but should be determined only on the basis of needs.

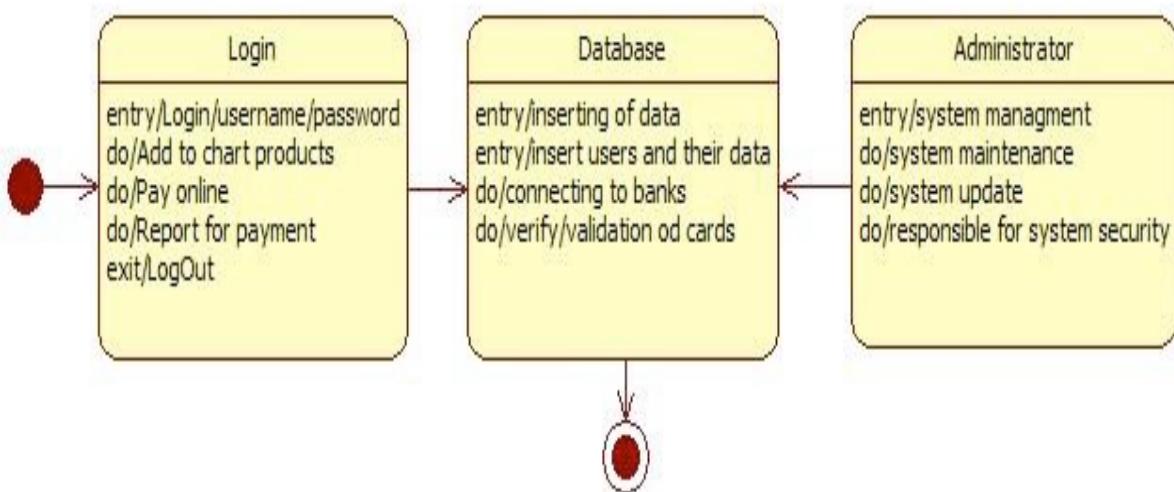


Fig16: State diagram for e-commerce website

And finally we can give a summary of all diagrams more specifically what they represent. Use case diagram represents the system functions from the perspective of users. Sequence diagrams are a temporary representation of buildings and their interactions. Diagram of cooperation is spatial representation of objects, connections and interactions between them. The object diagram represents the objects and their relationships and cooperation correspond to the simplified diagrams that not represent transmitting messages. Class diagrams represent the static structure in terms of classes and relations between them. The state diagram represents the behavior of a class at the time of execution. Activity diagram represents the behavior of an operation as a set of actions. Sequential diagrams represent the physical components of an application and distribution diagram represents the distribution of components in separate parts of the hardware.

Chapter 4

PROPOSED SYSTEM ANALYSIS

4.1 Introduction

To remove all the disadvantages of conventional methods, a system is proposed which is an **Online Shopping Website for Embedded & IoT products.**

The purpose of our website is to save time, save money for the users who are especially students and startups. Through our e-commerce website, one can save valuable time and money because prices are less than market prices and easily available to the customers. No need to go anywhere like metropolitan cities and do shopping of embedded products. The users can get different varieties of products and components online.

Through this web application, customers are allowed to view various products available enables registered users to purchase desired products instantly using PayPal payment processor (Instant Pay) and also can place order by using Cash on Delivery (Pay Later) option. This project provides an easy access to Administrators to view orders placed using Pay Later and Instant Pay options.

4.2 Requirement Analysis

Requirement Analysis is also known as Requirement Engineering. This is the process of defining user expectations for new software being built or modified. In software engineering, sometimes it is referred to loosely by names such as requirements gathering or requirements capturing. In other words, capability of the software is the requirement which must be met or possessed by the system or the system component to satisfy a contract, standard, specification, or other formally imposed documentation.

4.2.1 Functional Requirements for E-Commerce Websites

It needs to be fast

Website speed is one of the most important thing that you should bear in mind, when you are doing business using the website. If your website's load time is delayed just one second you might face the following consequences:

- Page view decreases by 11%
- Customer satisfaction decreases by 16%
- Conversion decreases by 7%

Just one-second delay in the website, load time can make a huge impact on that your business. So keeping a well-optimized website must be absolute. According to the study 47% of the customers think that the website will load by two or less than 2 seconds and nearly 40% of visitors will leave your website if it takes more than three seconds.

Image size

The dimensions of the original image you upload to your site can have a big impact on how it displays. We are recommended to use images that are between 1500 and 2500 pixels wide. Images smaller than 1500 pixels may appear blurry or pixilated when they stretch to fill containers, such as banners. It's always worth resizing images offline before you upload them – large files are unnecessary and could significantly hinder your page speeds.

- Rich content: Large number of images, GIFs and videos on a single web page is a recipe for slow load times. While visual content does improve the user experience, exercise moderation and keep it to what is necessary.
- Broken links: A broken link is a web-page that can't be found or accessed by a user, for various reasons. Web servers will often return an error message when a user tries to access a broken link. These broken links are also often known as “dead links” or “link rots.”

Examples of a broken link error code:

Here we have some examples of error codes that a web server may present for a broken link are as follows:

- 404 Page Not Found: The page/resource does not exist on the server.
- 400 Bad Request: The host server cannot understand the URL on your page.
- Bad host: Invalid host name: The server with that name does not exist or unreachable

- Bad URL: Malformed URL (Examples: a missing bracket, extra slashes, wrong protocol, etc.)
- Bad Code: Invalid HTTP response code: The server response violates the HTTP spec
- Empty: The host server returns the “empty” responses with that message no content and no response code.
- Timeout: Timeout: HTTP requests constantly timed out during the link check.
- Reset: The host server drops the connections that is either misconfigured or too busy.

Reasons for the broken links:

There are various reasons to occur the broken links, for example:

- The website owner entered into the incorrect URL (misspelled, mistyped, etc.).
- The URL structure of your site recently changed (permalinks) without a redirect and it is causing to a 404 error.
- The external site is no longer available, is offline, or has been permanently moved.
- Links of the content (PDF, Google Doc, video, etc.) that has been moved or deleted.
- Broken elements within the particular page (HTML, CSS, Javascript, or CMS plugins interference).
- Firewall or geo-location restriction cannot allow the outside access.

- Caching

Caching is a method to save information into your browser. So, that you do not need to load every element on the page each time, if you refresh the page. By using the latest caching technology (such as BigPipe caching) that can make a big difference.

It needs to be responsive

In this days, responsive web design is very much the standard for building websites. With the new gadgets arriving all the time, it's simply impractical to create a different version of your website for each new device and screen resolution. Responsive design is ensures that your website responds to the user's behavior and the environment. So as they switch from laptop to tablet. For example, it should be automatically adapt to accommodate the device's resolution, screen size and scripting abilities.

It needs a smooth checkout flow

We have plenty of ways to optimize your checkout process and checkout optimization is important to reduce the cart abandonment rate.

- Don't force the account creation (registration) process.
- Ensure the checkout area is isolated or self-contained: Once the customer has reached the checkout area, you need to keep them in there by reducing the amount of distracting and unnecessary information available to the customer.

- Have a short, stepped checkout process and show the customers where they are within the process. It is based on some personal details, full address details and card/payment information.

- Make form filling easy and intuitive through good design and best practice. Use asterisks for mandatory fields, Use drop downs where there are lists of options (e.g. Titles, Country Lists)
- Use radio buttons when there are only a few options.
- Pay attention to the design of your forms.
- Have clear delivery/shipping costs upfront. None of us likes the rude surprises and there is nothing worse than having to complete a three-page form filling exercise only to be confronted with unexpected shipping costs.

It needs to be personalized

Now a day's most successful websites are dynamic, user-friendly, and personalized to the user. It is now standard practice for big brand websites to have a dynamic web pages that changes the based on their individual. Strategic personalization is a key to improving the lead quality and displaying the relevant content to your visitors that will make them more likely to convert.

We have three common ways to personalize the user experience are through search terms, geographic location, and browsing behavior. By knowing the search terms, a user has entered to find your website by using that search terms, you can leverage the information to display more relevant content and advertisements. Personalizing pages based on geo-location can significantly

impact conversion rates if your business has a geographic focus. And also analyzing users' browsing behavior, such as which products they spend time looking at, you can start to display relevant offers and discounts as part of a targeted advertising strategy.

- Previous behavior (such as previous purchases).
- Similar users' behavior (such that as those who made a similar purchase).
- Information gathered directly from the user (such as a survey).
- Communications based on user behavior (such as abandoning a basket).
- Offers is based on personalized information (such as a birthday).
- Offers is based on user behavior (such as a loyalty program).
- Real-time data (such as location or time).

Some of the personalization that you can offer in an ECommerce site are-

OFFERS- Offers are the single most important aspect of your site to be personalize.

You can customize the product itself, the price is to be shown, impose time limits, or change the supporting copy and visuals supporting the offer.

Inline content

POP-UPS

Information bars

Product Recommendations

Best sellers Recommendations

It needs to be accessible

One of the important aspects of web design is Accessibility.

A ecommerce web sites accessibility is very important as the income opportunities are highly dependent on the actions are done on the site itself. The issues on Ecommerce Website Accessibility will have a direct effect on the sales.

Accessibility, in terms of web technology has varied and have a vast meaning. It is not just about the making your website or web application friendly for the people with who have disabilities but it is a lot more than that.

It simply means that how accessible your website or web application is to the different users.

It can be anything ranging from:

- People is using screen readers to access your text.
- By utilization of captions for video to understand the context by people who having hearing disabilities.
- People having some motor impairment who use non mouse methods like keyboards and shortcuts to use web.

To

- People on older versions of browsers
- People are using the different mediums like mobile phones and tablets

Everything counts under accessibility.

Catalog Management

Categories

- Search and sort to easily find categories
- Manage categories and sub-categories
- Feature categories are within navigation or on the homepage
- Set categories as “active” or “inactive”
- Manage categories thumbnails and images

Brands

- Manage brands
- Feature brands on the homepage
- Set brands as “active” or “inactive”
- Manage brand logos

Products

- Search and sort to easily find the products in certain categories or with their specific attributes
- Easily manage and edit products
- Ability to select the options like featured, free shipping, reviews allowed, require moderation for reviews and more
- Add and manages the main product images and the additional product images
- Set products as “active” or “inactive”
- Add the products to a single category or multiple categories
- Select product brand
- Add and managing the product options and option groups

Content Management

Pages

- Managing the content pages and create new content pages
- Edit pages are using a Microsoft Word-like content editor
- Add images and manage uploaded image library
- Image editing and cropping tool

Homepage Banners

- Manage homepage banners
- Set banner sort orders
- Set banner URL
- Set banners as “active” or “inactive”

Navigation

- Managing your main navigations including header, side and footer
- Add drop down to main navigation
- Set the links to opening the same or new window

Auto Email Messages

- Manage main email template design
- Set messaging for order status emails
- Set the messaging for thank you email on product reviews and blog the comment submissions

Review Management

- Manage all product reviews
- Set reviews to “approved” or delete reviews

Comment Management

- Manage all blog comments
- Set comments to “approved” or delete comments

Customer Management

Customers

- Search and sort to easily find the customers by using the first name and last name
- Manage customer accounts
- View customer details and previous orders
- View individual customers product reviews
- Add private comments to a customer
- Delete customer accounts
- Reset customer passwords

Order Management

Orders

- Search and sort to easily find orders by using specific variables
- Manage and update order status
- View order number and all customer information
- View the ordered information and purchase details (products, tax, shipping, addresses, etc.)
- Add private notes to the order

- View shipping and billing address maps
- Create and manage custom order statuses
- Receive email when order is placed

Search Engine Optimization Management

Dynamic Titles

- Managing all the dynamic title tag structure throughout the website.
- Configure the dynamic title and META tags for categories and sub-categories
- Configure the dynamic title and META tags for brand pages
- Configure the dynamic title and META tags for product pages

Specific Titles & Meta Information

- Configure the site wide default title and META tags
- Configure homepage title and META tags
- Set the unique title, META tags and URL information for specific content pages, category, brand or product pages

Settings

Shipping Options

- Set to store the static shipping rates based on the weight, dollar amount and zone.
- Set specific price or percentage of order.
- Set and manage the shipping discount codes and promotions.

- Set free shipping on individual products
- Set your stores to origin of shipment zip code and the country code
- Active and deactivate shipping carriers. Manage PayPal account settings
- Allow offline payment option

4.2.2 Non functional Requirements

Though many people may not have even heard of an NFR (Non-Functional Requirement), NFRs are among the most important things to define when building the specification for an e-commerce platform, as most have a direct impact on the experience and satisfaction of your users.

Non-functional requirements dictate page speed.

There are many types of NFRs, but one of the most recognizable is page speed. You may think that it is obvious, that your e-commerce platform should be fast, but defining page speed is actually a lot more complex than it sounds.

Different pages throughout an e-commerce platform will always be load at a different speeds. Because of differences in byte size and complexity, as well as the operating system, browser, and network having a big impact on page load times.

A typical page speed Non-Functional Requirement will define the device, operating system, browser, network and actual page that the speed relates to such as the: PDP should load in less than 4 seconds on Apple iPhone 6s and above iOS 10+, Safari on 4G. You do not need to specify the speed on all combinations of devices or networks, but you should at least set a speed benchmark. It is

advisable that this is done for mobile devices, as it is likely that mobile traffic will account for the majority of visits to your e-commerce website.

Types of non-functional requirements

There are many other types of non-functional requirements, all of which can have a critical impact on the performance, scalability, and usability of your e-commerce platform. These include:

- **Security**

Web Security is the part of Information Security just like other: computer, Internet, mobile and network Security. It is all about securing the web application:-

We have some basic points to check for safe surf, first one is that the website that you are watching is HTTPs or not if it is not then you have to step back and just look at top right corner of your website there will be a Lock click on that lock you will know written there that connection is secure or not.

By taking care of these things you can prevent fishing and other fraud.

Security threats that can be as follows

- Cross site scripting
- SQL injection
- Denial of service attack
- Data breach and
- Buffer overflow

- **Privacy**

- Each and every website needs a privacy policy. Either you are collecting personal data or not, your website should have a privacy policy.
 - The IP is considered as a personal information and that may be the only information retrieved. Your website tracks this information. In certain countries like the EU requires a privacy policy.
 - Website visitors should be informed that how you collect personal data, how you use that data, how long you will keep it, and how they can delete their information.
 - Having a privacy policy shows trust and transparency. It shows you are legit. I do not sign up for anything if the website does not look professional or tell me my rights.
 - You will get more business from certain type of person by having a privacy policy in place.
-
- **Scalability and performance** – Scalable web apps only consume the resources necessary to meet demand. Scalability is also known as decides between the over-spending on the server capacity to handle the peak usage, or to purchasing only based on the average needs, risking poor application performance or user experience when the traffic spikes.
 - **Speed of web services** – It is defining as how long the web services will take to provide a response
 - **Accessibility** – It is ensuring that the platform meets the basic accessibility standards throughout
 - **Documentation** – Ensuring that the platform is sufficiently documented

- **Quality** – It is even the best e-commerce platforms can be used badly so you should insist that code is developed to a good quality standard
- **Extensibility** – It is ensuring that the platform is extended in such a way to make future development feasible
- **Data integrity** – Defining how long data should be stored and how the integrity of data is maintained
- **Testing** – It is defining how unit testing will be built into the solution
- **Compatibility** – Ensuring that the platform can be easily integrated with 3rd party systems
- **Search** – It is defining how quickly the system will return the search results
- **Availability** – It is defining the agreed uptime of the platform under the normal conditions
- **Infrastructure** – It is defining the infrastructure performance thresholds (CPU and memory usage)

Although this list is not exhaustive, it demonstrates the wide range of non-functional requirements that can – and should – be defined when building out the list of requirements for, and specification of, an e-commerce platform.

NFRs are so important

NFRs essentially define the quality of your platform. A functional requirement will define its behavior, but the non-functional requirements will define how well it will exhibit that behavior. A well-defined set of NFRs will have the following benefits:

- Better code quality
- Better security

- Reduced total cost of ownership
- Better user experience
- Less bugs
- Better speed and performance
- Better uptime

4.2.3 System Requirements

A Software Requirements specification (SRS) for a software system is an entire explanation of the activities of a system that need to be developed. It consists of a set of use cases that illustrate all the instructions that all the users will have with the software. SRS furthermore consists of non-functional Requirements. Non-functional Requirements impose instructions on the design or even in the implementation.

4.2.3.1 Hardware Requirements

- Processor: Intel core i5 (or above),
- RAM: 4.0GB (or above)
- Hard disk storage: 500GB (or above)
- Platform used: Windows 7/8/10

4.2.3.2 Software Requirements

- Server: XAMPP/WAMP Server
- Database server: MySQL
- Editor: Notepad++
- PHP server connection

4.2.4 INPUT/OUTPUT DESIGN

Input Design:

The input design is link between the information system and the user. It comprises the developing specification and procedures the data preparation and these steps are necessary to put the transaction data into a usable form for processing can be achieved. By inspecting the computer to read the data from a written or printed document or it can occur by having people keying the data directly into the system. These designs of input focuses on the controlling amount of input is required, controlling the errors, avoiding the delay, avoiding the extra steps and to keep the process simple. The input is designed in such a way so that it provides security and ease of use with retaining privacy. Input Design considered the following things:

- What data should be given as input?
- How the data should be arranged or coded?
- This dialog to guide the operating personnel in providing the input.
- Methods for preparing input validations and steps to follow when an error occurs.

OBJECTIVES

1. Input Design is the process of converting a user-oriented description of the input into a computer-based system. This design is important to avoid errors in the data input process and show the correct direction to the management for getting the correct information from the computerized system.

2. It is achieved by creating user-friendly screens for the data entry to handle large volumes of data. The goal of designing input is to make the data entry easier and to be free from the errors. The data entry screen is designed in such a way that all the data manipulates which can be performed. It also provides record viewing facilities.
3. When the data is entered, input design will check for its validity. Screens are helpful to entering the data. Appropriate messages are provided as when needed so that the user will not be in the maize of instant. Thus the objective of input design is to be create an input layout which is easy to follow.

Output Design:

A quality output is one, which gathers the requirements of the end-user and presents the information. In any system results of processing are communicated to the users and other systems through outputs. In output design it is determined how the information is to be displaced for immediate need and also the hard copy output. It is the most important and direct source of information to the user. Efficient and intelligent output design improves the system's relationship that which helps the user in decision-making.

1. Designing the computer output should be proceed to an organized, well thought out manner; and the right output that must be developed while ensuring that each output element is designed. So that people will find the system that can use easily and effectively. During the analysis design computer output, they should be identify the specific output that is needed to meet the requirements.
2. Select methods for presenting information.

3. Create documents, reports, or other formats that contain information produced by the system.

The output form of the information system should accomplish one or more of the following objectives are:

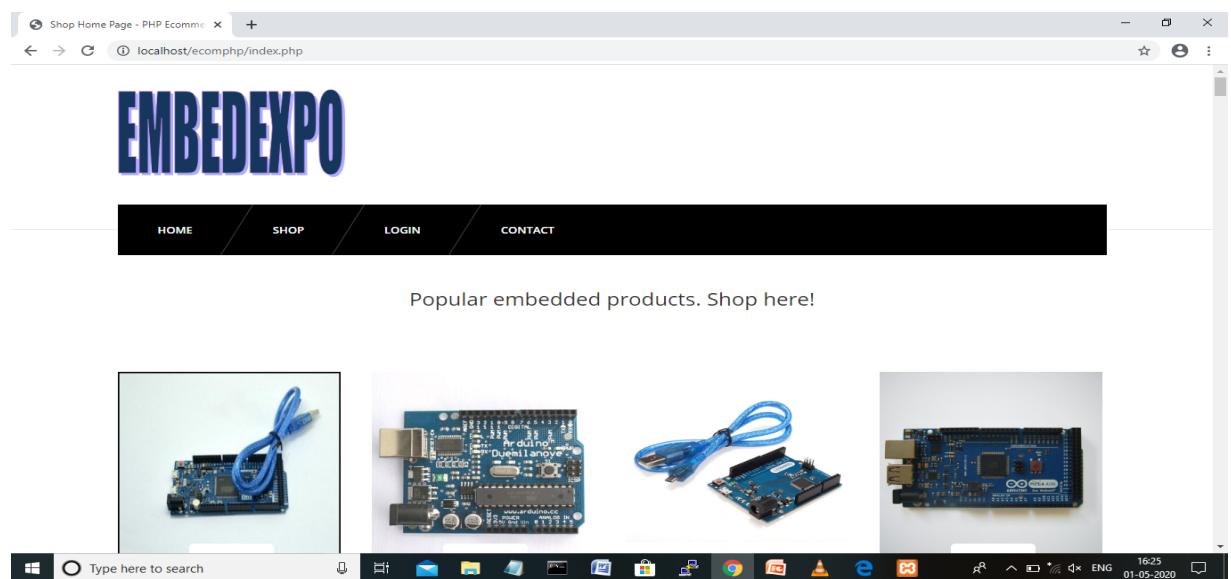
- Conveying the information about the past activities, current status or projections of the future.
- Signal important events, opportunities, problems, or warnings.
- Trigger an action
- Confirm an action.

Chapter 5

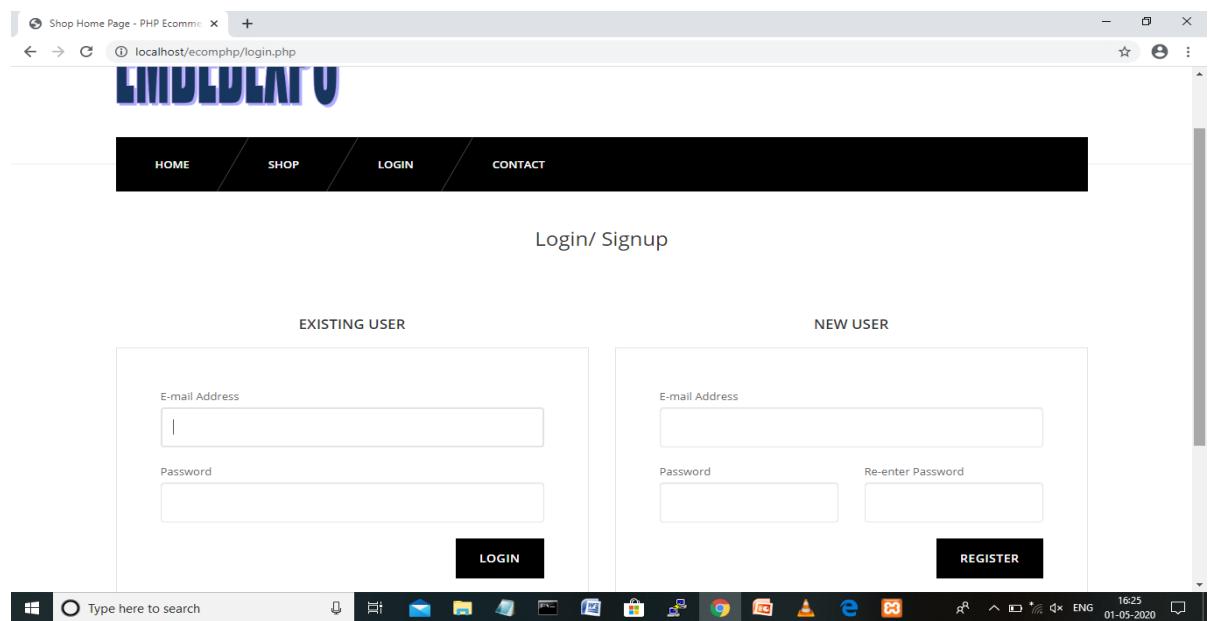
RESULTS AND DISCUSSION

CUSTOMER PAGES

HOME PAGE



LOGIN PAGE



SHOP CATEGORIES

A screenshot of a web browser showing the 'EMBEDDEXPO' shop categories page. The URL in the address bar is 'localhost/ecomphp/index.php'. The page features a navigation bar with links to HOME, SHOP, MY ACCOUNT, and CONTACT. On the left, there is a sidebar with a list of product categories: Arduino, Battery/Power, Cable/Connector, Component, Development/Programmer, Display/Camera, Interfacing/Relays, IoT Modems, and Raspberry Pi. Below the sidebar, there is a small image of an Arduino board. The main content area contains the text 'Popular embedded products. Shop here!' and three images of different Arduino boards: an Arduino Uno, an Arduino Due, and an Arduino Nano.

MY ACCOUNT

A screenshot of a web browser showing the 'EMBEDDEXPO' my account page. The URL in the address bar is 'localhost/ecomphp/index.php'. The page features a navigation bar with links to HOME, SHOP, MY ACCOUNT, and CONTACT. A dropdown menu under the MY ACCOUNT link shows options for Edit Profile, My Orders, and Logout. The main content area contains the text 'embedded products. Shop here!' and three images of different Arduino boards: an Arduino Uno, an Arduino Due, and an Arduino Nano.

EDIT PAGE

The screenshot shows a web browser window titled "Shop Home Page - PHP Ecommerce". The URL in the address bar is "localhost/ecomphp/edit-address.php". The page has a black header with navigation links: HOME, SHOP, MY ACCOUNT, and CONTACT. On the right side of the header is a search bar with a magnifying glass icon. The main content area features a large heading "EDIT MY ACCOUNT" and a sub-section titled "Update My Profile & Address". Below this, there are four input fields: "First Name" (Bhavana), "Last Name" (C), "Company Name" (embedexpo), and "Address" (tirupati). At the bottom of the page, a Windows taskbar is visible with various application icons.

MY ORDERS PAGE

The screenshot shows a web browser window titled "Shop Home Page - PHP Ecommerce". The URL in the address bar is "localhost/ecomphp/my-account.php". The page has a black header with navigation links: HOME, SHOP, MY ACCOUNT, and CONTACT. On the right side of the header is a search bar with a magnifying glass icon. The main content area features a heading "MY ACCOUNT" and a section titled "RECENT ORDERS". A table displays the following information:

ORDER	DATE	STATUS	PAYMENT MODE	TOTAL	
9	2020-02-29 12:38:16	Order Placed	cod	INR 1850/-	View Cancel

Below the orders, there is a section titled "MY ADDRESSES" with a note: "The following addresses will be used on the checkout page by default." It lists three addresses: "Bhavana c", "tirupati", and "sv nagar". At the bottom of the page, a Windows taskbar is visible with various application icons.

PRODUCT DETAILS PAGE

The screenshot shows a product details page for a NANO SHIELD. At the top, there's a large image of the red shield board with various components like resistors and capacitors. Below the image, the product name "NANO SHIELD" is displayed in bold black letters, followed by the price "INR 175.00/-". A detailed description of the product follows, mentioning its high quality, digital I/O ports, analog I/O ports, and various power supply options. There's a quantity selector set to "1", an "ADD TO CART" button, and a "Add to WishList" link. The browser address bar shows "localhost/ecomphp/single.php?id=22". The Windows taskbar at the bottom includes icons for File Explorer, Mail, Photos, and other applications.

RELATED PRODUCTS

The screenshot shows a "SUBMIT REVIEW" button on a white background, likely part of a review form. Below it, the heading "RELATED PRODUCTS" is visible. Three items are listed: 1) RASPBERRY PI 0, shown as a green circuit board, with a 5-star rating and the price INR 1500.00/- in orange. 2) 16*2 LCD DISPLAY, shown as a green LCD module with text, with a 5-star rating and the price INR 115.00/- in orange. 3) BLUETOOTH RELAY SHIELD HC05, shown as a red shield board with blue relays, with a 5-star rating and the price INR 475.00/- in orange. The browser address bar shows "localhost/ecomphp/single.php?id=22". The Windows taskbar at the bottom includes icons for File Explorer, Mail, Photos, and other applications.

CART PAGE

The screenshot shows a browser window titled "Shop Home Page - PHP Ecommerce" with the URL "localhost/ecomphp/cart.php". The main heading is "SHOP CART". Below it is a table with the following data:

	PRODUCT	PRICE	QUANTITY	TOTAL
X	NANO SHIELD	INR175.00/-	1	INR175.00/-

At the bottom right of the table is a "CHECKOUT" button.

CART TOTALS

Cart Subtotal	INR 175.00/-
Shipping and Handling	Free Shipping
Order Total	INR 175.00/-

At the bottom of the page is a Windows taskbar with various icons and system status.

CHECKOUT PAGE

The screenshot shows a browser window titled "Shop Home Page - PHP Ecommerce" with the URL "localhost/ecomphp/checkout.php". The top navigation bar includes links for HOME, SHOP, MY ACCOUNT, and CONTACT. On the right side of the header is a search icon.

The main heading is "CHECKOUT". Below it is a section titled "Billing Details" containing the following form fields:

First Name	Last Name
Bhavana	C
Company Name	
embedexpo	
Address	
tirupati	

At the bottom of the page is a Windows taskbar with various icons and system status.

PAYMENT/BILLING PAGE

YOUR ORDER

Cart Subtotal	INR 175.00/-
Shipping and Handling	Free Shipping
Order Total	INR 175.00/-

PAYMENT METHOD

Cash On Delivery Cheque Payment Paypal

Pay via PayPal: you can pay with your credit card if you don't have a PayPal account

I've read and accept the [terms & conditions](#)

PAY NOW

Windows taskbar at the bottom showing various icons and system status.

CONTACT PAGE

EMBEDEXPO

HOME SHOP MY ACCOUNT CONTACT

Contact us here

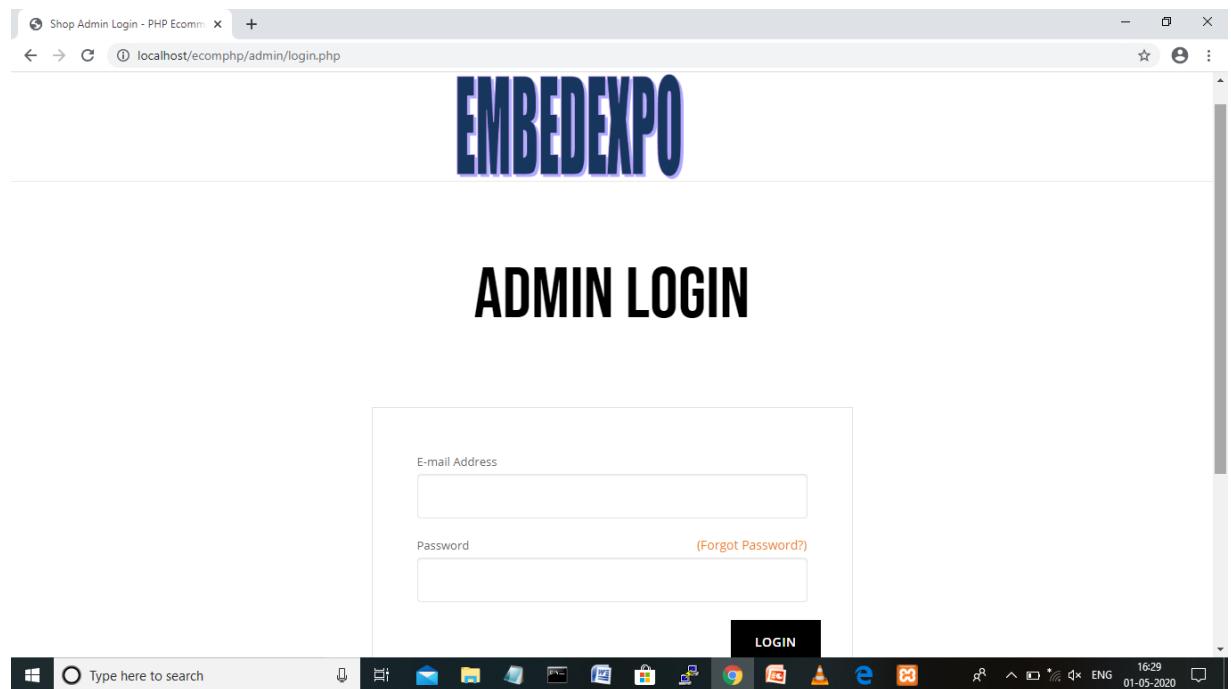
PHONE: 9030264588
EMAIL: embedexpo@gmail.com
ADDRESS: SPMVV, Tirupati

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Windows taskbar at the bottom showing various icons and system status.

ADMIN PAGES

LOGIN PAGE



VIEW CATEGORIES PAGE

The screenshot shows a web browser window titled "Shop Home Page - PHP Ecommerce". The URL is "localhost/ecomphp/admin/categories.php". The page has a header "EMBEDEXPO" and "For Admin". A navigation bar at the top includes links for DASHBOARD, CATEGORIES (which is active), PRODUCTS, ORDERS, CUSTOMERS, and LOGOUT. A dropdown menu under CATEGORIES shows "View Categories" and "Add Category". The main content area displays a table of categories:

#	Category Name	Operations
1	Arduino	Edit Delete
2	Battery/Power	Edit Delete
3	Cable/Connector	Edit Delete
4	Component	Edit Delete
5	Development/Programmer	Edit Delete
6	Display/Camera	Edit Delete
7	Interfacing/Relays	Edit Delete
8	IoT Modems	Edit Delete

The status bar at the bottom shows "localhost/ecomphp/admin/categories.php", a search bar, and system icons.

ADD CATEGORIES PAGE

The screenshot shows a web browser window titled "Shop Home Page - PHP Ecommerce". The URL is "localhost/ecomphp/admin/addcategory.php". The page has a header "EMBEDEXPO" and "For Admin". A navigation bar at the top includes links for DASHBOARD, CATEGORIES (which is active), PRODUCTS, ORDERS, CUSTOMERS, and LOGOUT. A dropdown menu under CATEGORIES shows "View Categories" and "Add Category". The main content area displays a form to add a new category:

Category Name
Battery/Power

Below the table is a "Submit" button. The status bar at the bottom shows "localhost/ecomphp/admin/addcategory.php", a search bar, and system icons.

VIEW PRODUCTS PAGE

The screenshot shows a Windows desktop environment with a web browser window open to the 'Shop Home Page - PHP Ecommerce' at localhost/ecomphp/admin/products.php. The browser title bar includes the URL and a '+' button. The page header features the 'EMBEDEXPO' logo and 'For Admin'. A navigation menu at the top has tabs for DASHBOARD, CATEGORIES, PRODUCTS (which is selected), ORDERS, CUSTOMERS, and LOGOUT. Below the menu is a table titled 'View Products' showing a list of products:

#	Product Name	Category Name	Thumbnail	Operations
1	ARDUINO DUE 2012 R3	1	Yes	Edit Delete
2	ARDUINO DUEMILANOVE 2009	1	Yes	Edit Delete
3	ARDUINO LEONARDO R3	1	Yes	Edit Delete
4	ARDUINO MEGA ADK	1	Yes	Edit Delete
5	ARDUINO NANO3.0 CH340	1	Yes	Edit Delete
6	ARDUINO PROMINI 328 5V16MHZ	1	Yes	Edit Delete
7	ARDUINO UNO R3 MEGA328P	1	Yes	Edit Delete
8	DIJAI, AXIS XY JOYSTICK MODULE ARDUINO	1	Yes	Edit Delete

The taskbar at the bottom shows various pinned icons and the date/time: 16:30 01-05-2020.

ADD PRODUCTS PAGE

The screenshot shows a Windows desktop environment with a web browser window open to the 'Shop Home Page - PHP Ecommerce' at localhost/ecomphp/admin/addproduct.php. The browser title bar includes the URL and a '+' button. The page header features the 'EMBEDEXPO' logo and 'For Admin'. A navigation menu at the top has tabs for DASHBOARD, CATEGORIES, PRODUCTS (selected), ORDERS, CUSTOMERS, and LOGOUT. Below the menu are input fields for adding a new product:

- Product Name:**
- Product Description:**
- Product Category:**
- Product Price:**

The taskbar at the bottom shows various pinned icons and the date/time: 16:30 01-05-2020.

VIEW ORDERS PAGE

The screenshot shows a web browser window titled "Shop Home Page - PHP Ecommerce". The URL is "localhost/ecomphp/admin/orders.php". The page has a header "EMBEDEXPO" and "For Admin". A navigation bar at the top includes links for DASHBOARD, CATEGORIES, PRODUCTS, ORDERS (which is highlighted), CUSTOMERS, and LOGOUT. Below the navigation bar is a table titled "View Orders" with the following columns: #, Customer Name, Total Price, Order Status, Payment Mode, Order Placed On, and Operations. The table contains the following data:

#	Customer Name	Total Price	Order Status	Payment Mode	Order Placed On	Operations
13	deepika s	964	In Progress	cod	2020-04-16 12:19:46	Process Order
12	sushma g s	1800	Order Placed	cod	2020-02-29 12:51:30	Process Order
11	pallavi k	1500	Order Placed	cod	2020-02-29 12:50:46	Process Order
10	deepika s	2072	Order Placed	cod	2020-02-29 12:49:37	Process Order
9	Bhavana c	1850	Order Placed	cod	2020-02-29 12:38:16	Process Order
8	guru nath	1120	Order Placed	cod	2020-02-25 14:38:11	Process Order

VIEW CUSTOMERS PAGE

The screenshot shows a web browser window titled "Shop Home Page - PHP Ecommerce". The URL is "localhost/ecomphp/admin/customers.php". The page has a header "EMBEDEXPO" and "For Admin". A navigation bar at the top includes links for DASHBOARD, CATEGORIES, PRODUCTS, ORDERS, CUSTOMERS (which is highlighted), and LOGOUT. Below the navigation bar is a table titled "View Customers" with the following columns: #, Customer Name, Customer Mobile, Customer Email, and Customer From. The table contains the following data:

#	Customer Name	Customer Mobile	Customer Email	Customer From
3	Bhavana c	8801630196	bhavana.chinnamgari@gmail.com	2020-02-04 16:08:27
4	guru nath	9030264588	venkatspmvv@gmail.com	2020-02-25 14:22:35
5	deepika s	8801630196	sdeepika0812@gmail.com	2020-02-05 15:42:32
6	pallavi k	8801630196	pallaviraju53@gmail.com	2020-02-29 12:50:16
7	sushma g s	8801630196	sushmags6999@gmail.com	2020-02-29 12:51:02

CONCLUSION

- We developed an ecommerce website for Embedded and IoT products distribution using Xampp/Wamp tools for local web server. For website design, we will use the PHP and HTML language and for more interactive way we will use CSS Scripts, Java Scripts.
- Our Website allows the users to purchase the products through online with less price and faster access. We will associate with the OEMs (Original Equipment Manufacturer) and sell the products to the customers in an effective manner.
- This would be very helpful for incubation-centers, start-ups and for the students to develop their academic projects.
- Information about product like Articles and related projects are specified.

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