

Ecommerce Order Tracking System

Submitted By

A.U.M. Tuhin

ID: 151-35-892

Batch: 16th

Department of Software Engineering

Daffodil International University

Supervised By

Md. Anwar Hossen

Senior Lecturer

Department of Software Engineering

Daffodil International University

Department of Software Engineering

Daffodil International University

APPROVAL

This **Project** titled "**Hireme.com**", submitted by **Shihab Nayem**, 151-35-989 to the Department of Software Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc in Software Engineering and approved as to its style and contents.

BOARD OF EXAMINERS

Dr. Touhid Bhuiyan

Professor and Head

Department of Software Engineering

Faculty of Science and Information Technology

Daffodil International University

Dr. Md. Asraf Ali

Associate Professor

Department of Software Engineering

Faculty of Science and Information Technology

Daffodil International University

Md. Maruf Hassan

Assistant Professor

Department of Software Engineering

Faculty of Science and Information Technology

Daffodil International University

Prof Dr. Mohammad Abul Kashem

Department of Computer Science and Engineering

Faculty of Electrical and Electronic Engineering

Dhaka University of Engineering & Technology, Gazipur

Chairman

Internal Examiner 1

Internal Examiner 2

External Examiner

Declaration

I hereby declare that I have taken this project under the supervision of Md. Anwar Hossen, Senior Lecturer, Department Of Software Engineering, Daffodil International University. I also declare that neither this report nor any part of this has been submitted elsewhere for award of any degree.

Supervised By:

Md. Anwar Hossen

Senior Lecturer

Department of Software Engineering Faculty of Science & Information Technology

Daffodil International University

Submitted By:

A.U.M. Tuhin

ID: 151-35-892

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Department of Software Engineering

Faculty of Science & Information Technology

Daffodil International University

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Acknowledgement

First of all, I am grateful to the Almighty Allah for making me eligible to complete this project. Then I would like to thank my supervisor **Md. Anwar Hossen, Senior Lecturer**, Department Of Software Engineering. I am extremely grateful and indebted to him for his expert, sincere and valuable guidance and encouragement extended to me.

Beside my supervisor, I would like to express my sincere thanks to **Dr. Touhid Bhuiyan**, Professor and Head of Software Engineering Department for his constant encouragement.

I would like to thank them who were helped in my project by their very important suggestions without their passionate participation and input; the project could not be successfully conducted. I take this opportunity to record my sincere thanks to all the faculty members of the Department of Software Engineering for their help and encouragement.

Last but not least, I would like to thank our parents, for their unconditional support, love and without this we would not have come this far.

Executive Summary

E-commerce order tracking system (EOTS) is a web based application. An order tracking system allows the customer to gain insight into where their order is at any given point in time. From the time an order is placed until it is delivered. That means an order tracking system needs to be able to follow and provide insight into the status of the order through its entire journey in the Google map to the customer until it reaches to customer door.

The application is basically for e-commerce Company and the customers. The application provides a full e-commerce website where customers can buy products by fulfilling all the requirements and after purchasing or placing order he/she can be able to track his/her order through the application.

The special feature of this application is google map tracking system. Getting orders from customers e-commerce authority can efficiently handle all the orders through the application at the meantime customers can get notify through email and the application.

The objectives of this project are to make e-commerce business more efficient to customer, increase business profits with customer's satisfaction. An order tracking system allows you to improve your customer experience and meet your customers' needs for order accuracy throughout the entire ordering, fulfillment, and delivery process.

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Chapter I Introduction

1.1. Project Overview

E-commerce order tracking system is a web based application. The application is basically for e-commerce Company and the customers. The application provides a full e-commerce website where customers can buy products by fulfilling all the requirements and after purchasing or placing order he/she can be able to track his/her order through the application.

The special feature of this application is real time google map tracking system. Getting orders from customers e-commerce authority can efficiently handle all the orders through the application at the meantime customers can get notify through email and the application.

After completing all the process of an order and ready for shipment when the delivery man starts delivery or shipment he can start GPS of his mobile phone with the order id and real time location (latitude, longitude) will automatically save to server corresponding to the order id. At the meantime customer will notify the location of his product through a google map in the application customer can able to notify the order information updates and time.

1.2. Project Purpose

1.2.1. Background

E-commerce is increasing rapidly in Bangladesh and it's a trend an e-commerce business but the failing rates are also at its revers. There are lots of reasons behind this failing. One of the reasons is they cannot be trustworthy and customers also do not satisfy. Time management is a big fact, after order something from an e-commerce site customers do not know when the order will reach to his hands. That's why customers need to inquire again and again by calling to customer support which wastes times and as well as cost.

To reduce this problem and Bangladeshi e-commerce needs e-commerce order tracking system.

1.2.2. Benefits & Beneficiaries

Benefits:

- Increase customer satisfaction
- Do not need to inquire again to customer support center
- Reduce costly calls
- Increase e-commerce profits holding customers to the website

Beneficiaries:

- E-commerce customers
- E-commerce authority

1.2.3. Goals

Ordering or purchasing something from Bangladeshi e-commerce site there are lot of problem customer are facing some are:

- Uncertain order placement's time and date.
- Need to inquire again and again by calling to know the status of the order
- Time wasting
- Customers do not return again after purchasing once

The main purpose of this project is to reduce these problems and make e-commerce more reliable, trustworthy and increase customer's satisfactions.

1.3. Stakeholders

A stakeholder is a party that has an interest in a company and can either affect or be affected by the business. The primary stakeholders in a typical corporation are its investors, employees, customers and suppliers.

- Customers
- E-commerce authority
- Employees
- Shareholders
- Suppliers

1.4. Proposed System Model

A software process model is a simplified representation of a software process. Each model represents a process from a specific perspective.

1.4.1. Agile-Model

Our proposed system model is agile model which is an incremental process of software development. Each iteration lasts one to three weeks on average. Engineering actions are carried out by cross functional teams. In software development the term 'agile' means the ability to respond to changes-changes from requirements, technology and people.

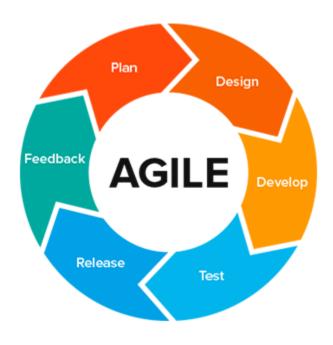


Figure 1 : Agile-Model

1.5. Project Schedule

In project management, a schedule is a listing of project's milestones, activities, and deliverables, usually with intended start and finish dates. A schedule is commonly used in the project planning and project portfolio management parts of project management.

1.5.1. Gantt Chart

Weeks	1	2	3	4	5	6	7	8	9	10	11	12
Works												
Analysis Phase												
Feasibility Study												
Project proposal												
Project UI												
Mid-term defense												
Implementation of the project												
Testing												
Document of the project												
Final defense												

Figure 2: Gantt chart

1.5.2. HR Planning for Development Phase

- 1. Project plan
- 2. Analysis
- 3. Requirement gathering
 - Brainstorming
 - Interview
 - Observation
 - Analysis
- 4. Design
 - System design
 - Database design
 - System user interface
- 5. Development
 - User Module
 - Event Module
 - Others
- 6. Testing
 - Test plan
 - Test Case
 - Test Execution

1.5.3. Release Plan

Release 1: beta version 1.0.0 on 15/10/2018

Release 2: beta version 2.0.0 on 30/10/2018

Release 3: version 3.0.0 on 25/11/2018

Release 4: version 4.0.0 on 04/12/2018

Chapter II Software Requirement Specification

2.1. Functional Requirements

Table 1: Functional Requirements

SRS No.	Name	Description	Priority
#01	Manage products	Admin can manage product. He can add	High
		product category, delete, edit product.	
#02	Manage Category	Admin can manage product category.	High
#03	Manage Orders	Staff will manage orders. He can confirm order	High
		and the next process of orders.	
#04	Order Product	Customers can place order. Before placing	High
		orders he can see products, add to cart pay bill.	
#04	Pay Bill	Customer can pay bills after placing order	High
#05	Track Order	Customer can trace his order status after	High
		placement. System will automatically notify by	
		email after completing any process of order.	
#06	Add Product to GPS	Staff can update order status and add to GPS	High
	tracking	tracking when shipment starts	
	1		

2.2. Data Requirements

Table 2: Data requirements

No	Description	Priority
#01	Admin has to insert the login credentials accurately otherwise system	High
	will show an error with message.	
#02	Admin has to insert all product information.	High
#03	Staff has to insert login credential to login to the system	Medium
#04	Staff has to update orders information.	Medium
#05	Customers need to insert login credentials after signup	High
#06	Customers have to update all his order address related information	Low

2.3. Performance Requirements

2.3.1. Speed and Latency Requirements

Table 3 Speed and Latency Requirements

No	Description	Priority
#01	When GPS starts it should send location info to server in real-time	Low
#02	The system should update the location in google map without page refreshing.	Low
#03	The system must have a high speed of manipulation data and reply to the user request.	Low

2.3.2. Precision or Accuracy Requirements

Table 4: Precision or Accuracy Requirements

No	Description	Priority
#01	The input data should be validate when Customer or admin provide	Medium
	data to the system	
#02	All data should be in place accurately where it is associated	Medium
#03	Need to validate all the collections of Mongodb database.	Medium

2.3.3. Capacity Requirements

Table 5: Capacity Requirements

No	Description	Priority
#01	The web application size must able to load at hosting site.	Medium
#02	The Mlab or Mongodb atlas database size must be able to store the system data	Low
#03	System should support 100k user at the beginning version	Low
#04	System should support 1000 request per second.	Low

2.4. Dependability Requirements

2.4.1. Reliability Requirements

Table 6: Reliability Requirements

No	Description	Priority
#01	All confidential data must have to be encrypted.	Medium
#02	All data should collect from users by permission and by accepting privacy policy.	Low
#03	No one can use customer's data for any other purpose except system needs.	Low

2.4.2. Availability Requirements

Table 7: Availability Requirements

No	Description	Priority
#01	The system should work 24 hours a day	Medium
#02	The system should provide the desired data to the user in time	Low

2.4.3. Robustness or Fault-Tolerance Requirements

Table 8: Robustness or Fault-Tolerance Requirements

No	Description	Priority
#01	If the system has been crashed, it should not be more than an hour.	Low
#02	System must be responsible and should be cross browser supported	Low

2.5. Maintainability and Supportability Requirements

2.5.1. Maintenance Requirements

Table 9: Maintenance Requirements

No	Description	Priority
#01	The system maintenance should be quick.	Low

2.5.2. Supportability Requirements

Table 10: Supportability Requirements

No	Description	Priority
#01	The system support latest nodejs and mongodb (mongoose) version.	Medium
#02	Should support all the browsers and screen size.	Low
#03	Should support latest and popular cloud services.	Low

2.5.3. Adaptability Requirements

Table 11: Adaptability Requirements

No	Description	Priority
#01	The system should adapt all upgrading version and time.	Low
#02	New version of system should support latest node modules	Low

2.6. Security Requirements

2.6.1. Access Requirements

Table 12: Access Requirements

No	Description	Priority
#01	All the users access have to be limited with their use case boundaries	Low
#02	Users need to be authorized first to access data.	Medium
#03	Only SEQURITY Administrator will be able to enter the system to	Low
	make maintenance.	
#04	Customer's boundaries should be within the browser.	Low

2.6.2. Integrity Requirements

Table 13: Integrity Requirements

No	Description	Priority
#01	Only authorized user can add or delete data with their respective accessibility and authorization.	Low
#02	Only admin can delete products and orders information.	Medium

2.6.3. Privacy Requirements

Table 14: Privacy Requirements

No	Description	Priority
#01	The user data must not be visible for public	High
#02	The user data should not contain any private issues	Medium
#03	All the confidential data should be encrypted.	Medium

2.7. Usability and Human-Interaction Requirements

No visible usability and Human-Interaction requirements.

2.8. Look and Feel Requirements

2.8.1. Appearance Requirements

Table 15: Appearance Requirements

No	Description	Priority
#01	The user interface must be attractive.	High
#02	The user interface must be user friendly.	Medium
#03	The user interface must be user interactive.	Medium

2.8.1. Style Requirements

Table 16: Style Requirements

No	Description	Priority
#01	The interface color should be flat or material.	Medium

Chapter III System Analysis

3.1. Use Case Diagram

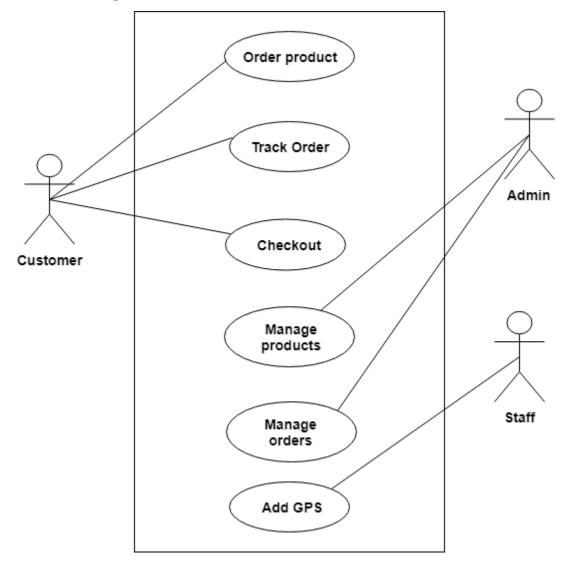


Figure 3: Use Case Diagram

3.2. Use Case Description

3.2.1. Order Product

E-commerce Customer Reorder-Cart Management. From this location, customers can add or remove items from their cart, adjust the quantity, or continue shopping on your e-commerce website to add more products to their order. E-commerce websites make the Customer Reorder function very easy for your customers.

Table 17: Order Product

Use Case Name:	Order product
Scenario:	Customer can browse product select and order.
Brief Description:	Customer chose product which he want to buy then add the
	product to cart and then order the product with proper payment
	method
Actor:	Customer
Precondition:	Customer has to sign up or login and products must be available
	in the system
Post condition:	Customer must chose a proper payment method
Main Success Scenario	1. Products must be available
	2. Products have to be added to system.
	3. After adding product to cart customer can order.
Scenario Extensions	1. If there is no products customer cannot add cart and order
	product.
	2. Proper payment selection must be needed either cannot order
	product.

3.2.2. Track Orders

Registered user can track their order through order id and he/she can see his order status with date and time and he/she can watch his/her product in Google map if the shipment has been start.

Table 18: Track Orders

Use Case Name:	Track Orders
Scenario:	Here customer can track his/her order
Brief Description:	After finishing order processing an order id will auto generate
	and customer can track his order through this id.
Actor:	Customer.
Precondition:	An order should be taken place before track.
Post condition:	Admin needs to maintain placed order and confirm.
Main Success Scenario	1. Order should be confirmed by staff.
	2. Admin will collect user data properly and provide them to the
	authority.
	3. For changing any information admin must need to notify users.
Scenario Extensions	1. System user must have an id and password.
	2. Admin should provide all the information properly.
	3. Admin cannot give any confirmation without the decision of
	the authority.

3.2.2. Manage products

System admin can change any setting through valid username and password either he cannot. He should be login authentic way either he cannot. Whenever he changes any setting he should give password again to make final change either not possible.

Table 19: Manage Products

Use Case Name:	Manage products
Scenario:	Here admin will manage products and products category.
Brief Description:	Here admin can add product to system, edit delete.
Actor:	Admin
Precondition:	Desired information should be available.
Post condition:	Product information must need available.
Main Success Scenario	1. System user must be authorized.
	2. Authority will give account to the system admin.
Scenario Extensions	1. If system user is not authorized.
	2. If user not registered.
	3. If the products information does not exist in the system user
	cannot search.

3.2.3. Manage Orders

Staff can manage orders which are taken place by customers. They can confirm orders, delete orders if order seems fake, process orders, check product quality and finally prepare for the shipment. Delivery men then add the product to tracking system and deliver it to customer.

Table 20: Manage Orders

Use Case Name:	Manage Orders
Scenario:	After placing orders by customers staff can manage orders.
Brief Description:	Proper authorized staff can confirm orders, delete orders, process
	orders, check product quality and prepare for shipment.
Actor:	Admin
Precondition:	An order needs to be posted by customer.
Post condition:	Orders should be confirmed.
Scenario Extensions	1.User should place orders
	2. Admin should confirm the order
Scenario Extensions	1. If users do not place order how could staff manage orders? So
	first need to place orders

3.2.4. Add product to tracking

After finishing orders management process delivery man adds the product to tracking system so that customer can see the product current status and observe it in Google map.

Table 21: Add tracking

Add tracking	
Here staffs can add product to tracking system.	
Here staff will add product to tracking. Then authority will manage those	
applications.	
Staff	
Orders must need to processed and prepare for shipment.	
GPS and location accuracy must be turn on.	
1. Staff needs to register.	
2. Orders should be confirmed, processed, checked and ready form shipment.	
3. Then staff add the product according to its id in tracking system	
If staff not authorized.	
If orders not properly place	

3.3. Activity Diagram

3.3.1. Activity Diagram for Customer

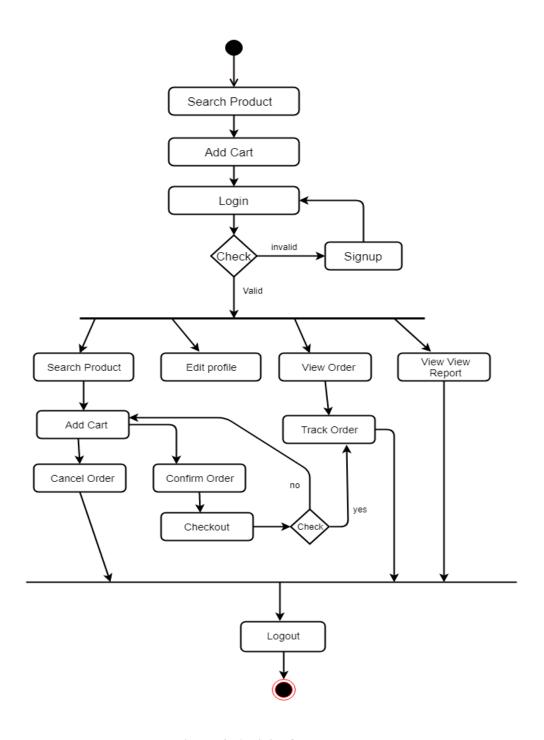


Figure 4: Activity for customer

3.3.2. Activity for Admin

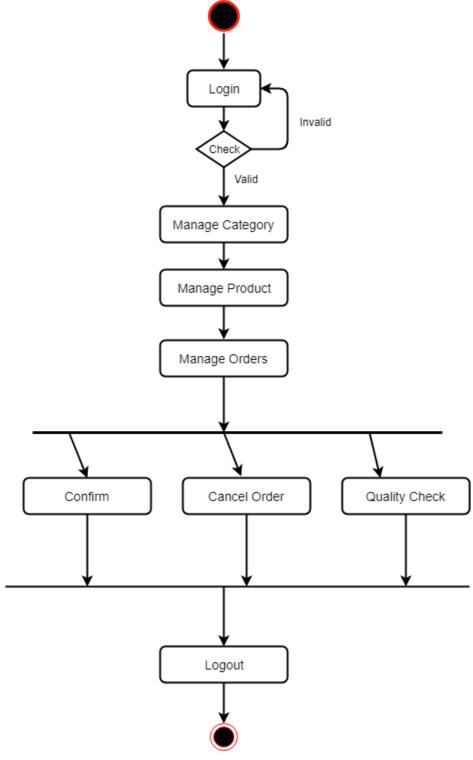


Figure 5: Activity diagram for admin and staff

3.3.3. Activity for Staff

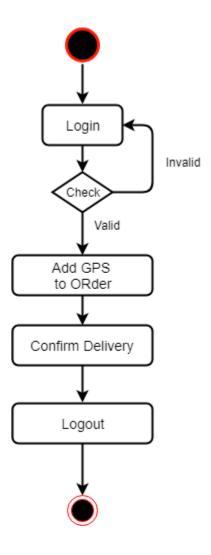


Figure 6: Activity for staff

Chapter IV System Design Specification

4.1 Sequence Diagram

4.1.1. Order product, Track Product

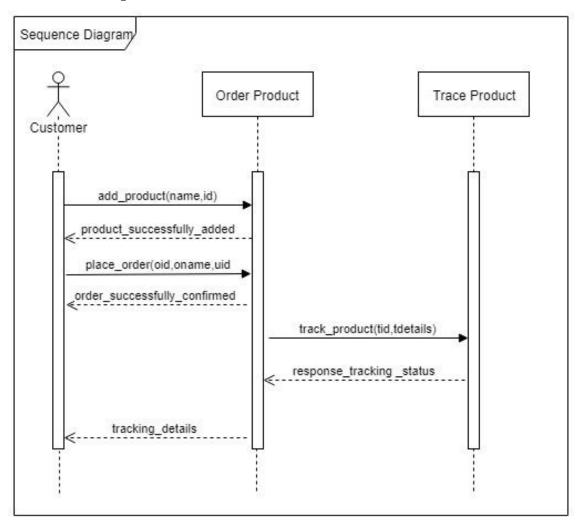


Figure 7: Sequence 1

4.1.2. Manage Orders, Add Tracking

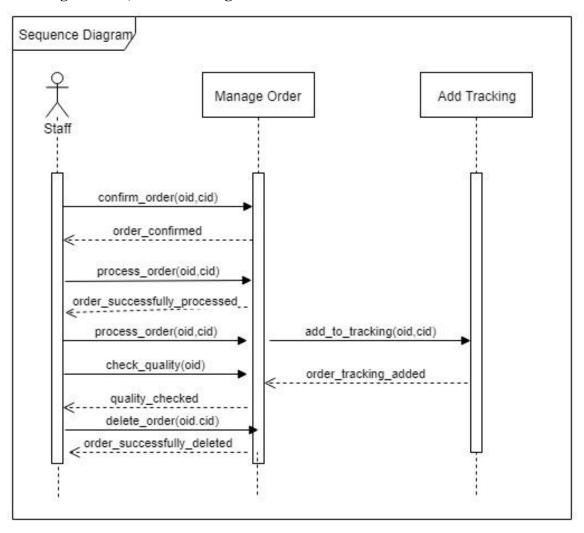


Figure 8: Sequence 2

4.1.3. Manage Orders

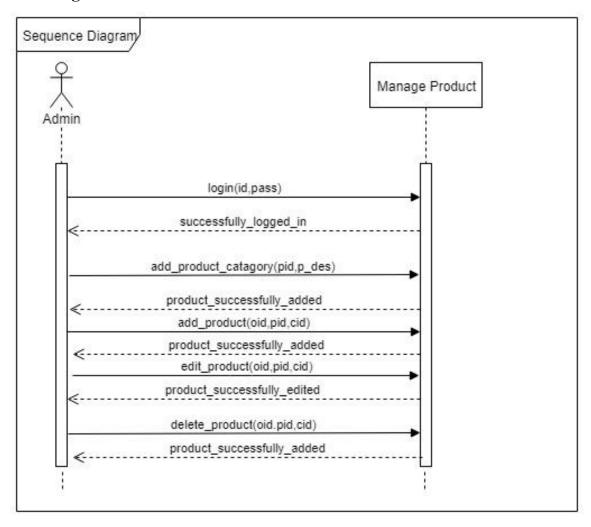


Figure 9: Sequence 3

4.2. Dataflow Diagram

4.2.1. DFD Level-0

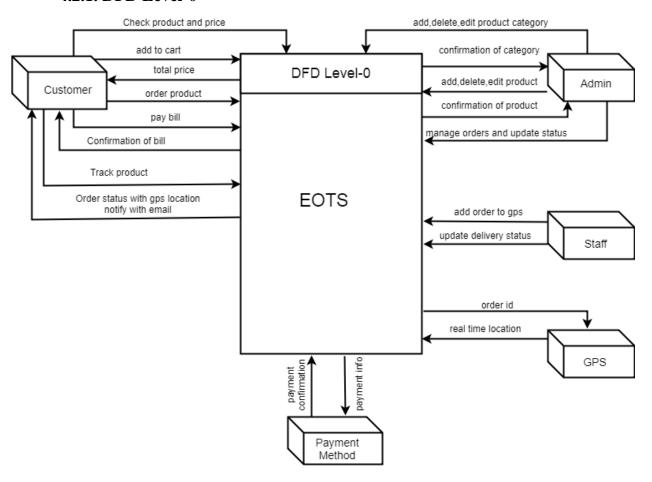


Figure 10: DFD Level-0

4.2.2. DFD Level-1

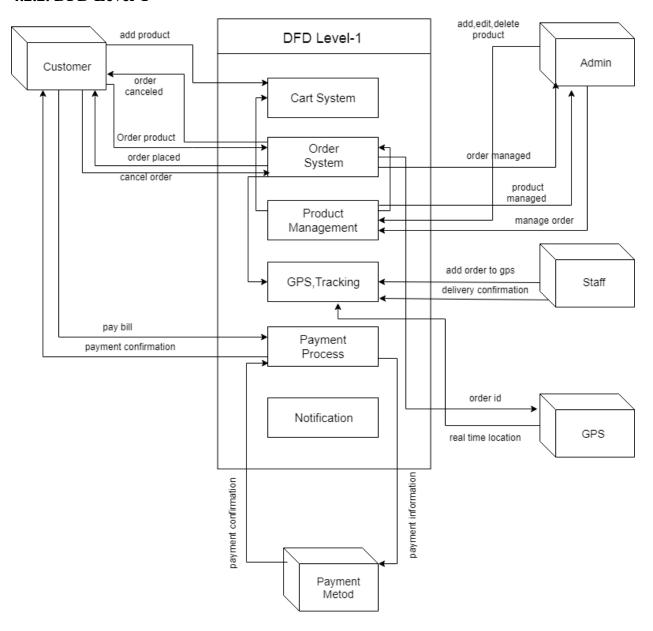


Figure 11: DFD Level-1

4.3. ERD Diagram

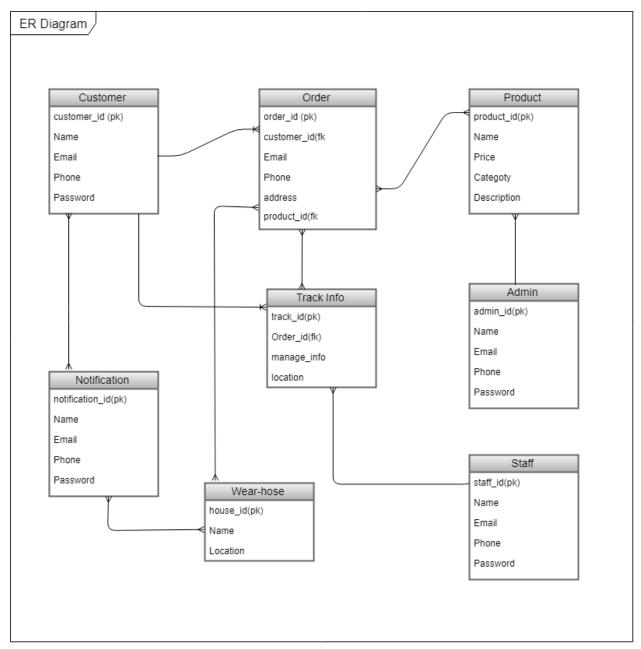


Figure 12: ERD

Chapter V User Interface and Manuals

5.1. User Interface

5.1.1. Home Page

After visiting the website url, this is home page. Click **Shop Now** button you will find more products, you can also browsing products by category by clicking **Products** in top navigation bar. At the top right of the navigation bar there is **My Cart**, **Sign** and **Signup**. If you are a existing user can you can login to the system.

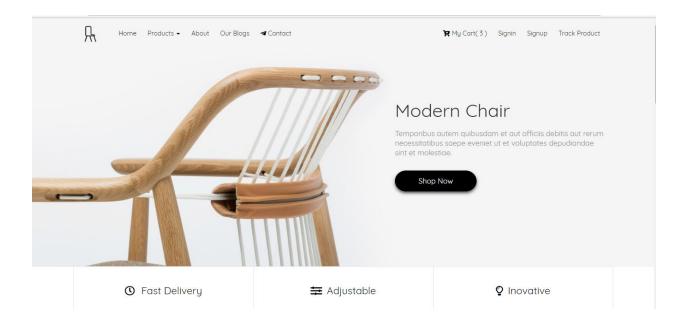


Figure 13: Home Page

5.1.2. Cart

After choosing products you can find this page. You can update your cart by clicking **Plus** and **Minus** sign button you can also clear a product as well as the whole cart simply clicking the **Clear Cart** button.

If you already login to system you can place a order by clicking the **Buy Now** button otherwise it redirects to **Signin** page

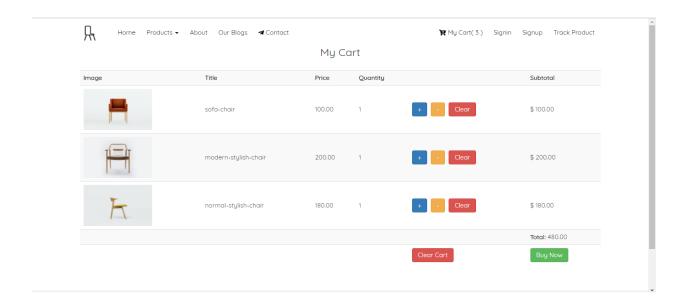


Figure 14: Cart

5.1.3. Sign in Page

This is customer login page. Existing customer can easily log in to the system simple giving the credentials in the field of email and password.

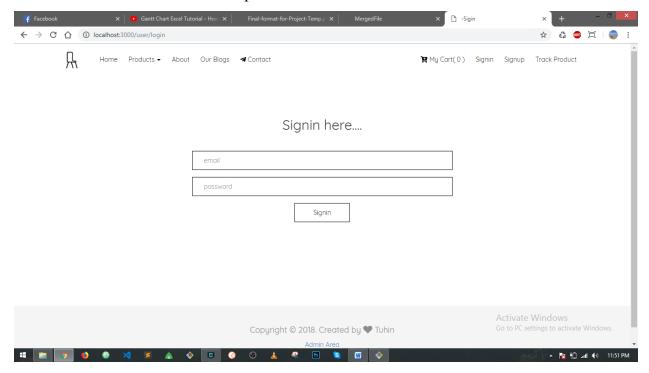


Figure 15: Sign in page

5.1.4. Order Tracking Page

This is the order tracking page for customer. Order information will auto update against already an order. Customer will notify if any status updates. Customer

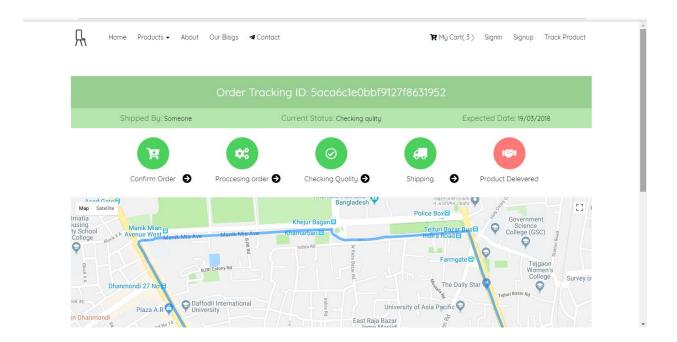


Figure 16: Order Tracking Page

5.1.5. Order Tracking Page

This is also the above remaining page of map and updated time of order.

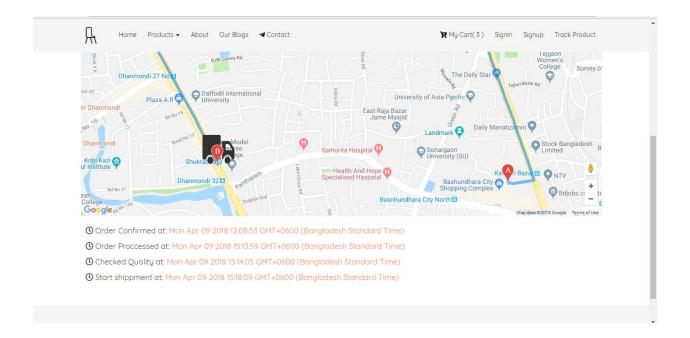


Figure 17: Order Tracking Page 2

5.1.6. Admin Area (Add Product)

This the admin page after authentication admin can add new product by clicking the **Add New Product** button, a form will open and admin can insert the products product related details.

Admin also update and delete clicking **Edit** and **Delete** button respectively.

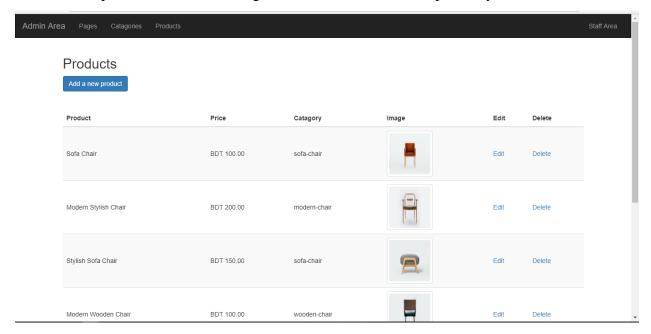


Figure 18: Add Product (admin)

5.1.7. GPS Tracking

This is the mobile version page for Staff (delivery man) when shipment starts. After insert an order id delivery man can start location tracking buy clicking **Start Tracking** button and this page will open. Real time location will auto update against this order.

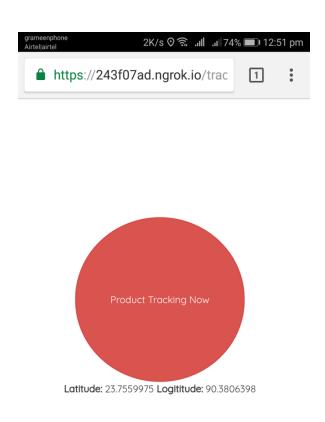




Figure 19: GPS Tracking

Chapter VI Development Tools & Technologies

6.1. User Interface Technologies

- HTML5, CSS3, JavaScript
- JQuery 3.2.1
- EJS (expressJS template engine)
- Twitter Bootstrap
- Font Awesome, Flat Icons

6.2. Implementation Technologies

6.2.1. NodeJS (11.3.0)

A JavaScript runtime build with chrome's v8 JavaScript engine

6.2.2. NPM (5.7.1)

NPM is the package manager for JavaScript and the world's largest software registry. Discover packages of reusable code and assemble them in powerful new ways.

6.2.3. ExpressJS (4.16.4)

Express.js, or simply Express, is a web application framework for Node.js, released as free and open-source software under the MIT License. It is designed for building web applications and APIs. It has been called the de facto standard server framework for Node.js

6.2.4. MongoDB (4)

MongoDB is a free and open-source cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with schemata. MongoDB is developed by MongoDB Inc., and is published under a combination of the Server Side Public License and the Apache License.

6.2.5. Google Map JavaScript API

Using this API easily can get the real time location of an object and easily able to show the location in google map.

6.3. Platform & Environment

6.3.1. Hardware

- Processor: Intel Core i3.
- RAM: 4GB.
- Hard drive: 1TB.
- Ubuntu 14.04./ Windows 8.1/Windows 10

6.3.2. Tools

- IDE/Editor: Visual Studio Code, Atom, Sublime Text3
- Cmder Terminal
- Robo 3T MongoDB client
- Server: Localhost:3000

6.3.3. Version Control

- Git
- Github (a web based version control hosting for software project)

Chapter VII System Testing

7.1. Introduction

This is aimed at identifying and correcting error. The major objectives of this activity are to ensure that the process done by the application is correct ad meets the objectives of the organization. Test plan aids in effective and systematic testing of the system and it aims at checking the errors of omission and commission that hinders the realization of the objectives.

7.2. Test Plan Strategy

The importance of the test plan is to show how the system is to be tested and also gives precise procedure to be followed during test plan. The test data is identified, what is being tested and the expected outcome as well as actual input. Test plan is one of the standard documents that should be produced in most software engineering projects. If the project does not have any test plan this means that the system produced is low quality. This may not be acceptable to the user it will not satisfy their needs. The test plan should be written as soon as requirements have been identified. The system will be tested with sample data to see how it would handle input and output functions as well as extreme data or conditions to determine the system behavior in overloaded situation which will directly slow the system that behaves in failure or extreme situation.

7.3. Test Case

A test case is a set of conditions or variables under which a tester will determine whether a system under test satisfies requirements or works properly. The process of developing test case can help find problems in the requirements or design of an application.

- Ensure that logical decisions on their true and false side.
- Practice all the logical decisions on their true and false side.
- Check equivalent partitions and boundary value within their operations bounds.
- Exercise internal data structure to assure their validity.

7.3.1. Test Case of Login

Test Case #01	Test Case Name: Testing the login panel.	
System: EOTS	Subsystem: Login	
Designed By: A.U.M. Tuhin	Design date: 25.11.18	
Executed By: A.U.M. Tuhin	Execute Date:25.11.18	
Short Description: This field handle's the login functionality of the website.		
Precondition: Go to http://localhost:3000/signin.		

Table 22: Test case of login

Steps	Action	Action Result	Expected System Response	Pass/Fail
01	Enter valid email and valid password	Get logged in.	Logged in into the system.	Pass
02	Valid email and invalid password	Not logged in and error message.	Not logged in and error message.	Pass
03	Click login without any data	Required message	Required message	Fail

7.3.2. Test Case of Sign Up

Test Case #01	Test Case Name: Testing the signup panel.	
System: EOTS	Subsystem: Login	
Designed By: A.U.M. Tuhin	Design date: 26.11.18	
Executed By: A.U.M. Tuhin Execute Date:26.11.18		
Short Description: This field handle's the login functionality of the website.		
Precondition: Go to http://localhost:3000/signup.		

Table 23: Test case of signup

Steps	Action	Action Result	Expected System Response	Pass/Fail
01	Click sign up without	Required	Required message	Pass
	any data	message		
02	Click sign up partially	Not signed up	Not signed up and required	Pass
	filling with data	and required	messages.	
		messages.		
03	Click sign up with valid	Signed up in and	No Required message	Fail
	data and password less	error message.		
	than 6 characters.			
04	Click sign up with valid	Not signed up in	Not signed up in and error	Pass
	data and password not	and error	message.	
	matching with confirm	message.		
	password.			
05	Click sign up with valid	Signed up and	Signed up and redirected to	Pass
	data and password.	redirected to	main landing page.	
		main landing		
		page.		

7.3.2. Test Case of Cart

Test Case #01	Test Case Name: Testing the cart panel.	
System: EOTS	Subsystem: Login	
Designed By: A.U.M. Tuhin	Design date: 26.11.18	
Executed By: A.U.M. Tuhin Execute Date:26.11.18		
Short Description: This field handle's the login functionality of the website.		
Precondition: Go to http://localhost:3000/cart.		

Table 24: Test case of cart

Steps	Action	Action Result	Expected System Response	Pass/Fail
01	Click add to cart on	One product is	One product is added in	Pass
	products.	added in cart	cart.	
		♣ For registered	For registered user	
		user cart is	cart is stored in	
		stored in	database.	
		database.	• For guest cart is	
		♣ For guest cart	stored in session.	
		is stored in		
		session.		
02	Increase/decrease cart	Cart is updated	Cart is updated accordingly	Pass
	item	accordingly	with price.	
03	Remove an item from	Product is not	Product is not removed	Fail
	cart	removed.		

7.3.3. Test Case of Location Tracking

Test Case #01	Test Case Name: Testing the tracking panel.	
System: EOTS	Subsystem: Login	
Designed By: A.U.M. Tuhin	Design date: 26.11.18	
Executed By: A.U.M. Tuhin	Execute Date:26.11.18	
Short Description: This field handle's the login functionality of the website.		
Precondition: Go to http://localhost:3000/cart.		

Table 25: Test case of location

Steps	Action	Action Result	Expected System Response	Pass/Fail
01	Add GPS tracking with	Start tracking	Start tracking	Pass
	order id.			
02	Get latitude and	Get two point	Get two point	Pass
	longitude			
03	Response back to client	Cannot get	Get successfully	Fail
	side of two point			

7.4. Features yet not tested

Table 26: Features yet not tested

No	Name	Users
01	Manage Orders	Admin
02	Manage Category	Admin
03	Barcode code generation	System/ Admin
04	Print order report	System/ Admin

Chapter VIII

Project Summary

8.1. GitHub Link

https://github.com/aumtuhin/final-project

8.2. Limitations

- The system is only for Bangladeshi ecommerce perspective.
- The system does not able to track international ecommerce orders.
- The system needs high speed mobile internet.

8.3. Obstacle & Achievements

Obstacle:

- Learning new technology and environment
- Limited time and budget

Achievements

- Learnt new technology
- Successfully build a project for production level

8.4. Conclusion

Despite the hardship s encountered in the entire development process the system has been developed for Ecommerce order tracking system thus enabling it improves its efficiency and effectiveness. Maintenance and usage of the system will be easy as the document and user manual of the system will be available to all users. Also there will be room for enhancement as this was considered during development. The system will offer better usability for users to buy products and share their thoughts about these product and process.

8.5. Future Work

Though the system was developed as fine but the future work will include some more major changes. Payment gateway will be integrated real time communication media like chat, notification will be introduced.

Key of Terms

A

 \mathbf{E}

S

I Abstract

Implementation Acknowledgement

Introduction Approval

Associate Review Analysis D

H Definition and abbreviations

Design map Hardware and Software Specification

Html5 Database Name

 \mathbf{C} J

Conclusion JavaScript

Class Diagram **JQuery**

Context Diagram Future work

Functional Requirements

E-commerce Entity Relationship Diagram T

Testing System description

Test case Software Requirement Specification Tools

Software Development Plan **Technical Description**

System Design IJ

System Overview System Scope

Use case diagrams Software Specification

N \mathbf{F} Non-Functional requirements

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