

Gumti Petroleum

Coursework: COMP1181

BSc (Hons) Business Information Technology

Submitted to	Submitted by
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Acknowledgement

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Executive Summary

This project is about developing an automated system for an organization named Gumti Petroleum in Bangladesh. Currently the organization doesn't have any automated system. So they are willing to move to an automated way to process their work. The main focus of this project is about their working process only like fuel purchase, sale, employee management etc. To develop this required system in this project, few stages have to be followed that will make the system more acceptable to the user. Some analysis will take place and it will help to find out whether the system is compatible or not. Also need some research to compare with other systems and make the system more accurate. After developing the system, there will need some test to make it error free. There may have some processes that will not be developed on that time, in further development those will take place to make it more accurate.

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Chapter-1

Introduction

Day by day increasing motor vehicle and this is a popular transportation in world wide. This multiple types of vehicles need a huge amount of fuel and CNG gas. For this reason petrol pump business going to be a profitable business.

People invest huge amount of money in this business and they want to profit. For making profit needs proper management. But day by day this business area going to be large. The business owner has to manage multiple information like employee information, salary information, purchase and sales information, transaction information with partner companies' etc. Most of the petrol pump in Bangladesh manages regular work through manual system or paper based system, but this is difficult to manage. This is not so secured or easy to manage business process. Information access control can't easy. Any unauthorized person can be viewed business information.

Due to increase the sale of Gumti Petroleum they decide to increase branching. Now this is a big business and this is not so easy to manage using a manual system, that's why they want to move an automated system to manage this business. That system will make easy all of the business processes and increase productivity.

Chapter-2

Initial Study

- ❖ Overview of the Project
- ❖ Background of the Project
- ❖ Project Aims & Objectives
- ❖ Problem Area
- ❖ Possible Solution

2.1 Overview of the Project:

The "Petroleum Pump Management system" has been developed for defeating the problems of utilizing the manual system like paper based system. This application is developed to minimize the time waste and reduce the hardships to using the existing system. In addition this system is intended for the specific need of the organization to complete business tasks in a smooth and viable way.

Presently, the entire world is moving to the computerized system from manual systems. The computerized system makes the things simpler for the individuals. Gumti Petroleum (GP) is petrol Pump Company and they want to run a computerized system to manage regular task. This GP Company selling car fuel and CNG.

So this proposed system will be designed and developed for managing purchasing and sale fuel, employee attendance and salary information, equipment information, etc. This system will be also able to manage the company's due and transaction details. This proposed system will be able to provide faster service to make maximum business satisfaction. This system can provide various reports from this system and this report will be exportable.

2.2 Background of the Project:

The "Petroleum Pump Management system" has been developed for defeating the problems of utilizing the manual system like paper based system. This application is developed to minimize the time waste and reduce the hardships to using the existing

system. In addition this system is intended for the specific need of the organization to complete business tasks in a smooth and viable way.

In this present time, GP purchase fuel from multiple subsidiaries company of Bangladesh and locally sell this fuel. GP Company has multiple branches in whole of the country. They increasing their branches to increase their business area and earn more profit. Gumti petroleum signed deals with various transport companies so those transport companies will purchase their vehicle's fuel from GP Company. But Gumti Company has to sell fuel with due payment to all those contracted transport companies and company will pay this bill within a fixed time of period. There have many types of staffs and they have different types of access level. Like company's managing director oversee the whole business process. All business information recorded in a paper based document which helps the MD to look up all business documents.

The branch manager will be responsible for his branch and he will oversee his branch. He will manage branch wise business through the branch accountant and machine operator. Only contracted buyer company will purchase fuel with due of cost, but others buyer has to clear, full payment. Branch manager or branch accountant will inform the contract buyer company's authority about due bill information.

2.3 Project Aims & Objectives:

2.3.1 Aims of the project:

- **Automated system:** The main aims of this system are making easier the business process of the Gumti Petroleum by developing an automated system. By this system this GP Company will be able to store centrally the business data

and data will be accessible from anywhere. This business company will be benefited financially and business task will be easier.

- **Organizing fuel stock:** The fuel stock information will be organized and easy to measure. This will help the branch manager to take the decision to purchase fuel also the head office will be seen this stock information.
- **Faster working process:** The new system will be processed all business tasks faster than the previous paper based system and it will make a positive effect to the Gumti Petroleum.
- **Paperless process:** As the whole business process will be automated, the use of paper in business task will be reduced and the system will store all business records in a secured database.
- **Easy to make business decision:** As the system will generate multiple statistical report based on purchase, sale, cash flow, stock, etc. that will be helpful for the management of the Gumti Petroleum to make any business decision for the future. All calculation will be fully automated, so there is no chance to generate the wrong report.
- **Secure Business Data:** After the implementation the proposed system, the organization's business date will be more secure and system will be manage data access control policy.

2.3.1 Objectives of the system:

The overall objective of this project is increasing manageability of business process of the Gumti Petroleum through automation and makes more accurate business report. This will help to increase the business.

- To make an automated system which will able to make automated all of the business process. And complete all calculation accurately.
- Fuel purchase and sale information will be stored in the system by responsible staff.
- To provide a web based platform for staffs to manage business task based on their business role.
- To provide a facility to centrally store all branch business data and make it accessible from anywhere through complete authentication process.
- To generate an accurate business statistical report like sales report, purchase report, due report etc.
- To track employee attendance, overtime and calculate employee salary.

2.4 Problem Area

Gumti Petroleum is now managing their business through paper based system. All purchase and sale information is recorded into a book that is vulnerable to theft or lost business data. This so difficult to manage access control in paper based system, any level of staffs can view any business information this should not happen. Weekly or monthly sales and purchase report making by an employee, the report is more likely to

be a mistake here. After sealing fuel salesman provide a hand written receipt to customer. The end of the day an employee calculate total sale of this day and record it into a book. Employee calculates huge data to get fuel stock information. The end of the month branch employee has to go through huge papers to calculate all transactions, sale, purchase, due, employee salary, employee attendance etc. and send a copy to head office by courier.

2.5 Possible Solution

After doing wide research and analysis about this problem, developing a computerized system will be the possible solution for the Gumti Petroleum. This system will make easy official communication between head office and the branch office. This will make a modern office environment. Business data will be stored centrally and data can be accessible from anywhere with completing the proper authentication process. Business process will be faster and efficient. Gumti petroleum can send an invoice to the buyer company through the email facility of this system. Branch office can easily generate reports about the purchase, sale, transaction, due, employee attendance and etc. head office also oversee branch offices through this system. The head office can view the monthly revenue report of any branch. All calculation will be automated and accurate.

Chapter-3

Literature Review

- ❖ Introduction
- ❖ Discussion on Petrol Pump Business
- ❖ Discussion on Solutions
- ❖ Comparison of leading Solutions
- ❖ Recommended

3.1 Introduction:

A literature review could be a magnificent summary of past investigate on a specific topic. The literature review overviews, books, academic articles, and other sources significant to a specific region of research. (guides.library.bloomu.edu, 2018)

3.2 Discussion on Petrol Pump Business:

Present time there are numerous system is developed for inventory Management system. There are some basic issues in these systems and some are individual issues. A few issues are explained underneath-

- **Lack of future forecasting** – Numerous of business dependably takes decision inspecting on their past reports and discover approaches to beat the issues. So there is a high shot of bringing issues up in the future about the administration of the private company. A large portion of the business in now days enhance their client benefit levels and they have no long haul answer for their business which can cause damage.
- **Complexity** – There are numerous troubles in the small organizational system like the system isn't much easy to understand to the client. Because of absence of appropriate functioning, there is a shot of lost stock and it can diminish the benefit of the business.
- **Decentralized design** – Decentralized structure is at first less expensive for a private company on a low budget plan however it very well may be all the more exorbitant in to eventual fate of the business when there will be changes.

3.3 Discussion on Solutions:

In stock and inventory system, there can be numerous issues and furthermore have a few solutions for those issues. Some normal solutions are given-

- Researching in a long haul solution can wipe the issue of prompt future. It will meet the client needs and to make future marketing plans. Getting continuous information for the business will produce the income from the business what's more, will make strides.
- An easy to understand the structure of an administrative framework will cooperate with the framework effortlessly. Be that as it may, there likewise need of client preparing for better communication as there can be a measure of non tech individual client. Preparing and utilizing innovation like bar coding to distinguish thing can diminish the shot of losing the thing.
- A concentrated structure can give the capacity to the framework to keep running for a long. It increment the exactness of the framework and help to make the activities constant.
- Optimization of the system can be a decent solution for beaten numerous issues like Absence of estimating. It decreases the waste and enhance the functionality. Improvement of framework gives data about the amounts of stocks and help in keeping up the precise stock.

3.4 Comparison of leading Solutions:

There are many inventory management systems to manage business. Here I will look at between a few businesses who sell fuel lie Gumti Petroleum.

- **Wainfo Petrol Pump Management System:**

This is one of the best systems for managing petrol pump. This system able to manage multiple modules like billing, accounting, inventory etc. This system is a desktop based management system.

Screen of this software:

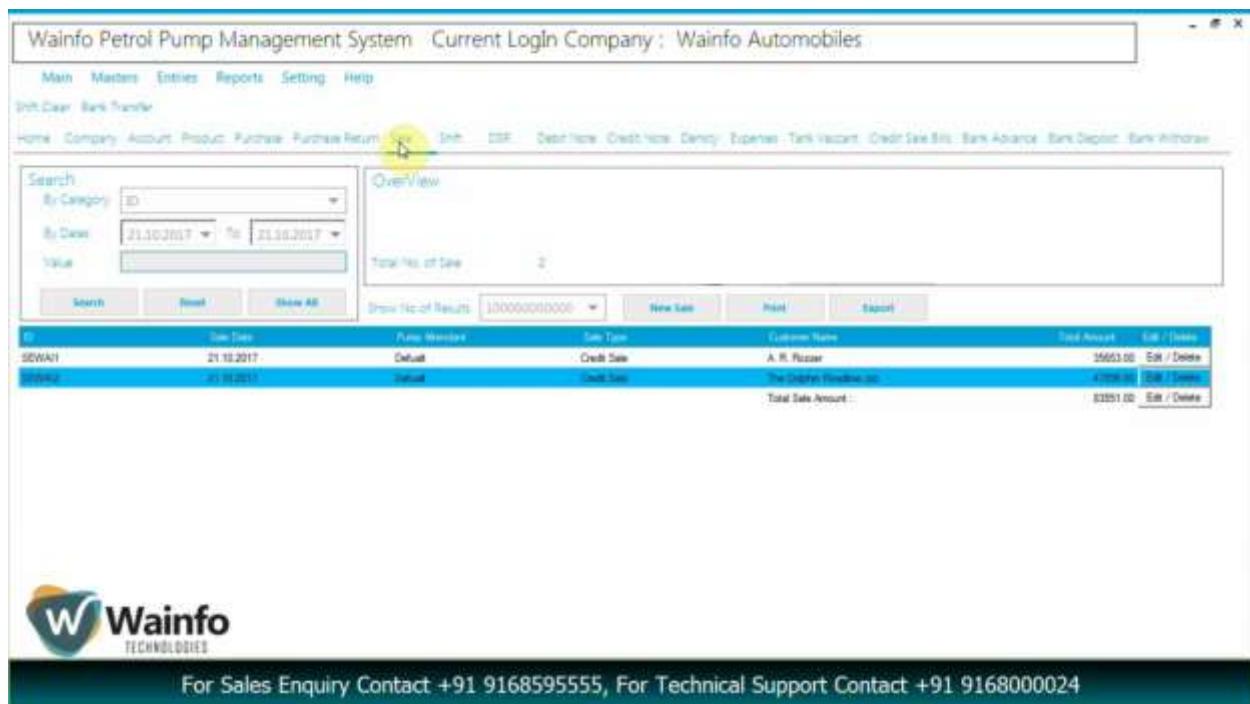


Figure 1 Wainfo Petrol Pump Management System sales list

Sale Entry - Add New Entry

Masters

Pump Attendant	Defualt	Sale Type	Credit Sale				
Customer Code	02	Customer Name	A. R. Rozzer				
Date	21-10-2017	Customer Balance	0.00				
Slip / Trunk	Slip No	Shift	Day Shift				
Card Type	VISA	Card No					
Settlement No		Back No					
Slip No	Vehicle No	Prod Code	Product Name	Rate	Qty	Total	Operation
			HSD	56.00	0.00	0.00	

Transport Charges: 0.00

Notes:

Grand Total: 0.00

New **Save** **Clear** **Back**

Figure 2 Sale Entry Interface

Best features

- Able to manage multiple modules of pump business.
- Organized and easy to understand for users.
- This system can generate multiple necessary reports.

Limitations

- This is use SQLite database, so cloud data backup is not established.
- This system able to manage individual pump station.

- **My Pump**

My Pump is a web based petrol pump management system with Frontend and backend.

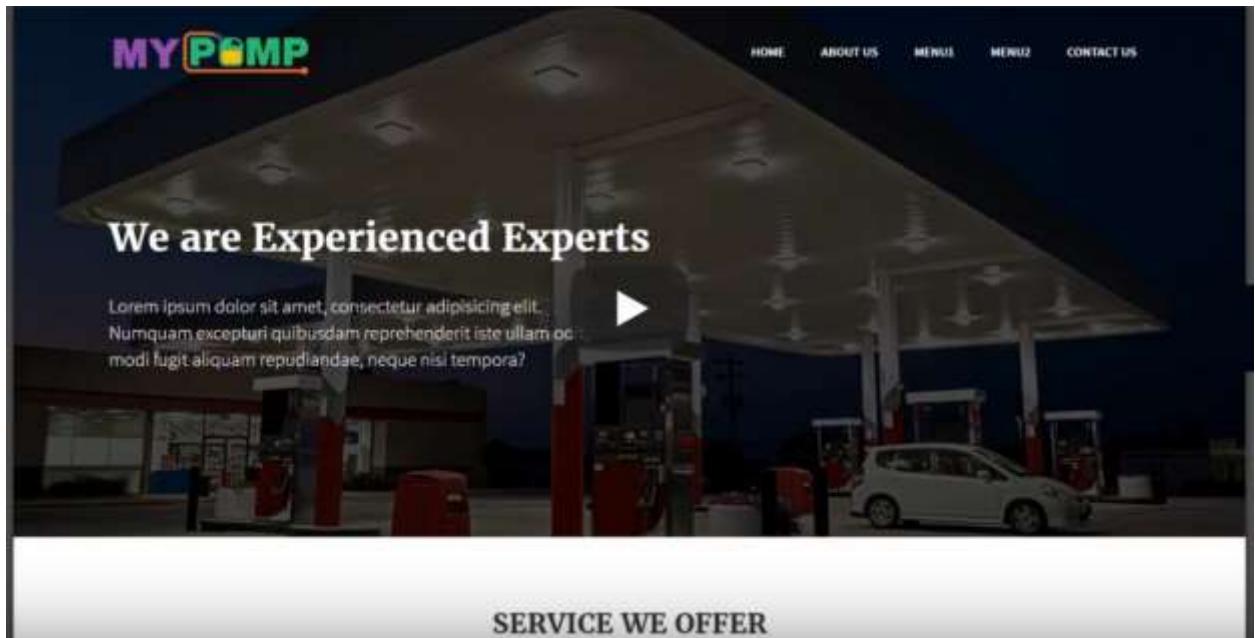


Figure 3 My Pump Frontend

The screenshot shows the My Pump Backend's Income Report page. The left sidebar contains navigation links: Dashboard, Sell Fuel, Machine Reading, Income Report (which is currently selected), Expense Info, Machine Info, Petrol Info, Seller Info, Currency Setting, and Website Setting. The main content area is titled "Income Report" and displays a table of income data. The table has columns for ID, Date, Total Sell, Total Expense, Net Amount, and Action. Two entries are listed:

ID#	Date	Total Sell	Total Expense	Net Amount	Action
1	14-january-2017	BDT - 23150	BDT - 100	BDT - 23050	View Invoice
2	13-january-2017	BDT - 5175	BDT - 70	BDT - 5105	View Invoice

Figure 4 My Pump Backend

Best Features:

- This is web based system, so it accessible from anywhere
- It can generate some business report

Limitation:

- This is not well secured
- This system able to manage only one petrol pump.

- **USHA Fueling Station:**

This is Microsoft Access based system. This system has well authentication process.



Figure 5 User login interface of USHA

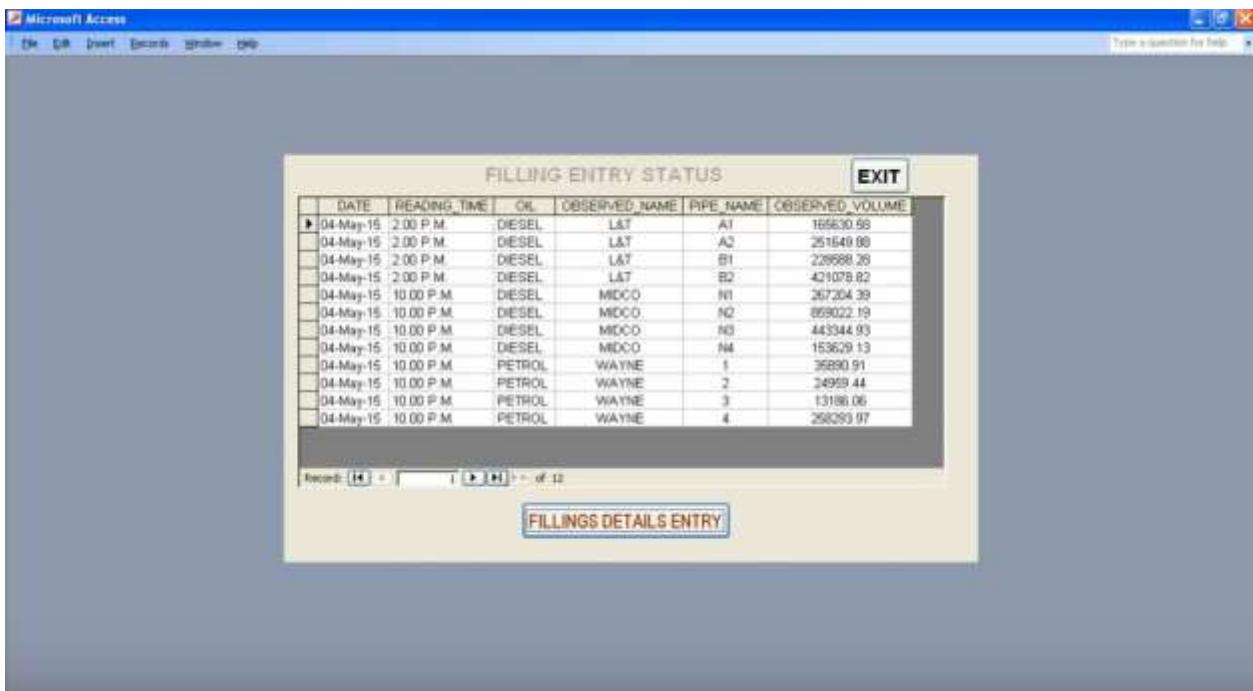


Figure 6 Fuel Status

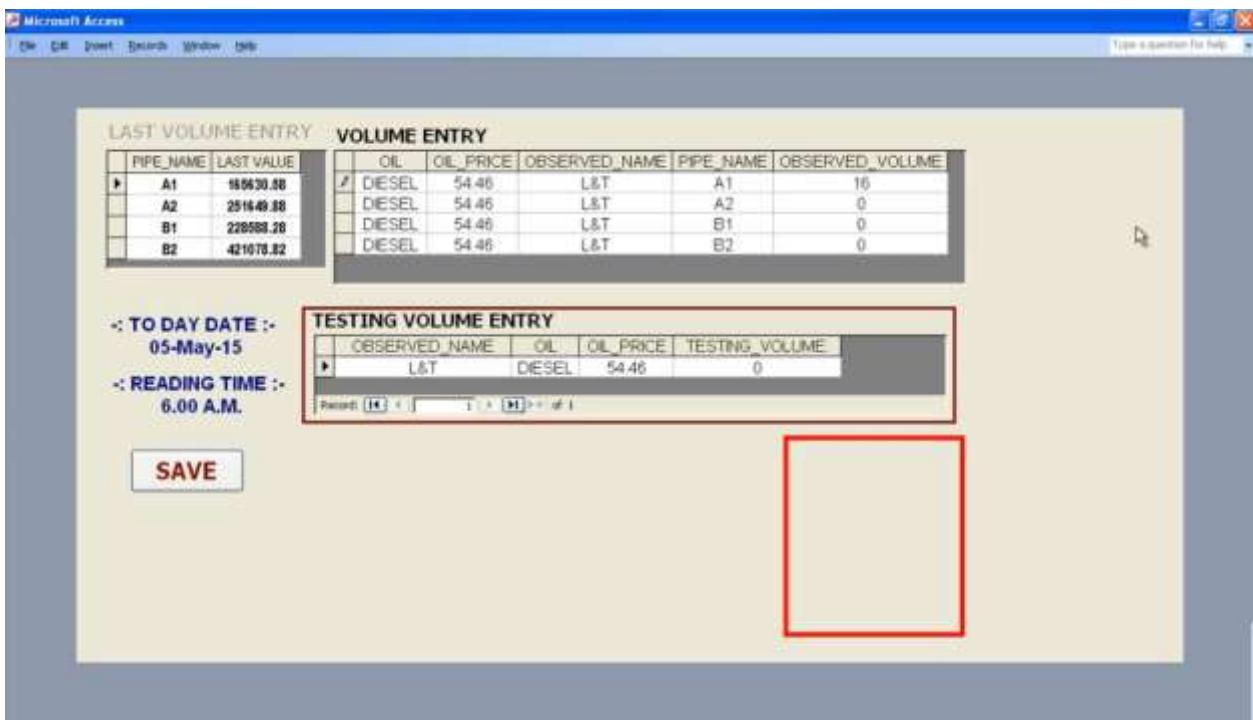


Figure 7 Fuel Sales Information

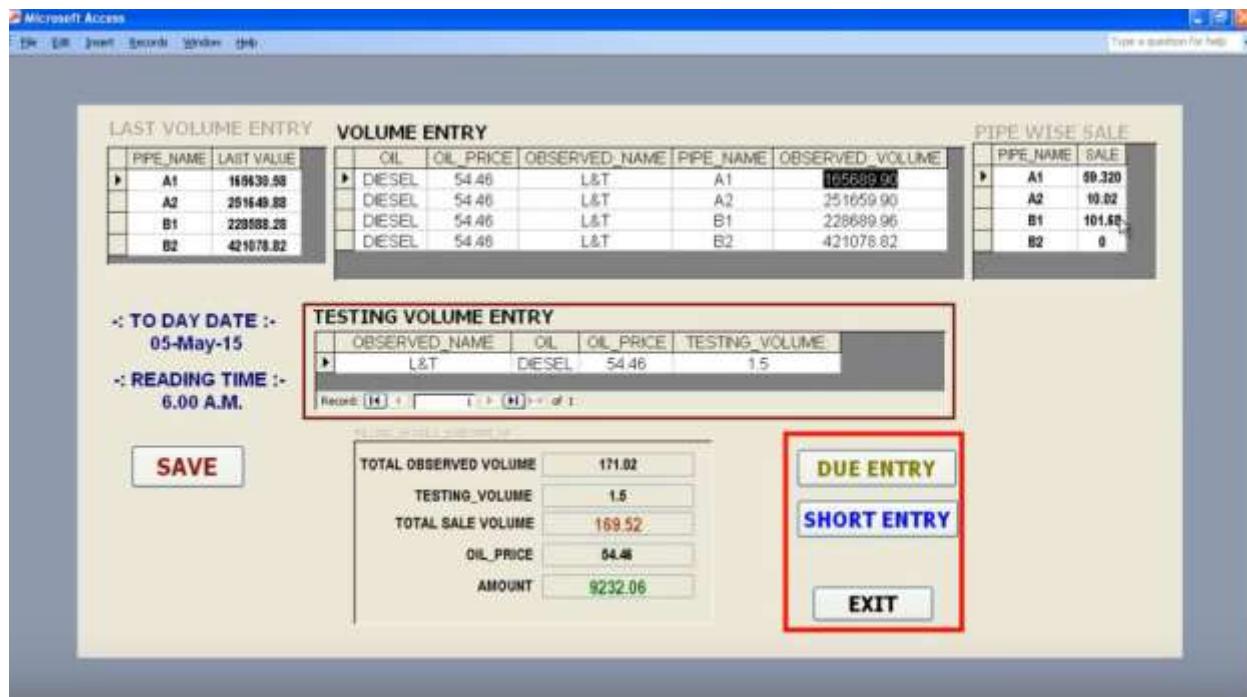


Figure 8 Fuel sale interface

Best Features:

- Easy to use
- Good enough for small business

Limitation:

- There is no data recovery option.
- No accessible from anywhere.

3.5 Recommended:

The Gumti Petroleum's system should able to manage all business process. Have to manage user's authentication with strongly control the information access policy. A few approaches ought to be executed to induce the foremost business benefit.

There have some challenges to develop Gumti Petroleum's system. The challenges are-

- System should able to manage head office and branches of Gumti Petroleum.
- Use central database to store al business data centrally, also have to ensure data backup.
- Make sure user maximum usability.
- Should overcome all limitations of existing system.

The system has to meet the client demand; the system should address every one of the challenges made reference to above. The client ought to access the system that will convey another change to the system and make the system distinctive to another.

Chapter-4

Methodology

- ❖ Introduction
- ❖ What to use?
- ❖ Why to use?
- ❖ Selections of methodology
- ❖ Implementation plans

4.1 Introduction:

Selecting a methodology is fundamental to developing a project the methodology ought to be suitable and appropriate to the nature of the project. Methodology permits superior understanding of end user necessities and business needs of the development group. In this area a brief discussion is given around the chosen methodology for the proposed system with legitimate assessment.

4.2 What & why to use?

There are many development methodologies used for developing a system, such as Rapid Application Development (RAD), Structured Systems Analysis and Design Method (SSADM) or Waterfall, Dynamic Systems Development Method (DSDM) etc.

- **Rapid Application Development (RAD):**

RAD is an application development methodology. Parallel developed the functional modules as prototypes and compact to develop the full project for faster delivery. This method allows changes during the development process, there's no point by point preplanning. This methodology follows iterative and incremental development. The prototypes developed are reusable is the most important aspect of this methodology. This development methodology can successfully applied where the project task can be broken down into multiple modules, else RAD can't give the expected result.

Advantage of RAD:

- Reduced development time.
- Development progress can be measured.
- Requirements changing can be compromise.
- Fast initial reviews happen

Disadvantage of RAD:

- Required strong technical team members for identifying business needs.
- More management complexity.
- Highly skilled project developer or designer required, because of project success depends on modeling skills.
- User involvement required throughout the development life cycle.

(tutorialspoint, 2018)

▪ Systems Analysis and Design Method (SSADM) or Waterfall

Waterfall follows a straightforward structure of SDLC (System Development Life Cycle) and that is an old method of SDLC. The waterfall methodologies divided the system into separate phases and complete one phase then move forward. Each of the phases depends on the previous phase's information. SSADM and Waterfall methodology is easy to manage and understand. This methodology does not allow any changes during the system development process.

Advantage of Waterfall:

- Easy to understand and manage.
- Finish one phase, then moves on to the next.
- Easy to organize tasks.

Disadvantage of Waterfall:

- Not a good methodology for object-oriented projects.
- Does not allow any changes during development process.
- This isn't applicable for long term project.
- System user recommendation, acceptance and feedback can't add during developing a phase.
- During development process testing not allowed.
- Detailed documentation is required to moving on next phase.

(techopedia.com, 2018)

▪ Dynamic Systems Development Method (DSDM)

The Dynamic Systems Development Method (DSDM) is a spry venture conveyance system, basically utilized as a program improvement strategy. It could be a system which encapsulates much of the current knowledge about extends administration. DSDM is established within the program improvement community, but the merging of computer program advancement, prepare designing and consequently trade improvement ventures has changed the DSDM system to end up a common system for complex issue tackling errands.

The DSDM system can be actualized for dexterous and conventional improvement forms.

(dsdmoagilemethodology, 2011)

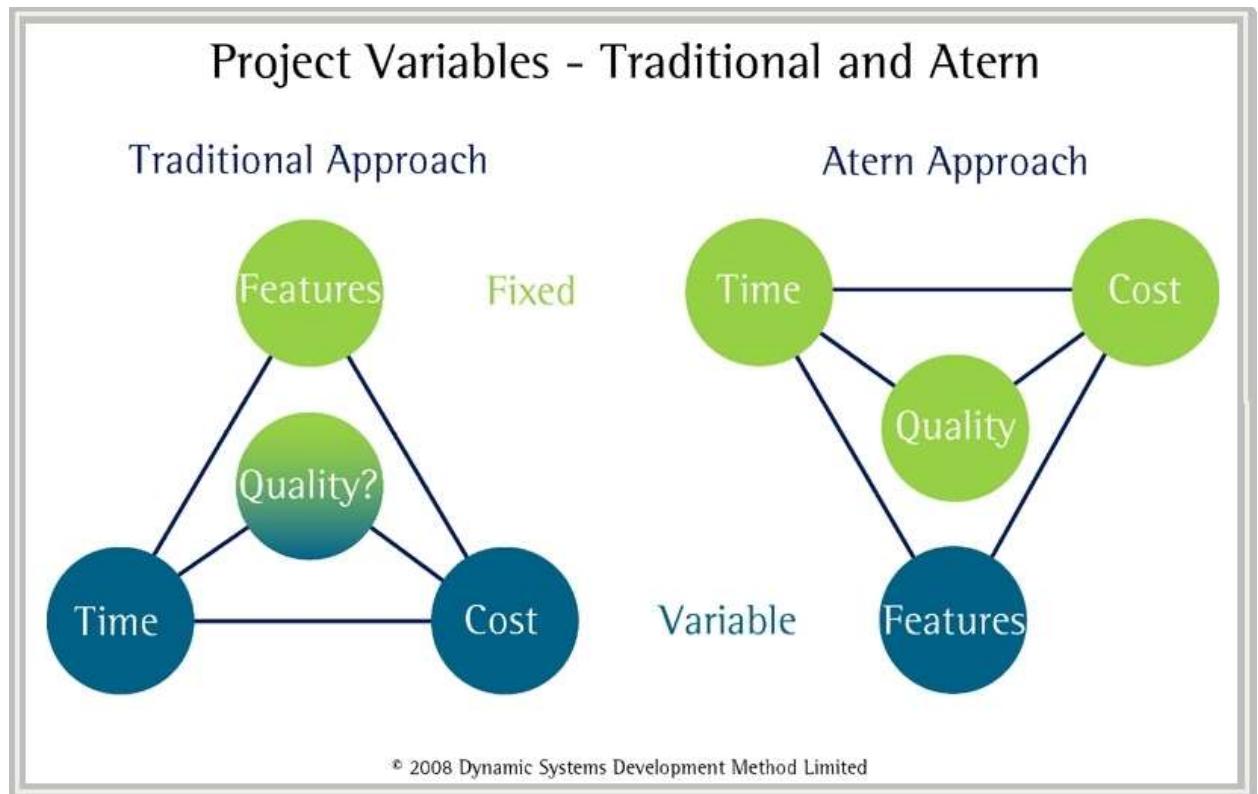


Figure 9 Understanding DSDM Project Variables (mcpa, 2017)

Advantage of DSDM:

- Allow changing requirements during the development process.
- Increase stakeholder participation in the software development process.
- Ensure the project delivery within the timeframe.
- Iterative & incremental delivery.
- Has a specific approach to set priorities of requirement.

Disadvantage of DSDM:

- Development team requires a skilled in both the technical and business areas.
- The improper stakeholder participation may lead to the failure of the project
- DSDM is not perfect for small projects.

The accomplishment of the proposed system absolutely relies upon the client's amusement. So the need of client requirements ought to be considered to begin with for the achievement of the development. The stakeholder requirements may be changed during the development process. In order to manage the changes of user requirement during the development process, it's necessary to select a development methodology that allows changing requirement during project development and allow stakeholder involvement in the process of development.

There are specific users, specific time limitations, budget and many criteria given by the Gumti Petroleum Company for development of the proposed system. So DSDM is the best methodology to develop the proposed system.

Suitability with the proposes system –

- **Focus on the business needs–** DSDM methodology uses Moscow prioritization to explore the business requirements and find out accurate developable business requirements. So, DSDM Atern will be the best solution for Gumti Petroleum.

- **Deliver on time** – DSDM Atern follow possible time-box to complete the specific task and it helps to develop full project within a fixed time period. This project has a boundary of time, so DSDM will appropriate development methodology to develop this project within the time.
- **Collaborate** – DSDM allows stakeholders participation in the development process and it's necessary for developing a quality system. Gumti Petroleum's multi-level staffs can cooperate with the development team to make it robust system.
- **Never compromise quality** – DSDM obey that, a solution has to be "good enough". At the beginning, it sets the level of quality. Projects must test continuously and survey always. So, DSDM can provide quality project to the Gumti Petroleum.
- **Build incrementally from firm foundation** – The organization can take advantage of system before complete the development process and inspiring stakeholder feedback and confidence.
- **Develop iteratively** – DSDM accepts that at the first time work is not always perfect. It allows changes until the right solution.
- **Communicate continuously and clearly** – DSDM tries to find out the business requirements through build a clear communication between stakeholders and the development team. DSDM also follows some techniques for better understanding like prototyping, modeling, daily Standups, workshops, presentations and etc.

- **Demonstrate control** – The group ought to be proactive when checking and controlling advance in line with Foundations Stage. They have to be always assess the extend practicality based on the trade destinations.
(methodsandtools, 2016)

To complete the Gumti Petroleum's project DSDM have some key techniques, which will help complete quality project within time.

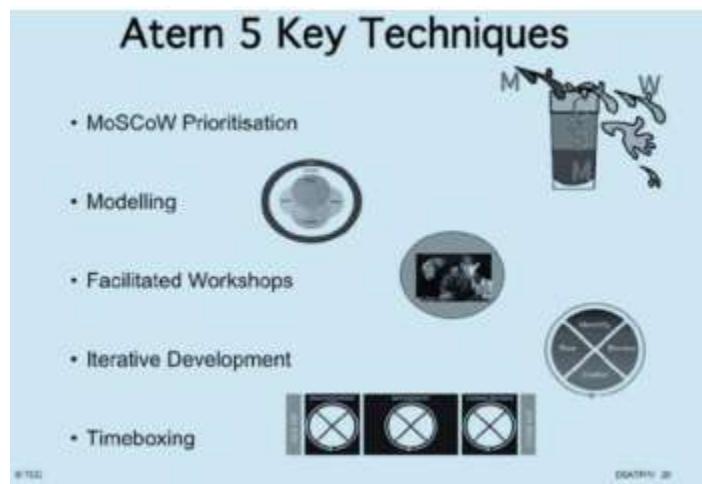


Figure 10 DSDM Atern key techniques

- **MoSCoW Prioritization** – This will help developers to prioritizing the business requirements of Gumti Petroleum, which will help to ensure the business benefits from the system. The MoSCoW prioritization categories are-
 1. **Must Have:** The requirements which are fundamental for launching this system, those requirements are placed here.
 2. **Should Have:** Which requirements are less important than "Must Have" requirements, those requirements are placed here.
 3. **Could Have:** Which requirements are increasing the productivity and usability of the system, those requirements are placed in here.

4. **Won't Have:** In this section placed some requirements which is not so important right now, but can be developed in further development.
- **Modeling:** Helps to improve understanding and visualize a business process. It produces sets of diagrams such as Unidentified Modeling Language (UML) for specifying the artifacts of software development.
 - **Facilitated workshop:** In this technique, stakeholders and system developer make a general discussion to find out the current problems. The developer can find out actual business requirements using this technique.
 - **Iterative development:** It advance arrangements from a tall level thought to convey a product and this arrangement is the most item that's subjected to the iterative development prepare.
 - **Time-boxing:** To ensure the project delivered on time, there is a technique for managing it.



Figure 11 Time-boxing stage

This technique ensures a quality solution with on-time delivery.

Based on Gumti Petroleum business requirements, DSDM Atern is a suitable methodology for developing this system. So, this is possible to provide quality solutions to the Gumti Petroleum within the fixed time and budget.

4.3 Selection of methodology:

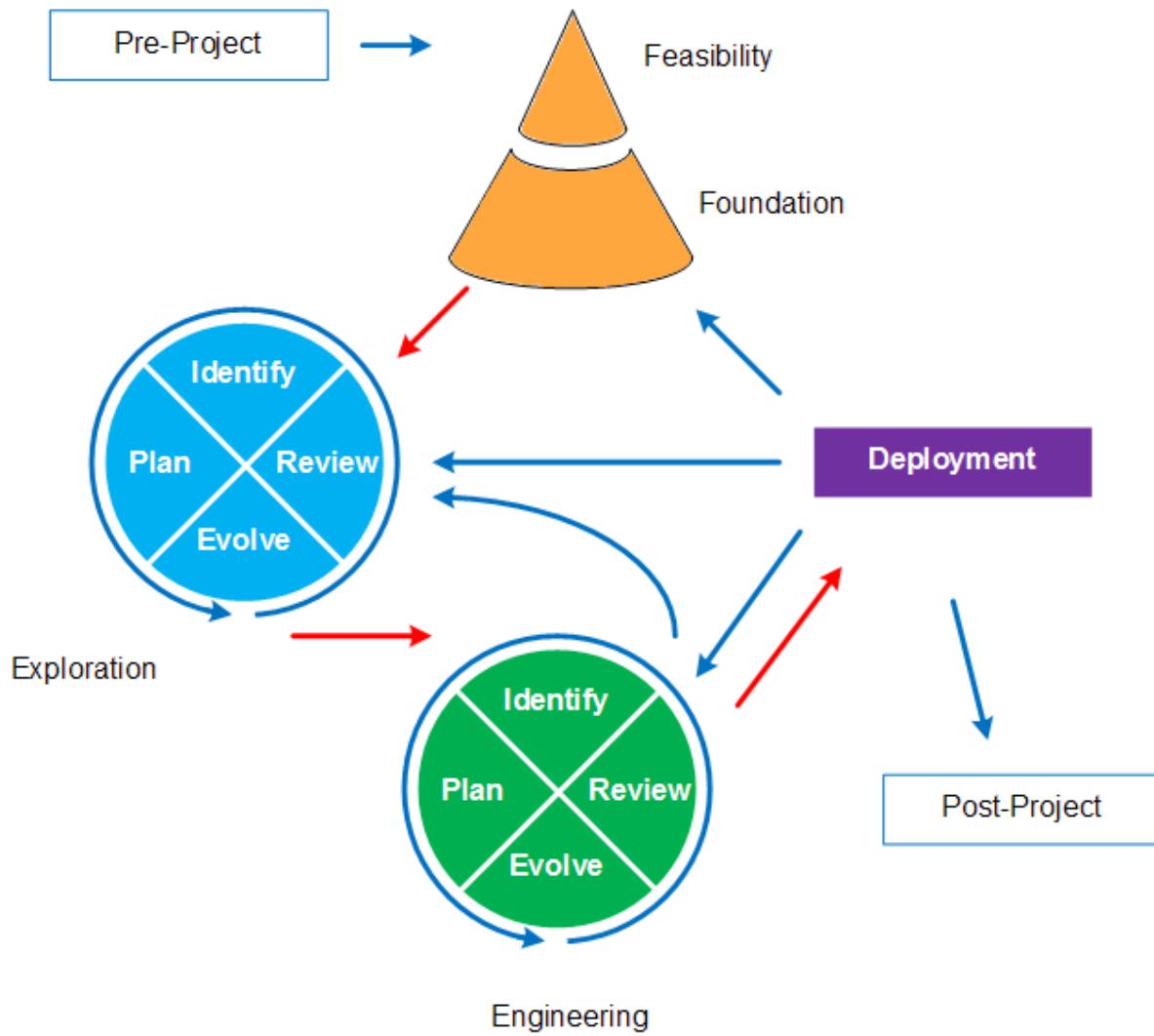


Figure 12 The Sections of Methodology (agile.tech-academy.co.uk, 2018)

- **Pre-Project Phase** – Formalizing a proposal for a project. Clarifying project goals and places it with regards to other potential work done by the business is crafted by Pre-Project stage. The principle goals of this stage is to find out the business issues, distinguish the business visionaries and sponsor, affirmation

about the undertaking is in line with business procedure and make arrangement and asset for the feasibility stage. (agile.tech-academy.co.uk, 2018)

- **Feasibility Phase-** Practicality of venture ought to be ceaselessly surveyed, to guarantee benefits exceed costs
 - Sets up whether practical arrangement
 - Distinguish benefits
 - Layout conceivable approaches, counting procedures for sourcing arrangement & project management
 - Describe authoritative governance
 - State to begin with cut gauges of timescale & costs
 - Plan & asset Establishments phase
- **Foundations:** This stage is pointed to set up firm and steady establishment of the project. It is the beginning time of analyzing the prerequisites of the trade require, depends on the priority and significance. It to portray the commerce prepares that ought to be supported by the arrangement. It's too beginning of planning the arrangement architecture and distinguishing the physical components.
- **Exploration:** This stage is utilized to explore the point by point trade necessities iteratively and incrementally additionally interpret into a viable arrangement. To assist examination, it elaborate prioritized necessity list from Establishment stage. The conclusion item of Exploration stage is refined on the Designing stage to guarantee the technical acceptance.

- **Engineering:** This stage is utilized iteratively and incrementally and the advancing arrangement is refined to meet the concurred acknowledgment. Basically the improvement centers on the non-functional prerequisites like execution, security, viability, etc. From functional viewpoint, this stage gives a chance to approve the fitness of the arrangement for the trade reason.
- **Deployment Phase:** Getting the arrangement prepared for execution is the point of this stage and secondly the reason is to act as a key survey point earlier to the arrangement. The objective of the stage is to affirm the ongoing performance and practicality is required and convey it onto the live situation.
- **Post-Project:** Survey whether the business benefits depicted within the trade case have been accomplished. (agile.tech-academy.co.uk, 2018)

4.4 Implementation plans:

Project implementation plan given below-

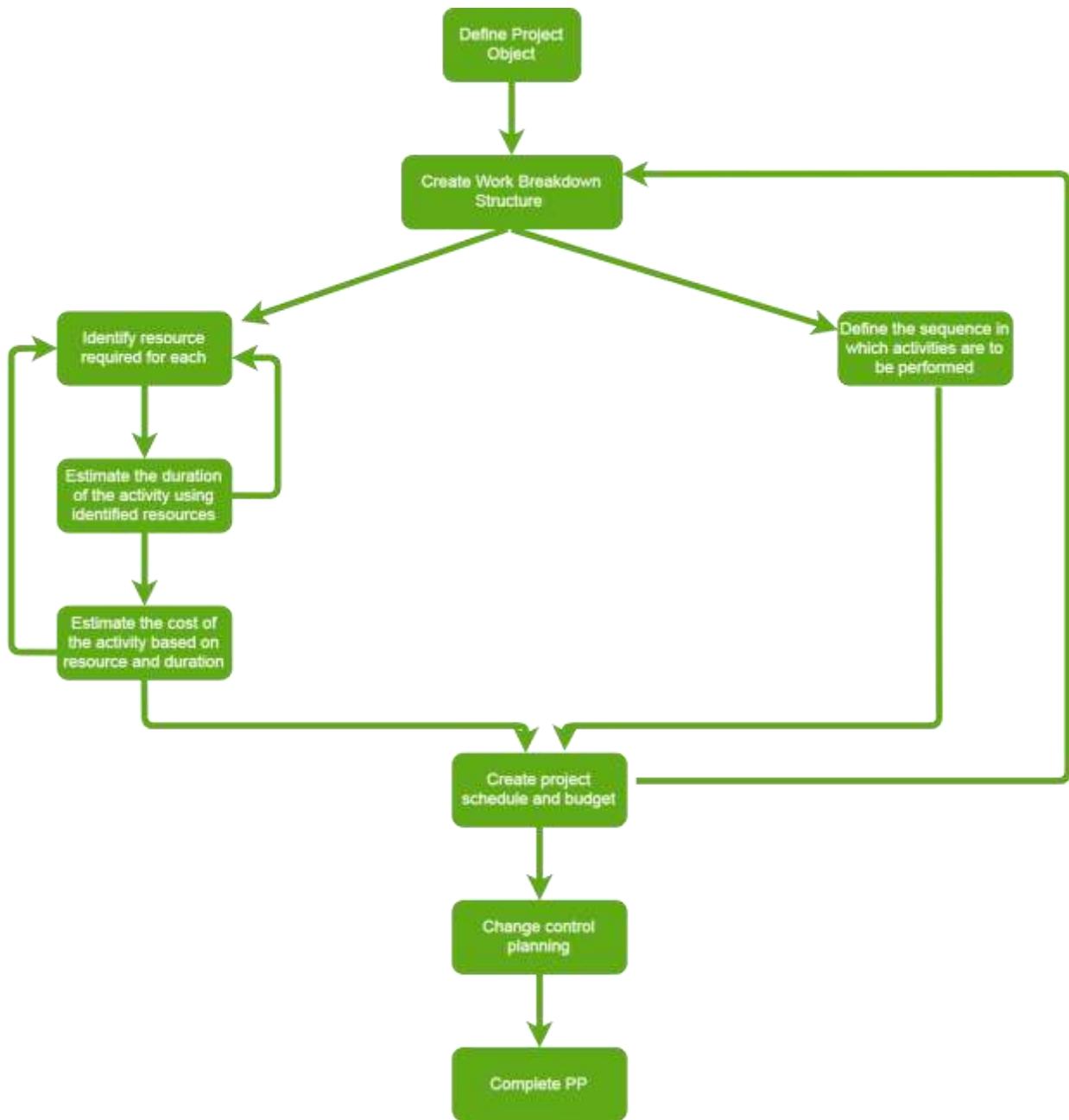


Figure 13 Project implementation plan

Chapter-5

Methodology

- ❖ Introduction
- ❖ Project Plan
- ❖ Test Plan
- ❖ Risk Management Plan
- ❖ Quality Plan

5.1 Introduction:

The whole project will be developed based on planning. So planning is the most important factor for developing the Gumti Petroleum system. A strong project plan can present a quality system. For completing the development process all of the planning is placed here like a project plan, test plan, risk management plan, quality plan etc.

5.2 Project Plan:

5.2.1 Work Breakdown Structure (WBS)

To manage the project development process, there needs a project plan that will help the development team to develop this project. The management plan of the GP's system from initial study to system implementation is shown by WBS (Work Break-down Structure). The whole project development tasks are divided into multiple parts. The WBS is shown below.

	Task Name	Duration	Start	Finish	Predecessors	Resource Names
1	Gumti Petroleum	75 days?	Wed 08/08/18 8:00 AM	Tue 20/11/18 5:00 PM		Developer,Analyst,Tester,User
2	Introduction	1 day	Wed 08/08/18 8:00 AM	Wed 08/08/18 5:00 PM		Analyst
3	Initial Study	7 days	Thu 09/08/18 8:00 AM	Fri 17/08/18 5:00 PM		Analyst
4	Literature Review	7 days	Sat 18/08/18 8:00 AM	Mon 27/08/18 5:00 PM		Analyst
5	Methodology	11 days	Mon 27/08/18 8:00 AM	Mon 10/09/18 5:00 PM		Analyst
6	Planning	7 days	Mon 10/09/18 8:00 AM	Tue 18/09/18 5:00 PM		Analyst,User
7	Feasibility Study	3 days	Thu 20/09/18 8:00 AM	Mon 24/09/18 5:00 PM		Analyst,Developer
8	Foundation Phase	5 days	Sun 23/09/18 8:00 AM	Thu 27/09/18 5:00 PM		Analyst,Developer
9	Exploration Phase	5 days	Sun 30/09/18 8:00 AM	Thu 04/10/18 5:00 PM		Analyst,Developer
10	Engineering Phase	4 days	Sun 07/10/18 8:00 AM	Wed 10/10/18 5:00 PM		Analyst,Developer
11	Deployment Phase	10 days	Sat 13/10/18 8:00 AM	Thu 25/10/18 5:00 PM		Analyst,Tester
12	Testing	4 days	Sat 27/10/18 8:00 AM	Wed 31/10/18 5:00 PM		Developer,Tester,User
13	Implementation	3 days	Sat 03/11/18 8:00 AM	Tue 06/11/18 5:00 PM		Analyst,Developer,User
14	Critical Appraisal	3 days	Thu 08/11/18 8:00 AM	Mon 12/11/18 5:00 PM		Analyst
15	Lessons Learned	4 days	Sun 11/11/18 8:00 AM	Wed 14/11/18 5:00 PM		Analyst,Developer,Tester
16	Conclusion	2 days	Sat 17/11/18 8:00 AM	Tue 20/11/18 5:00 PM		Analyst

Figure 14 Time allocation for the project.

Activity Network-

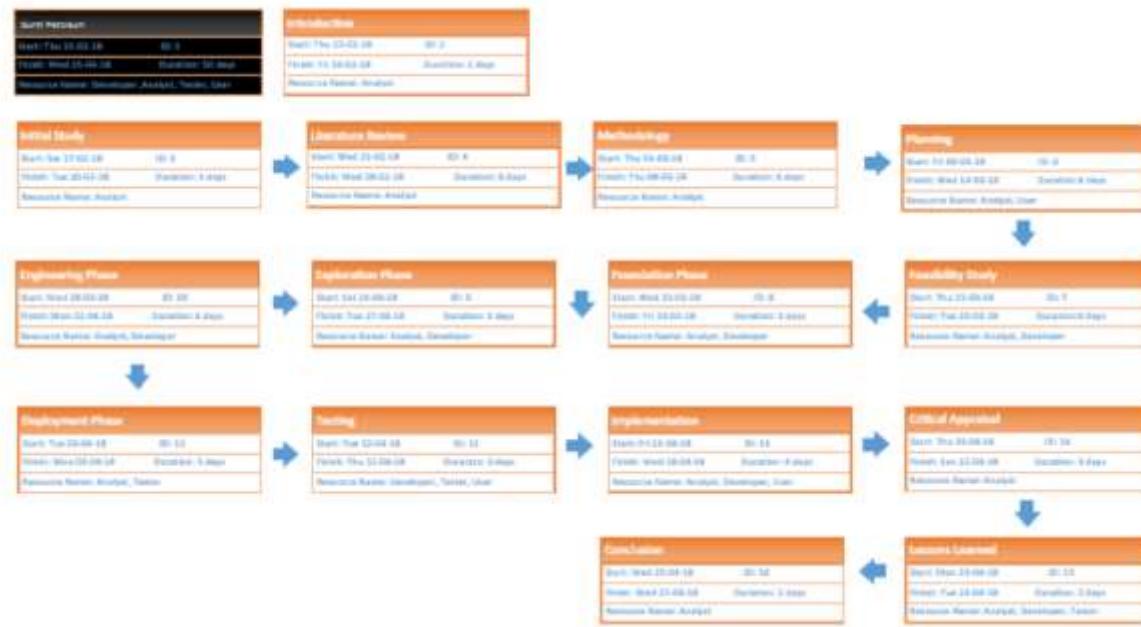


Figure 15 Activity network diagram

Gantt chart –

Gantt chart is the information about the project allocated time and project resources. It makes effective, justifiable way to check the project time with project resources during the project development process.

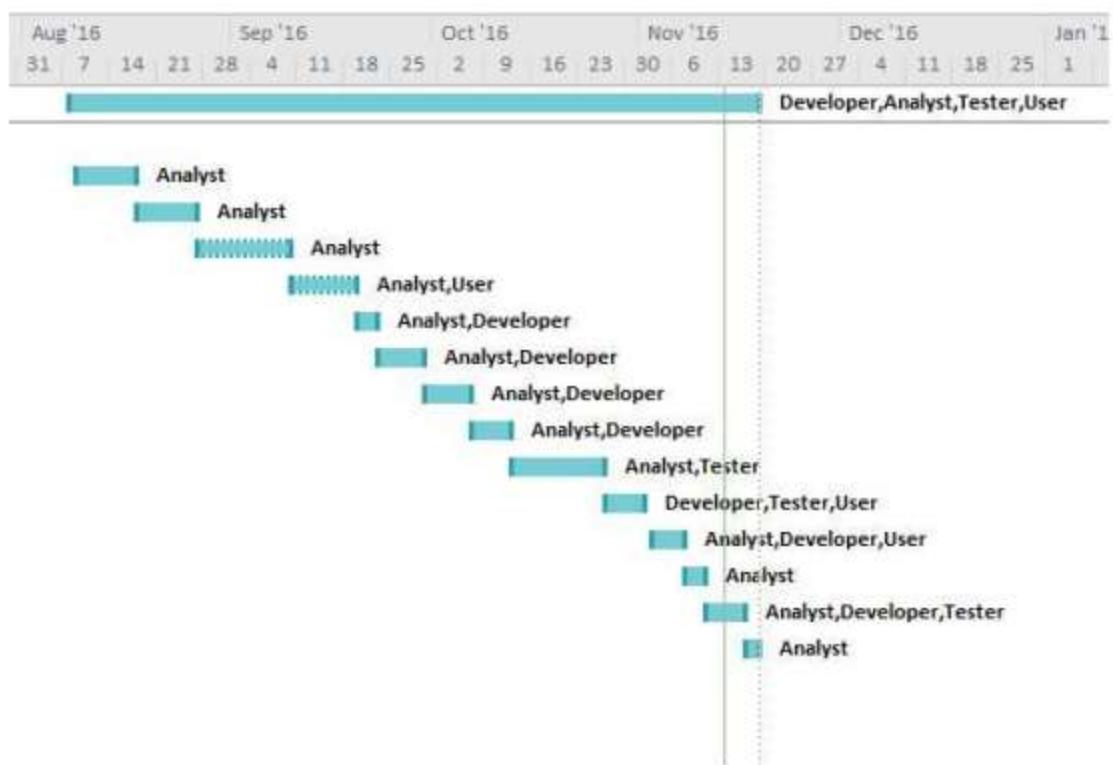


Figure 16 Gantt chart

5.3 Test Plan:

In this part discussed about the testing process of the Gumti Petroleum system by following DSDM process. The test procedures will be characterized to move on the new system that will offer assistance to ensure the quality of the new automated system.

Testing against time box –

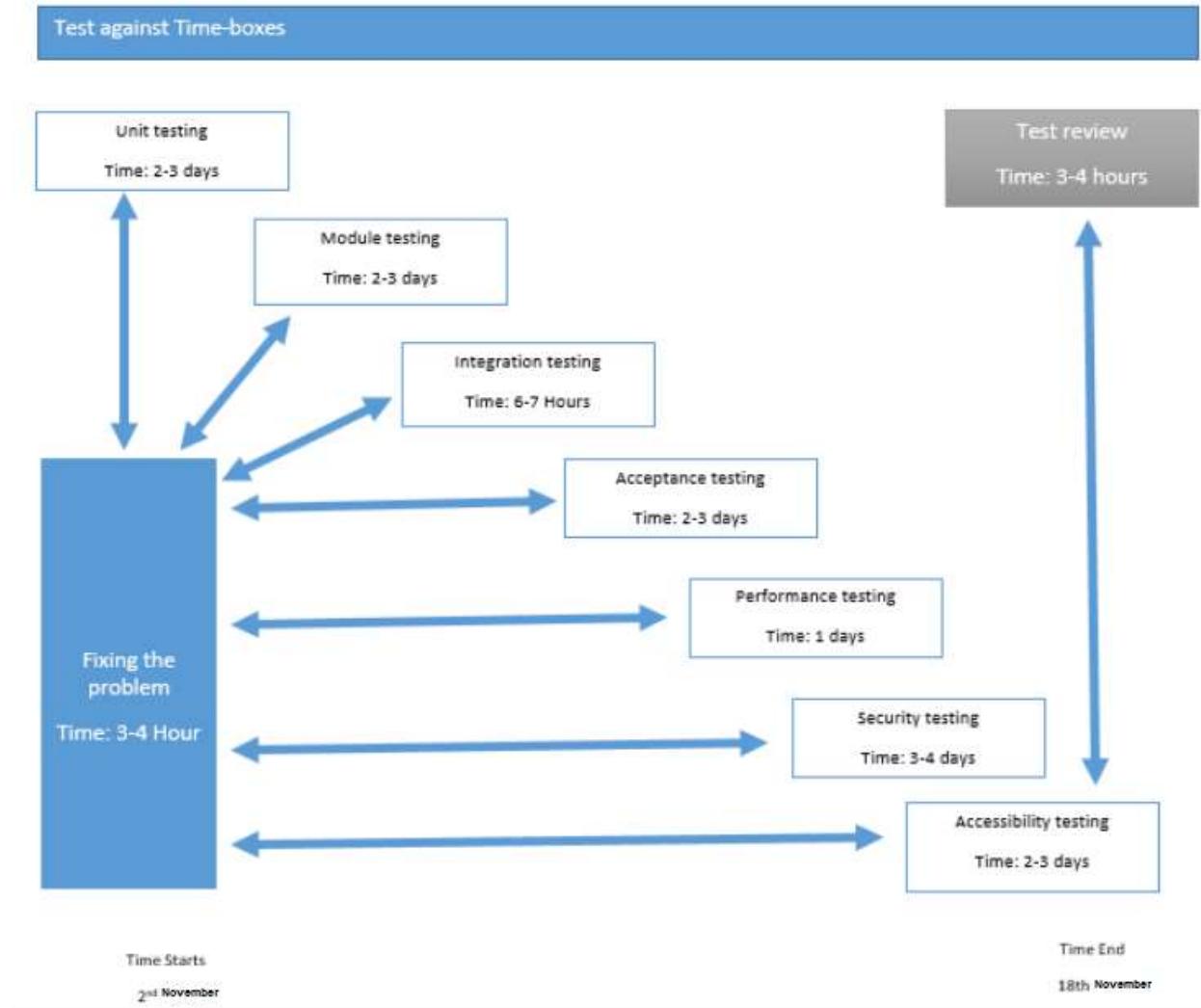


Figure 17 Testing with time-boxes

5.3.2 Required testing –

For testing this project accuracy there are many types of test category. Some test types need to apply in this project as important for Gumti Petroleum. After developing each single function, it will be tested to test its performance. Test types are given below-

1. Unit Testing:

Unit testing focuses on every smallest unit of an application. In this project, I test an individual unit or group which is interconnected units. It's completed by a software engineer by utilizing some test input and watching its comparing outputs. (geeksforgeeks.org, 2018)

2. Module testing:

Module testing may be a prepare for testing the individual subroutines, subroutines, methods, or classes in a program. Rather than testing entirety program at once, module testing suggests testing the littler building pieces of the program. (geeksforgeeks.org, 2018)

3. Integration testing:

The goal is to take unit tested segments and assemble a program structure and the design managed that. Integration testing will be trying in which a gathering of segments is consolidated to create output. (geeksforgeeks.org, 2018)

4. Acceptance testing:

Acceptance tests are regular tests accomplished to check if a system fulfills its business prerequisites. They require the whole system to be up and running and spotlight on reproducing client practices. Be that as it may, they can likewise go further and measure the execution of the system and reject changes if defined objectives are not met. (Sten Pittet, 2018)

5. Performance testing:

Performance tests check the practices of the developed application when it is under noteworthy load. This is non-functional and can have the different shape to comprehend the dependability, stability, and accessibility of the working platform. (Sten Pittet, 2018)

6. Security testing:

The objective of security testing is to recognize the dangers in the application and find its potential vulnerabilities. It likewise helps in recognizing all conceivable security chances in the application and help system developers in fixing these issues through coding. (guru99.com, 2018)

Test case

For testing the system accurately, for which an experiment is delivered with Desires and predefined result are looked at in the experiment. In the experiment, it is verified that the test assurance of the experiment creates same outcomes. An experiment is given beneath:

Test Case ID		
Test Type		
Priority		
Test Case Details		
Test Name		
Pre-Condition		
Steps	Expected Result	Actual Result

User Acceptance Test Plan

The principle motivation behind this testing is to approve the end to end business stream. It doesn't center on the restorative blunders, Spelling oversights or System testing. This testing is completed in discrete testing condition with generation like information setup. It is a sort of discovery testing where at least two end clients will be included. (guru99.com, 2018)

User Acceptance Testing Result Template:

Test Case ID		User Name	
Test Type		Role	
Test Name			
Pre-Condition			
Steps	Expected Result	Actual Result	Comments

Test Environment

The environment requirements for testing are listed below:

- ✓ 3 or more PCs with Windows 7 or upgraded OS
- ✓ Web browser like Google chrome, internet explorer, Mozilla Firefox etc.
- ✓ Internet connections
- ✓ A printer which connected with PC
- ✓ 5 or more user with username and passwords with multiple access levels
- ✓ Access to the system database

Risk management Plan–

A Risk Management Plan (RMP) is set up by an undertaking supervisor to address risks, their potential effect to a program and comprises of approach to lessen these risks. The RMP informed the system authority and developer team how they plan on lessening risks to a specific level by a specific time. An RMP ought to be organized to distinguish, survey, and relieve risks that affect generally speaking project life-cycle cost, plan, as well as execution. (acqnotes.com, 2018)

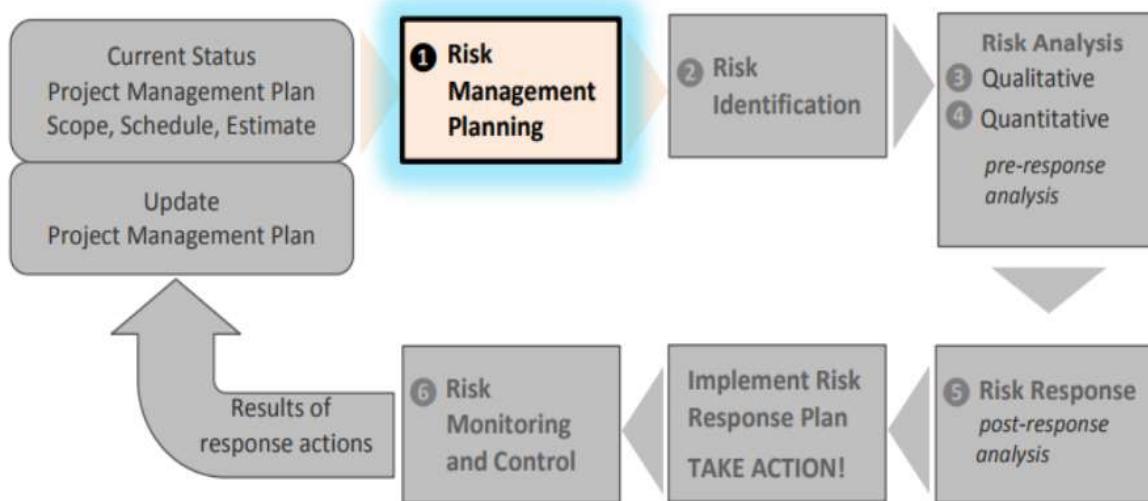


Figure 18 Risk Management Planning process

Risk identification –

Risk identification is the way toward deciding risks that could conceivably keep the program, endeavor, or investment from accomplishing its destinations. It incorporates record and imparting the worry. (mitre.org, 2018)

The following steps are followed to identify the risk.

- Recognize the expansive huge risks that may influence project goals
- Depict and record the risks with conceivable causes
- Record the effect and likelihood of the risks

Various types of risk and their areas of impact are illustrated in below with proper description.

Types of Risk	Description	Objectives
Project Risk	Any uncertainty that, if it occurs, would affect one or more project objectives.	Time, cost, performance, quality, scope, client satisfaction.
Business Risk	Any uncertainty that, if it occurs, would affect one or more business objectives.	Profitability, market share, competitiveness, internal rate of return (IRR), reputation, repeat work, share price.
Safety Risk	Any uncertainty that, if it occurs, would affect one or more safety objectives.	Low accident rate, minimal lost days, reduced insurance premiums, regulatory compliance.
Technical Risk	Any uncertainty that, if it occurs, would affect one or more technical objectives.	Performance, functionality, reliability, maintainability.
Security Risk	Any uncertainty that, if it occurs, would affect one or more security objectives.	Information security, physical security, asset security, personal security.

Figure 19 Types of risks

There various types of techniques are followed to identify the risk. A risk identification template is given below, this will use for identifying the risk of the proposed system.

		Area of Impact			
Source of Risk		Area 1	Area 2		Area j
Source 1					
Source 2					
Source i					

Risk Identification Template

Risk assessment

Some likelihood of happening any issues and its power to occur amid development are given underneath with stamping –

Risk Type	Name	Occurrence (1-10)	Intensity (1-10)
Methodology	Business role availability	7	8
	Delivery of the solution on time	8	9
External	Legislation change	1	9
	Government restriction	1	7
Internal	Data Misuse	5	8
	Data stolen	5	8
Environmental	Electrical risk	3	6
	Bad weather	3	6

Technical	PC crush	5	9
	Environment crush	6	8
	Virus	3	8

Risk precaution –

There needs some precaution to prevent or reduce the risk to happen. Some precaution is given below-

Risk Type	Name	Occurrence (1-10)	Intensity (1- 10)	Action Plan
Methodology	Business role availability	7	8	Experience and responsible employee should recruit
	Delivery of the solution on time	8	9	Accurately follow time box
External	Legislation change	1	9	Take consult from a legal advisor before starting project
	Government restriction	1	7	Ask permission from government
	Data Misuse	5	8	Handle data sharing

Internal				permission
	Data stolen	5	8	Implement data protection act and monitor
Environmental	Electrical risk	3	6	Ensure backup time for load shedding
	Bad weather	3	6	Manage data backup plan
Technical	PC crush	5	9	Must have backup of all resources
	Environment crush	6	8	Use paid licensed anti-virus
	Virus	3	8	

Steps taken for possible risk –

There some DSDM techniques to reduce the risk in this project, that are given below-

- For avoiding late delivery should use the time – box
- Keep a backup of the project data.
- Use anti-virus software to reduce the risk of cyber-attack.
- Make efficient planning for each phase of the project to prevent or reduce the project risk.

Change management

Change management is the control that guides how we plan, prepare and bolster each change to effectively receive change with the end goal to drive authoritative achievement and results. (prosci.com, 2018)

Factors that might cause change –

A few components of the organization can alter amid the development time, such as-

- **Business Factors:** If the business policy changes during the development process, the project development process can be changed.
- **Internal Factors:** If occurs some internal factor in the business.
- **External Factors:** If occurs some external factor in the business.

DSDM Atern welcomes changes:

It is no undeniable that there will be changes in a project for normal premise. It's impractical to develop a project impeccably without rolling out any changes. A few standards are trailed by DSDM:

- There should be time-response to any kind of change made there.
- Iteratively develop the project
- There should take stakeholders feedback after finishing each of the phases.

Team management:

Changing the project management issues or time box might be a problem.

Change type	Change	Decision taker	Comments
Business factor	Policy changes	Project manager / Business manager	Factors relates to business is required to understand clearly.
Internal factor	Team member change	Project manager	Precaution measures should be handled by internal change.
	Allocated time change		
External factor	Legislation change	Business manager / Legal advisor	It's important to justify changes at first stages.
Team management	Time boxes	Project manager	Need to maintain the time boxes for each task.

Change workshop plan:

There need a facilitated workshop for the whole team for implementing the new changes of the project to make a decision whether accepts this change or not. Some benefits of facilitated workshop-

- Everyone can share own opinion.
- Helps to inspiring the team.
- Possible to increase the stakeholder's involvement.
- Effective discussion on project requirement and issues.

Changes that are allowed –

Despite the fact that DSDM permit the progressions amid the development procedure, it doesn't mean it concur with all changes. It relies upon the need for the change and

acknowledgment at that time. In the event that that change isn't required for that time, at that point DSDM does not permit to acknowledge. Each of the changes are permitted that won't cross the time impediment and won't require more assets that are not accessible. Additionally, if the change needs to change the entire project plan, at that point that changes are not permitted.

Key decision taker of change

Everyone can't participate in any kinds of the project decision. The decision maker are-

- The project manager
- Team Leader
- Business owner/ authority.

Quality management plan

Some development rules are applied in the development process to ensure the quality of the system. The plan with some measurement to ensure the quality of the system this is quality management.

Rules applied to maintain quality –

Each conceivable quality undertakings need to apply for ensuring the quality of the system. Satisfying the entire quality requirement results the quality of the project. So to satisfy the prerequisite a few aspects are embraced by DSDM-

- **Quality Control:** It ensures that the project has been completed with the entire requirement.
- **Quality assurance:** This term provides surety about perfection of the system as required.
- **Quality management:** To ensure the quality project, it takes feedback.

DSDM Atern standard quality measure:

DSDM never bargain quality and they utilize two kinds of standard that measure the product quality.

- **Solution quality:** It uses some techniques like Time-boxing, MoSCoW prioritization, modeling watch to ensure stakeholder satisfaction and business requirement.
- **Process quality:** This standard alludes to the business quality standards and guarantee that whether the project pursued the prescribed procedures and the solution meet the gauges or not.

Quality plan and measuring meter

To take the feedback from stakeholders a format can be applied to measure the quality of the developed system.

Section	User aspects of quality	Quality Standard	User acceptance	Measured by	Authority acceptance	Status
User Interface						
System Performance						
Technology						
Usability						
Requirement 1						
Requirement 2						

Chapter-6

Feasibility

- ❖ Introduction
- ❖ All possible types of feasibility
- ❖ Cost benefit analysis
- ❖ DSDM is good or bad for this project –
PAQ
- ❖ Instrumental Success Factors (ISF)

Introduction

A feasibility study is an examination utilized in estimating the capacity and probability to finish a system effectively, including every single significant factor. It must record for components that influence it, for example, economic, technological, legal and scheduling factors. Project managers utilize feasibility studies to decide potential positive and negative results of a project some time recently contributing a significant sum of time and cash into it. (investopedia.com, 2018)

All possible types of feasibility

There are four types of feasibility that will consider in this Gumti Petroleum Project.

1. Technical feasibility

Technical feasibility study about is the total investigation of the project as far as info, forms, output, fields, projects and systems. It is an extremely viable instrument for long haul arranging and investigating. (evirtualservices, 2018)

Technical assets likewise should be accounted on this angle. It additionally helps to distinguish the equipment and programming and how they will satisfy the business needs. For Dhaka Motor's framework, specialized plausibility will guarantee the technical condition and it needs. It will assist the system with being accessible all around with simple support.

- Web BASED system
- PHP (7.0.4) for backend
- Windows OS Server
- AJAX

2. Operational feasibility

Operational feasibility alludes to the proportion of taking care of issues with the assistance of another proposed system. It helps in exploiting the chances and satisfies the necessities as identified amid the development of the system. It takes care that the users and management support the project. (evirtualservices, 2018)

There some operational problem in current Gumti Petroleum manual system-

- The current system is not automated
- Waste huge time to complete a business task
- No security on business data.
- No able to manage whole business data centrally.

This issues should be overcome in the new system which is able be procured by operational feasibility.

3. Economic feasibility

Economic feasibility investigation is the most ordinarily utilized strategy for deciding the productivity of new system. It is otherwise called cost analysis. It helps in recognizing benefit against investment anticipated from a system. Cost and time are the most basic elements engaged with this field of study. (evirtualservices, 2018)

4. Resource feasibility

It is additionally a fundamental piece of a feasibility study. It incorporates questions with respect to the time required to finish the project, the type and measure of assets required and subordinate components. It also looks up whether the system

is interfering with any present business action. So it deals with the ideal usage of the resources accessible. (evirtualservices, 2018)

Cost benefit analysis

A cost-benefit analysis is a procedure organizations use to break down decisions. The business or investigator entireties the advantages of a circumstance or activity and over that subtract the expenses related with making that move. A few specialists or experts additionally manufacture the model to put dollar esteem on elusive things, for example, the benefits and costs related to living in a specific town, and most investigators will likewise factor opportunity cost into such conditions. (investopedia, 2018)

Calculating cost of required hardware and software for Gumti Petroleum new system-

Hardware			
S/L	Product Name	Quantity	Amount(BDT)
1	Intel i3 3.2GHz 6 th Gen Processor	4	16000
2	8GB DDR3 RAM	4	4800
3	500GD HDD	4	12000
4	Monitor 15.2inch LED	4	28000
5	Printer	1	9000
6	Wi-Fi Router	1	2600

Software			
7	Windows 10	1	12000

Cost of buy new domain for this web system-

Domain name	Price (BDT)	Renew/ transfer
.com/.net/.org/.biz	950 TK	950 TK
.info	800 TK	800 TK
.us	850 TK	850 TK
.co	2412 TK	2412 TK

Web hosting price-

PLAN 1	PLAN 2	PLAN 3	PLAN 4
TK.1000 /year	TK.1500 /year	TK.2000 /year	TK.2500 /year
ORDER NOW	ORDER NOW	ORDER NOW	ORDER NOW
500 MB SSD Storage	1 GB SSD Storage	2 GB SSD Storage	3 GB SSD Storage
15 GB Bandwidth Monthly	30 GB Bandwidth Monthly	60 GB Bandwidth Monthly	90 GB Bandwidth Monthly
RAID 10 SSD Server	RAID 10 SSD Server	RAID 10 SSD Server	RAID 10 SSD Server
LiteSpeed Web Server	LiteSpeed Web Server	LiteSpeed Web Server	LiteSpeed Web Server
1 Website Hosting	2 Websites Hosting	3 Websites Hosting	4 Websites Hosting
Get FREE Domain This Plan	FREE Domain 1st year	FREE Domain 1st year	FREE Domain 1st year
FREE SSL Life Time	FREE SSL Life Time	FREE SSL Life Time	FREE SSL Life Time
FREE Weekly Backup	FREE Weekly Backup	FREE Weekly Backup	FREE Weekly Backup
Unlimited Sub Domains	Unlimited Sub Domains	Unlimited Sub Domains	Unlimited Sub Domains
Unlimited Email Accounts	Unlimited Email Accounts	Unlimited Email Accounts	Unlimited Email Accounts
Unlimited Databases	Unlimited Databases	Unlimited Databases	Unlimited Databases

Figure 20 Web Hosting Package's price

Additional Cost of implantation or managing this system

- Internet bill- 1200/ month (Each of the Branch)
- Training cost- 60000 BDT

This initial investment may be a big issue for Gumti Petroleum. But within 1 year company can get return of this investment.

DSDM is good or bad for this project – PAQ

Project Approach Questionnaire (PAQ) is useful to distinguish and affirm the dimension of accomplishment of the project by poll. The survey is finished in plausibility stage. PAQ gives a progression of inquiries in any project. It will be a decent practice for this project to ensure the PAQ properly.

Instrumental Success Factors (ISF)

Situating DSDM venture into fruitful result, the project needs to meet the Instrumental Success Factors (ISF). For this project to diminish the risk in DSDM approach, the risks ought to be recognized and the best approach to relieve it and the ISF needs to meet. It will ensure that the DSDM decrease the project risks and a lot higher likelihood of achievement. Some factors are-



Instrumental Success Factors

Figure 21 Factors of Instrumental Success Factors (ISF) (pmway, 2017)

Chapter-7

Foundation

- ❖ Introduction
- ❖ Problem area identification
- ❖ Rich picture
- ❖ Business Process Modelling and Notation (BPMN)
- ❖ Specific problem area and description
- ❖ Possible solution
- ❖ Overall requirement list
- ❖ What technology to be implemented?
- ❖ Recommendation and justification

7.1 Introduction

Foundation is the second stage of DSDM Atern methodology life cycle. The diagram plan of this stage and the feasibility organize are reliant by foundation stage.

Some objective of this stage is-

- This level identifies the high level requirement.
- High level requirement ought to be concurred.
- Consent to the systems and layout.
- Business processes are portrayed as high level.

All stakeholders and developers who are included with the project attempts to know about the project requirements and endeavor to discover distinctive approaches to take care of those issues in foundation stage.

7.2 Problem area identification

Problem identification proof gives the stage to examining a wide scope of interventions and producing alternatives. Activities developed in ensuing strides of the Framework should address the issues identified here. (atap.gov.au, 2016) It will identify the problems of Gumti Petroleum by analyzing information.

- **Interview** – The interview is a technique to get information to people about the system. System development plan make based on the interview. So Gumti Petroleum's staff will have to interview to identify the problems.

The employee who participated in this interview process:

1. **Mr. Kazi Sajid**(Managing Director)
2. **Mr. Anower Hossain** (Branch Manager)

3. **Mr. Salahuddin** (Branch Accountant)
4. **Mr. Sahadat Hossain** (Machine Operator)

Interview of the Managing Director:

This is too difficult to manage this business because of It is a huge business with 13 branches spread across the country. There are about 156 employees and this is not so easy to manage their information like attendance, salary, etc. Managing regular sale and purchase information strongly and track every transaction information. This takes huge time to manage every business function.

Interview of the Branch Manager:

I have to manage my branch regular working process like fuel purchase & sale, employee schedule and attendance, regular transaction. In one word I have to oversee the branch working process. This is not so easy to do in paper based system. I wish, if there is an automated system to manage this business process.

Interview of the Branch Accountant:

I have to manage all accounts information of my branch. Adjusting the purchase amount and sale amount also focus on credit and debit due. This information is so sensitive, so have to handle carefully. I have to spend huge time managing my regular work with this current system. I hope if Gumti Petroleum can deploy an automated system, it will helpful to manage this working process within spending few times.

Interview of the Machine Operator:

I am responsible for a specific machine for a single day. I have to issue a handwritten receipt for sale fuel to a customer, then the customer pay bill to cashier with this receipt. But this is wasting time the business time. If there was an automated system I can generate an automated receipt and take this cash from me. This will save business time.

- **Observation:**

Observe the present business condition likewise can give numerous data. The Gumti Petroleum present condition can be seen by the developer group investigator to discover the issues. Each staff's work and seeing on it can recognize numerous imperative realities and issues that will achieve a superior solution.

- **Questionnaire:**

This is another approach to recognizing issues of an association by questioning the business people. There can have many recorded things to ask by the development team. This can be on paper based or through on the web and a short inquiry will be asked and the appropriate response will be yes or no. It will distinguish all the issue of Gumti Petroleum and can be accounted.

7.3 Rich picture

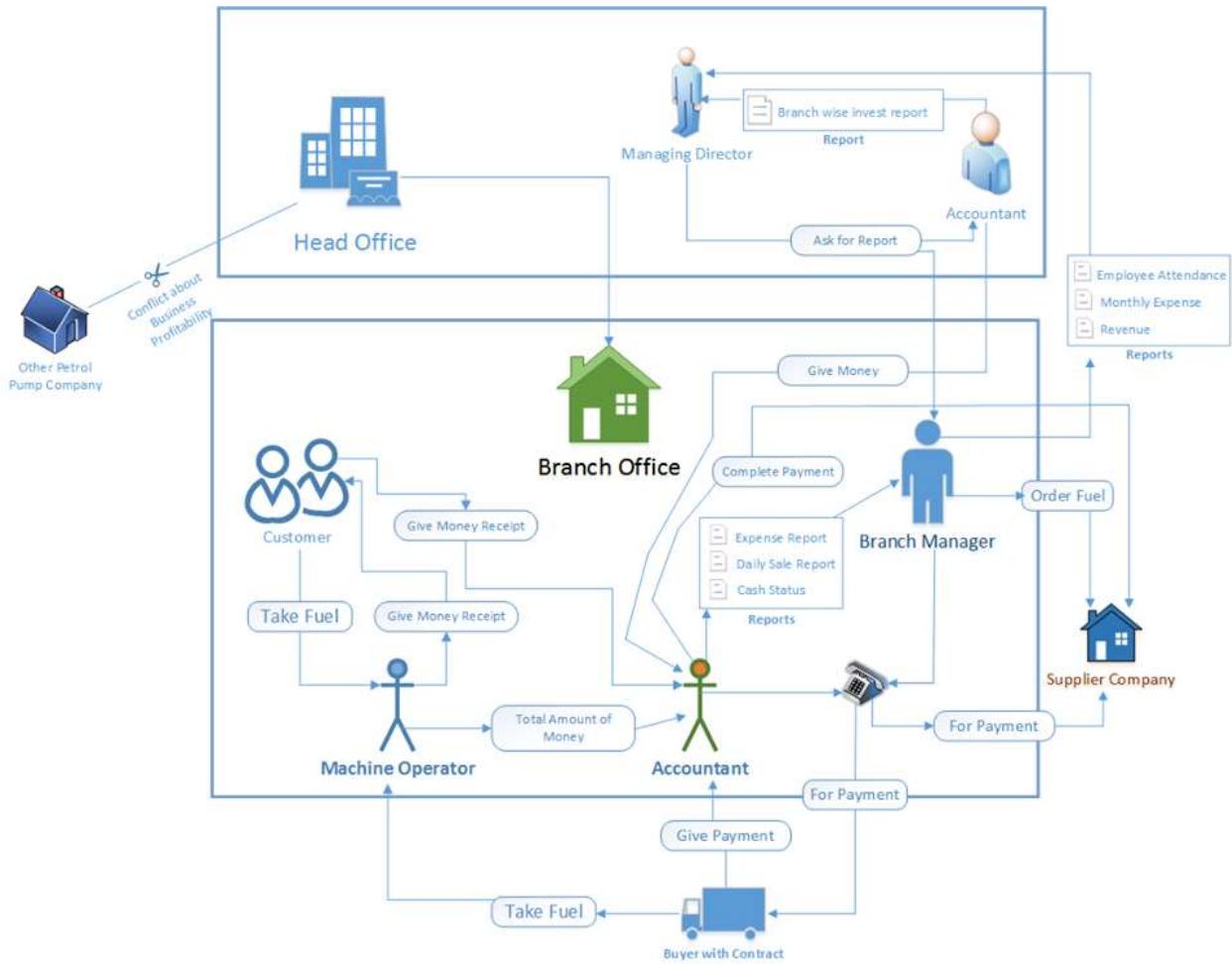


Figure 22 Rich Picture of existing system

7.4 Business Process Modelling and Notation (BPMN)

Business Process Model and Notation is a graphical portrayal for indicating business forms in a business procedure model. BPMN created the Business Process Management Initiative. (wikipedia, 2015) It will enable the development team to better knowledge about the entire business.

Sale Fuel:

To sale fuel, machine operator has to complete some steps like select fuel, input fuel quantity, checking availability, etc. To understand this business process developer need to identify the flow of the business process. The BPMN diagram of the business process is given below-

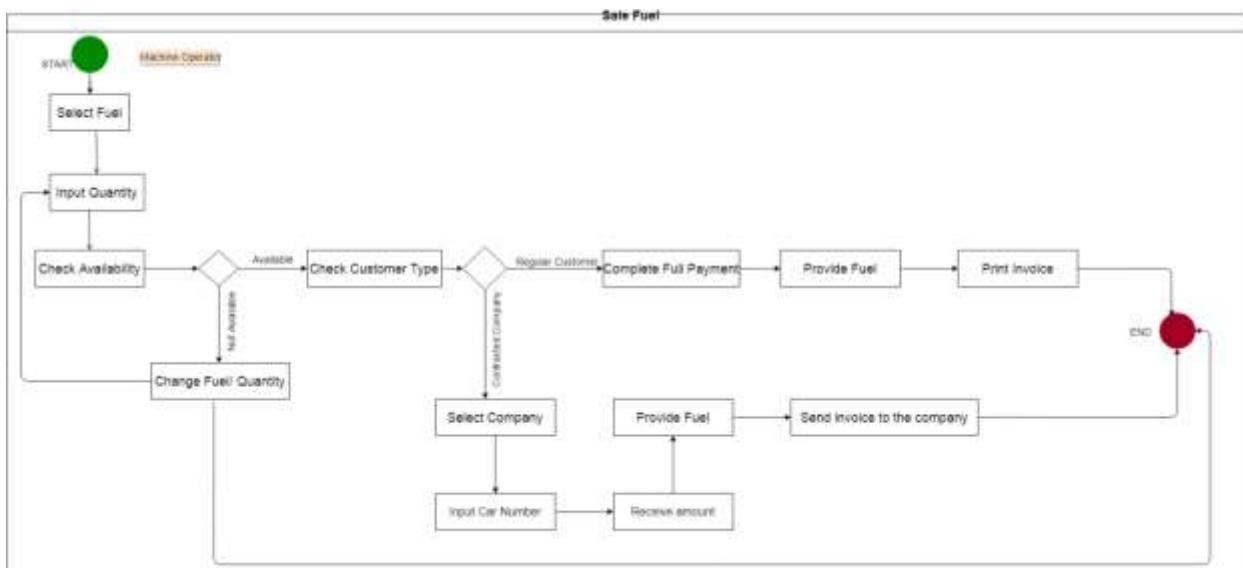


Figure 23 BPMN diagram for sale fuel

7.5 Specific problem area and description

Some problem area has been identified in Gumti Petroleum's current manual system.

This business organization is going to develop new systems to overcome this problem.

Problems are-

- Fuel purchasers to fuel sale all are on paper based work.
- Difficult to find any past business document like purchase invoice, due payment invoice, etc.

- Provide handwritten invoice to customer.
- Wasting huge working time to doing regular business tasks.
- Difficult to manage each contracted company's account in a manual system.

7.6 Possible solution

Some possible solutions can solve specific problems of Gumti Petroleum. This solution can be helpful to overcome all of the problems with the current manual system. Developing a new automated system with some features the system will be effective for this organization. The features are-

- Keep stock information with all relevant details Enable search facility to get information by searching.
- Make interactive & a user friendly user interface to make maximum user satisfaction.
- Store whole business data centrally to make it accessible from all branches.
- Manage all business documents digitally.
- Generate invoice automatically and keep track.
- Generate business reports to help decision making.

7.7 Overall requirement list

In view of the issues and conceivable arrangements, some general requirement are recorded that will be implemented in the new automated system for Gumti Petroleum.

Two types of business requirements are there-

- **Functional Requirement:** All operational requirements are placed here.
 - i. User authentication.

- ii. Manage employee
 - iii. Manage employee schedule and attendance.
 - iv. Purchase fuel
 - v. Sale fuel
 - vi. Business expance
 - vii. Due transaction
 - viii. Generate statistical report.
-
- **Non-functional Requirement:** All general requirements are placed here.
 - i. Provide invoice
 - ii. Secured system
 - iii. User friendly interface

These requirements can be more specific to fulfill.

7.8 What technology to be implemented?

Gumti Petroleum has to follow a specific technology to develop their new automated system. There two types of technology are available, this are-

i. Desktop Based Technology:

Desktop based application is bounded within desktop or laptop. Need a specific platform with some required hardware configuration to run this application. Users have to install or setup this application on this platform. They're low risk to hackers attack than web based application, but others risk is present here.

ii. Web Based Technology:

Web based applications are remotely available from anywhere. It depends on the client-server design that makes the association among client device and the server pc. There are a few focal points of the web application as opposed to work area application. It requires a greater number of things than work area application like web, internet browser and etc.

7.9 Recommendation and justification

According to the business requirement and situation a web based application will be the best solution for this organization. This system will be accessible from anywhere. All branch business data will be stored in a cloud database and head office and the branch office can access the required data. So a web based system will be an appropriate solution for Gumti Petroleum.

The required technologies for this new system-

- I. HTML (For frontend)
- II. CSS 3
- III. Bootstrap (CSS Framework)
- IV. PHP (for backend)
- V. MySQL (Database)
- VI. JavaScript (Frontend)

Advantages of web based system in Gumti Petroleum –

- One central database for whole business organization.
- Head office can get branch office report easily.

- Top level can oversee the whole business organization without any trouble.
- Any additional software is not required to run this system.

These advantages will be effective to enhance the business. Gumti Petroleum's automated system will be developed as a web application.

Chapter-8

Exploration

- ❖ Introduction
- ❖ Old system use case
- ❖ Full system use case
- ❖ Requirement catalog
- ❖ Prioritize requirement list
- ❖ Prototype of new system
- ❖ Initial Class Diagram

8.1 Introduction

As talked about in the past chapter, this stage is utilized to explore the nitty gritty business requirements iteratively and incrementally and furthermore convert into a practical arrangement. To encourage investigation, it expands organized requirement rundown from Foundation stage by utilizing apparatuses like to utilize case or action outline. In this area, we will demonstrate the utilization instance of the present arrangement of Gumti Petroleum.

8.2 Old system use case

- Use case for purchase fuel:



Figure 24 Use case for fuel purchase

- Use case for sale fuel:

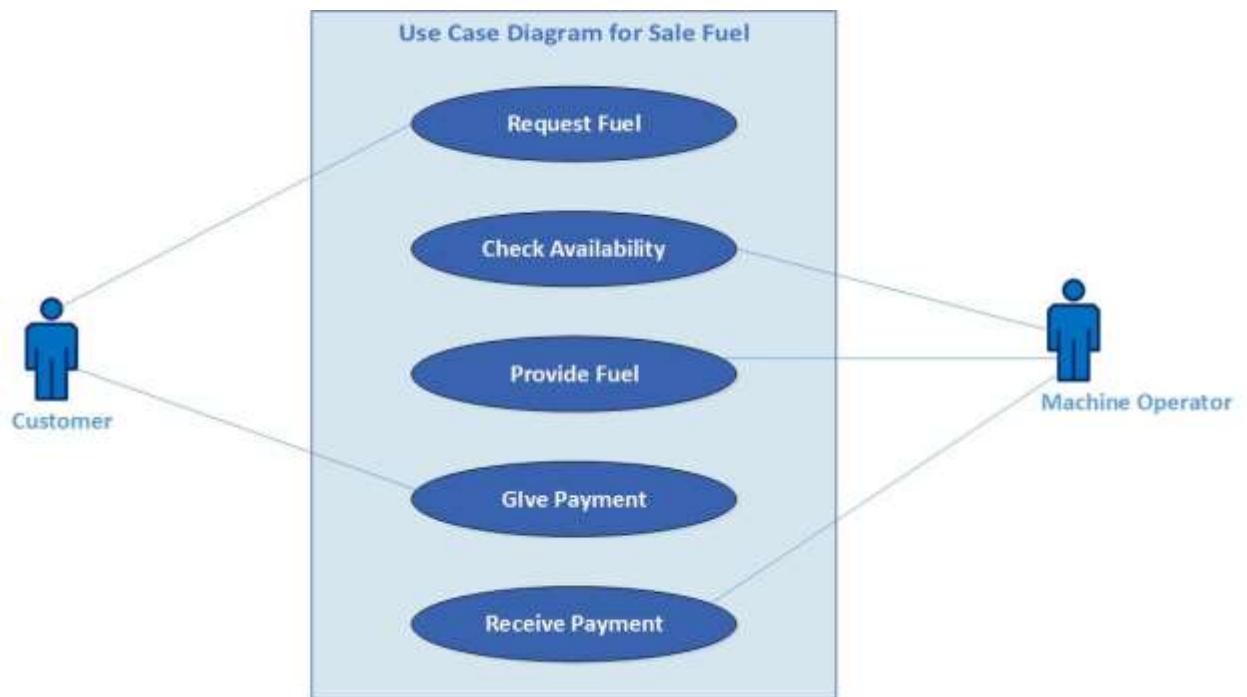


Figure 25 Use case for sale fuel

8.3 Full system use case

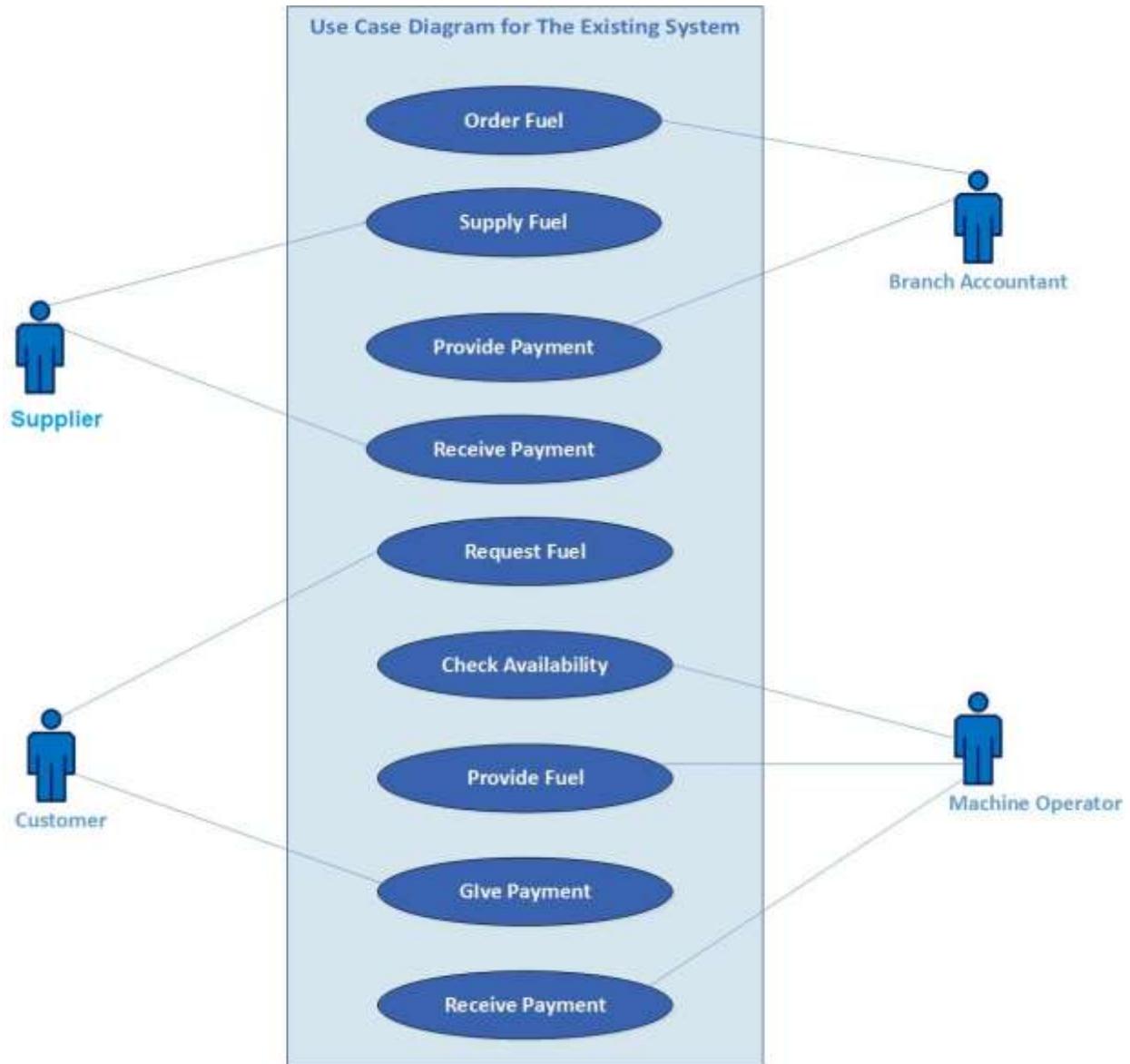


Figure 26 Use case of the existing system

8.4 Requirement catalog

Some requirement founded after analyzing the old system of Gumti Petroleum. This will be helpful to develop the new system. There are two types of requirements are given below-

Requirement List (Functional)	
1	User authentication
2	Store employee information
3	Keep purchase information
4	Keep sale information
5	Create employee schedule
6	Keep attendance information
7	Create salary
8	Record transaction information
9	Generate monthly revenue report
10	Keep expenses details
11	Employee wise report
12	Invoice email facility
13	Create employee profile
14	Live chat
15	Record Customer information

Requirement List (Non-functional)	
1	Secured system
2	Faster response
3	Accurate calculation

8.5 Prioritize requirement list

MoSCoW technique will be applied to prioritize the Gumti Petroleum's requirements.

The requirements are prioritized in below-

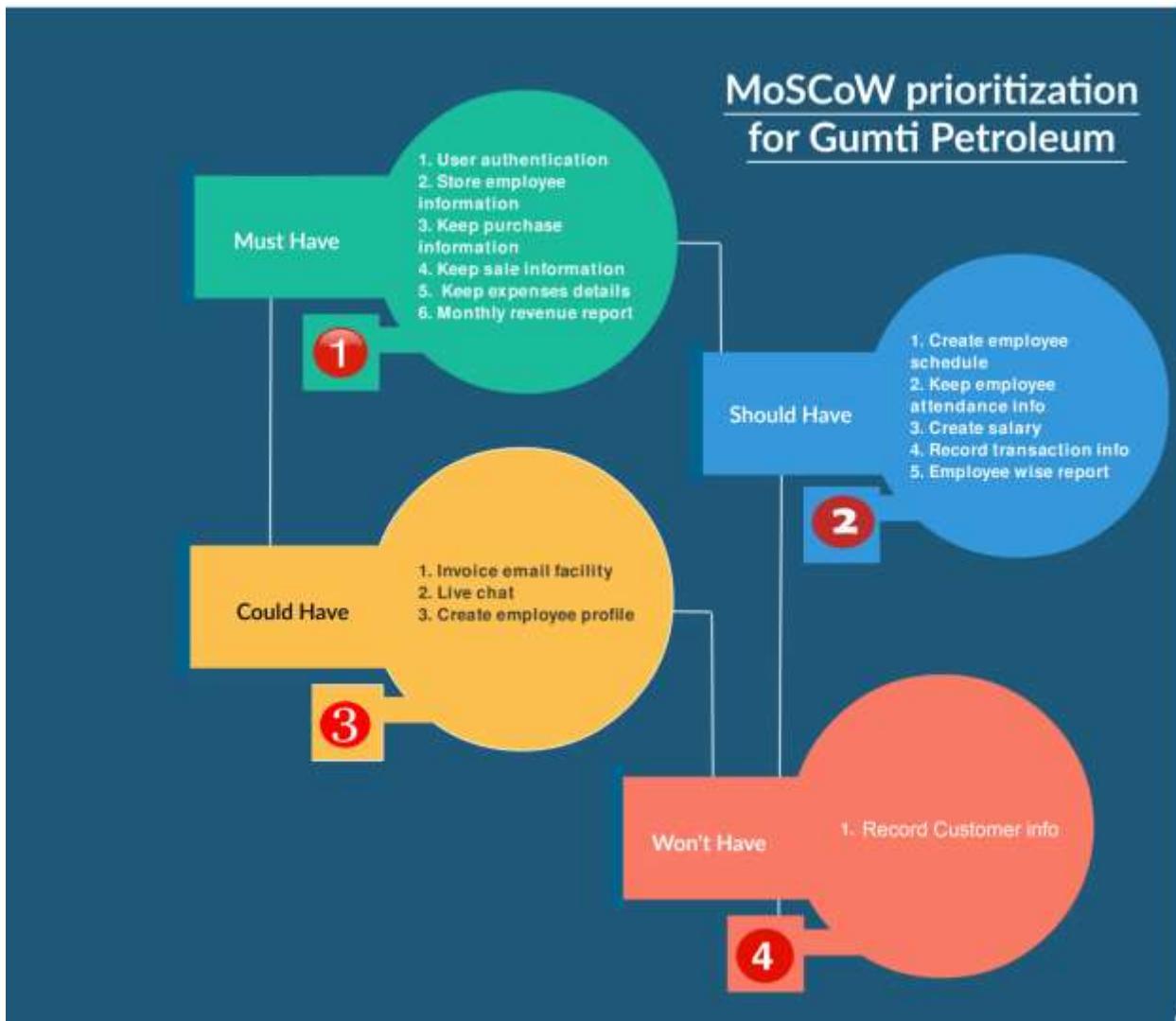


Figure 27 MoSCoW prioritization

8.6 Prototype of new system

Some prototype of new system are provided –

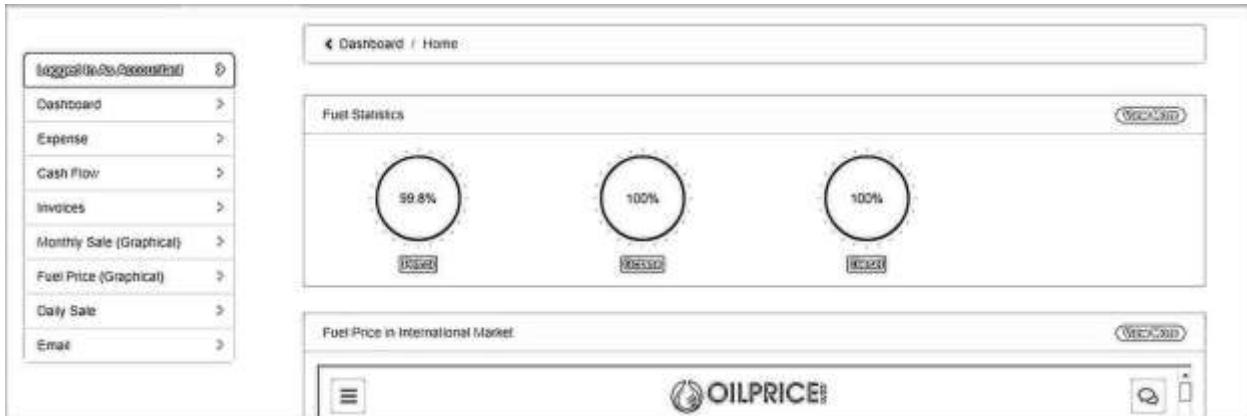


Figure 28 Dashboard Prototype

The 'Purchase Fuel' form contains the following fields:

- * Supplier: Select dropdown
- * Fuel: Select dropdown
- Quantity*: Text input field with 'Litre' unit indicator
- Unit Price*: Text input field with 'BDT' unit indicator
- Total Cost*: Text input field with 'BDT' unit indicator
- Paid*: Text input field with 'BDT' unit indicator
- Due*: Text input field with 'BDT' unit indicator
- Invoice*: File upload field with 'Choose File' button and 'No file chosen' message

At the bottom are 'Save' and 'Cancel' buttons.

Figure 29 Purchase fuel

Sale Fuel

* Fuel	<input type="text" value="Select Fuel"/>
Total Cost*	<input type="text"/> BDT
Paid*	<input type="text"/> BDT
Partner Company	
Buyer Company	<input type="text" value="Asia Transport"/>
Due*	<input type="text"/> BDT
Car Number	<input type="text"/>

Fuel Stock

Name	Price/BDT	Stock/Litre
Petrol	86.00	1996.00
Octane	82.00	1500.00
Diesel	70.00	1000.00

Figure 30 Sale fuel

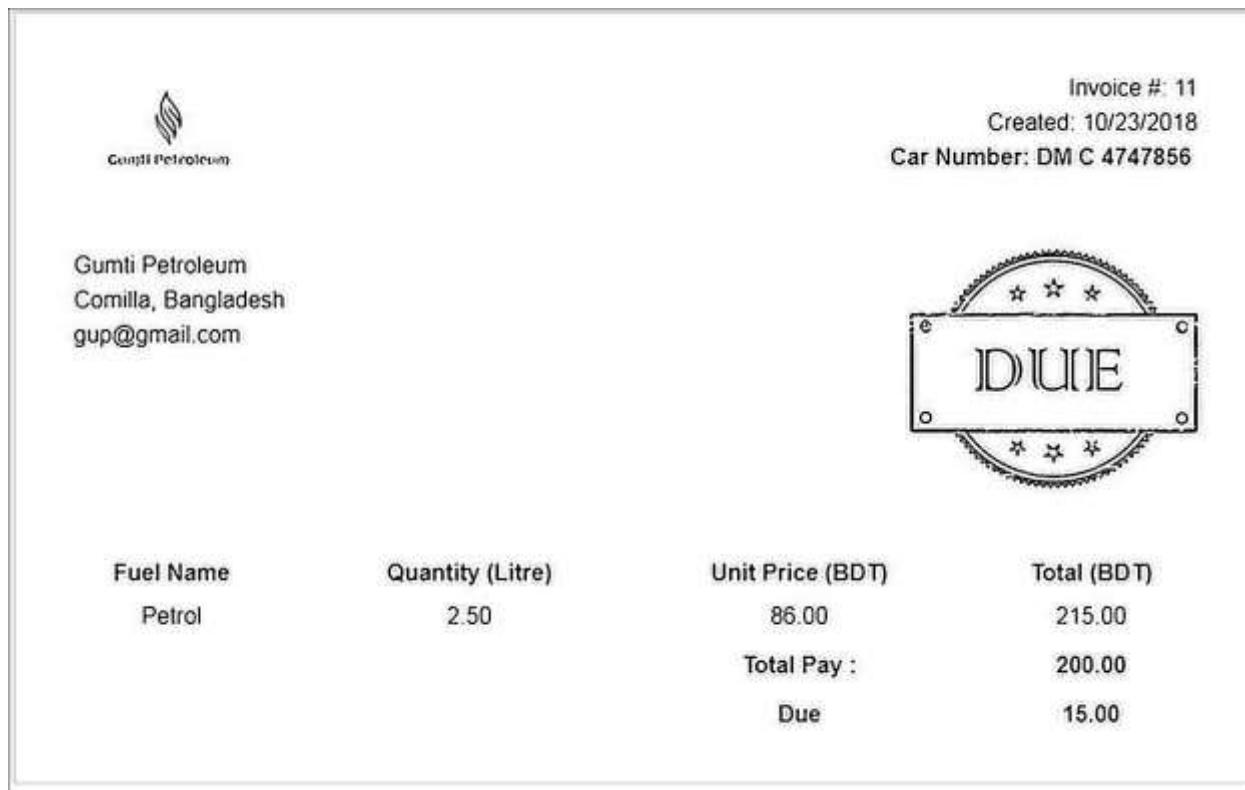


Figure 31 Sale invoice

The image shows a screenshot of an email inbox interface. On the left, there is a sidebar with navigation links: 'Compose', 'Home', 'Inbox' (which is selected), 'Sent', and 'Contacts'. Below these is a large circular icon with a stylized 'G' and 'M'. The main area is titled 'Inbox' and contains a table of messages. The columns are 'From', 'Subject', 'Message', and 'Date'. The messages listed are:

From	Subject	Message	Date
Foysal Ahammed	Test ajax for gmail inbox in IMAP	" This is email body	Wed, 12 Sep 2018 14:48:44 +0600
Foysal Ahammed	Request for resend invoice 48	" Invoice	Tue, 11 Sep 2018 15:24:43 +0600
Foysal Ahammed	IMAP Test Email	" This is a test mail for IMAP	Tue, 11 Sep 2018 12:24:05 +0600

Figure 32 Email Inbox

8.7 Initial Class Diagram



Figure 33 initial class diagram

Chapter-9

Engineering

- ❖ Introduction
- ❖ New System Modules
- ❖ New system use case
- ❖ ERD Diagram
- ❖ Deployment Diagram
- ❖ System Interface Design

9.1 Introduction

The discussion of this phase is about the new system. The new system modules are identified in this section and system interface will be developed. Some use case of the new system will be placed here.

9.2 New System Modules

The new system is a complete system with multiple modules. Those are interconnected with each other. Modules are described below-

- **Login:** This module ensures the authorized accessibility in the system and it also manages role based data access policy.
- **Purchase:** Keep record all purchase information with all relevant information.
- **Sale:** This is a high level requirement of the business. It stores all sale information including payment information. Business sale policies are properly implemented in this module. System will send an invoice through email to the buyer company.
- **Employee:** These modules store all employee information like schedule, attendance, overtime, salary and etc. Also provide a complete employee profile for every employee.
- **Transaction:** Keep records every transaction history with all relevant information. Employee will be able to track all credit & debit transaction.
- **Email:** This module can provide the complete email facility. The employee can check inbox & send email also can compose a new email. Company's all email contacts will be suggested here.

- **Partner Management:** All contracted company information will be managed here. Doing purchase and sale with those companies, that information will be recorded here.

9.3 New system use case:

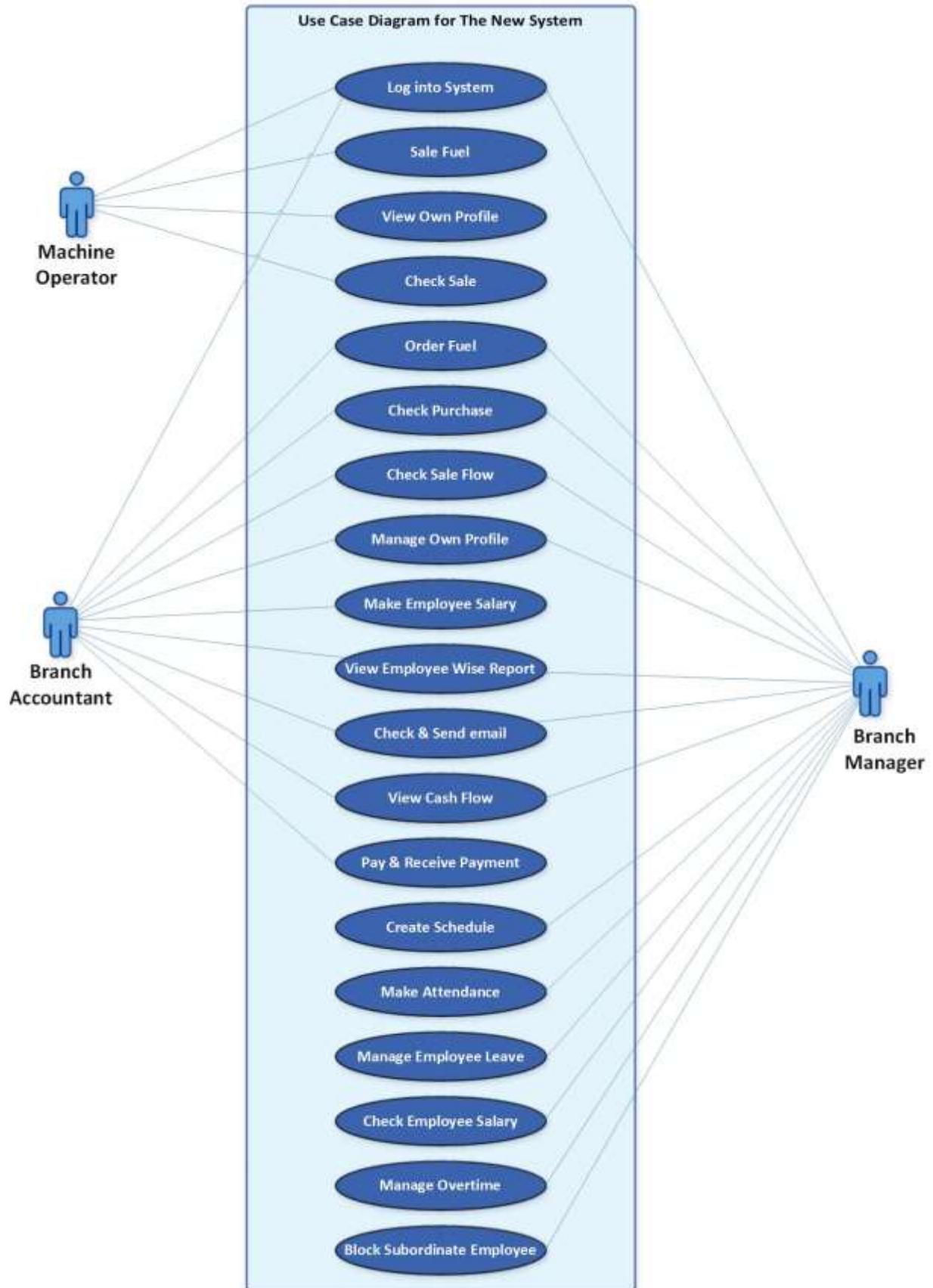


Figure 34 New system use case

9.4 ERD Diagram

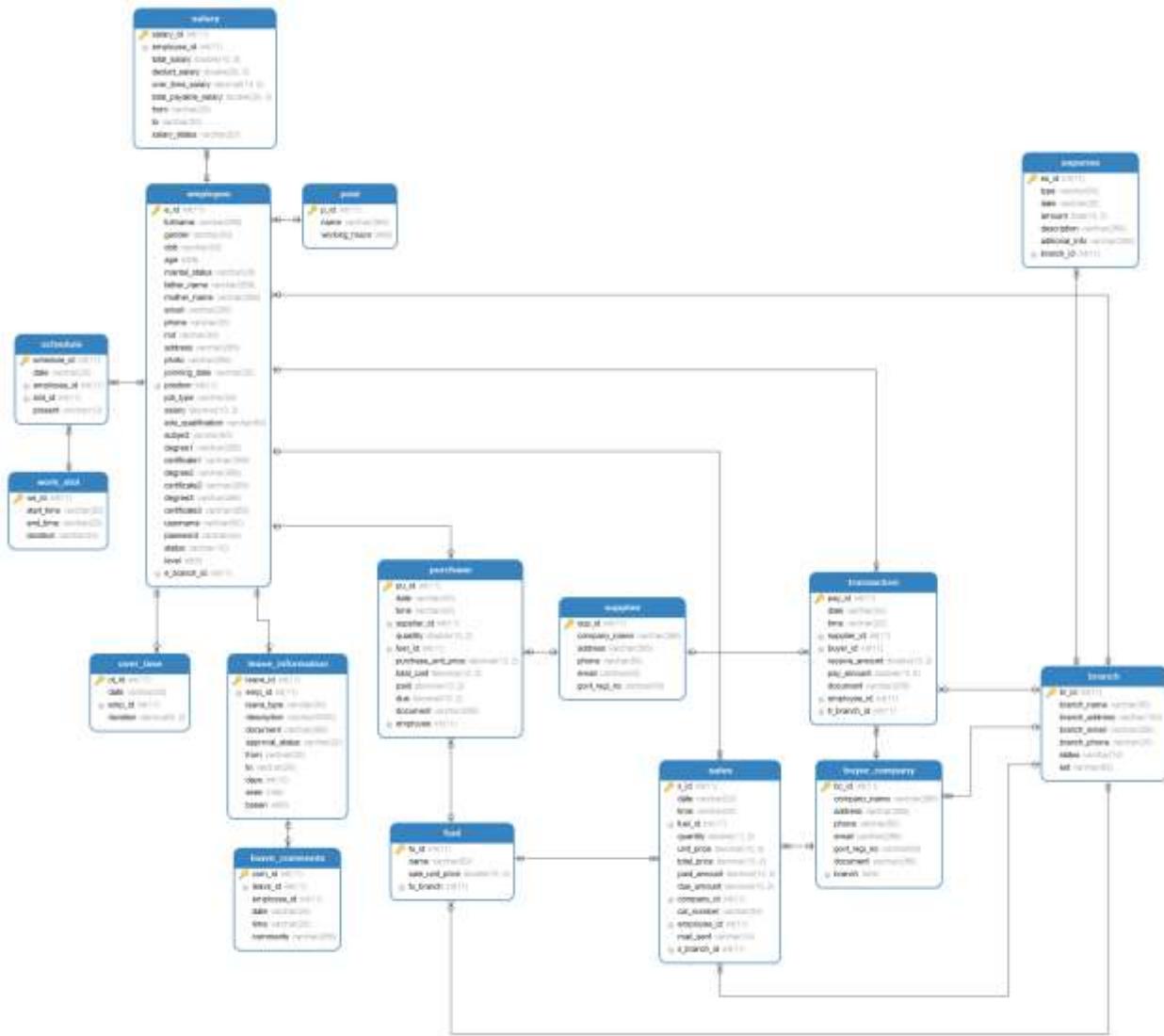


Figure 35 ERD diagram

9.5 Deployment Diagram

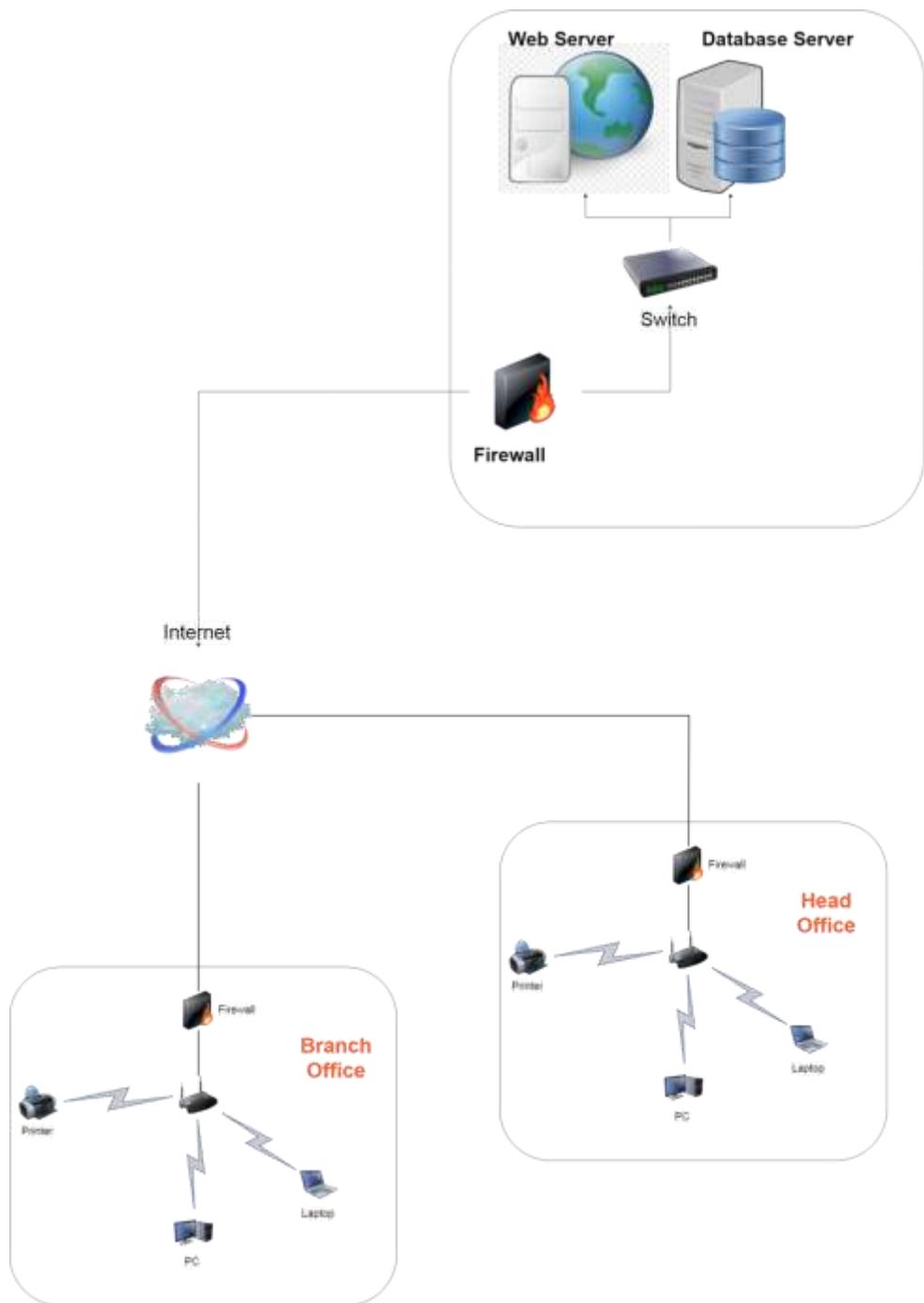


Figure 36 Deployment diagram for new system

9.6 System Interface Design

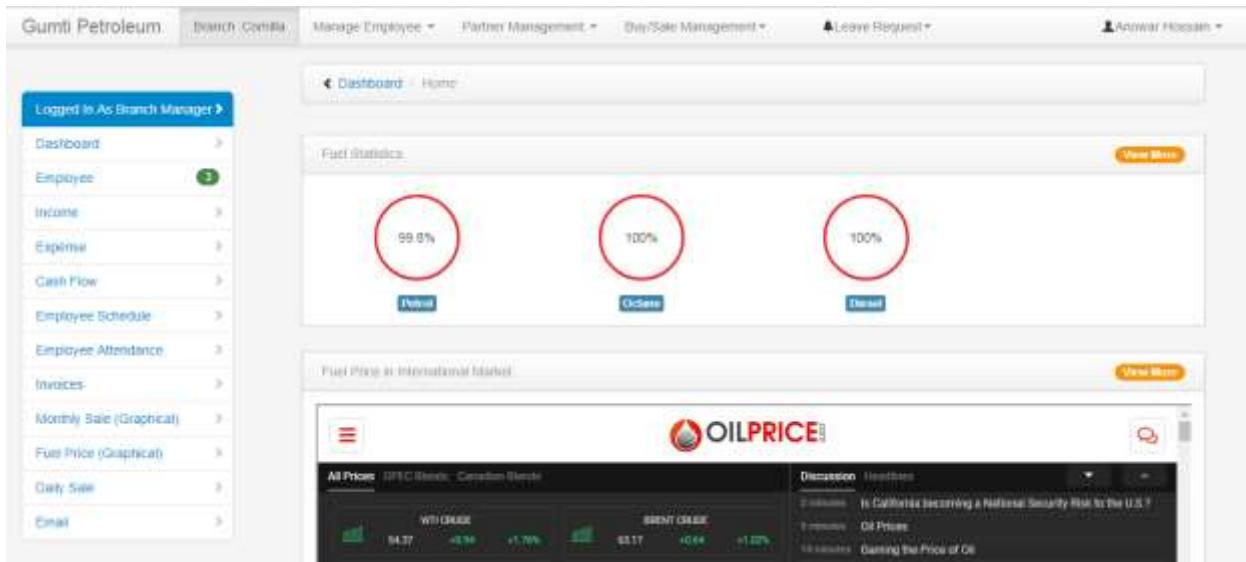


Figure 37 System interface for branch manager

The screenshot shows the system interface for adding purchase information. It features a sidebar menu on the left with the same items as Figure 37. The main form is titled 'Purchase Fuel' and contains fields for 'Supplier' (dropdown menu), 'Fuel' (dropdown menu), 'Quantity' (text input with unit 'Liter'), 'Unit Price' (text input with unit 'BDT'), 'Total Cost' (text input with unit 'BDT'), 'Paid' (text input with unit 'BDT'), 'Due' (text input with unit 'BDT'), and an 'Invoice' file upload field ('Choose File'). Below the form are 'Save' and 'Cancel' buttons.

Figure 38 Interface for adding purchase information

Gumti Petroleum Search Head Office Manage Employee Branch Management Partner Management [Logout Request](#) [Email Alhamra](#)

Logged In As Managing Director

- [Dashboard](#)
- [Employee Prof](#)
- Employee** (3)
- [Branch](#)
- [Invoices](#)
- [Report](#)
- [Monthly Sale \(Graphical\)](#)
- [Fuel Price \(Graphical\)](#)
- [Email](#)

Add Employee Information

Personal Information

* Full Name:

* Gender: Male Female Other

* DOB:

* Age:

* Marital Status:

* Father Name:

* Mother Name:

Email:

* Phone:

* NID:

* Address: Type Student's Address.

* Photo: Choose File No file chosen

Job Information

* Branch:

* Joining Date:

* Designation:

* Job Type:

Salary:

Educational Information

* Educational Qualification: Select Degree:

* Degree Name: Choose File No file chosen

Degree Name: Choose File No file chosen

Degree Name: Choose File No file chosen

User Account Information

Username:

Status:

Access Level:

Figure 39 Interface for adding new employee

The screenshot shows a software application window titled "Sale". In the top left corner, there is a sidebar with the title "Gumti Petroleum" and a message "Logged In As Machine Operator". Below this are three menu items: "Dashboard", "Invoices", and "Daily Sale". The main area is titled "Sale Type" and contains fields for "Fuel" (dropdown menu), "Total Cost" (text input), "Paid" (text input), and "Due" (text input). To the right of these fields is a table titled "Fuel Stock" with columns "Name", "Price/BDT", and "Stock/Litre". The table lists three items: Petrol (86.00, 1996.00), Octane (82.00, 1500.00), and Diesel (70.00, 1000.00). At the bottom of the form are two buttons: "Sale" (blue) and "Cancel".

Figure 40 Interface for sale fuel

The screenshot displays the Gumi Petroleum Employee Profile interface. The top navigation bar includes links for Dashboard, Head Office, Manage Countries, Branch Management, Fleet Management, Leave Requests, and Portal Allocated. A sidebar on the left titled "Logout As Managing Director" lists various management options like Dashboard, Employee Post, Employees, Branch, Vehicles, Report, Monthly Sale (Graphical), Fleet Price (Graphical), and Email.

The main content area shows the profile of Faysal Ahammad, a Male born on 1984-02-28, with marital status Unmarried, Father Name Faysal Anamur, Mother Name Saida Sehar Begum, Email faysal.m@gmail.com, Phone 0318231898988, NID 155191518D000092, and Address 1234 Green Mall. It also displays three certificates: 5GC High School Diploma, HSC, and another High School Diploma from Beacon House.

Below the profile, there are sections for Leave Information, Overtime Information, and Date Range. Each section contains search filters (From, To, Days, Type, Status) and a "Search" button. The "Leave Information" section shows 0 entries, while the other two show 0 to 0 of 0 entries.

Figure 41 Employee profile interface

Chapter-10

Development

- ❖ Introduction
- ❖ Core Module Coding Sample:
 - ❖ Possible problem break down
 - ❖ Prioritization while developing

10.1 Introduction:

This segment depicts about the development period of this system. In this segment, all core modules are executed. This area likewise depicts about possible break of issue and furthermore prioritization while developing.

10.2 Core Module Coding Samples

Coding sample of selling fuel:

```
?php
$connect = mysqli_connect("localhost", "root", "", "epump");
$output = '';
if(isset($_POST["fu_id"]))
{
    if($_POST["fu_id"] != '')
    {

        $sql = "SELECT
ff.fu_id,
ff.`name`,ff.sale_unit_price,
(SELECT SUM(p.quantity) FROM purchase as p WHERE p.fuel_id = ff.fu_id) AS
Total_Purchase,
(SELECT SUM(s.quantity) FROM sales as s WHERE s.fuel_id = ff.fu_id) AS
Total_Sales,
((SELECT SUM(p.quantity) FROM purchase as p WHERE p.fuel_id = ff.fu_id) -
(SELECT SUM(s.quantity) FROM sales as s WHERE s.fuel_id = ff.fu_id)) AS
Available_Fuel
FROM
fuel AS ff
WHERE
ff.fu_id='". $_POST["fu_id"] ."'";
    }
    else
    {
        $sql = "SELECT * FROM fuel where fu_id='10000'";
    }
    $result = mysqli_query($connect, $sql);
    while($row = mysqli_fetch_array($result))
```

```

{
    $stock=$row['Available_Fuel'];

    $output .= '<div class="control-group">
        <label class="control-label">Unit Price<span class="required">*</span></label>
        <div class="controls">
            <input type="text" readonly id="price" class="span6 m-wrap" name="unit_price"
                value="'. $row['sale_unit_price'] .'"><span>BDT</span>
        </div>
    </div>
    <div class="control-group">
        <label class="control-label">Quantity<span class="required">*</span></label>
        <div class="controls">
            <input name="quantity" id="quantity" type="number" step="0.5"
                onchange="myFunction()" min="1" max="'.$stock.'" onkeypress="return
                isNumberKey(event)" required="required" class="span6 m-wrap"/>
            <span>Litres</span>
        </div>
    </div>

';

}

echo $output;
}
?>
```

```

<script>
$(document).ready(function(){
    $('#fuel').change(function(){
        var fu_id = $(this).val();
        $.ajax({
            url:"load_data.php",
            method:"POST",
            data:{fu_id:fu_id},
            success:function(data){
                $('#load').html(data);
            }
        });
    });
});
</script>
```

```

<script type="text/javascript">
function showHide(elem) {
    if(elem.selectedIndex != 0) {
        document.getElementById('due').style.display = 'block';
    }else if(elem.selectedIndex == 0) {
        document.getElementById('due').style.display = 'none';
    }
}
window.onload=function() {
    divs0 = document.getElementById("frmMyform").getElementsByTagName('due');
}
</script>

```

```

if (isset($_POST['add_sale'])) {
    $fuel=$_POST['fuel'];
    $quantity=$_POST['quantity'];
    $price=$_POST['unit_price'];
    $total_cost=$_POST['total_cost'];
    $paid=$_POST['paid'];
    $due=$_POST['due'];
    $car_number=$_POST['car_number'];
    $employee_id=$_SESSION['employee_id'];
    $date=date('m/d/Y');
    $time=date('h:i:s a');
    $branch=$_SESSION['branch'];
    if ($total_cost>$paid && $buyer_company=='') {
        header('location:../sale.php?complete_payment=0');
    }else{
        if ($buyer_company=='') {
            $buyer_company='1';
        }else{
            $buyer_company=$_POST['buyer_company'];
        }
        $query="Insert into sales
values('','$date','$time','$fuel','$quantity','$price','$total_cost','$paid','$due',
'$buyer_company','$car_number','$employee_id','Not Sent','$branch')";
        $result=mysqli_query($con,$query);
        if ($result==TRUE) {
            header('location:../sale.php?success=1');
        }else{
            header('location:../sale.php?error=0');
        }
    }
}

```

```
    }  
}
```

More coding are given [Appendix B](#)

10.3 Possible problem break down

Handle two types of customer:

The Machine operators can sale fuel easily. But there raised some complexity in fuel sale to the buyer company.

- Is it possible to handle two types of fuel buyer?
- Is it possible, the system will allow for sale fuel, which is not more than stock amount?
- To use customized encryption method to encrypt the user password.

The solution for handle two types of buyer-

```
<div id="load">  
  
    </div>  
    <div class="control-group">  
        <label class="control-label">Total Cost<span  
class="required">*</span></label>  
        <div class="controls">  
            <input name="total_cost" id="total_cost" readonly="" type="text"  
value=<?php if(isset($_GET['total_cost'])){ echo $_GET['total_cost']; } ?>"  
required="required" class="span6 m-wrap"/>  
            <span> BDT</span>  
        </div>  
    </div>
```

```

<div class="control-group">
    <label class="control-label">Paid<span
class="required">*</span></label>
    <div class="controls">
        <input name="paid" id="paid" type="number" min="0"
onkeypress="return isNumberKey(event)" value=<?php if(isset($_GET['paid'])){echo $_GET['paid'];} ?>" required="required" class="span6 m-wrap"/>
        <span> BDT</span>
    </div>
</div>
<fieldset>
    <legend>Partner Company</legend>

    <div class="control-group">
        <label class="control-label" for="selectError"> Buyer
Company</label>
        <div class="controls">
            <select id="selectError" name="buyer_company"
onchange="showHide(this)">
                <option value="">Select</option>

                <?php
                $query="select * from buyer_company where bc_id<>'1'";
                $result=mysqli_query($con,$query);
                //echo mysqli_error();
                if(mysqli_num_rows($result)>0){

                    while($row=mysqli_fetch_array($result, MYSQLI_ASSOC)){
                        //echo "<option
value='".$row['p_id']."'>".$row['name']. "</option>";

                        if (isset($_GET['supplier_id'])) {
                            echo "<option value='".$row['sup_id']."' selected>
<?php if($_GET['supplier_id']==$row['sup_id']) echo
"selected"; ?>
                            <?php echo "> . $row['company_name'] . "</option>";
                        } else{
                            echo "<option
value='".$row['bc_id']."'>".$row['company_name']. "</option>";
                        }
                    }
                }
                ?>
            </select>
        </div>
    </div>
</fieldset>

```

```

        </div>
    </div>
    <div id="car" style="display:none;">
        <div class="control-group">
            <label class="control-label">Due<span
class="required">*</span></label>
            <div class="controls">
                <input name="due" readonly="" id="due" type="text"
onkeypress="return isNumberKey(event)" value=<?php if(isset($_GET['due'])){ echo
$_GET['due']; } ?>" class="span6 m-wrap"/>
                <span> BDT</span>
            </div>
        </div>
        <div class="control-group">
            <label class="control-label">Car Number</label>
            <div class="controls">
                <input name="car_number" id="car_number" type="text"
value=<?php if(isset($_GET['car_number'])){ echo $_GET['car_number']; } ?>">
            </div>
        </div>
    </fieldset>
    <div class="form-actions">
        <?php
        if (isset($_GET['edit'])) {
            ?>
            <button type="submit" name="update_sale" class="btn btn-
primary">Update</button>
        <?php
        }else{
            ?>
            <button type="submit" name="add_sale" class="btn btn-
primary">Sale</button>
        <?php
        }
        ?>
        <a href="Purchase.php"><button type="button"
class="btn">Cancel</button></a>
    </div>
    </fieldset>
</form>
<!-- END FORM-->
</div>

```

The solution for handle fuel selling amount-

```
?php
$connect = mysqli_connect("localhost", "root", "", "epump");
$output = '';
if(isset($_POST["fu_id"]))
{
    if($_POST["fu_id"] != '')
    {

        $sql = "SELECT
ff.fu_id,
ff.`name`,ff.sale_unit_price,
(SELECT SUM(p.quantity) FROM purchase as p WHERE p.fuel_id = ff.fu_id) AS
Total_Purchase,
(SELECT SUM(s.quantity) FROM sales as s WHERE s.fuel_id = ff.fu_id) AS
Total_Sales,
((SELECT SUM(p.quantity) FROM purchase as p WHERE p.fuel_id = ff.fu_id) -
(SELECT SUM(s.quantity) FROM sales as s WHERE s.fuel_id = ff.fu_id)) AS
Available_Fuel
FROM
fuel AS ff
WHERE
ff.fu_id='". $_POST["fu_id"] ."'";

    }
    else
    {
        $sql = "SELECT * FROM fuel where fu_id='10000'";
    }
    $result = mysqli_query($connect, $sql);
    while($row = mysqli_fetch_array($result))
    {
        $stock=$row['Available_Fuel'];

        $output .= '<div class="control-group">
<label class="control-label">Unit Price<span class="required">*</span></label>
<div class="controls">
```

```

<input type="text" readonly id="price" class="span6 m-wrap" name="unit_price"
value="'. $row['sale_unit_price'] .'"><span>BDT</span>
</div>
</div>
<div class="control-group">
<label class="control-label">Quantity<span class="required">*</span></label>
<div class="controls">
<input name="quantity" id="quantity" type="number" step="0.5"
onchange="myFunction()" min="1" max="'.$stock.'" onkeypress="return
isNumberKey(event)" required="required" class="span6 m-wrap"/>
<span>Litres</span>
</div>
</div>

';

}

echo $output;
}
?>
```

Customized encryption method:

```

<?php

function encryptIt( $q ) {
    $cryptKey = 'qJB0rGtIn5UB1xG03efyCp';
    $qEncoded = base64_encode( mcrypt_encrypt( MCRYPT_RIJNDAEL_256, md5(
$cryptKey ), $q, MCRYPT_MODE_CBC, md5( md5( $cryptKey ) ) ) );
    return( $qEncoded );
}

function decryptIt( $q ) {
    $cryptKey = 'qJB0rGtIn5UB1xG03efyCp';
    $qDecoded = rtrim( mcrypt_decrypt( MCRYPT_RIJNDAEL_256, md5( $cryptKey
), base64_decode( $q ), MCRYPT_MODE_CBC, md5( md5( $cryptKey ) ) ), "\0");
    return( $qDecoded );
}
```

10.4 Prioritization while developing

To enhance the development process it is required to prioritize the system modules. So, all the requirements are set as prioritization in below.

- **Priority 1-** Store Employee information:

To run the new system for maintaining the Gumti Petroleum business, at first store all employee information. Because of all of the modules are dependent on it.

- **Priority 2-** Store purchase information:

Storing the fuel purchase information is one of the important modules of this system. Fuel sale module fully depends on this module. Because of fuel selling process can't start without purchase fuel.

- **Priority 3-** Sale information:

This is the main module of this system. Selling is the main business of Gumti Petroleum. To develop this module developer teams have to consider about multiple factors like customer type, fuel stock information, Buyer Company, payment and etc.

- **Priority 4-** Payment:

Managing all payment information is essential for a business organization. All of the cash and due transactions with the supplier and Buyer Company's, regular sale, expenses and employee salary information. The monthly revenue report will be generated from this information.

- **Priority 5-** Employee management:

Managing employees all information with employee schedule, attendance, overtime, leave information and salary. Employee profile will be organized.

- **Priority 6- Revenue report:**

The business organization has to generate revenue report to take future decision.

- **Priority 7- Email**

Email facility is required to send invoices, employee account recovery, and official communication.

Chapter- 11

Testing

- ❖ Introduction
- ❖ Test Plan Acceptance.
- ❖ Test Case
- ❖ Unit Testing
- ❖ Module Testing (2 to 3)
- ❖ Integration Testing (2 to 3)
- ❖ Security Testing

11.1 Introduction:

Testing is essential to ensure the system is working successfully. It will help to develop an error free system. Many tests are applied on this project. Test plan and test case have recorded in this section. In this area, testing process will be applied some section of the system and test result will be shown.

11.2 Test Plan Acceptance

The achievement or disappointment of the project will be ensured by test plan to know client sentiment furthermore, to ensure whether the test plan for the task is effective or ineffective.

Marks 1 – 10

		User name – Foysal	Role – Analyst			
No	TEST TYPE	TEST NAME	EXPECTED RESULT	Actual result	Marks	COMMENT
1	Unit testing	Search invoice by invoice id	Get invoice	Accurate invoice found	10	Properly found the invoice
2	Module testing	Insert fuel purchase information	Save into database	Saved into database	10	Properly saved purchase information
		Sale fuel	Sold fuel	Sold fuel properly	10	Successfully sold fuel
3	Integration testing	Sale not complete without payment	Sale complete with payment	Sale successfully with payment	10	Properly sold
		Authentication	Unauthorized user cannot login & show a	Expected result	10	Security message properly

			message			showing
4	Security testing	Role based access policy	One user can't access to another users account	Successful	10	Access prevented

11.3 Test Case

No	TEST TYPE	TEST NAME	EXPECTED RESULT	SUCCESS FACTOR	COMMENT
1	Unit testing	Search invoice by invoice id	Get invoice	Accurate invoice found	Properly found the invoice
2	Module testing	Insert fuel purchase information	Save into database	Saved into database	Properly saved purchase information
		Sale fuel	Sold fuel	Sold fuel properly	Successfully sold fuel
3	Integration testing	Sale not complete without payment	Sale complete with payment	Sale successfully with payment	Properly sold
4	Usability testing	Interface Usability	Properly usable with perfect color, icons, navigations, etc.	Expected result	Successful usable
		Functional Usability	Properly functioning all functions like purchase, sale, payment etc.	Expected	All functions working perfectly

11.4 Unit Testing:

Testing Name	How	Expected Result	Actual Result	Comment
Search invoice	Entering invoice id	Show the invoice	Expected	This unit is working successfully
Check attendance	Selecting date	Show specific date attendance	Expected	This unit is working successfully

Result

Test name- Search invoice

The screenshot shows a web-based fuel management system interface. At the top, there's a search bar with the value '12' and a blue 'Search Invoice' button. The main content area displays an invoice summary for 'Invoice # 12'. The summary includes the creation date 'Created: 10/23/2018' and 'Car Number: N/A'. A large red stamp with the word 'PAID' is prominently displayed. Below the stamp, a table provides detailed information about a fuel purchase:

Fuel Name	Quantity (Litre)	Unit Price (BDT)	Total (BDT)
Petrol	1.50	86.00	129.00
		Total Pay :	129.00
		Due	0.00

Figure 42 Unit Testing (Searching Invoice)

Test Name: Check attendance

The screenshot shows a web-based application titled "Employee Attendance". At the top left is a green "Add New" button. Below it is a search bar with a placeholder "Search By Date" and a "Search" button. A red box highlights the date "10/23/2018" which appears twice: once in the search bar and once in the "Date" column of the table below. The table has columns for "EID", "Name", "Date", and "Present". It lists three employees: Salahuddin Mozumder, Mr. Worker, and Anowar Hossain, all marked as "Present" on 10/23/2018. There are "Edit" buttons next to each row. At the bottom, it says "Showing 1 to 3 of 3 entries" and has navigation buttons for "Previous" (page 1), "Next", and "Edit".

Figure 43 Unit testing (Check attendance)

11.5 Module Testing (2 to 3)

Testing Name	How	Expected Result	Actual Result	Comment
Purchase Fuel	Entering purchase details	Show the purchase details	Expected	This module is working successfully
Sale fuel	Select fuel & entering quantity	Complete sale process with additional checking	Expected	This module is working successfully

Result

Test Name- Purchase Fuel

Purchase Fuel

* Supplier	Padda Petroleum	
* Fuel	Petrol	
Quantity*	500	Litre
Unit Price*	80	BDT
Total Cost*	40000	BDT
Paid*	20000	BDT
Due*	20000	BDT
Invoice*	Choose File	44896695_28089333_51402104832_n.png
<button>Save</button> <button>Cancel</button>		

Figure 44 Module Testing (Purchase Fuel 1)

Purchase History							
Add New +/-							
	Copy	CSV	Excel	PDF	Print	<input type="text" value="Search:"/> +/-	
Fuel Name	Unit Price	Quantity	Total Price	Due	Details	Edit	Delete
Diesel	80.00	1000.00	80000.00	0.00	Details	Edit	Delete
Octane	75.00	1500.00	112500.00	0.00	Details	Edit	Delete
Petrol	80.00	500.00	40000.00	20000.00	Details	Edit	Delete
Petrol	79.00	1000.00	79000.00	69000.00	Details	Edit	Delete
Petrol	72.00	1000.00	72000.00	2000.00	Details	Edit	Delete

Fuel Name	Unit Price	Quantity	Total Price	Due	Details	Edit	Delete
Showing 1 to 5 of 5 entries							

Previous 1 Next

Figure 45 Module Testing (Purchase Fuel 2)

Test Name- Sale Fuel

Sale Fuel

* Fuel	Petrol
Unit Price*	86.00 BDT
Quantity*	2 Litre
Total Cost*	172 BDT
Paid*	172 BDT

Fuel Stock

Name	Price/BDT	Stock/Litre
Petrol	86.00	2496.00
Octane	82.00	1495.00
Diesel	70.00	1000.00

Partner Company

Buyer Company Select

Sale **Cancel**

Figure 46 Module testing (Sale fuel 1)

Regular Sale

#Invoice	Date	Time	Fuel Name	Quantity	Unit Price	Total	Invoice
12	10/23/2018	01:31:54 pm	Petrol	1.50	86.00	129.00	Invoice
14	11/22/2018	02:30:10 am	Petrol	2.00	86.00	172.00	Invoice
#Invoice	Date	Time	Fuel Name	Quantity	Unit Price	Total	Invoice

Showing 1 to 2 of 2 entries

Previous **1** Next

Figure 47 Module testing (Sale fuel 2)

11.6 Security Testing (2 to 3)

Testing Name	How	Expected Result	Actual Result	Comment
Authentication	Use unknown username and password	System prevent access	Expected	Authentication process successfully implemented
Role based access	Try to login as branch manager	Get access on branch manager dashboard	Expected	Role based security is working

Result

Test name- Authentication

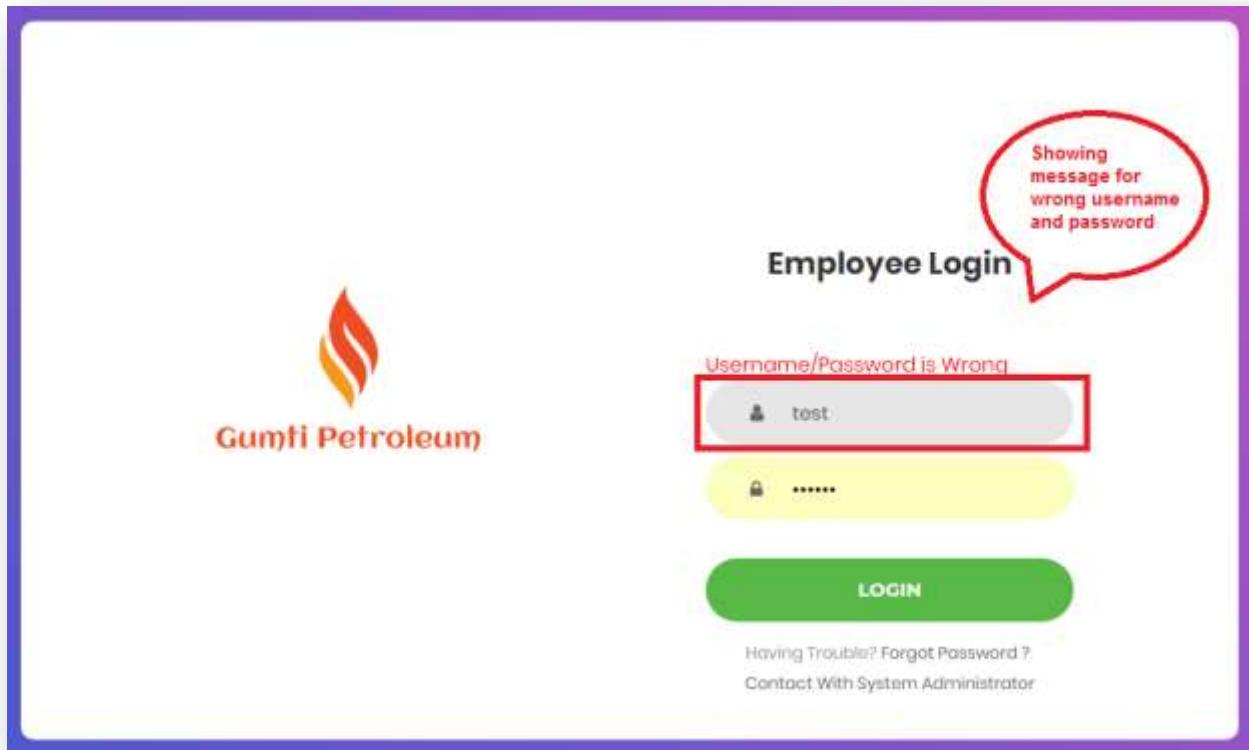


Figure 48 Security Testing (Authentication)

Test name- Role based access:

The screenshot shows a web application interface for 'Gumti Petroleum'. At the top, there is a navigation bar with links: 'Branch Control', 'Manage Employee', 'Partner Management', 'Div/Sale Management', 'Leave Request', and 'Answer Human'. Below the navigation bar is a sidebar on the left with a red border around the title 'Logged In As Branch Manager'. The sidebar contains a list of menu items: Dashboard, Employee (with a green notification badge '1'), Income, Expense, Cash Flow, Employee Schedule, Employee Attendance, Invoices, Monthly Sale (Graphical), Fuel Price (Graphical), Daily Sale, and Email. To the right of the sidebar are two main content sections. The first section is titled 'Fuel Statistics' and displays three circular progress bars: Petrol at 99.78%, Octane at 99.666667%, and Diesel at 100%. The second section is titled 'Fuel Price in International Market' and shows a screenshot of a website called 'OILPRICE.com' displaying oil price data for WTI Crude and Brent Crude.

Figure 49 Security Testing (Role based access)

Chapter-12

Implementation

- ❖ Introduction
- ❖ Training
- ❖ Big Bang
- ❖ Scaling & Load Balancing

12.1 Introduction

This chapter is about the implementation of the Gumti Petroleum's new developed automated system. Now this system is ready to run after completing all tests successfully. So to implement the system, there are some procedures or principles that will assist the organization with learning about the system or run it legitimately. Implementation process should be planned to get proper result. Some viewpoint ought to be taken consideration to implement the system-

12.2 Training

Training is an essential part for the implementation of a system successfully. There are so many non-technical employees in Gumti Petroleum, so training will increase the usability of the new implemented system. So training is mandatory for this implementation process.

The following training log will followed during training period-

S/L	Feature	Processes	Session no.	Date
1	Add employee information	i. Gather all employee information ii. Insert them to the system	1 (2 hours)	1 November 2018
2	Purchase fuel	i. Select a supplier company ii. Select fuel iii. Enter quantity iv. Enter unit price v. Enter paid amount vi. Select purchase invoice	1 (2hours)	2 November 2018
3	Sale fuel	i. Select fuel ii. Enter quantity iii. Enter paid amount iv. Select buyer company if needed	1 (2hours)	3 November 2018

		v. Enter car number if needed		
4	Create schedule	i. Select schedule type ii. Select date iii. Select a work slot	1 (2hours)	4 November 2018
5	Create Salary	i. Select start and end date ii. Select employee iii. Click "Get Report" button iv. Click "Confirm Salary"	2 (2-3 hours)	4 May 2018

12.3 Big Bang

A huge explosion selection of a procedure or system is a moment changeover, a "one-and-done" type of methodology in which everybody related to another system or process switches over in mass at a particular point in time. It's a huge change over a moment. (tcagley, 2017)

Some pros and cons

BIG BANG METHOD	
PROS	CONS
Shorter implementation time	Full testing is difficult prior to go live
Single system in use company-wide	No reliable long-term fallback
Exciting build up to ERP launch	Wider scope of potential system issues
More focused training	High stakes learning environment
Lower costs	Temporary lack of productivity

Figure 50 PROS & CONS of Big Bang Method (top-sage-resellers, 2017)

So, the Big Bang is the best choice for Gumti Petroleum after considering the pros and cons.

14.4 Scaling & Load Balancing

Scaling is a procedure of making the system adaptable that is the capacity of the system to deal with the development of the work. It very well may be estimated in different measurement like functional adaptability, stack versatility and so forth.

Load adjusting is a capacity that conveys the outstanding task at hand over numerous machines. It causes the greatest accessibility of the application. In this system stack balancer can be executed

Chapter-13

Evaluation

- ❖ Introduction
- ❖ Functionality
- ❖ Usability
- ❖ Security
- ❖ Suitability

13.1 Introduction:

Evaluation decides the way toward guaranteeing the execution of a total item or arrangement with the end goal to ensure will it ready to perform in live economic situations. In this area of the archives, the developed system is assessed dependent on a few qualities of evaluation.

13.2 Functionality:

This criterion alludes to assess how well the new system meets the predefined business requirements and guarantees that the system is practically and effectively performed the required estimation.

The proposed system is developed by following a particular structure that fits with the idea of the project. On the underlying stage different requirement is recognized and after that requirements are organized agreeing the business require. The last developed solution was meeting every single basic requirement that is fundamental to the proposed business. In the follow a screen shot of the developed system is given.

The screenshot shows the 'Sale Fuel' interface. On the left, there's a sidebar with a blue header 'Logged In As Machine Operator' and three menu items: 'Dashboard', 'Invoices', and 'Only Sale'. The main area has a form titled 'Sale Fuel' with fields for 'Fuel' (set to 'selected Fuel'), 'Total Cost*' (BOT), 'Paid*' (BOT), and 'Buyer Company' (with a 'Select' dropdown). To the right, there's a table titled 'Fuel Stock' with columns 'Name', 'Price/BDT', and 'Stock/Litre'. The table contains three rows: Petrol (86.00, 2494.00), Octane (82.00, 1495.00), and Diesel (70.00, 1000.00).

Name	Price/BDT	Stock/Litre
Petrol	86.00	2494.00
Octane	82.00	1495.00
Diesel	70.00	1000.00

Figure 51 Main requirement

This interface is for the machine operator to sell fuel. Selling is the main purpose of this business organization and this system's sales function is properly working. Machine operators can manage all selling functions through this system. So it can be ensured that the developed system is functionally rich.

13.3 Usability:

Usability determines to the quality of a user's experience when interacting with the system, including effectiveness, efficiency of the system. How users effectively and easily use the system, it described in this part of the evaluation.

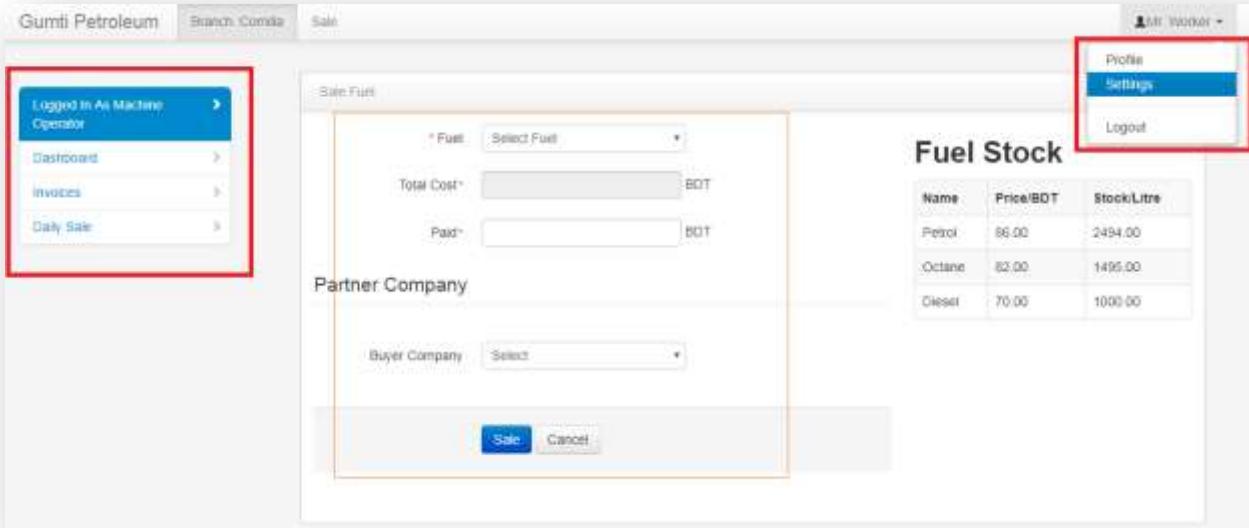


Figure 52 System user interface

13.4 Security:

Security is one of the major concerns matter for developing a new system. Business organization might lose business confidential data for security problem. So during developing this system, security aspects are considered high.

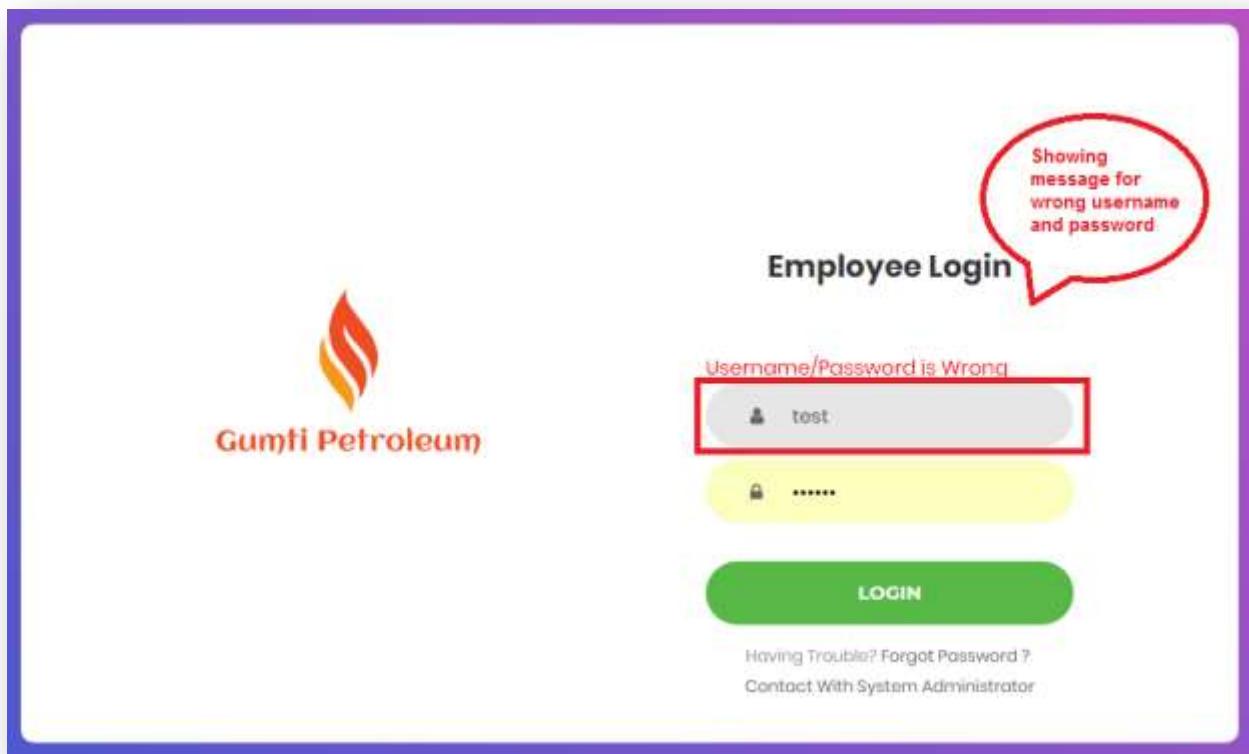


Figure 53 Unauthorized Access Denied

Chapter-14

Critical Appraisal

- ❖ Introduction
- ❖ Objectives Met
- ❖ Objectives Not Met
- ❖ Further Development

14.1 Introduction

The point of this segment of the report is to recover and assess the nature of the project. At the underlying phase of the undertaking - a few objectives and targets were set for the task with the end goal to give a fruitful arrangement. In this area the developed system is basically broken down and the accomplishments and disappointments are talked about extravagantly.

14.2 Objectives Met:

With the end goal to break down whether the targets of the system completely met and whether not met - the characterized destinations at the underlying stage of the task are recorded in the following.

Academic Objectives

- Following and rehearsing a particular technique for the developing of the system
- Project documentation should be standard.
- Delivering an improved system examination documentation
- Producing feasibility study report and risk analysis reports
- Structuring and building up a database
- Delivering a functional system
- Performing different testing and implementation techniques

Business Objectives

- **To store employee information**

Storing all employee information was an important requirement that developed on this system. This employee information will be related all of the modules. Like fuel selling, fuel purchase, all is done by an employee and it will be recorded.

Success factor- This was a high level requirement and this requirement has been fulfilled. This module has been tested and it works successfully.

- **To store purchase information:**

To keep record all purchase information with all relevant information. This is related to employee information. Because of which employee is responsible for this purchase this will be recorded. Purchase payment information will be recorded.

Success factor- This was a high level requirement for this business. This function is tested and it's working as a business want.

- **To store sale information:**

To keep account of the fuel sale information, this function is developed and it's enabled the Gumti Petroleum to store all types of sale information, such as regular sale & the buyer company sale.

Success factor- This was a most important requirement and it is tested properly and it works successfully. It keeps record all sale information with payment and provide an auto generated invoice.

Personal Objective

- i. To develop an error free system

Develop a system which will be error or bug free and able to smoothly handle all exceptions. But this is not so easy to develop errorless system. But we tried our best to develop this.

Success factor- All units of the system working successfully without any error.

This system able to provide expected features to the users.

- ii. To provide various reports

The system will provide various types of report to top level management of the business, this report will be helpful for forecasting about business and management can make statistical decision. The system also provides daily or specific time interval report.

Success factor- Appropriate planning database is one of the purposes behind creating reports. Reports are created from numerous viewpoints and data that put away in database.

14.3 Objectives not met

In this section will outline the objectives that the system can't meet right now and what is the reason of this failure of the system.

I. Producing System Log

It is difficult to create a system log for a project inside a brief timeframe period.

System log is utilized to give direction to its clients on the off chance that they don't comprehend or confront any inconvenience amid utilizing the system.

Reasons why not met- For lack of time and planning the system log was not possible to develop for the proposed system.

14.4 Further Development:

A few destinations did not meet the solution due to time or different issues. Be that as it may, in future, these objectives will be developed to expand the efficiency and usability of the system. A few goals are given underneath which did not available in this system-

I. individual email module

There is an email module including inbox, sent item and compose feature, but right now this is able to handle one common email address for all users. In a further development the system will be able to manage individual email for each user.

Chapter-15

Critical Appraisal

- ❖ Introduction
- ❖ What have I learned
- ❖ What problem I have face
- ❖ What solutions occurred

15.1 Introduction:

Lesson learned session is by and large held amid the task finish off or close to the culmination of the task with the end goal to bring the fulfillment of endeavoring. This segment diagrams the learning's from the undertaking, issue faces amid the project development and the problems solving.

15.2 What I have learned

The proposed system contains different stages and all stages have delivered information and experience. In the accompanying most imperative few are talking about

- On the underlying stage it had to comprehend the project objective and needed to pick the correct methodology that is fitting with the idea of the project. So an unmistakable comprehension on various methodologies had done.
- With the end goal to complete an effective systems different existing systems were basically investigated that comprehended the success of a system.
- Through Business Process Modeling and Notation (BPMN) outline it was dissected the business procedures of the proposed arrangement that scholarly step by step instructions to execute the procedure into automated systems.
- At the underlying phase of the venture different diagram such activity diagram, rich picture and use case was drawn that elucidated the highlights and elements of the project.
- Different requirements were distinguished through observation, interview and requirements workshop. Through the prerequisite prioritization it was found out

what prerequisite ought to be executed in the system with the end goal to conveyance inside restricted timescale.

15.3 What problem I have faced

- 1) Gathering the business information accurately, right now Gumti Petroleum uses a manual system to maintain their business process. This is not so easy to getting proper information by go through on a business document.
- 2) The allocated time for developing this project is not so enough to complete this system accurately. So this was a great challenge to maintain the time schedule strictly.
- 3) In the requirements prioritization section, prioritization is a bit difficult for most of the important requirement.

15.4 What solutions occurred:

In order to solve the faced problems some techniques were used. Those are described in below-

1. To gather requirements from the business stakeholders used the interview as requirement gathering technique. Where proposed system stakeholders just shared their opinion and answers to questions.
2. Time management and time planning is the best solution to develop a system within an appropriate time slot.

Chapter-16

Conclusion

At least all the required assignments have created in this system and this has achieved the objective. All the phases of DSDM were effectively finished. It had developed a web based system with the business requirements of the Gumti Petroleum. This project has taken 75 days to finish and in 75 days every one of the errands were planned. The principle objective of the venture was to build up a computerized system for the association where they can maintain their business productivity. Actualizing all the genuine task of petrol pump the point of this undertaking and this project achieved its objective. Accomplishment of the task is, it satisfied all the most need necessity given by Gumti Petroleum and it finished in time. All the necessity were tried and every one of them is furthermore and errorless furthermore achieving the objective is the fundamental achievement of this project. To achieve the accomplishment of this undertaking, I have done numerous exercises like breaking down the current framework, making arrangement for the system, building up the system, test the entire system and actualize it to the association. Every one of the exercises are reported in this documentation. The estimation of the task is its capacity to maintain the business powerfully. It satisfies all the prerequisite of Gumti Petroleum and gave an answer of their issues. After doing this work, my experience was extremely astounding. In spite of the fact that there were numerous challenges in this task, I additionally defeated those issues and that was the achievement and my learning.

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APPENDIX A – System Interface

Branch Manager Panel Screen-

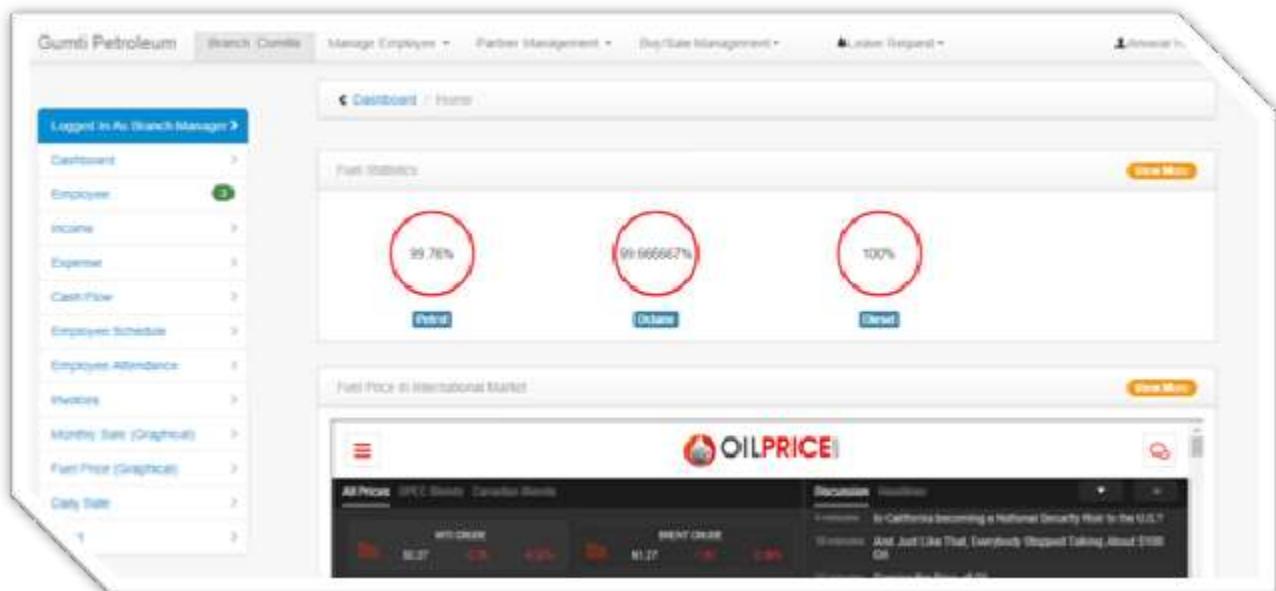


Figure 54 Home page for branch manager

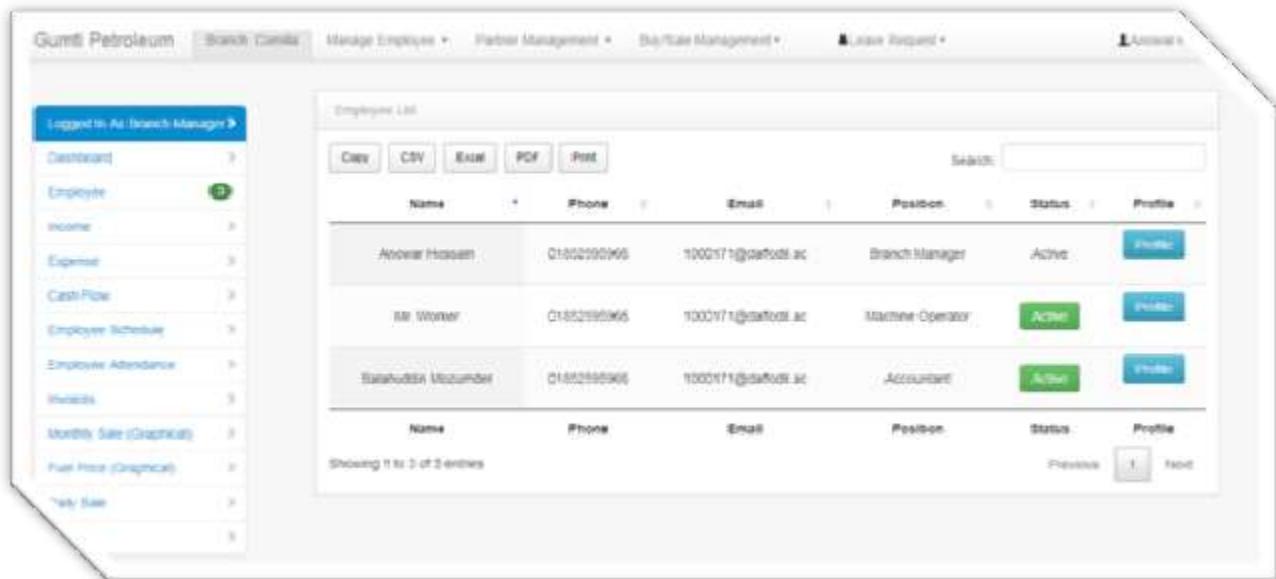
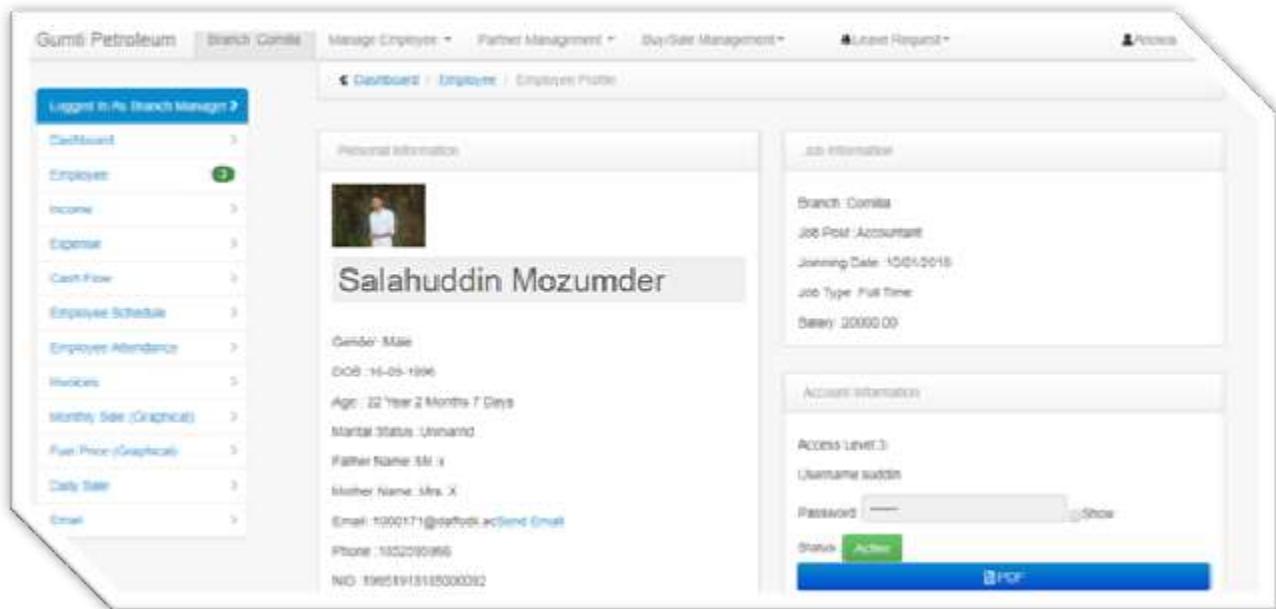
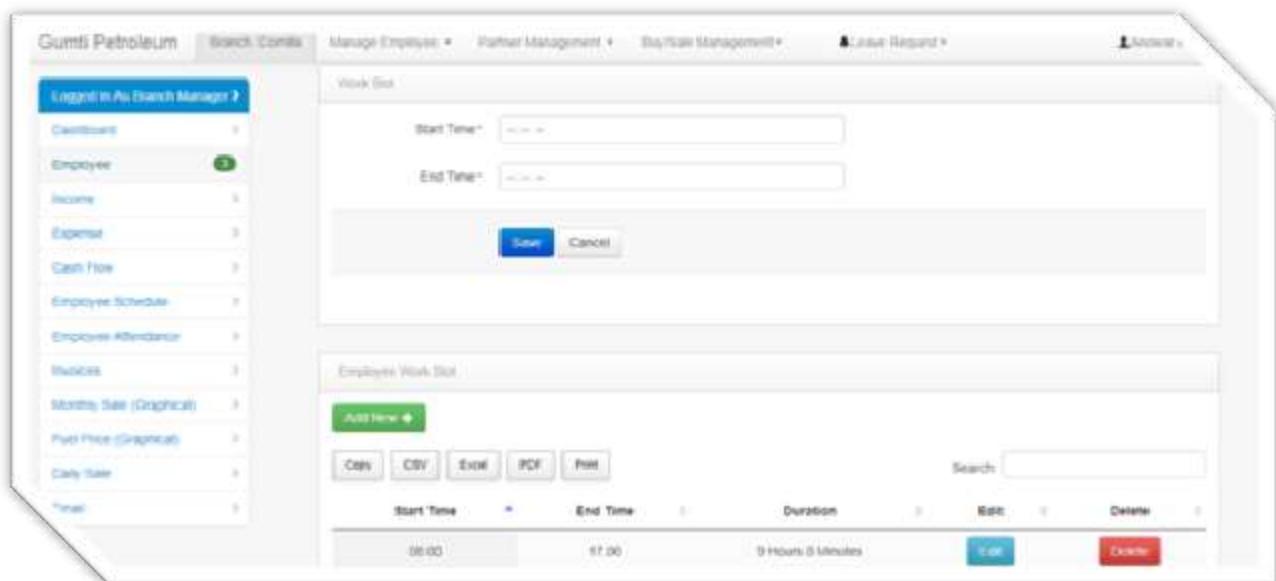


Figure 55 Branch's employee list



The screenshot shows the employee profile page for 'Salahuddin Mozumder'. The left sidebar lists navigation options: Dashboard, Employee (highlighted), Income, Expense, Cash Flow, Employee Schedule, Employee Attendance, Invoices, Monthly Bill (Graphical), Fuel Price (Graphical), Daily Bill, Email, and Time. The main content area is divided into three sections: Personal Information, Job Information, and Account Information. Personal Information includes a photo of the employee, gender (Male), DOB (16-05-1996), age (32 years 2 months 7 days), marital status (Unmarried), Father Name (SM X), Mother Name (Mrs. X), email (1000171@softuni.ac.bg), phone (102209096), and NID (10220913115500002). Job Information shows Branch (Domita), Job Post (Accountant), Joining Date (10/01/2018), Job Type (Full Time), and Salary (20000.00). Account Information shows Access Level (3), Username (sudin), Password (hidden), Status (Active), and a PDF download button.

Figure 56 Employee profile



The screenshot shows the work slot creation page. The left sidebar lists navigation options: Dashboard, Employee (highlighted), Income, Expense, Cash Flow, Employee Schedule, Employee Attendance, Invoices, Monthly Bill (Graphical), Fuel Price (Graphical), Daily Bill, Email, and Time. The main content area has two sections: Work Slot and Employee Work Slot. The Work Slot section contains fields for Start Time and End Time, with Save and Cancel buttons. The Employee Work Slot section includes an Add New button, file download options (CSV, Excel, PDF, Print), a search bar, and a table for managing work slots. The table columns are Start Time, End Time, Duration, Edit, and Delete. A specific row shows a start time of 08:00, an end time of 07:00, and a duration of 9 Hours 8 Minutes, with Edit and Delete buttons.

Figure 57 Work slot creation page

The screenshot shows the Gunti Petroleum Branch Expense page. On the left, a sidebar menu lists various financial categories like Dashboard, Employee, Income, Expense, Cash Flow, etc. The main area displays a table of expenses for October 2018. One entry is visible:

Type	Date	Amount	Description	Additional Info	Edit	Delete
Phone Bill	10/15/2018	2500.00	Branch Phone bill	P19	<button>Edit</button>	<button>Delete</button>

Below the table, it says "Showing 1 to 1 of 1 entries".

Figure 58 Branch expense page

The screenshot shows the Gunti Petroleum Employee Over Time page. The sidebar menu is identical to the previous page. The main area has two sections: "Employee Overtime" and "Employee Work Shift". The "Employee Overtime" section contains fields for Date, Employee (dropdown), Duration (dropdown), and buttons for Save and Cancel.

Figure 59 Employee over time page

The screenshot shows the 'Employee Attendance' section of the application. On the left, there's a sidebar with navigation links like Dashboard, Employee (selected), Income, Expense, Cash Flow, Employee Schedule, Employee Attendance (selected), Invoices, Monthly Sale (Graphical), Fuel Price (Graphical), Daily Sale, and Email. The main area displays a table of employee attendance for October 23, 2018. The table has columns for ID, Name, Date, Present status, and Edit button. Three entries are shown: Salahuddin Huzumdar, Mr. Worker, and Anwar Hussain.

ID	Name	Date	Present	Edit
2	Salahuddin Huzumdar	10/23/2018	Present	<button>edit</button>
4	Mr. Worker	10/23/2018	Present	<button>edit</button>
6	Anwar Hussain	10/23/2018	Present	<button>edit</button>

Figure 60 Employee attendance page

The screenshot shows the 'Employee Salary' section. The sidebar includes links for Dashboard, Employee (selected), Income, Expense, Cash Flow, Employee Schedule, Employee Attendance, Invoices, Monthly Sale (Graphical), Fuel Price (Graphical), and Salary (selected). The main area shows a table of employee salaries for October 2018. The table has columns for Employee, Salary, Deduct, Overtime, Payable, and Status. One entry is displayed: Salahuddin Huzumdar with a salary of 20000.000, deductions of 17414.355, overtime of 0.00, payable of 1588.645, and a status of unpaid.

Employee	Salary	Deduct	Overtime	Payable	Status
Salahuddin Huzumdar	20000.000	17414.355	0.00	1588.645	Unpaid

Figure 61 Employee salary page

The screenshot shows the 'Employee Leave' section of the application. On the left, a sidebar menu lists various management options like Dashboard, Employee, Income, Expense, etc. The main area displays a table of leave requests with columns for Name, Reason, From, To, Status, Details, and Delete. Three entries are shown:

Name	Reason	From	To	Status	Details	Delete
Ahmed Hossen	Official Leave	10/21/2018	10/23/2018	Approved	Details	Delete
Mt. Woker	Medical	10/24/2018	10/25/2018	Approved	Details	Delete
Sakibullah Mizunder	Official Leave	10/01/2018	10/03/2018	Approved	Details	Delete

Showing 1 to 3 of 3 entries.

Figure 62 Employee leave page

The screenshot shows the 'Employee Leave Details' page. The left sidebar is identical to Figure 62. The main content area has three sections: 'Leave Information' (Application Status: Approved), 'Additional Information' (Leave From: 10/01/2018, Leave To: 10/03/2018, Days: 3), and 'Employee Information' (Employee ID: 2, Employee Name: Sakibullah Mizunder). A message at the bottom says 'Document Not Submitted'.

Figure 63 Employee leave details

The screenshot shows a web-based application interface for managing password view history. At the top, there is a navigation bar with links for 'Branch: Central', 'Manage Employee', 'Partner Management', 'Buy/Sell Management', 'Leave Request', and 'Logout'. On the left, a sidebar titled 'Logged In As Branch Manager' lists various menu items: Dashboard, Employee (with a green badge showing '3'), Income, Expense, Cash Flow, Employee Schedule, Employee Attendance, Invoices, Monthly Sale (Graphical), Fuel Price (Graphical), and Daily Sale. The main content area is titled 'Password View History' and contains sections for 'Date Range' (with 'From' and 'To' fields) and 'Employee' (with a dropdown 'Select Employee'). Below these are buttons for 'Copy', 'CSV', 'Excel', 'PDF', and 'Print'. A table displays the history of password views, with columns for 'Viewer', 'Victim ID', 'Date', 'Time', and 'Reason'. One entry is shown: 'Ahmed Hosain' viewed 'Mr. Worker' on '10/25/2016' at '23:15:14 pm' for 'Testing'. There are also 'Search' and 'Next' buttons. At the bottom, it says 'Showing 1 to 1 of 1 entries'.

Figure 64 Password view history

The screenshot shows a web-based application interface for viewing supplier information. At the top, there is a navigation bar with links for 'Branch: Central', 'Manage Employee', 'Partner Management', 'Buy/Sell Management', 'Leave Request', and 'Logout'. On the left, a sidebar titled 'Logged In As Branch Manager' lists various menu items: Dashboard, Employee (with a green badge showing '3'), Income, Expense, Cash Flow, Employee Schedule, Employee Attendance, Invoices, Monthly Sale (Graphical), Fuel Price (Graphical), and Daily Sale. The main content area is titled 'Supplier Information' and contains a table with columns for 'Company Name', 'Address', 'Phone', 'Email', and 'Reg. No.'. One entry is shown: 'Padta Petroleum' with address 'Panthalapet', phone '9852996994', email 'royalsharmaved@gmail.com', and reg. no. '10-099408'. There are buttons for 'Copy', 'CSV', 'Excel', 'PDF', and 'Print'. A search bar is available. At the bottom, it says 'Showing 1 to 1 of 1 entries'.

Figure 65 View supplier company list

Gumti Petroleum Branch Details

Logged In As Branch Manager

Manage Employee | Partner Management | Buyer/Seller Management | Raise Request | Log Out

Company Wise Purchase Report

Select Supplier & Date Range

Supplier: From: To:

Select | Get Report

Padda Petroleum

CSV | CSV | Excel | PDF | Print | Search:

Date	Fuel	Quantity	Unit Price	Total Price	Paid	Due	Details
10/23/2018	Petrol	1000.00	72.00	72000.00	70000.00	2000.00	<button>Details</button>
10/25/2018	Octane	1500.00	15.00	112500.00	112500.00	0.00	<button>Details</button>
10/26/2018	Diesel	1000.00	90.00	90000.00	80000.00	0.00	<button>Details</button>
10/31/2018	Petrol	1000.00	79.00	79000.00	70000.00	8900.00	<button>Details</button>

Figure 66 Company wise purchase report

Due Purchase Report

Copy | CSV | Excel | PDF | Print | Search:

Date	Fuel	Quantity	Unit Price	Total Price	Paid	Due	Details
10/23/2018	Petrol	1000.00	72.00	72000.00	70000.00	2000.00	<button>Details</button>
10/31/2018	Petrol	1000.00	79.00	79000.00	10000.00	69000.00	<button>Details</button>
11/22/2018	Petrol	500.00	60.00	40000.00	20000.00	20000.00	<button>Details</button>

Date Fuel Quantity Unit Price Total Price Paid Due Details

Showing 1 to 3 of 3 entries

Previous 1 Next

Figure 67 due in purchase

Gumti Petroleum Search: Comilla Manager Employee Partner Management Buy/Sell Management Loan Request Answer to...

Logged In As: Branch Manager

- Dashboard
- Employee **2**
- Income
- Expense
- Cash Flow
- Employee Schedule
- Employee Attendance
- Invoices
- Monthly Sale (Graphical)
- Pivot Price (Graphical)
- My Task

Add/Edit Buyer Company

Company Name*	<input type="text"/>
Address*	<input type="text"/>
Phone*	<input type="text"/>
Email*	<input type="text"/>
Regi. No.*	<input type="text"/>
Document*	<input type="file"/> Choose File No file chosen
Save Cancel	

Figure 68 Buyer company add page

Buyer Company Information

Add New 

Company Name	Address	Phone	Email	Regi. No.	Document	Edit	Delete
Asia Transport	Comilla	1852595966	1000171@daffodil.ac	57465	Document	Edit	Delete
Chittagong Buyer 1	apdfth	144	loysal.int@gmail.com	315498	Document	Edit	Delete
Company Name	Address	Phone	Email	Regi. No.	Document	Edit	Delete

Showing 1 to 2 of 2 entries

Previous  Next

Figure 69 Buyer Company List

The screenshot shows a web-based application interface for managing branch transactions. At the top, there is a navigation bar with links for 'Manage Employee', 'Partner Management', 'Buy/Sell Management', 'Business Requests', and a user profile icon. On the left, a sidebar menu lists various options: Dashboard, Employee (with a green notification badge), Income, Expense, Cash Flow, Employee Schedule, Employee Absence, Invoices, Monthly Sale (Graphical), Fuel Price (Graphical), Daily Sale, and Email. The main content area is divided into two sections, each titled 'Transaction History (Credit)'. Each section contains a table with columns for Name, Date, Time, Amount, and Invoice. The first section shows two entries for 'Pasta Petroleum' with amounts of 20000.00 and 70000.00. The second section shows one entry for 'Pasta Petroleum' with an amount of 70000.00. Both sections include buttons for 'Copy', 'CSV', 'Excel', 'PDF', and 'Print', and a search bar.

Figure 70 Branch transaction history page

The screenshot shows a modal dialog box titled 'Add/Update Fuel Information'. It contains two input fields: 'Fuel Name*' and 'Unit Price*'. Below the fields are two buttons: 'Save' (in blue) and 'Cancel'. The dialog box has a light gray background and is centered on the page.

Figure 71 Interface for add fuel with price

Add/ Update Fuel Information

Fuel Name * Diesel

Unit Price * 70.00

Figure 72 Update fuel price

Fuel List			
Add New +			
Copy	CSV	Excel	PDF
Fuel Name	Unit Price	Edit	Delete
Diesel	70.00	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
Octane	92.00	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
Petrol	86.00	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>

Fuel Name Unit Price Edit Delete

Showing 1 to 3 of 3 entries

Previous Next

Figure 73 Fuel list with price

Purchase Fuel

* Supplier	Select
* Fuel	Select
Quantity*	<input type="text"/> Litre
Unit Price*	<input type="text"/> BDT
Total Cost*	<input type="text"/> BDT
Paid*	<input type="text"/> BDT
Due*	<input type="text"/> BDT
Invoice*	<input type="file"/> Choose File No file chosen
<input type="button" value="Save"/> <input type="button" value="Cancel"/>	

Figure 74 Adding purchase information

Purchase History

Fuel History							
Add New + <input type="text"/> Search:							
Fuel Name	Unit Price	Quantity	Total Price	Due	Details	Edit	Delete
Diesel	80.00	1000.00	80000.00	0.00	Details	Edit	Delete
Octane	75.00	1500.00	112500.00	0.00	Details	Edit	Delete
Petrol	80.00	500.00	40000.00	20000.00	Details	Edit	Delete
Petrol	79.00	1000.00	79000.00	69000.00	Details	Edit	Delete
Petrol	72.00	1000.00	72000.00	2000.00	Details	Edit	Delete

Showing 1 to 5 of 5 entries

Previous 1 Next

Figure 75 Fuel purchase history

Purchase Details

Date & Time :	11/22/2018 -02:23:31 am
Supplier Company :	Padda Petroleum
Fuel Name :	Petrol
Quantity :	500.00 Litre
Unit Price :	80.00 BDT
Total Cost:	40000.00 BDT
Paid :	20000.00 BDT
Due :	20000.00 BDT
Invoice :	Invoice
Responsible Staff :	Andwar Hossain

Figure 76 Fuel purchase details

Regular Sale

Search:

#Invoice	Date	Time	Fuel Name	Quantity	Unit Price	Total	Invoice
12	10/23/2018	01:31:54 pm	Petrol	1.50	86.00	129.00	<input type="button" value="Invoice"/>
14	11/22/2018	02:30:10 am	Petrol	2.00	86.00	172.00	<input type="button" value="Invoice"/>

#Invoice
Date
Time
Fuel Name
Quantity
Unit Price
Total
Invoice

Showing 1 to 2 of 2 entries.
Previous
1
Next

Figure 77 Regular sale list

Buyer Company								
	Copy	CSV	Excel	PDF	Print	<input type="text" value="Search:"/>		
#	Date	Time	Fuel Name	Quantity	Unit Price	Total	E-Status	Invoice
11	10/23/2016	12:56:40 pm	Petrol	2.50	86.00	215.00	Not Sent	Invoice Send
13	11/21/2016	07:59:12 pm	Octane	5.00	82.00	410.00	Not Sent	Invoice Send

Showing 1 to 2 of 2 entries

Previous 1 Next

Figure 78 Buyer company sale history

Date 10/01/2018 To 10/31/2018	
Fuel Name :	Petrol
Quantity :	4.00 Litre
Subtotal Cost :	344.00 BDT
Total Sale:	344 BDT
Total Cash:	329 BDT
Total Due:	15 BDT

Figure 79 Date to date sale report

Due Purchase History							
	Copy	CSV	Excel	PDF	Print	Search:	
Fuel Name	Unit Price	Quantity	Total Price	Due	Details	Edit	Delete
Petrol	80.00	500.00	40000.00	20000.00	Details	Edit	Delete
Petrol	79.00	1000.00	79000.00	69000.00	Details	Edit	Delete
Petrol	72.00	1000.00	72000.00	2000.00	Details	Edit	Delete

Showing 1 to 3 of 3 entries

Previous [1](#) Next

Figure 80 Due purchase list

Purchase Details	
Date & Time :	11/22/2018 -02:23:31 am
Supplier Company :	Padda Petroleum
Fuel Name :	Petrol
Quantity :	500.00 Litre
Unit Price :	80.00 BDT
Total Cost :	40000.00 BDT
Paid :	20000.00 BDT
Due :	20000.00 BDT
Invoice :	Invoice
Responsible Staff :	Anowar Hossain
	Edit Delete

Figure 81 Due purchase details

Due Sale History									
#	Date	Time	Fuel Name	Quantity	Unit Price	Total	E-Status	Invoice	Email
11	10/23/2018	12:56:40 pm	Petrol	2.50	86.00	215.00	Not Sent	<button>Invoice</button>	<button>Send</button>
13	11/21/2018	07:59:12 pm	Octane	5.00	82.00	410.00	Not Sent	<button>Invoice</button>	<button>Send</button>
#	Date	Time	Fuel Name	Quantity	Unit Price	Total	E-Status	Invoice	Email

Showing 1 to 2 of 2 entries

Previous: 1 Next

Figure 82 Due sales list



Gumti Petroleum

Gumti Petroleum
Cumilla, Bangladesh
01852457878
gup@gmail.com

Invoice #: 11
Created: 11/23/2018



DUE

Asia Transport
Comilla
1000171@daffodil.ac
Car Number: DM C 4747856

Fuel Name	Quantity (Litre)	Unit Price (BDT)	Total (BDT)
Petrol	2.50	86.00	215.00
		Total Pay :	200.00
		Due	15.00

Figure 83 Due sale invoice



Invoice #: 1.
Created: 11/23/2018



Gumti Petroleum
Cumilla, Bangladesh
01852457878
gup@gmail.com



Fuel Name	Quantity (Litre)	Unit Price (BDT)	Total (BDT)
Petrol	1.50	86.00	129.00
Total Pay :			129.00
Due			0.00

Figure 84 Invoice for complete payment

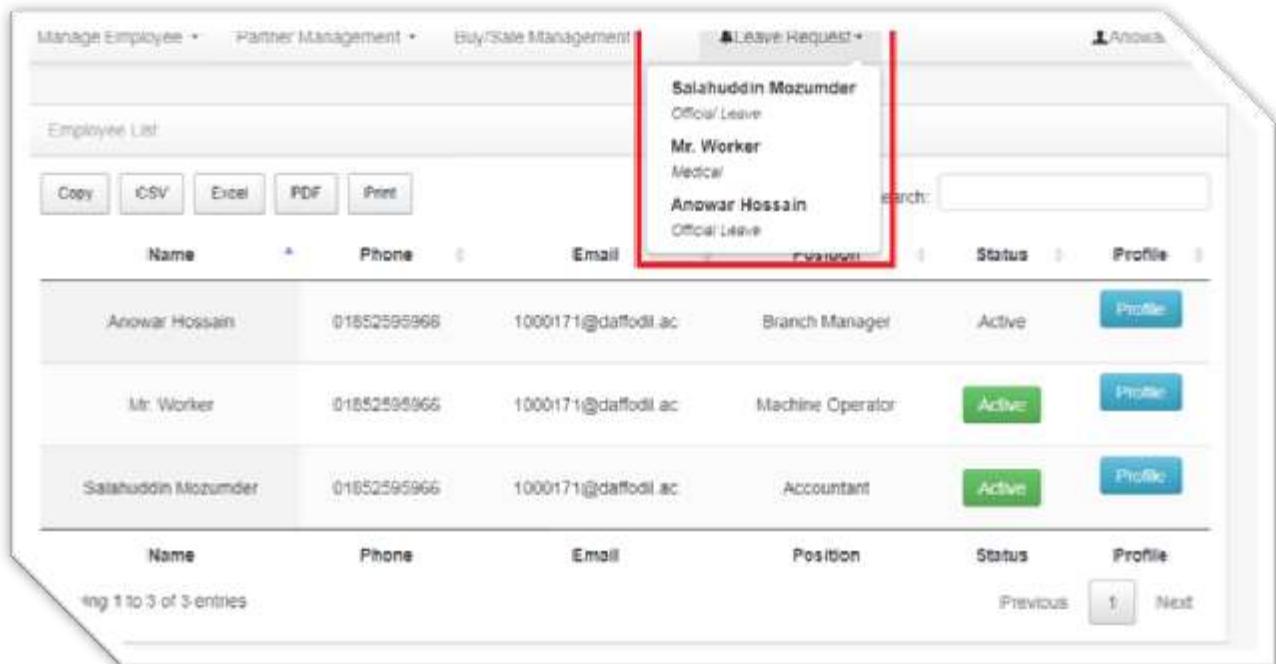


Figure 85 Notification for employee leave request



Figure 86 Re-login interface for view own profile

A screenshot of a mobile application's account settings screen. The title "User Account Settings" is at the top. Below it is a section titled "Update Username". Inside this section, there is a form with a label "Username*" and a text input field containing "sapon". To the right of the input field, the word "Available" is displayed. A blue button labeled "Update Username" is at the bottom of the section.

Figure 87 Interface for update username

Update Password

Password*

Password must contain the following:

- ✗ A lowercase letter
- ✗ A capital (uppercase) letter
- ✗ A number
- ✗ Minimum 12 characters

Figure 88 Interface for update password

The screenshot shows a Gmail inbox with the following details:

From	Subject	Message	Date
Foysal Alhammed	Test ajax for gmail inbox in IMAP	* This is email body	Wed, 12 Sep 2018 14:48:44 +0600
Foysal Alhammed	Test Gmail IMAP protocol	* In computing, the Internet Message Access Protocol (IMAP) is an Internet standard protocol used by email clients to retrieve email messages from a mail server over a TCP/IP connection.=C2=A0IMAP=C2=A0is defined by RFC 1591.	Wed, 12 Sep 2018 02:35:51 +0600
Foysal Alhammad	Request for resend invoice 48	* Invoice	Tue, 11 Sep 2018 15:24:43 +0600
Foysal Alhammed	IMAP Test Email	* This is a test mail for IMAP.	Tue, 11 Sep 2018 12:24:05 +0600

Figure 89 Email inbox

The screenshot shows a contact management interface. On the left, there's a sidebar with a profile picture of Anowar Hossain, a 'Compose' button, and navigation links for Home, Inbox (with 1 unread), Sent, and Contacts. A red circle with a white 'G' is overlaid on the sidebar. The main area is titled 'Contacts' and contains a table of email contacts. The table has columns for Name and Email. Each contact row includes an 'Email' button. At the top of the contact list are buttons for Copy, CSV, Excel, PDF, Print, and a search bar.

Name	Email	
Anowar Hossain	1000171@daffodil.ac	Email
Asia Transport	1000171@daffodil.ac	Email
Chittagong Buyer 1	faysal.int@gmail.com	Email
Foysal Ahammad	faysal.int@gmail.com	Email
Mahmudun Nabi Mahin	1000171@daffodil.ac	Email
Mohammed Wahidun Nabi Mehedhi	1000171@daffodil.ac	Email
Mt. Manager	1000171@daffodil.ac	Email
Mr. Worker	1000171@daffodil.ac	Email

Figure 90 all email contacts of this company

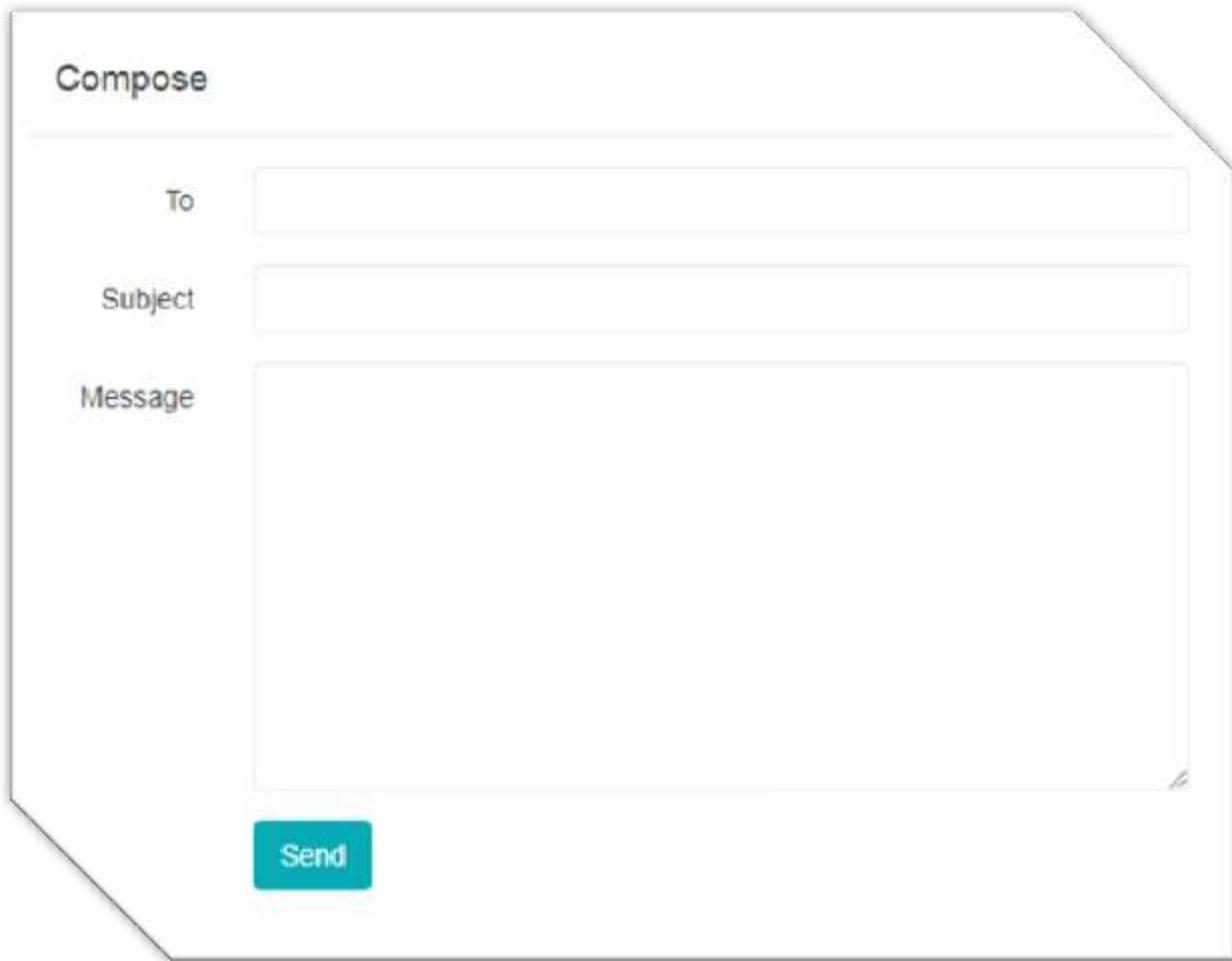


Figure 91 Interface for compose new email



Figure 92 Fuel purchase price analysis

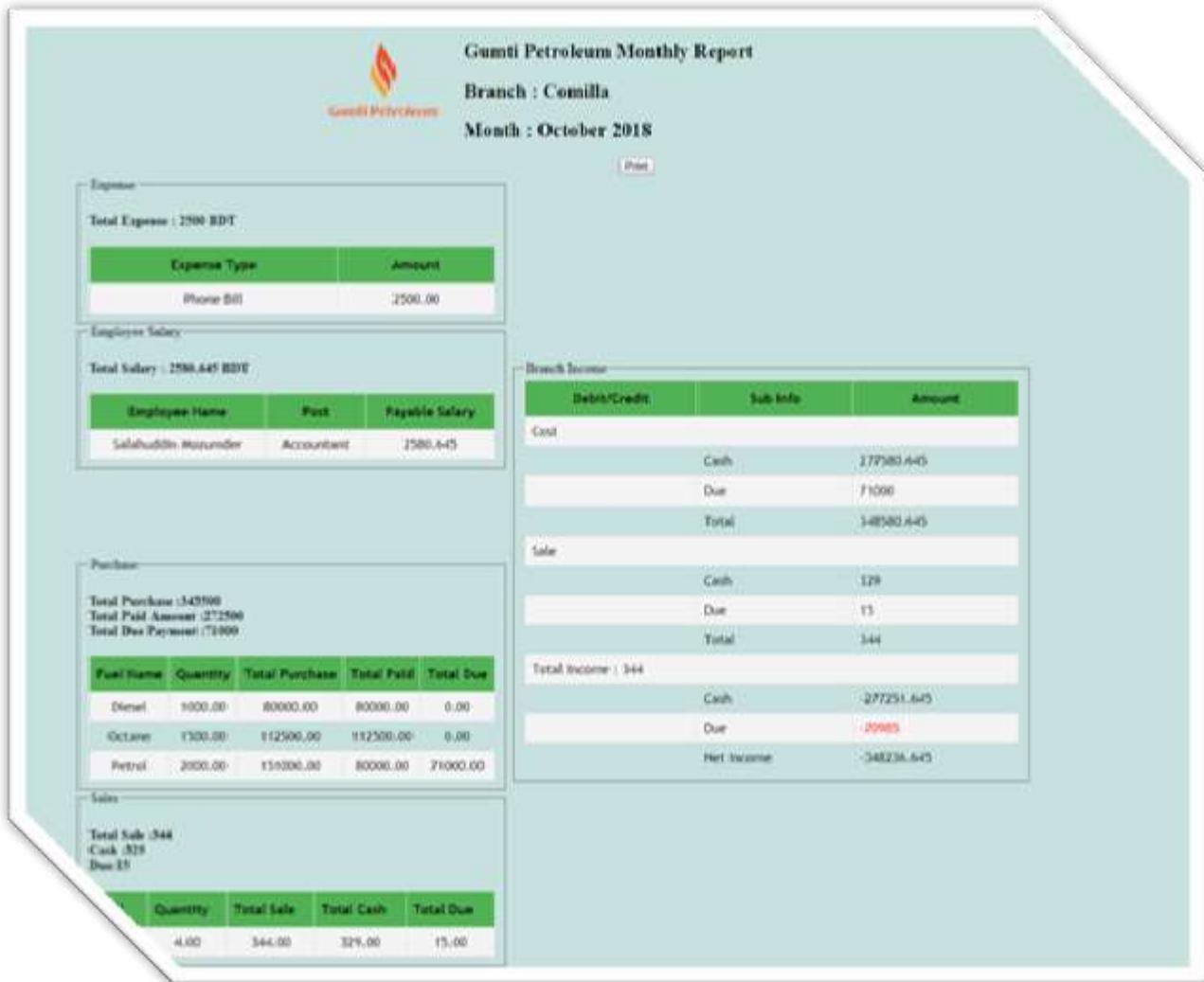


Figure 93 Monthly revenue report for a branch

Employee Name : Salahuddin Mozumder		
Employee Attendance	Total Salary :	20000.00
Total Working Days : 31 Days	Deduct Salary :	17419.35483871
Present : 1 Days	Over Time Salary :	0
Over Time : Days	Total Payable Salary :	2580.6451612903
Leave : 3 Days		
Absent : 27 Days		

Figure 94 Employee wise monthly report

Branch Accountant Panel:

Some changes for branch accountant

Purchase Details	
Date & Time :	11/22/2018 -02:23:31 am
Supplier Company :	Padda Petroleum
Fuel Name :	Petrol
Quantity :	500.00 Litre
Unit Price :	60.00 BDT
Total Cost :	40000.00 BDT
Paid :	20000.00 BDT
Due :	20000.00 BDT Make Payment
Invoice :	Invoice
Responsible Staff :	Anwar Hossain
	Edit Delete

Figure 95 Enable "Make Payment" option for accountant

Sales Details	
Date & Time:	11/21/2018 -07:59:12 pm
Supplier Company:	Asia Transport
Fuel Name:	Octane
Quantity:	5.00 Litre
Unit Price:	82.00 BDT
Total Cost:	410.00 BDT
Paid:	300.00 BDT
Due:	110.00 BDT Receive Payment
Email Status:	Send
Invoice:	Invoice
Responsible Staff:	Mr. Worker
Edit Delete	

Figure 96 Enable "Receive Payment" option for accountant

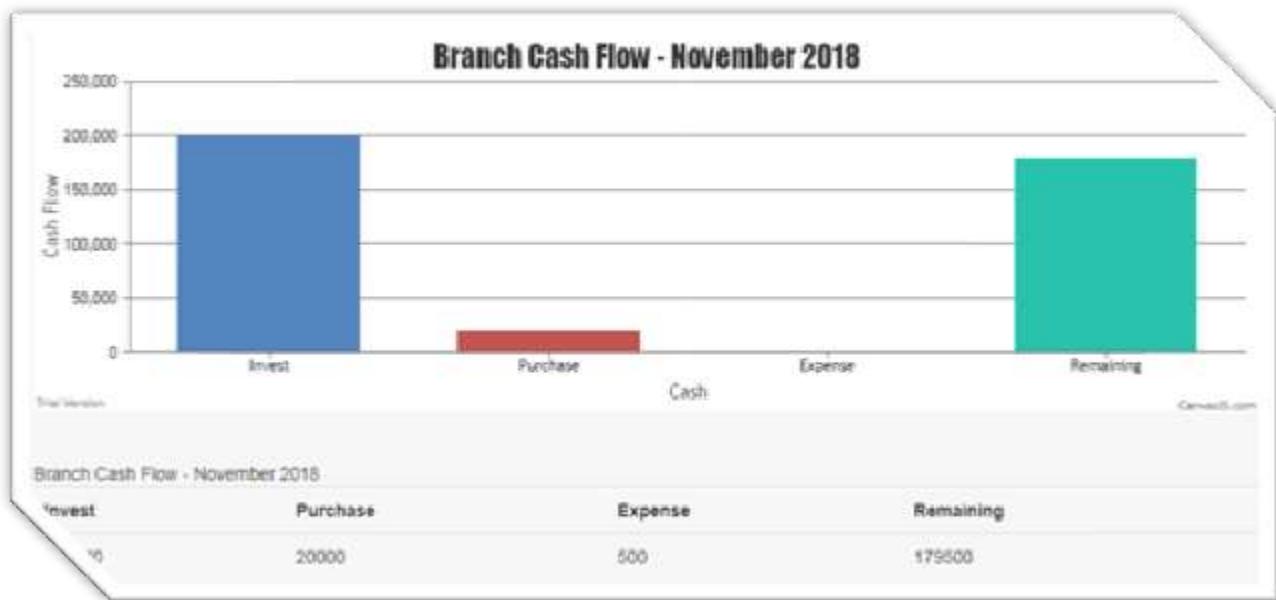


Figure 97 Branch cash flow

Machine Operator panel:

The screenshot shows the 'Gumti Petroleum' machine operator dashboard. On the left, a sidebar lists 'Logged In As Machine Operator', 'Dashboard', 'Invoices', and 'Daily Sale'. The main area has a 'Fuel Statistics' section with three circular progress bars: 'Pump' at 99.76%, 'Octane' at 99.999957%, and 'Diesel' at 100%. Below it is a 'Fuel Price in International Market' section showing a screenshot of the 'OILPRICE' website with current oil prices.

Figure 98 Home page

The screenshot shows a 'Daily Sale' report for November 22, 2018. It includes a search bar, a date selector ('Search By Date'), and a table of sales details. The table has two sections: one for individual sales and another for a summary row. The total sales for the day are 172 BDT.

Date :11/22/2018

Total Sale: 172 BDT

Total Cash: 172 BDT

Total Due: 0 BDT

Time	Name	Quantity	IPrice	Cash	Due
02:30:10 am	Petrol	2.00	172.00	172.00	0.00

Time	Name	Quantity	IPrice	Cash	Due
Total 1 to 1 of 1 entries					

Previous **1** Next

Figure 99 Check own daily sale

Sale Fuel

* Fuel	Petrol	
Unit Price*	86.00	BDT
Quantity*		Litre
Total Cost*		BDT
Paid*		BDT

Partner Company:

Buyer Company	Selected
---------------	----------

Fuel Stock

Name	Price/BDT	Stock/Litr
Petrol	86.00	2404.00
Octane	82.00	1495.00
Diesel	70.00	1000.00

Sale **Cancel**

Figure 100 Fuel selling interface

APPENDIX B: Coding

Customize encrypting method

```
<?php

function encryptIt( $q ) {
    $cryptKey = 'qJB0rGtIn5UB1xG03efyCp';
    $qEncoded = base64_encode( mcrypt_encrypt( MCRYPT_RIJNDAEL_256, md5(
$cryptKey ), $q, MCRYPT_MODE_CBC, md5( md5( $cryptKey ) ) ) );
    return( $qEncoded );
}

function decryptIt( $q ) {
    $cryptKey = 'qJB0rGtIn5UB1xG03efyCp';
    $qDecoded = rtrim( mcrypt_decrypt( MCRYPT_RIJNDAEL_256, md5( $cryptKey ),
), base64_decode( $q ), MCRYPT_MODE_CBC, md5( md5( $cryptKey ) ) ), "\0");
    return( $qDecoded );
}
```

```
?>
```

Login Code

```
<?php
include('db.php');
include('encrypt_key.php');
session_start();
if (isset($_POST['login'])) {
    $username = mysqli_real_escape_string($con, $_POST['username']);
    $password=encryptIt(mysqli_real_escape_string($con, $_POST['pass']));
    $result=mysqli_query($con,"SELECT * FROM employee where username='".$username'
and password='".$password' and e_branch_id='1'");
    $result1=mysqli_query($con,"SELECT * FROM employee where username='".$username'
and password='".$password"');
    if ($row = mysqli_fetch_array($result)) {
        $_SESSION['employee_id']=$row['e_id'];
        $_SESSION['username']=$username;
        $_SESSION['fullname']=$row['fullname'];
        $_SESSION['status']=$row['status'];
        $_SESSION['level']=$row['level'];
        $_SESSION['position']=$row['position'];
        $_SESSION['branch']=$row['e_branch_id'];
        $_SESSION['head_login']=TRUE;
        if ($row['status']=='Deactivate') {
            header("Location:../deactivate");
        }else{
            header("Location:../head");
        }
    }
}else if ($row = mysqli_fetch_array($result1)) {

    $_SESSION['employee_id']=$row['e_id'];
    $_SESSION['username']=$username;
    $_SESSION['fullname']=$row['fullname'];
    $_SESSION['status']=$row['status'];
    $_SESSION['level']=$row['level'];
    $_SESSION['position']=$row['position'];
    $_SESSION['branch']=$row['e_branch_id'];

    $_SESSION['branch_login']=TRUE;
    if ($row['status']=='Deactivate') {
```

```

        header("Location:../deactivate");
    }else{
        header("Location:../");
    }

}else{
    header("Location:../login/index.php?error");

}
}

```

Purchase fuel:

```

session_start();
date_default_timezone_set('Asia/Dhaka');
if (isset($_POST['add_purchase'])) {
    $supplier=$_POST['supplier'];
    $fuel=$_POST['fuel'];
    $quantity=$_POST['quantity'];
    $price=$_POST['price'];
    $total_cost=$_POST['total_cost'];
    $paid=$_POST['paid'];
    $due=$_POST['due'];
    $due=$_POST['due'];
    $employee_id=$_SESSION['employee_id'];
    $date=date('m/d/Y');
    $time=date('h:i:s a');
    $name =str_replace(" ","_",$FILES['invoice']['name']);
    $temp=$FILES['invoice']['tmp_name'];
    move_uploaded_file($temp,"employee_images/".$name);
    $url="employee_images/$name";
    $query="Insert into purchase
values('','$date','$time','$supplier','$quantity','$fuel','$price','$total_cost',
'$paid','$due','$url','$employee_id')";
    $query1="INSERT into fuel_rate values('','$date','$fuel','$price')";
    $result1=mysqli_query($con,$query1);
    $result=mysqli_query($con,$query);
    if ($result==TRUE) {
        header('location:../purchase.php?success=1');
    }else{
        header('location:../purchase.php?error=0');
    }
}

```

```
}
```

Sale Fuel:

```
include('db.php');
session_start();
date_default_timezone_set('Asia/Dhaka');
if (isset($_POST['add_sale'])) {
    $buyer_company=$_POST['buyer_company'];
    $fuel=$_POST['fuel'];
    $quantity=$_POST['quantity'];
    $price=$_POST['unit_price'];
    $total_cost=$_POST['total_cost'];
    $paid=$_POST['paid'];
    $due=$_POST['due'];
    $car_number=$_POST['car_number'];
    $employee_id=$_SESSION['employee_id'];
    $date=date('m/d/Y');
    $time=date('h:i:s a');
    $branch=$_SESSION['branch'];
    if ($total_cost>$paid && $buyer_company=='') {
        header('location:../sale.php?complete_payment=0');
    }else{
        if ($buyer_company=='') {
            $buyer_company='1';
        }else{
            $buyer_company=$_POST['buyer_company'];
        }
        $query="Insert into sales
values('','$date','$time','$fuel','$quantity','$price','$total_cost','$paid','$due',
'$buyer_company','$car_number','$employee_id','Not Sent','$branch')";
        $result=mysqli_query($con,$query);
        if ($result==TRUE) {
            header('location:../sale.php?success=1');
        }else{
            header('location:../sale.php?error=0');
        }
    }
}
```

APPENDIX C: Testing

Usability Testing

Test Name	How	Expected Result	Actual result	Comment
Interface Usability	Analyzing Interface	Use relevant colors and icon.	Expected	Successfully usable
Functional usability	Checking the functions	Functions like purchase, sale, due payment work properly	Expected	All function work properly

Result

Test name- Interface usability

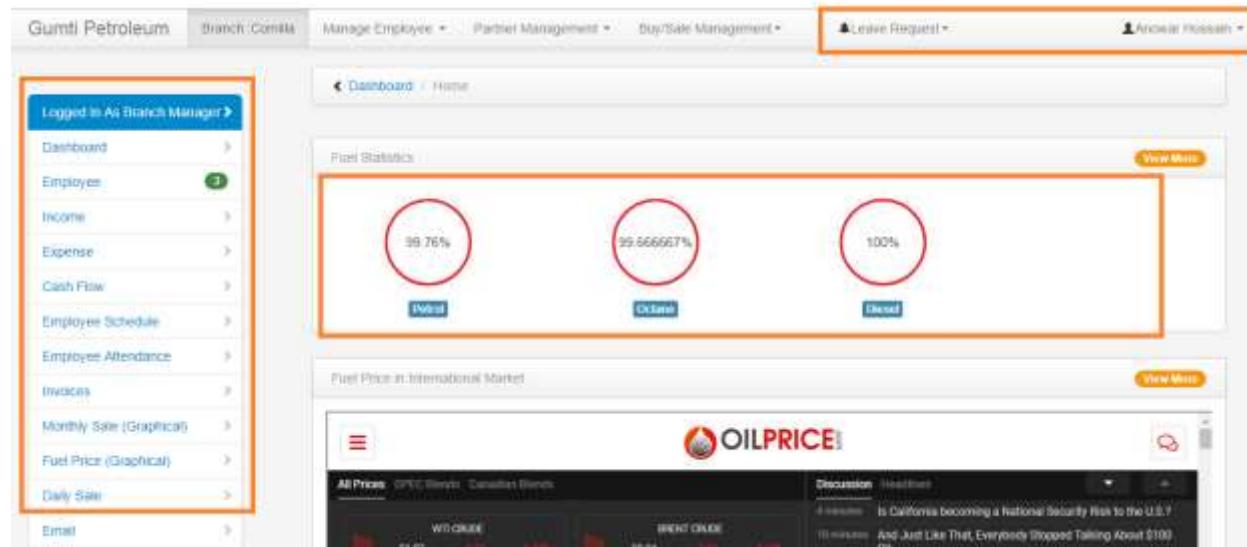


Figure 101 Usability Testing (Interface usability)

Test name- Functional usability

Sale Fuel

* Fuel	Petrol
Unit Price*	86.00 BDT
Quantity*	2 Litre
Total Cost*	172 BDT
Paid*	172 BDT

Fuel Stock

Name	Price/BDT	Stock/Litre
Petrol	86.00	2496.00
Octane	82.00	1495.00
Diesel	70.00	1000.00

Partner Company

Buyer Company	Select
---------------	--------

Sale **Cancel**

Figure 102 Purchasing fuel

Regular Sale

<input type="button" value="Copy"/>	<input type="button" value="CSV"/>	<input type="button" value="Excel"/>	<input type="button" value="PDF"/>	<input type="button" value="Print"/>	Search: <input type="text"/>			
#Invoice	Date	Time	Fuel Name	Quantity	Unit Price	Total	Invoice	
12	10/23/2018	01:31:54 pm	Petrol	1.50	86.00	129.00	<input type="button" value="Invoice"/>	
14	11/22/2018	02:30:10 am	Petrol	2.00	86.00	172.00	<input type="button" value="Invoice"/>	

#Invoice Date Time Fuel Name Quantity Unit Price Total Invoice

Showing 1 to 2 of 2 entries Previous Next

Figure 103 Fuel purchase information added

Test name – Compatibility in Browser

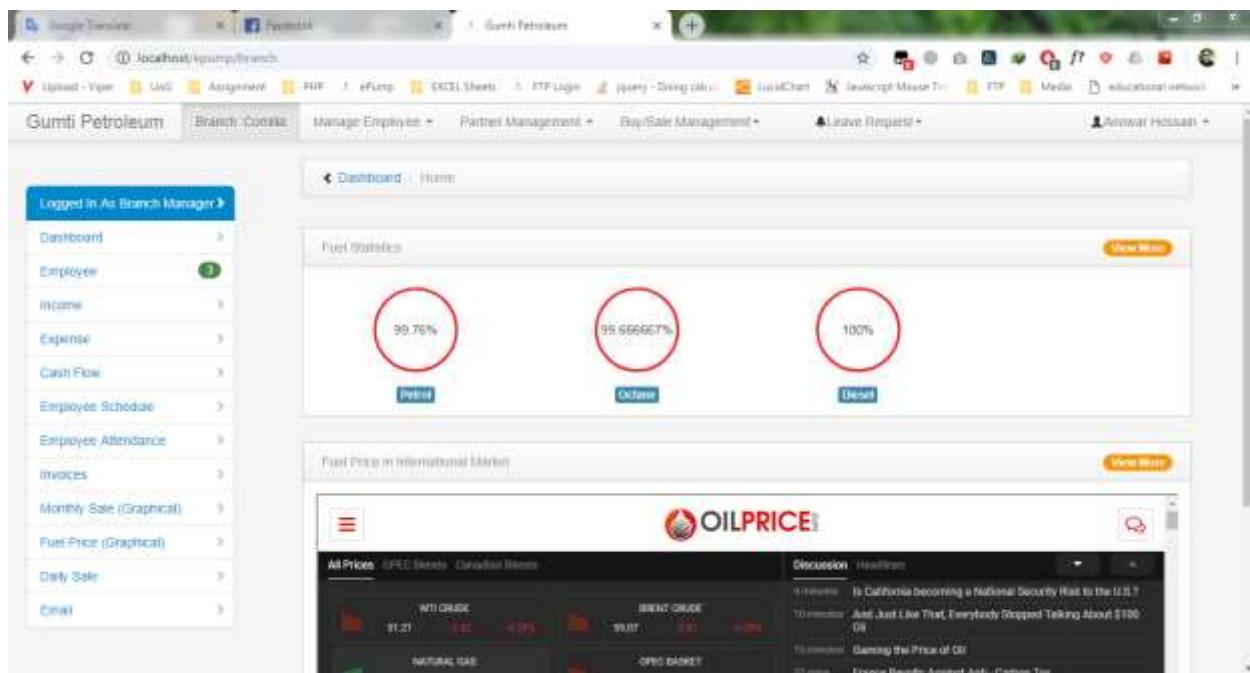


Figure 104 Google Chrome

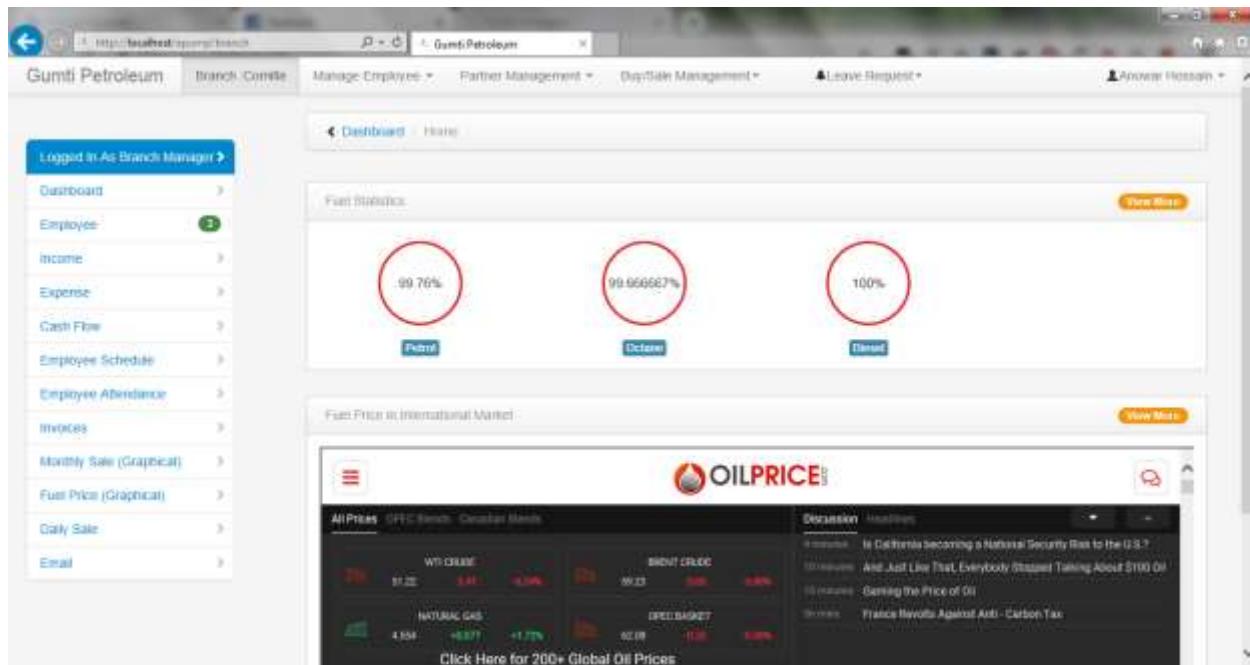


Figure 105 Internet Explorer