UNIVERSITY OF PLYMOUTH

Project Proposal

Inventory Management System

PUSL2021

Computing Group Project

Group no.: A 04

Plymouth Batch: 11

UNIVERSITY OF PLYMOUTH

PUSL2021 Computing Group Project

Group details

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1.0 Overview

1.1 Introduction

According to the Department of Census and Statistics there are around 71,126 small scale businesses and 10,405 medium scale businesses in Sri Lanka (2023). Most of these businesses are product-based businesses which usually maintain an inventory. Some of the service-based businesses in this category also maintain an inventory. The main issue in this category is most of these companies or establishments maintain their inventory with either a Microsoft Excel sheet or manually. Some of these establishments doesn’t even have an inventory record.

Because of this reason most of these businesses or establishments can lose their capital and as a result of that reason these establishments most of the time declare bankruptcy. The staff of the company can even commit inventory theft by utilizing Microsoft Excel sheets or the old-fashioned pen and paper approach and if they are employing these conventional techniques, employees can even modify the records. Using this inventory management system, records may only be changed by the owner or the appropriate employee who has the proper authority.

1.2 Problem Identified

The problem our group found was those traditional methods of record-keeping in an organization can lead to numerous mistakes such as, product misplacements, employee theft of goods or the firm's assets, when it comes to inventories or warehouses. Even when something like this occurs, it is easier to change these traditional records and ensure that no one can identify it. Therefore, these issues may be not reported to the organization's management.

1.3 Solution

For the problem we identified, the solution we came up was a JAVA based “Inventory Management System” that can easily keep records of the organisation’s inventory. By this system only the owner or the relevant employee with the given authorization can only alter the records as mentioned in above. Therefore, corruption within the organisation will be drastically reduced. Most of the large-scale organizations use these types of systems to organize their inventory. But the problem is they are far more expensive and very confusing for a normal human being with a basic knowledge of computers.

So, we thought about making this system less expensive and reasonable for a person who owns a small business organization. And we thought about making the system more simplistic, so the owners do not need that much of expertise to use this system. We are hoping that this solution will help the organization massively because it will reduce the risk of error unlike traditional means of record keeping.

2.0 Objectives

In this project, there are several objectives which can be also known as milestones. The final objective of our project is to create, develop, and provide a cutting-edge system that will please our users with our "Inventory Management System" solution.

However, the final overall objectives which will be accomplished by developing this system are mentioned below,

- Can access real-time data about the inventory.
- Improved security and loss prevention of the organization’s data.
- Can improve the accuracy of the data.
- Helps the decision-making process and evaluation of the inventory.
- Cost efficiency
- Increased time efficiency.
- Can reduce stealing and corruption.
- No need to create and analyse reports because it automatically happens.
- Reduced costs for manual data recording methods.
- Can access from anywhere around the world.

To accomplish those objectives our team is moving along with our schedule to complete the relevant tasks and each member will be assigned to complete specific tasks based on their abilities, expertise, and potential. As a group we identified the main areas we need to be done in order to develop this amazing “Inventory Management System” and they are mentioned below,

1. Planning
2. Analysis
3. Design
4. Deployment

2.1 Planning and Resource Allocation

The first step we will be completing is a feasibility study about the proposed project. This is an evaluation to check whether we can achieve this project's objectives successfully and this analysis will also help to identify the important risks associated with the project that must be manged if the project is approved. This will be completed by the entire group and overseen by the group leader. There are 6 parameters we are going to analyse to check the proposed idea's technical feasibility, schedule feasibility, economic feasibility, operational feasibility, and they are,

- Technology
- Financial capability
- Stakeholders
- Time
- Resources (labour, infrastructure.)
- Legal aspect

Planning is done after the feasibility study is completed. Therefore, we can get an idea about our maximum potential to develop a solution for this problem. Planning is overseen by the planning leader in the group. This will be done by focusing on the following key areas,

- Objectives of the system.
- Scope of the system.
- Time estimation.
- Identifying the resources which are needed.
- Budget planning.
- Staffing the project.
- Allocating the resources.
- Management of the identified risks.

2.2 Analysis

When designing a system, it is crucial to collect requirements from the targeted audience who requires a solution to the problem otherwise, the solution won't be applicable to that audience and won't be effective. The project group leader oversees this goal, the requirement gathering. The requirements collection will be done by conducting,

- Observations
- Interviews
- Questionnaires
- Document review
- Surveys

This will help us to understand about how their current inventory have been managed so far. After prioritizing the analysed requirements, we will be able to come up with an initial design for our “Inventory Management System”.

2.3 Design

In this stage, we will be designing the following,

- User interfaces
- UML diagrams
- Architectural diagrams

This will help our team to get the final idea about how we are going to design this system.

2.4 Deployment

After the design stage, we will be starting to work with the following final tasks of this project,

Development

- We will finish the system's overall coding.

Testing

- This is where it will be determined whether there are any flaws or errors in the system after it has been developed.

Implementation

- The system will now be fully implemented on the client's desktop.

3.0 Target Audience

Target audience or the expected users, who need this system are small scale businesses or establishments, and medium scale businesses which is currently in the need of an inventory system and to reduce loss preventions. These types of establishments mainly do not have any sort of system to their organization. So, they are the ideal type of users for our project.

For examples the below mentioned businesses which do not manage an inventory management system can be shown,

- Retail stores owners – Small business owners who want to manage their stock levels.
- Farmers – Small farm owners who have farms such as livestock farms, dairy farms, agribusinesses.
- Wholesale distributers –Small business owners that sell the products in bulk.
- E-commerce business owners – Small business owners who only sells products through online platforms.
- Bookstore owners – Small store owners that sell books stationary materials and etc.
- Cafes and restaurant owners – Café and restaurant owners who want to manage a system-based inventory management system.
- Small educational institutions – Small institutions owners who want to manage an inventory for purposes such as number of students who have registered, monthly fees of the students etc.
- Government offices – Officers who need to keep their records securely and accurately.
- Hotel owners – To keep records about each inventory.
- Warehousing facilities – Warehousing facilities that rents warehouses.
- Hospitals – Remote hospitals who need to keep track about their medical equipment.

4.0 Application Features and Description

4.1 Programming language: Java

Java is a widely used programming language used to build desktop and mobile applications. Platform independence is one of the main advantages of Java programming language allowing the program to be able to run on various operating systems (Windows, macOS, Linux) with little modifications. Java also uses a large standard library providing a wide range of functionalities. It is not necessary to heavily rely on third-party libraries to implement application features. Scalability is also a major factor in choosing Java as the programming language for the IMS desktop application.

4.2 Framework: JavaFX

JavaFX provides a more modern user interface compared to Swing. JavaFX also supports CSS styling, animation, and 3D graphics and richer in UI components such as charts, and tables. An example will be shown below to showcase the GUIs of the JavaFX.

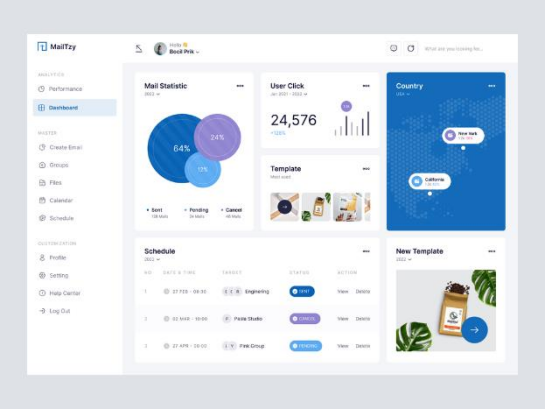

Figure 1: Example JavaFX GUI

(Source:https://www.linkedin.com/pulse/exploring-power-javafx-soheil-nazari/)

4.3Application features

Login

- Multiple users can access the system with a unique username and password.
- Admin can manage user access and activities.

Inventory Tracking

- When the business/organization receives the new stock, the inventory can be updated.
- When a customer buys products, the inventory will be automatically updated.

Product Information

- Manages a product database with details such as product ID, product name, category, quantity, etc.
- Facility to view and update the database.
- Control access of users.

Supplier Management

- Managing a supplier database with details such as Supplier ID, name, contact information, etc.
- Facility to view and update the database.

Staff Management

- Managing a staff database with details such as staff ID, name, contact information, etc.
- Facility to view and update the database.

Customer order calculation

- Provide an interface to enter product details and calculate the price of customer orders.

Notification

- Generate notifications when the stock is low.

Reporting

- Facility to generate reports on admin requests.

5.0 Time allocation

5.1 Gantt Chart

Task	Start Date	End Date	2023												2024															
			October				November				December				January				February				March				April			
			W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
Planning																														
Problem identification	01/10/2023	07/10/2023																												
Information Gathering	01/10/2023	07/10/2023																												
Feasibility analysis	08/10/2023	14/10/2023																												
Analysis																														
Requirement Gathering	15/10/2023	21/10/2023																												
Requirement Analysis	15/10/2023	22/10/2023																												
Initail Design	22/10/2023	31/10/2023																												
Design																														
Architecture design	01/01/2023	14/11/2023																												
Interface Design	15/11/2023	30/11/2023																												
Development																														
Application development	12/01/2023	31/01/2024																												
Database creation and connection	02/01/2024	29/02/2024																												
Testing																														
Bug detection	01/03/2024	07/03/2024																												
Bug fixing	08/03/2024	31/03/2024																												
User acceptence testing	01/04/2024	07/04/2024																												
Implimentation																														
Implementing the system	08/04/2024	21/04/2024																												

Figure 2: Gantt Chart

The above figure is a Gantt chart that represents our work regarding this project and in this project, there are 6 main milestones. These milestones are planning, analysis, design, development, testing and implementation. The start of the project is on 1st of October 2023 and the end of the project is on 21st of April 2024.

The first step of the project is planning and to complete this milestone we have to complete 3 sub tasks. And they are problem identification, information gathering and feasibility analysis. The start of this phase is on the 1st of October 2023 and this phase ends on 14th of October 2023.

The next phase is analysis and to complete this stage, we have to complete the following and they are, requirement gathering, analysing the collected requirements and creating an initial design. This process will be starting on 15th October 2023 and ending on 31st of October 2023.

After finishing the analysis stage, we are going to move up to the design phase. In this phase we will create architectural designs and UI/UX designs. This process will start on 1st of November 2023 and will end on 30th November 2023.

Then we will start our development phase which will be the most challenging part of our project. In this phase we will develop the application then create and connect a database to the system. This will start on 1st of December 2023 and will end on 29th February 2024.

After completely developing the system, we will be moving on to the testing stage and in this stage, there will be 3 sub tasks and they are, bug detection, bug fixing and user acceptance testing. This stage will start on 1st of March 2024 and will end on 7th April 2024.

Implementation stage is the final stage of the project. We will implement this system to its user so they can get to know more about the system and use it. This process will start on 8th April 2024 and will end on 21st of April 2024.

6.0 Budget

This project will have a zero cost as this is a software product and we only give a software product to the client. Therefore, this will be a zero-budget project.

7.0 Conclusion

As the conclusion, our group found that many small to medium scale businesses are suffering from issues which are occurred because of poorly maintained inventories. As a solution for that, we came up with a JAVA based inventory management system which will help these businesses or establishments properly maintain their inventory. And the development team will consist of 3 skilled personal. The target audience will be small to medium scale businesses in Sri Lanka. The main objective of this project is to help these businesses increase their efficiency in their inventory while avoiding employee theft. This project will be completed on 21st of April 2024.

References

Statistics, D. o. C. a., 2023. *ECONOMIC STATISTICS OF SRI LANKA,* s.l.: s.n.