Supermarket Automation Software

A Feasibility Study and Analysis

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Introduction

This study is based on the feasibility of a Supermarket Automation Software. It is initially planned to be implemented for a local market to automate their manual efforts and improve their management policies and decisions. This will impact our community by improving the sales and benefits after implementation of this model.

Current System vs Proposed System

The current system has its strengths in delivering the proper items in proper condition on time. It can handle high demands and offers their products to the community at a high discounted price.

The weaknesses of the current system take place in its automation efforts and management. A lot of manual interventions are required in the supermarket which can easily be automated with our proposed system. From the management perspective, the supermarket manager can be provided more insights regarding the sales and trends for each item in the supermarket which will help out a lot in planning and taking major business decisions.

Project Background

We are planning to implement our project as a web-application. The computer systems to be provided to the supermarket employees will be Windows-based systems to provide a user-friendly user-interface which will benefit them in their training as well.

1.Project Initiation

This project was initiated with the following main motives:

- Serving our local community and providing a helping hand to an already profitable business.
- To further knowledge in software project development and management
- To test my skills as a software developer

Problem Statement

The manager of a supermarket wants us to develop an automation software. The supermarket stocks a set of items. Customers pick up their desired items from the different counters in required quantities. The customers present these items to the sales clerk. The sales clerk passes the items over a bar code reader and an automatic weighing scale and the data regarding the item type and the quantity get registered.

• SAS should at the end of a sales transaction print the bill containing the serial number of the sales transaction, the name of the item, code number, quantity, unit price, and item price. The bill should indicate the total amount payable.

• SAS should maintain the inventory of the various items of the supermarket. The manager upon query should be able to see the inventory details. In order to support inventory management, the inventory of an item should be decreased whenever an item is sold. SAS should also support an option by which an employee can update the inventory when new supply arrives.

• SAS should support printing the sales statistics for every item the supermarket deals with for any particular day or any particular period. The sales statistics should indicate the quantity of an item sold, the price realized, and the profit.

• The manager of the supermarket should be able to change the price at which an item is sold as the prices of the different items vary on a day-to-day basis.

Project Objectives

The following are the objectives to be met by the project:

- Generating report based on sales statistics of items
- Managing the inventory with updated sales items
- Providing a user-friendly interface to the supermarket employees
- Logging transactions and generating bill receipts
- Updating the sales prices for items by manager
- Developing a database architecture to log and store all records pertaining to item information and sales transactions

Feasibility Analysis

The feasibility of the proposed system is high as it is solving real world problems by automation and computerized systems. On implementation of the system, the manual efforts will be highly reduced and major processes of the supermarket will be automated. The managers and major decision makers for the supermarket will also be greatly benefitted. The feasibility of the project is further measured on the following subcategories:

Operational Feasibility

In the perspective of operational feasibility, the project has high feasibility. The problems mentioned in the problem statement can be solved by implementing an automation system based on the following technology stack. The user interface can be designed using HTML and CSS. For the business logic and data flow modelling JavaScript/Java Servlet can be used. The backend database to be compatible with the UI and the hosted operating system can be implemented using Microsoft SQL Server Management Studio/MongoDB based on the feasibility.

The goal of this study is to understand the degree to which our proposed system is working. Based on our operational analysis, the project has a high degree of feasibility and can easily solve the above-mentioned problems on implementation.

Technical Feasibility

Technological feasibility is to understand the organizational capability to work with the proposed system. The technologies mentioned are freely available and the technical skills required to implement are manageable. Time limitations for the product development process and ease of implementation are synchronized.

Initially the web hosting platform will be free tier plan and based on workload and traffic, the software can be easily scaled to a higher bandwidth plan. The training and transition of the staff members to use the software will be relatively easy and simple as it would have a user-friendly interface. From all of this analysis, we can conclude that our system will be technically feasible.

Economic Feasibility

The software being a web application will incur an initial development and hosting cost. Since the initial bandwidth requirement is very less and the application does not include multimedia data transfers, the financial costs will be reasonably low and feasible.

After the development and successful implementation, the maintenance and administration of the system will incur separate costs. Bug fixes and feature updates will also be included as a part of the software maintenance. Besides the associated costs, there will be many benefits for the customers as well associated with existing system automation and increase in sales

From the above implications, it is clear that SAS is financially feasible

Cost Benefit Analysis

In the project, the cost and benefit categories are analyzed and are as follows:

Tangible Costs

The tangible costs involved in the initial development and implementation of SAS are:

Purpose	**Quantity**	**Unit Price (Rupees)**	**Total Price (Rupees)**
Computer Systems	4	20,000	80,000
Printers	4	5000	20,000
Database	3	3000	9000
Staffing and Training	N/A	4000	4000
Software Development	N/A	4000	4000
Implementation	N/A	5000	5000
Monthly Maintenance	N/A	5000	5000
Grand Total			**1,27,000**

Intangible Costs

The intangible costs associated with SAS are as follows:

- Energy Consumption
- Consumer's Dissatisfaction

Tangible Benefits

Tangible benefits are items which can be quantified in monetary terms and with certainty. Some of them as summarized below:

- Increase flexibility
- Improvement of management control and planning
- Increasing sales in current supermarket.

Intangible Benefits

These are the benefits for which a value cannot be precisely determined. Some of them are summarized below:

- Effective service for consumers
- Consumer satisfaction index
- Accurate selling process for items

Technical Risk Evaluation

As a part of the software development and management process, it must be ensured to be prepared for any risks and issues encountered. Technical risks encountered can ve as follows:

- Software crashes encountered on new releases
- Loss of data and source code due
- Loss of sales statistics and transaction details
- Security breach encountered in the software

The following steps are taken to troubleshoot and remedy any technical risks encountered.

- Software code should be well documented
- Proper unit and integration testing must be performed
- The code must be source controlled and versioning should be done through GIT
- Proper periodic updates will be provided for the software
- Backup of the database and web application must be generated periodically for disaster recovery
- Proper administrative practices must be followed and documented by the employees
- Adhering to proper network and software security guidelines