American International University-Bangladesh

Department of Computer Science

Faculty of Science and Technology [FST]

SOFTWARE DEVELOPMENT AND PROJECT MANAGEMENT[D]

Section: [B]

Group No: 10

Project Title

Store Management System.

Submitted By

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1.0 Introduction:

The purpose of this document is to provide an in-depth overview of the project's objectives and functionalities by Eagle Solution. We are aiming for an extensive number of readers, including developers, business analysts and project stakeholders that the document serves as a primary source of reference. A unified goal can be achieved among all concerned stakeholders by establishing good communication through a clear definition of the project's purpose and scope. The primary goal is to guide the process of development and implementation facilitating a seamless and collaborative approach to accomplish the project's expected outcomes.

2.0 Project Title: " Store Management System" developed by Eagle Solution.

3.0 Objectives:

- ***Objective 1:*** Implement a role-based system for efficient user management.
    - *Subobjective 1.1:* Develop Admin functionalities for user addition, modification, and removal.
    - *Subobjective 1.2:* Implement Manager roles for product and staff management.
    - *Subobjective 1.3:* Enable Staff with read-only access to stock details and order fulfillment responsibilities.
- ***Objective 2****:* Establish product and stock management.
    - *Subobjective 2.1:* Allow Admin and Manager to create, modify and manage product details.
    - *Subobjective 2.2:* Enable allocation of products to specific racks and sub-racks.
    - *Subobjective 2.3:* Provide Staff with real-time stock monitoring for order fulfillment.
- ***Objective 3:*** Facilitate seamless transactions and billing.
    - *Subobjective 3.1:* Grant Admin and Manager access to transaction reports and analytics.

    - *Subobjective 3.2:* Empower Staff to process customer transactions and provide receipts.
- ***Objective 4:*** Implement additional features for enhanced functionality.
    - *Subobjective 4.1:* Develop a secure login system for Admin, Manager, and Staff.
    - *Subobjective 4.2:* Enable Admin to add and manage Managers and Staff.
    - *Subobjective 4.3:* Implement resource allocation functionalities.
    - *Subobjective 4.4:* Provide a centralized view of resources for Admin and Manager.
    - *Subobjective 4.5:* Incorporate features for customer details, payments, and payment history.
    - *Subobjective 4.6:* Integrate functionalities for blocking users, applying discounts, and loyalty programs.
    - *Subobjective 4.7:* Implement systems for user feedback, product reviews, and ratings.
    - *Subobjective 4.8:* Develop a robust search system for customer navigation.
    - *Subobjective 4.9:* Implement functionalities for returns, refunds, and comprehensive reporting.

4.0 Justification:

The Store Management System is justified as it addresses critical business needs. It enhances efficiency through role-based access, ensuring secure operations and maintaining data integrity. The system facilitates data-driven decision-making, optimizing inventory management and overall business performance. A user-friendly interface elevates customer experiences, and additional features like discounts and loyalty programs foster customer satisfaction and loyalty. The system's scalability ensures long-term relevance, while centralized data minimizes errors and reduces costs. It stands as a strategic investment for sustained growth, trust-building, and operational excellence in the dynamic retail sector.

5.0 Systems Overview: (Includes Use case diagram)

5.1 Overview:

The proposed Store Management System is a comprehensive solution designed to streamline and optimize the operations of a retail store. This system aims to provide efficient management, enhanced user experiences, and data-driven decision-making through role-based access control and a robust set of features.

5.2 Use Case:

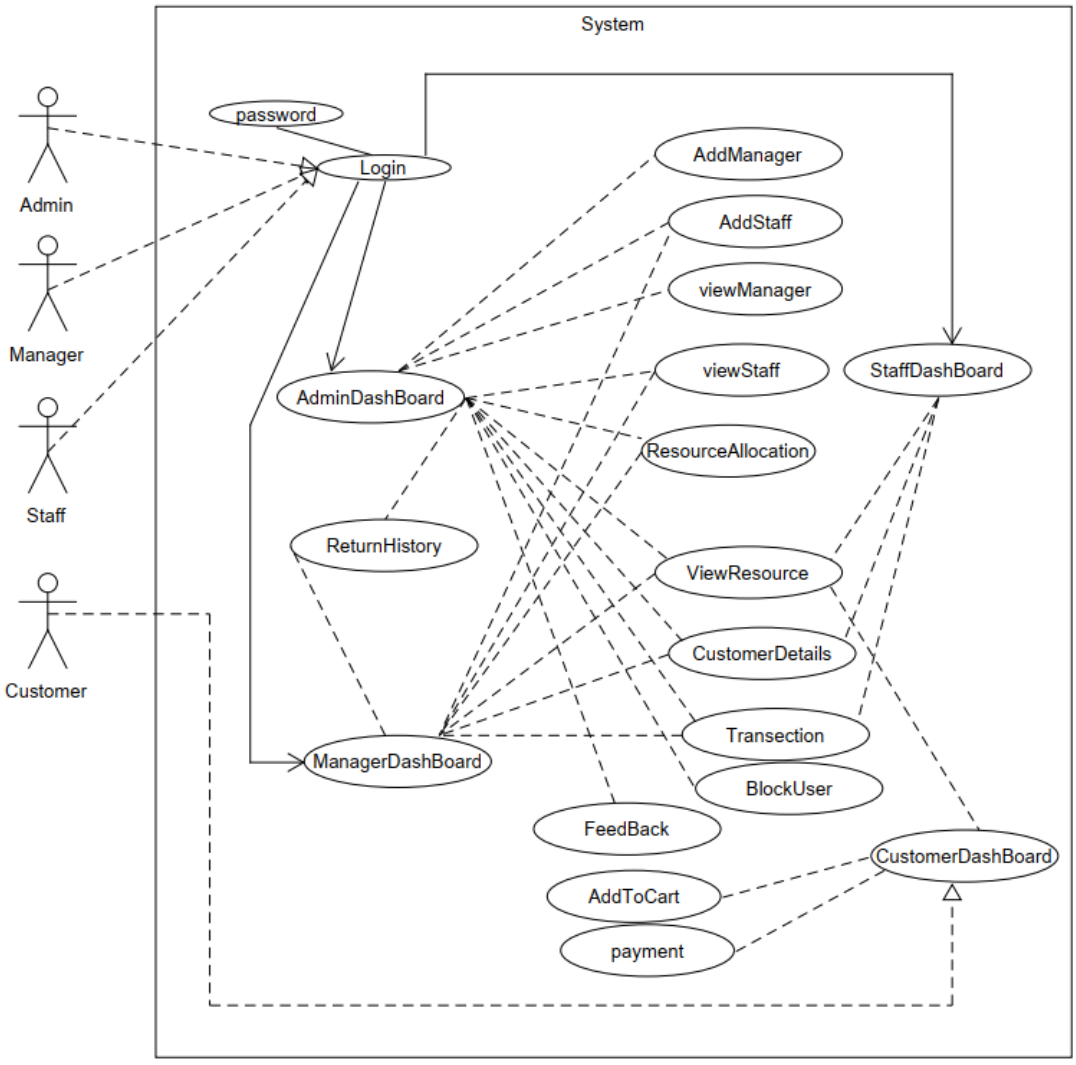

Figure-1: Use Case of Store Management System.

6.0 Stakeholders analysis:

Primary Stakeholders:

1. **Admins:** Holders of full control over the system.

2. **Managers:** Responsible for product and staff management.
3. **Staff:** Involved in day-to-day operations, focusing on stock and customer interactions.
4. **Customers:** End-users interacting with the system during purchases.

Secondary Stakeholders:

1. **Developers:** Responsible for system development, coding and programming.
2. **IT Support Teams:** Handling technical support and maintenance.
3. **Product Suppliers:** External entities providing the store with products.
4. **Business Analysts:** Analyzing system performance and providing insights.
5. **Risk Management Consultants:** Advising on potential risks.

7.0 Feasibility study:

Technical Feasibility: The Store Management System is designed to operate seamlessly on standard computers. Compatibility testing will be conducted across various devices and operating systems, including Windows, to confirm feasibility. The system will be built with technologies such as HTML5, CSS3, and JavaScript for the front end, along with .NET and PHP for backend development. This ensures compatibility, security, and scalability across diverse platforms.

The utilization of Microsoft SQL Server for database management aims to provide robustness and scalability necessary for handling extensive product, customer, and transaction data. The system's architecture will be designed to accommodate increased user loads during peak operational hours, ensuring scalability through load balancing and optimized server configurations. Additionally, the system will support integration with external services, facilitating real-time data synchronization and updates.

The technical feasibility analysis suggests that the proposed Store Management System aligns well with available technology, infrastructure, and software requirements. This alignment ensures the effective development and implementation of the system.

Financial Feasibility: The initial development costs for the Store Management System encompass expenses such as developer salaries, software licensing fees, and infrastructure setup. The estimated budget for these costs is calculated at 37,86,120 BDT. The client has committed to covering the necessary expenses, and the revenue projections indicate that the operational income will align with the incurred costs, ensuring financial sustainability post-implementation.

In conclusion, the Store Management System is financially feasible, with the client's commitment to covering the initial investment and the expected alignment of revenue sources with operational costs. The concept that the system's development and installation will be economically feasible is supported by this feasibility assessment.

8.0 Systems component:

8.1 User Management:

8.1.1 User Registration and Account Management:

- Account creation and authentication.
- User profile setup and customization.
- Role-based access control for Admin, Manager, Staff, and Customer.

8.2 Product and Stack Management:

8.2.1 Product Management:

- CRUD operations for products.
- Image storage and retrieval.
- Pricing and inventory management.

8.2.2 Stock Management:

- Assigning products to specific racks and sub-racks.
- Real-time stock monitoring for order fulfillment.

8.3 Transaction Processing:

8.3.1 Transaction Handling:

- Processing customer transactions.
- Generating receipts for completed transactions.
- Updating inventory after each transaction.

8.3.2 Payment Integration:

- Integration of payment methods for customer transactions.
- Secure payment processing.

8.4 Reporting and Analytics:

8.4.1 Sales Reports:

- Overview of sales data and trends
- Filterable reports for specific time frames.

8.4.2 Inventory Reports:

- Real-time inventory status and updates.
- Low-stock alerts to prevent stockout.

8.5 User Interface

8.5.1 UI Design

- User-friendly interfaces for Admin, Manager, Staff, and Customer.
- Responsive design for optimal user experience.

8.5.2 Dashboard Management:

- Centralized dashboard for quick navigation.
- Access to key information and functionalities.

8.6 Additional Components:

8.6.1 Advanced Search:

- Search capabilities for products, customers and orders.
- Filtering and sorting options.

8.6.2 Loyalty Program:

- Loyalty program scheduling.
- Implementation of discounts and rewards for customers.

8.6.3 Product reviews and ratings:

- Collection and display

8.6.4 Helpdesk:

- Customer support.
- Ticketing system for issue tracking.

9.0 Process Model to be followed:

For our Store Management System, we have Chosen Waterfall model because of it might be beneficial for us. As we all know, it's a sequential and structured approach to software development, where each phase is completed before moving on to the next stage. Now here I'm going to justify why we are choosing the waterfall model for our project:

- **Well-Defined Phases**: In waterfall model, each phase has a clear focus, which can be advantages in complex projects like Store Management Systems. This structured approach can help us to ensure that all aspects of the system are thoroughly addressed.
- **Clear Requirements:** Because we have a well-defined and stable set of requirements from the start of our project, this model can be effective.
- **Predictable Timeline:** In this model's sequential nature allows for better predictability in terms of timeline and budget. Our project is under fintech domain and this type of project strictly needs to follow the timeline and budget.
- **Internal and External Reporting:** Some fintech related companies often need to provide progress reports to both internal stakeholders and external partners. Because of this model clear milestones and documentation can aid in producing these reports.
- **Well Defined Testing:** In this model, it typically includes dedicated testing phases after development. For our project, comprehensive testing is crucial to ensure both accurate policy calculations and security.
- **Stable Environment:** This model provides a stable environment it can be beneficial for us. Because all of our tools, technology and working methodology are well-established.
- **Client Involvement:** This model encourages strong client involvement during the Requirement Gathering phase to Deployment phase.

10.0 Efforts estimation:

Software Projects	a	b	c	d
Organic	2.4	1.05	2.5	0.38
Semi-Detached	3.0	1.12	2.5	0.35
Embedded	3.6	1.20	2.5	0.32

Constructive Cost-Model:
SLOC=15000 lines
Project Type: **Organic**
Co-Efficient: 2.4 [a=2.4, b=1.05, c=2.5, d=0.38]
Person Month, PM= Coefficient< effort Factor>*(SLOC/1000) ^P
= 2.4*(15000/1000) ^1.05
= 41.22

Development Time, DM= $(2.5*41.22^{0.38})$
= 10.27
= 11 Months
= 44 Weeks (22 Working Days per Month)
= 1549 Hours

Working Hour Required People ST= PM/DM
=41.22/11
= 3.75
= 4 people

Budgeting:

Developer Salary for 12 Months:

Per Developer Salary Per Working Hour = 800 Tk
Total Developer Salary= 800*1549
= 1,239,200 Tk

Project Manager Salary for 12 Months:

Project Manager Per Month Salary = 70000 Tk
Project Manager Total Salary = 70000*11
= 770,000 Tk

Requirement Analysis:

Time Needed: 1 Month (22 working Days= 176 Working Hour)
Requirement Analysis Person's Hourly Wage = 700 Tk

Total Requirement Analysis Expense = 700*176= 123,200 Tk
Transportation Cost Estimation = 30,000 Tk
Training and Hardware Expenses Estimation= 1,70,000 Tk

Rent Expense:

Room Per month = 17000 Tk
For 11 Months = 17000*11
= 187,000 Tk

Total Utilities in 11 Months: 100,000 Tk

Maintenance (Till 10 Months After Delivery):

Time for Maintenance Per Month = 12 Hours
Expense Per Hour = 1000 Tk
Total Estimated Time needed For Maintenance = 120 hours
Total Estimated Maintenance Cost = 1000*120
= 120,000 Tk

Marketing Expense: 50,000 TK

Web Hosting Expenses for 1 year: 7000Tk

Backup Storage Cost for 1 year: 15000 Tk

Hardware Expense: 200,000 TK
Consultant Expense: 100,000 Tk

Total Estimated Expense: 1,239,200+770,000 +123,200 +30,000 +1,70,000 +187,000 +120,000 +50,000 +7000+15000+200,000+100,000
=2,912,400

Profit:

30% Of Total Estimated Expense= 2,912,400*30%
= 873,720Tk
Total Estimated Expense = 873,720+2,912,400
=3,786,120Tk

Total Project Budget: 3,786,120 **Tk**

Milestone:

Milestone	Description	Date
Complete SRS	• Meeting with customers. • Identify needs and project constraints. • Product statement	5 weeks
Complete Requirement Analysis	• Functional Specification • Technical Specification • Non-Functional Specification	10 weeks
Complete Planning	• Define Scope and Objective • Project plan, timeline • Resource Allocation • Review Planning	15 weeks
Design	• System UI, Database Scheme Generation • High level UI Design Architecture • Development of User Interface	20 weeks
Complete Coding	• Define system functionality. • Define behavior. • Customer module • Admin module • Manager module • Staff module • Product module • Integrate all modules. • Integrate database. • Integrate additional component	35 weeks
Complete Management	• Isolation Software Elements • Represent IN • Store in GitHub	40 weeks
Complete Testing	• Functional and Non-functional testing • System Testing • Evaluate technical checking. • Evaluate all function and module	45 weeks

Deployment and Installation	• Deploy the system in server. • User acceptance testing • Customer Reviews	47 weeks

Table-2: Milestone List of Store Management System.

Gantt Chart:

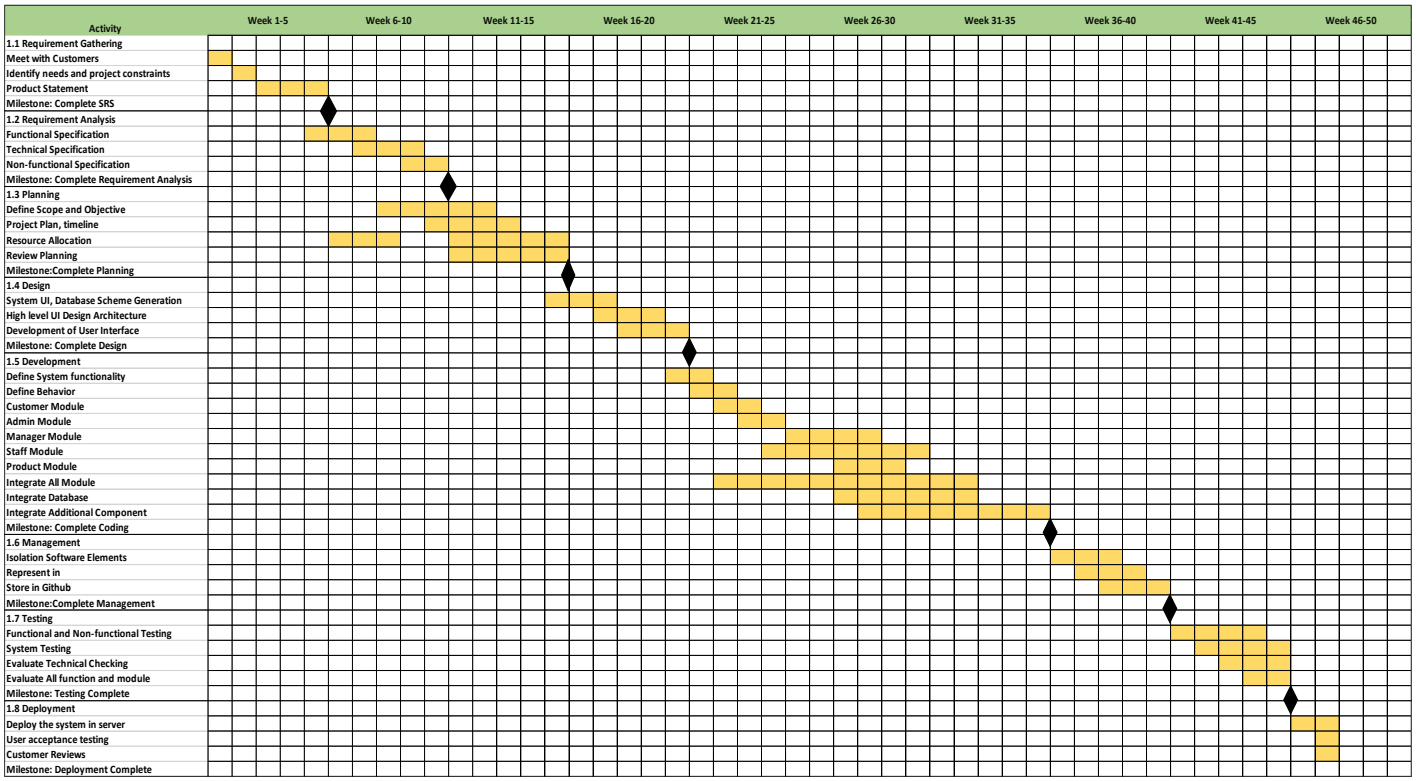

Figure-2: Gantt Chart of Store Management System.

Work Break Down Structure:

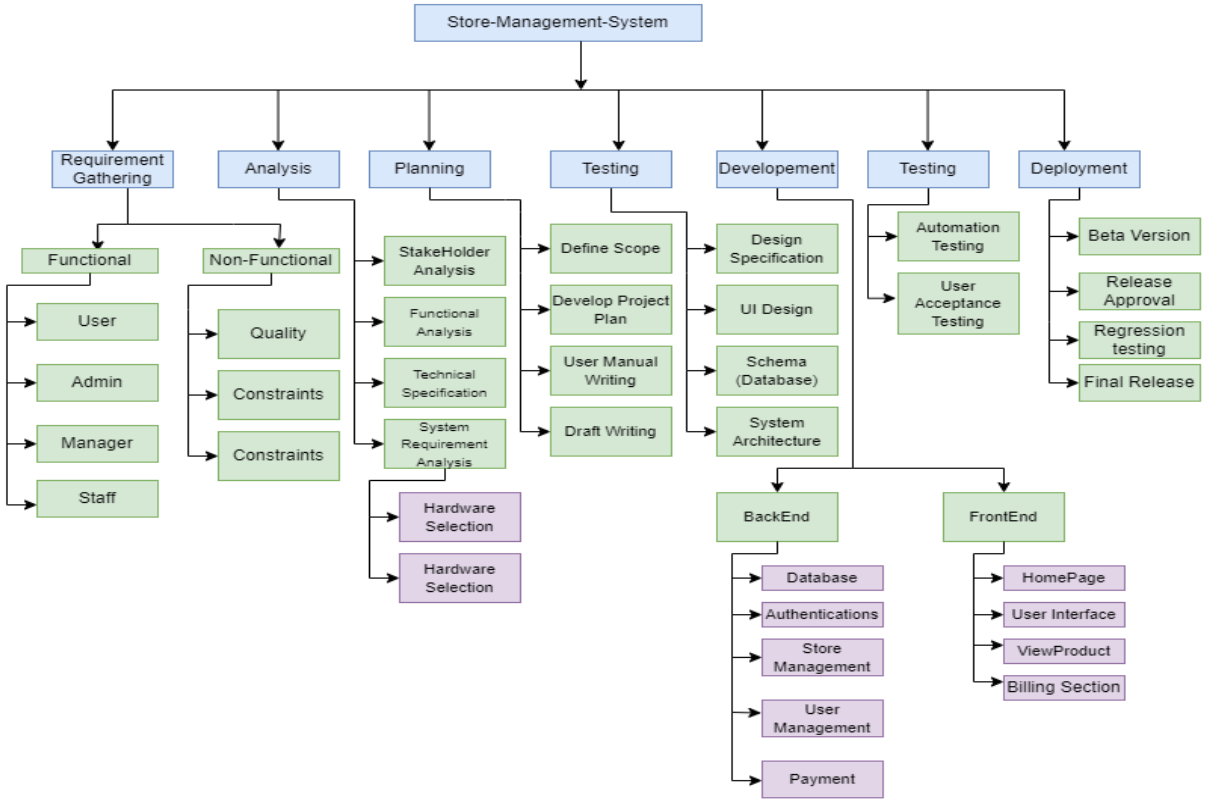

Figure-3: Work Break Down Structure of Store Management System.

11. 0 Activity Diagram:

Activity	Duration(Week)	Precedence
A. Requirement Gathering	4	-
B. Requirement Analysis	4	**A**
C. Planning	5	**B**
D. Hardware Selection	1	**C**
E. Software Selection	1	**C**
F. Design	7	**C**
G. File Creation	5	**C**
H. Write User Manual	10	**C**
I. Development	15	**D, E, F**
J. Testing	7	**I**
K. Deployment	2	**G, H, J**

Table-3: Activity Chart of Store Management System

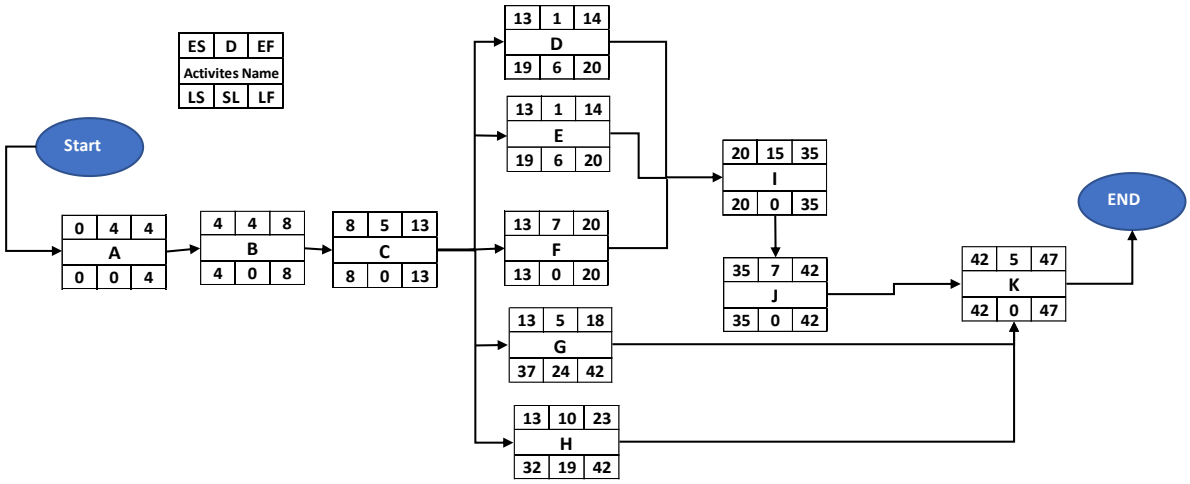

Figure-4: Activity Diagram of Store Management system

From This diagram we get:

- **PATH 1:** A+B+C+F+I+K= (4+4+5+7+15+7+5) = 47
- **PATH 2:** A+B+C+D+I+J+K= (4+4+5+1+15+7+5) = 41
- **PATH 3:** A+B+C+E+I+J+K= (4+4+5+1+15+7+5) = 41

- **PATH 4:** A+B+C+G+K = (4+4+4+5+5) = 22
- **PATH 5:** A+B+C+H+K = (4+4+4+10+5) = 27

After finding all the path we can say that **PATH 1** is the Critical Path.

12.0 Risk Analysis:

ID	Description	Risk Categories	Probability	Cost	RE	Utility Policy
1	Human errors in development environment	Development Environment	6	8	48	Ensure resource certainty
2	Late changes in requirements	Project Size	5	8	40	Timely changes handling
3	Difficulty in ensuring data privacy	Business Impact	6	10	60	Secured data
4	Underestimation of project size	Project Size	7	6	42	Accurate size estimation
5	System taking more time for certain data	Project Size	8	6	48	Optimize system performance
6	Lack of necessary customer interactions	Project Size	4	7	28	Ensure customer interactions.
7	Lack of training in computer operations	Development Environment	6	5	30	Ensure adequate training
8	High rate of staff turnover	Stuff Size	8	7	56	Aim for a low staff turnover

Table-4: Risk Analysis Chart of Store Management System

In this table we take the probability and cost on a scale of 1 to 10. If the rating is higher than the more serious hazards, If the rating is lower than the risk is also less. Because we have already completed identifying risk now we have to plan for our risk. There are some steps of planning where we will decide what to do with risk

- **Risk Acceptance**: There is no other way to accept the risk rather than prevent the risk.
  - **Example**: During system testing, it may show detecting problems in inventory management. But with insufficient time to address them before the release, we may accept the risk for the initial launch and plan to rectify it in subsequent updates.

- **Risk Avoidance**: Avoiding the activity that could bring risk.
  - **Example**: In a team of 4 developers assigned to build the Store Management System, there is a potential risk. If one team member faces challenges and cannot complete a critical activity on time, it could impact the project timeline. To mitigate this risk, we propose involving another eligible team member from the beginning. But involving another member who is eligible to handle the same work, we could involve him with the project from the starting period by maintaining the same or moderately high employee cost.

- **Risk Transfer**: Transferring the risk prevention responsibilities to another team or organization.
  - **Example**: Identifying the risk of data transfer between system modules affecting detailed product information. We can transfer the responsibility for risk prevention to external organizations through a contractual agreement.

- **Risk Reduction**: The actions to reduce a particular risk.
  - **Example for Project**: To address the risk of system crashes, we could develop a mechanism to save data during unexpected failures, allowing the system to retrieve data without starting from scratch after a crash.

- **Risk Mitigation**: Trying to reduce the post-impact of a risk.
  - **Example for our Project**: In response to a high rate of staff turnover, we could mitigate the risk by hiring talented fresh graduates with competitive salaries until the completion of the project. In cases of confusion regarding risk prevention or acceptance, we may use "Risk Reduction Leverage" (RRL) to evaluate cost-effectiveness.

We can save 0.4 percent of this loss by paying BDT 60,000 to teach some individuals on-site work, but there are no end-user trainers. Thus, there is a 5% possibility of failures of BDT 1,50,000. We'll appreciate the RRL's value if it costs more than one.

RRL= {(REbefore – REafter) / Risk reduction cost}

= {(5% of 1,50,000) – (0.4% of 1,50,000)}/60,000

= (7500 – 600) / 60000

= (6900 / 60000)

= 0.115

As the RRL< 1, the step is not worth doing. These are the possible risks and prevention for our Store Management System project.

13.0 Budget for the project:

The fee for the whole project from the first step to the last one will be 37,86,120 BDT. The breakdown is provided below:

Expenses	Total Amount (BDT)
Development cost	12,39,200
Project Manager cost	770,000
Requirement analysis	123,200
Transportation	30,000
Training and Hardware	170,000
Office Rents	187,000
Utilities	100,000
Maintenance	120,000
Marketing	50,000
Web Hosting	5,000
Backup Storage	15,000
Consultant Expense	1,00,000
Hardware Expense	2,00,000
Total Cost is	**29,12,400**
For Profit 30% of total cost	8,73720
Total Budget is	**37,86,120**

Table 5: Budget of Store Management System.

14.0 Conclusion:

This “Store Management System” document outlines the comprehensive framework for the development by Eagle Solution. With a clear understanding of the project's objectives, user roles, and functionalities, stakeholders can align their efforts towards achieving the system's goals. The justification highlights the critical business needs that the system addresses, emphasizing its potential to enhance efficiency, decision-making, and customer satisfaction in the retail sector. The stakeholder analysis identifies key players, ensuring a collaborative approach to system development. Moreover, the technical and financial feasibility studies underscore the viability and strategic value of the proposed system. As we embark on this journey, the Store Management System is poised to become a cornerstone for operational excellence, growth, and trust-building within the dynamic landscape of retail management.

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