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Software Development Project Management Final Project

Project Title: Textile Operations Management System

Course Title: Software Development Project Management

Section: [D]

Course Teacher: Md. Anwarul Kabir

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1.0 Project Introduction:

For a textile dyeing unit, a dyehouse management system must be created to facilitate digital record keeping, inventory tracking, and forecasting. The software program must be web-based in order to be securely accessed by users with varying levels of access from any location. The software must be able to accept inputs for all textile-related tasks and generate clear results with images for quick interpretation. For continuous updates and maintenance, continuous integration and continuous delivery (CI/CD) must be implemented.

2.0 Project Title:

Textile Operations Management System

3.0 Objectives: This project is to create a web-based management system for a textile dyeing factory where data entry operators can create entries from different documents such as chemicals consumption sheet, gate pass, daily dyes and chemicals report. These inputs are then saved to a database and are used to create reports

➤ The tracking of orders that are being processed and the inventory needs that result from processing the orders present challenges for Crystal Composite Limited. Although daily data are being gathered, they do not give a thorough picture of the operations. Due to this, they are experiencing problems with congestion and improper usage of their time slots, which results in inefficiency and losses.

➤ The root cause of the problems is that the data are being collected and compiled using legacy systems and tools like excel sheets. The data is therefore hard to comprehend and cannot be accessed from everywhere by management for them to be able to make quick decisions and foresee necessary actions.

4.0 Justification:

This project is to create a web-based management system for a textile dyeing factory where data entry operators can create entries from different documents such as

chemicals consumption sheet, gate pass, daily dyes and chemicals report. These inputs are then saved to a database and are used to create reports.



Crystal Composite Limited are facing difficulty with the tracking of orders that are being processed and the inventory requirements that arise with processing the orders. The day-to-day data are being collected but the data does not provide any comprehensive overview of the operations. Because of this, they are facing issues like congestion and their time slots are not being utilized properly leading to inefficiency and losses.



The root cause of the problems is that the data are being collected and compiled using legacy systems and tools like excel sheets. The data is therefore hard to comprehend and cannot be accessed from everywhere by management for them to be able to make quick decisions and foresee necessary actions.

5.0 Project Overview:



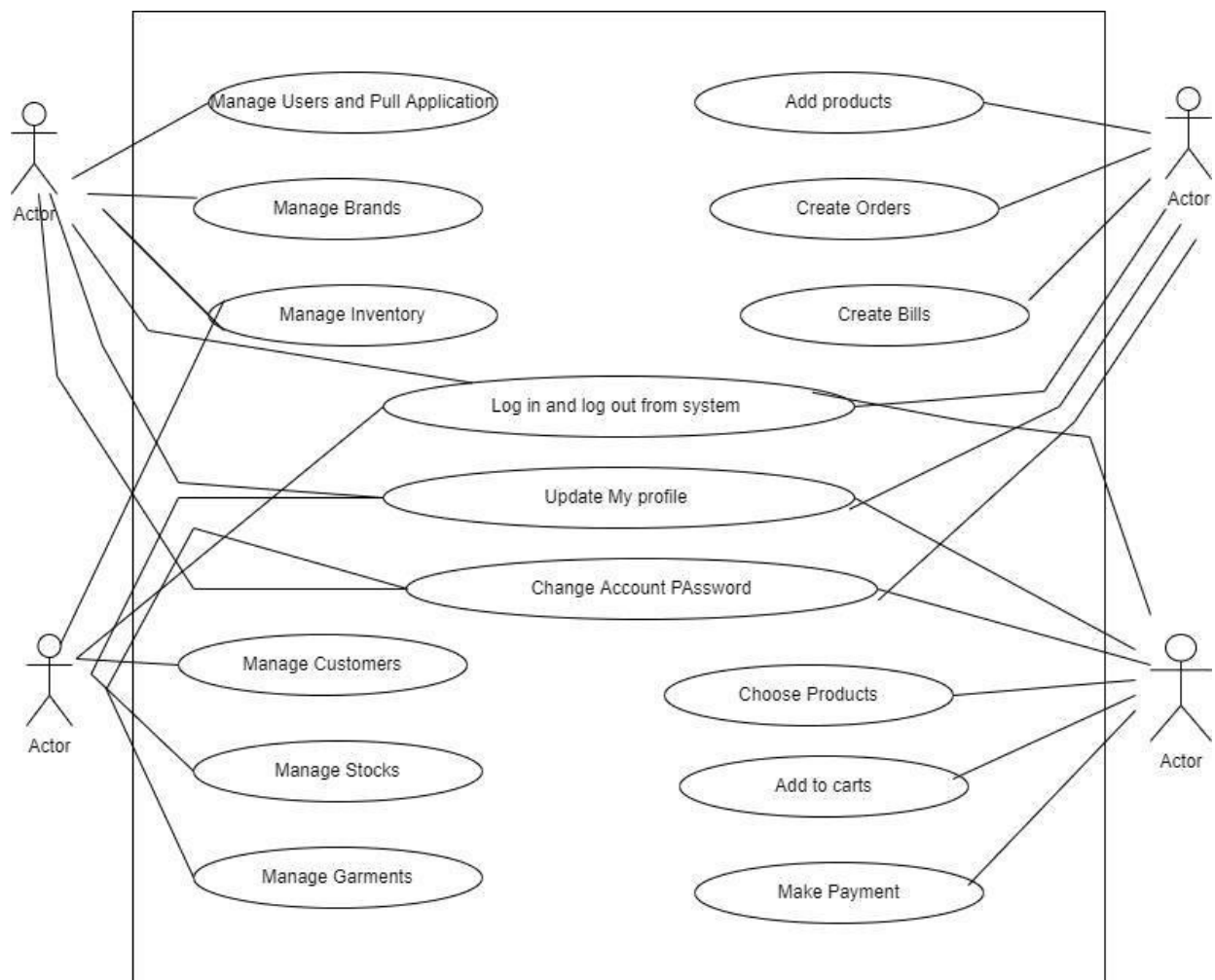
The software shall allow users to login with their given username and password.



If the username and/or password has been inserted wrong for more than three times, the random verification code will be generated by the system to retry login.

- ✓ If the number of login attempt exceed its limit (5 times), the system shall block the user account login for one hour *[optional function]*.
- ✓ The software shall have several user levels.
- ✓ The software will have different views and functionalities based on the user level.
- ✓ Privileged users can update/edit presets that are required for the software to operate.
- ✓ The software shall track live cash transactions and balance data records with preceding targets.
- ✓ The software shall track remaining chemical inventory, chemical inventory purchases and daily usage.

Use Case Diagram:



6.0 Stakeholders analysis:

Type of Stakeholders:

1. Internal Stakeholder:

An internal stakeholder is a person, group or a company that is directly involved in the project.

Project Manager: Responsible for managing the whole project. Project Manager is generally never involved in producing the end product but he/she controls, monitors and manages the activities involved in the production.

Project Team: Performs the actual work of the project under the Project Manager including development, testing, etc.

Company: Organization who has taken up the project and whose employees are directly involved in the development of the project.

Funders: Provides funds and resources for the successful completion of the project.

2. External Stakeholder:

An external stakeholder is the one who is linked indirectly to the project but has significant contribution in the successful completion of the project.

Customer: Specifies the requirements of the project and helps in the elicitation process of the requirement gathering phase. Customer is the one for whom the project is being developed.

Supplier: Supplies essential services and equipment for the project.

Government: Makes policies which helps in better working of the organization.

7.0 Feasibility study:

Usability: A trained user shall be able to submit a complete request for a chemical selected from a vendor catalog in an average of four and a maximum of six minutes.

Availability: The system shall be accessible over the internet from any device including mobile devices.

8.0 Systems component:

1. System Login

Functional Requirements

1. The software shall allow users to login with their given username and password
2. If the username and/or password has been inserted wrong for more than three times, the random verification code will be generated by the system to retry login.
3. If the number of login attempt exceed its limit (5 times), the system shall block the user account login for one hour *[optional function]*

Priority Level: High

Precondition: user have valid user id and password

2. Restricted Views

2.1 The software shall have several user levels.

2.2 The software will have different views and functionalities based on the user level.

Priority Level: High

Precondition: correct user levels are set

3. Privileged users can update/edit presets that are required for the software to operate

Priority: High

Precondition: Users are created with correct access levels.

4. Live production tracking

4.1 The software shall provide data on ongoing production

Priority Level: High

Precondition: Required data are available

5. Cash and expenses tracking

5.1 The software shall track live cash transactions and balance data records with preceding targets

Priority Level: High

Precondition: Operations presets and targets are available and preset by enterprise board

6. Chemical inventory tracking:

6.1 The software shall track remaining chemical inventory, chemical inventory purchases and daily usage

Priority: Medium

Precondition: Existing inventory balances and their purchase records including Purchase rates, Total Purchases will be compiled

7. Chemical inventory alerts

7. 1 Software will alert users when it is time to restock Commodity dyeing chemicals

Priority: High

Precondition: Commodity Materials Critical Presets, average time to restock material are taken into account and critical levels are preset.

8. List view of orders

8.1 Software will display total list of orders that have and have not been allocated a production schedule

Priority: Medium

Precondition: All Orders, Contact Directory, Production Pricing is readily available for the user to select.

9. Order schedule

9.1 Software will display allocated orders according to calendar and date of selection, materials required, total cost of production and profit margins of proceeding order with a link on the dashboard.

Priority: High

Precondition: User will allocate all orders according to the best allotted machine according to production capacity

10. Requisition management

Software will display all required Materials for procurements according to required dates and average usage rates

Priority: High

Precondition: All Average Usage Rates, Orders and Materials Remaining Datasets have to be preset and functioning in synchronization for the requisition management system to be able to operate coherently.

Speed: Any system feature shall not take longer than 30 seconds to load with a 1MBps connection or above.

9.0 Process Model to be followed:

A **waterfall** display is a traditional display that can be utilized to create a structure with a simple and unified design throughout the structure's development process. The show is referred described as a waterfall because it essentially progresses in a downward pattern from one stage to the next. An alternative name for this is a life cycle display that runs linearly. It is quite simple to acquire and use. A waterfall show requires that each phase be fully performed; rarely, a phase will only just begin. As part of requirements structuring, engineers enter each prospective requirement for a structure into a prerequisite archive. Recently, the following stages of improvement—each of which must be completed—were established. Perfect for small businesses with definite needs.

10.0 Efforts estimation: *Here we use the **cocomo model** to estimate the estimation of our project. Suppose that our project is an organic type. The project is estimated to be 14,000 SLOC. Now we have to calculate effort, development time and required number of people.*

project type= organic, So

Coefficient<Effort Factor>=2.4, SLOC= source lines of code=14000, P= project complexity=1.05

We know that,

$$\begin{aligned}\text{Effort} = \text{PM} &= \text{Coefficient<Effort Factor>} * (\text{SLOC}/1000) ^P \\ &= 2.4 * (14000 / 1000) ^{1.05} \\ &= 38\end{aligned}$$

Here, T= SLOC-dependent coefficient=0.38, PM=38

We know that,

$$\begin{aligned}\text{Development time} = \text{DM} &= 2.50 * (\text{PM})^T \\ &= 2.50 * (38) ^{0.38}\end{aligned}$$

=10 month

Here, PM=38, DM=10

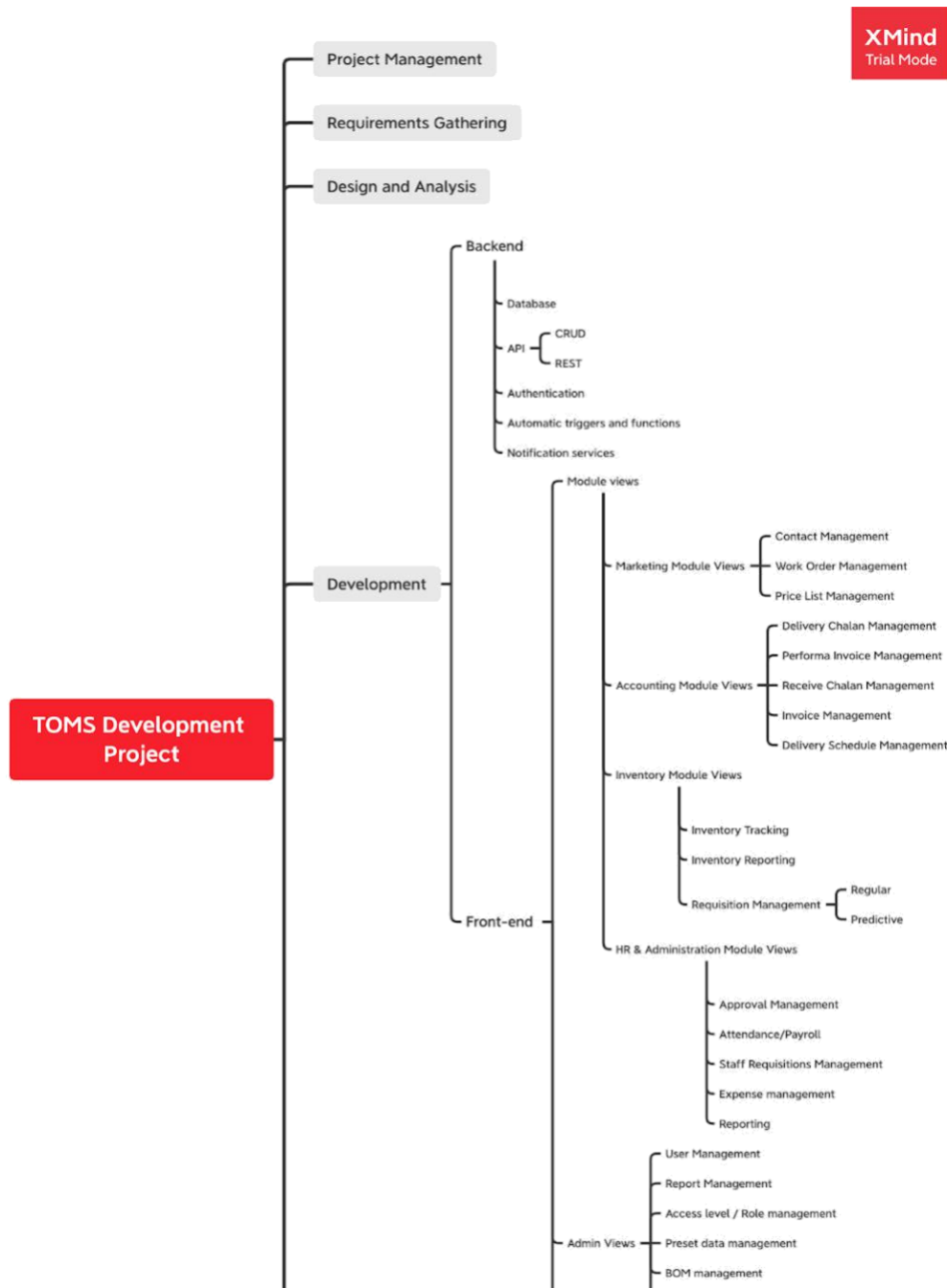
We know that,

Required no. of people = ST = PM/DM

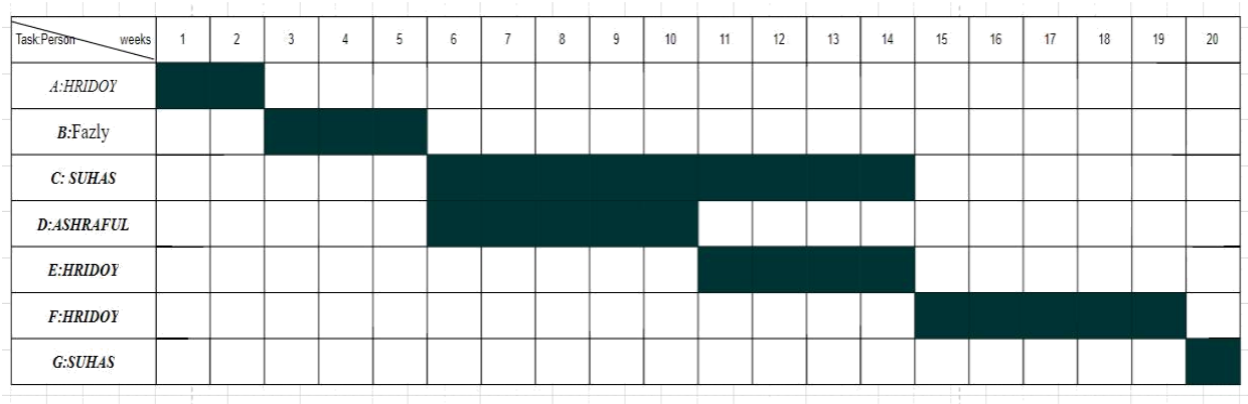
= 38/10

=4

Work Breakdown Structure:



11.0 Activity Diagram:



ACTIVITY KEY:

A. Requirements Gathering

B. Design and analysis

C. Backend Development, Mock API and API

D. Frontend development, Module views

E. Frontend development, Admin views and reports

F. Testing

G. Deployment

12.0 Risk Analysis:

Risks	Category	Probability	Impact	RMMM
Size estimation significantly low	PS	30%	2	<ul style="list-style-type: none"> - Use multiple size estimation techniques to verify the estimation. - Have room for error in the budget
Developer inexperienced	ST	40%	2	<ul style="list-style-type: none"> - Define required experiences for the job clearly while recruiting.

				- Have senior developer with previous experience lead the development work
Customer changes requirement at development stage	PS	60%	2	- Communicate scope of changes and the change control policy clearly with the customer - Have a change control board
Technology stack gets deprecated	TE	20%	3	- Use LTS versions where possible - Decouple as much as possible so replacements are possible.
Breaking changes in prebuilt packages	TE	30%	2	- Prevent automatic updates to the repository modules and packages - Analyse each update before applying the updated version - Use a version control system
Funding lost	CU	15%	1	- Communicate frequently - Secure early funding - Collect an upfront payment

Impact values:

Catastrophic -1

Critical - 2

Marginal - 3

Negligible - 4

13.0 Budget for the project:

Here per developer salary per working hour=800 taka.22 days working day in a month and 7 hours working hours in day

Here 10 months= $10 \times 22 \times 7 = 1540$ working hour.

Total developer salary= $800 \times 1540 = 12,32,000$ Taka

For requirement analysis,

Time 1 month= $22 \text{ days} \times 7 \text{ working hour}$

=154 working hour

Hourly wage of 1 requirement analysis person= 300-taka

Total cost= $300 \times 154 = 46,200$ Taka Transport; 10000

Taka

Utility cost in 10 months, 12,000 Taka

Hardware Expenses= 80,000 Taka

Rent service: Room per month :7000 taka

10 months =70000 Taka

Maintenance cost= Required time 50 hours

Per hour cost 1100 taka

Net total cost= $1100 \times 50 = 55000$ Taka

Training cost= 10,000 Taka

Total estimation cost= $1,056,000 + 35,200 + 12,000 + 16,000 + 1,20,000 + 50,000 + 50,000 + 10,000$

$= 12,32,00 + 46,200 + 10000 + 12000 + 80000 + 70000 + 55000 + 10000$

$= 15,15,200$ Taka

Profit:

20 % of total estimation cost= $15,15,200 \times 18\%$

$= 2,72,736$

Total budget of project $= 15,15,200 + 2,72,736$

$= 17,87,936$ Taka

14.0 Conclusion: In Bangladesh, the textile industry has been significant. The textile industry in Bangladesh is made up of a variety of small to large privately and publicly owned businesses. The majority of the textile businesses in our country focus on paper. Although some businesses employ automated systems, the number is very small. These businesses produce textile-related products. This project seeks to keep an eye on every business operation, including order taking, sampling, purchasing raw materials, producing the items, shipping, and billing. Because these tasks are currently performed manually by the company, they take a long time to complete

