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# ASSIGNMENT 3

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Software Project Management



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Question # 1:

Risk Register

ID	Risk Description	Category	Likelihood (L)	Impact (I)	Risk Level (L x I)	Mitigation Strategy	Contingency Plan	Owner	Status
R1	<b>Technical Skill Gap:</b> The development team lacks the required technical skills to implement advanced features.	Technical	Moderate	High	High	Conduct regular skills assessments to identify gaps. Provide targeted training sessions and mentorship programs. Collaborate with external experts if necessary.	Have a contingency plan to hire or consult external specialists if skill gaps persist.	Project Manager	Pending
R2	<b>Hardware/Software Constraints:</b> Unforeseen issues with servers, development tools, or databases may arise, causing delays.	Technical	Low	Moderate	Low	Regularly monitor and test the hardware/software infrastructure for vulnerabilities. Maintain relationships with reliable vendors for quick issue resolution.	Have backup servers and tools ready to minimize downtime. Regularly update and test backup and recovery procedures.	Development Team	Pending

R3	<b>User Feedback Participation:</b> End users might not actively participate in providing feedback or testing the system.	User Involvement	Moderate	Moderate	Moderate	Implement a user engagement plan, including incentives for feedback. Conduct frequent communication and feedback sessions.	Collaborate with marketing and community organizations to encourage user participation. Offer rewards or recognition for active participants.	Project Manager, UX Designers	Pending
R4	<b>Budget Overrun:</b> The project may exceed the allocated budget due to unexpected expenses.	Financial	Low	High	Moderate	Implement strict budget monitoring mechanisms, conduct regular financial reviews, and communicate budget status transparently with stakeholders.	Define clear criteria for budget adjustments and seek sponsor approval for any deviations. Identify potential cost-cutting measures without compromising project quality.	Project Manager	Pending
R5	<b>Technology Stack Compatibility:</b> Issues may arise if the chosen MERN stack is not suitable for certain functionalities.	Technical	Moderate	High	High	Regularly assess technology stack compatibility through prototyping and testing. Keep abreast of updates and improvements in the MERN stack.	Have alternative technology stacks identified and ready for implementation. Develop a migration plan if necessary.	Development Team	Pending
R6	<b>Time Constraints:</b> The project may face delays in completion within the allocated five-month timeframe.	Schedule	Moderate	High	High	Implement a robust project schedule with clear milestones. Conduct regular progress reviews and adjust the schedule as needed.	Identify critical path activities and allocate additional resources if required. Communicate schedule changes transparently with stakeholders.	Project Manager	Pending
R7	<b>Scope Creep:</b> Additional features or changes to project scope may be introduced during development, impacting timelines and resources.	Scope	High	Moderate	High	Clearly define project scope in the initial planning phase. Implement a change control process for scope modifications.	Document and assess the impact of scope changes before approval. Allocate additional resources if necessary.	Project Manager	Pending
R8	<b>Dependency Risks:</b> Delays in third-party software or services could impact project timelines.	External Dependencies	Moderate	High	High	Identify critical dependencies early in the project. Establish communication channels with third-party providers.	Have contingency plans for alternative providers or solutions. Regularly communicate with third-party providers to monitor their timelines.	Development Team	Pending

R9	<b>Data Security Concerns:</b> Breaches or vulnerabilities in the system's security could compromise user data.	Security	Low	High	Moderate	Implement robust security measures during development. Conduct regular security audits and penetration testing.	Have a response plan for data breaches, including communication and recovery procedures. Regularly update security protocols.	Data Security Experts	Pending
R10	<b>Integration Challenges:</b> Integrating various system modules may pose challenges leading to functionality issues.	Technical	Moderate	High	High	Plan and test integrations thoroughly during development. Establish clear communication channels between development teams working on different modules.	Conduct integration testing at various stages of development. Have a rollback plan in case of integration failures.	Development Team	Pending

Question # 2:

Stakeholder Risk Register

ID	Stakeholder	Role	Interest Level	Power Level	Engagement Level	Communication Preferences	Expectations
S1	<b>Dr. Asif Muhammad Malik</b>	Project Supervisor and Manager	High	High	Actively Involved	Regular meetings, detailed progress reports, email updates	Overall project success, alignment with organizational goals, and return on investment
S2	<b>Huzefa Tanveer (Development Team)</b>	Development Team Member	High	Moderate	Actively Involved	Daily stand-up meetings, collaboration tools, instant messaging	Successful implementation of technical aspects, adherence to timelines
S3	<b>Aans Rehman (Development Team)</b>	Development Team Member	High	Moderate	Actively Involved	Daily stand-up meetings, collaboration tools, instant messaging	Successful implementation of technical aspects, adherence to timelines
S4	<b>Teachers (End Users)</b>	End Users	High	Low	Moderately Involved	Surveys, feedback sessions, periodic updates	User-friendly platform, improved learning experience, efficient content delivery
S5	<b>Students (End Users)</b>	End Users	High	Low	Moderately Involved	Surveys, feedback sessions, periodic updates	User-friendly platform, enhanced engagement, and understanding of video lectures
S6	<b>Administrators</b>	System Maintenance and Monitoring	Moderate	Moderate	Moderately Involved	Periodic system reports, meetings for issue resolution	Stable and secure system performance post-launch
S7	<b>Educational Institutions (External Stakeholders)</b>	External Stakeholders	High	Moderate	Periodically Informed	Periodic progress reports, presentations, email updates	Alignment with educational needs, potential profitability
S8	<b>Potential Investors (External Stakeholders)</b>	External Stakeholders	High	Moderate	Periodically Informed	Periodic progress reports, presentations, email updates	Potential return on investment, alignment with educational goals

S9	<b>Regulatory Authorities, IT, and Infrastructure Teams (External Stakeholders)</b>	External Stakeholders	Moderate	High	Periodically Informed	Periodic progress reports, technical documentation	Compliance with regulations, robust IT infrastructure, data security
S10	<b>Data Security Experts (External Stakeholders)</b>	External Stakeholders	High	High	Periodically Informed	Periodic security reports, meetings for security discussions	Robust data security measures, compliance with security standards

### Question # 3:

#### 1. Check Sheets:

Definition:

Check Sheets, also known as tally sheets or frequency charts, are simple tools used to systematically collect and organize data. They are designed to facilitate the recording of data in a structured format, making it easier to identify patterns or trends.

Purpose:

- **Data Collection:** Check Sheets are primarily used for collecting data on the frequency of specific events or issues.
- **Visual Representation:** They provide a quick and visual way to interpret data, often using tick marks or other symbols.

Application in Project Management:

- **Defect Tracking:** Check Sheets can be employed to track defects or errors during the project development phase.
- **Process Monitoring:** Teams can use Check Sheets to monitor the frequency of various process-related issues or deviations.

Our Project Checksheet:

Date	Task/Activity	Assigned To	Status	Comments/Notes
01-09-23	Project Kick-off Meeting	Dr. Asif Muhammad Malik	Completed	Successfully launched the project with clear goals.
02-09-23	Team Formation and Roles Assignment	Project Manager (Dr. Asif Muhammad Malik)	Completed	Roles defined, and responsibilities assigned.
03-09-23	Development Team Daily Stand-up Meeting	Development Team (Huzefa Tanveer, Aans Rehman)	Ongoing	Regular updates on project progress and challenges.
10-09-23	Stakeholder Engagement Review	Project Manager	Pending	Stakeholder engagement levels to be assessed.
15-09-23	Progress Presentation to Potential Investors	Project Manager, External Stakeholders	Pending	Preparation underway for project progress presentation.
20-09-23	System Maintenance and Security Discussion	Administrators, Data Security Experts	Pending	Review and discussion scheduled for ongoing system maintenance and security measures.

#### 2. Histogram:

Definition:

A Histogram is a graphical representation of the distribution of data. It displays the frequency of data points within specified ranges or bins, presenting a visual overview of the data's central tendency and spread.

Purpose:

- **Data Distribution:** Histograms help in understanding the distribution of data and identifying patterns.
- **Variability:** They highlight variations and trends in the data.

Application in Project Management:

- **Performance Metrics:** Histograms can be used to analyze project performance metrics, such as task completion times or defect counts.
- **Resource Allocation:** Project managers can use histograms to visualize the distribution of resource usage across different project tasks.

Our Histogram:

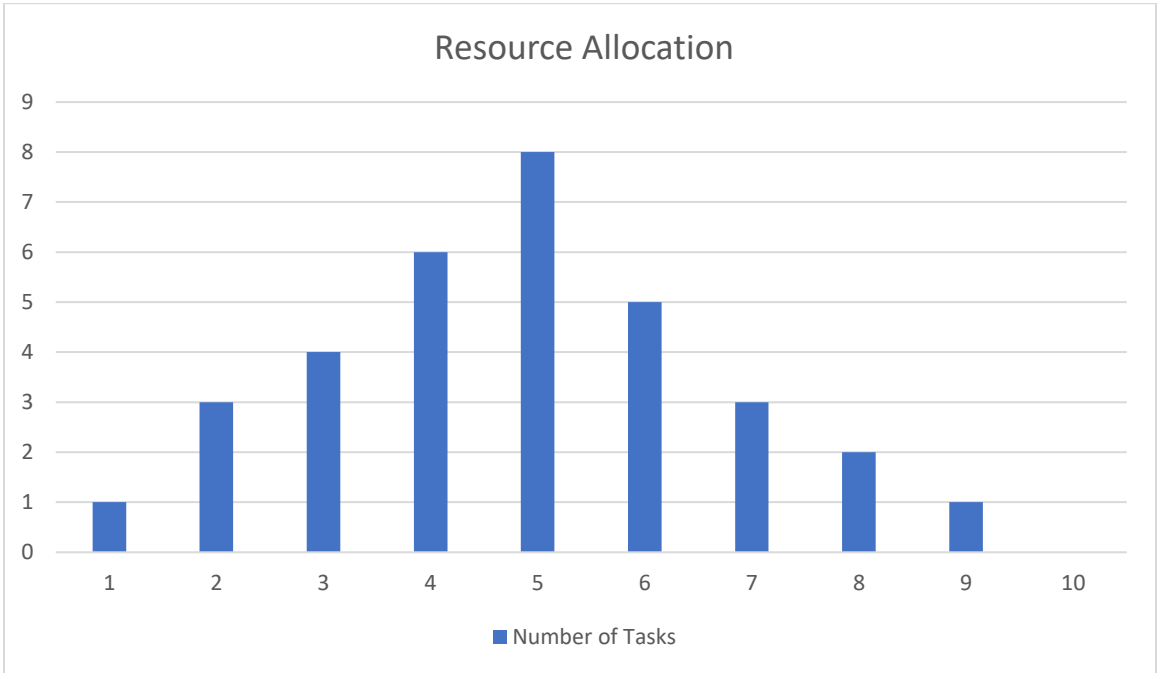


Figure 1: Histogram

- Resource Allocation is represented on the x-axis, and the Number of Tasks is represented on the y-axis.
- This histogram illustrates the distribution of tasks across a more granular scale of resource allocation.

3. Fishbone Diagram:

Definition:

A Fishbone Diagram is a visual tool that helps identify and analyze possible causes of a specific problem. It is called a "fishbone" because of its shape, resembling the skeletal structure of a fish.

Purpose:

- **Root Cause Analysis:** Fishbone Diagrams are particularly useful for identifying the root causes of problems.
- **Structured Brainstorming:** They facilitate a structured approach to brainstorming and problem-solving.

Application in Project Management:

- **Issue Resolution:** Teams can use Fishbone Diagrams to systematically identify and address the root causes of project issues.
- **Risk Analysis:** The tool is also helpful in identifying potential risks and their underlying causes.

Our Project Fishbone Diagram:



Figure 2: Fishbone Diagrams: I have also mentioned all the data mentioned in the textual format below incase if it is not visible. I have made this diagram on some paid tool that's what I wasn't able to take a clear picture.

1. Technical Issues:

- *Inadequate Testing Procedures:*
  - Lack of comprehensive test plans.
  - Insufficient testing of edge cases.
- *Software Bugs and Glitches:*
  - Limited use of automated testing tools.
  - Incomplete debugging processes.
- *Integration Issues (MERN Stack):*
  - Challenges in integrating MongoDB, Express.js, React, and Node.js.
  - Compatibility issues between different components.

2. Resource Constraints:

- *Insufficient Development Team Resources:*
  - Limited skilled developers.

- High workload leading to burnout.
- *Hardware Resource Limitations:*
  - Inadequate server capacity.
  - Slow development environments.
- *Budget Constraints:*
  - Resource allocation challenges.
  - Insufficient funds for necessary tools and technologies.

### 3. Communication Challenges:

- *Lack of Clarity in Project Requirements:*
  - Unclear or evolving project specifications.
  - Misalignment between stakeholders and development team.
- *Ineffective Team Communication:*
  - Lack of regular team meetings.
  - Insufficient use of collaboration tools.
- *Misalignment with Stakeholders:*
  - Unmet expectations on project progress.
  - Differences in understanding project priorities.

### 4. External Dependencies:

- *Vendor-Related Delays:*
  - Delays caused by third-party vendors.
  - Unpredictable changes in vendor timelines.
- *Delayed Receipt of Third-Party Software:*
  - Dependencies on external tools and software.
  - Challenges in obtaining necessary licenses.
- *Unanticipated External Service Issues:*
  - Third-party services not meeting project timelines.
  - Unexpected changes in external service availability.

Cause-and-Effect Relationships:

- **Technical Issues:**
  - *Cause:* Inadequate system testing procedures.
  - *Effect:* Potential introduction of bugs, leading to delays in development and testing.
- **Resource Constraints:**
  - *Cause:* Insufficient development team resources.
  - *Effect:* Slower progress on coding tasks and longer development cycles.
- **Communication Challenges:**
  - *Cause:* Lack of clarity in project requirements.
  - *Effect:* Increased likelihood of misunderstandings, rework, and project delays.
- **External Dependencies:**
  - *Cause:* Delays caused by dependencies on external vendors.
  - *Effect:* Extended project timelines due to external factors beyond the project team's control.

## 4. Flow Chart:

Definition:

A Flow Chart is a visual representation of a process, showing the sequence of steps and decision points. It uses different shapes to represent various elements, such as processes, decisions, and inputs/outputs.

Purpose:

- **Process Visualization:** Flow charts provide a clear and concise visualization of complex processes.
- **Process Analysis:** They help in analyzing the flow of activities, identifying bottlenecks, and optimizing processes.

Application in Project Management:

- **Project Workflow:** Flow charts can be used to map out the workflow of a project, illustrating the sequence of tasks and decision points.
- **Process Improvement:** Project managers use flow charts to identify areas for process improvement and streamline project workflows.

Our Project Flowchart:

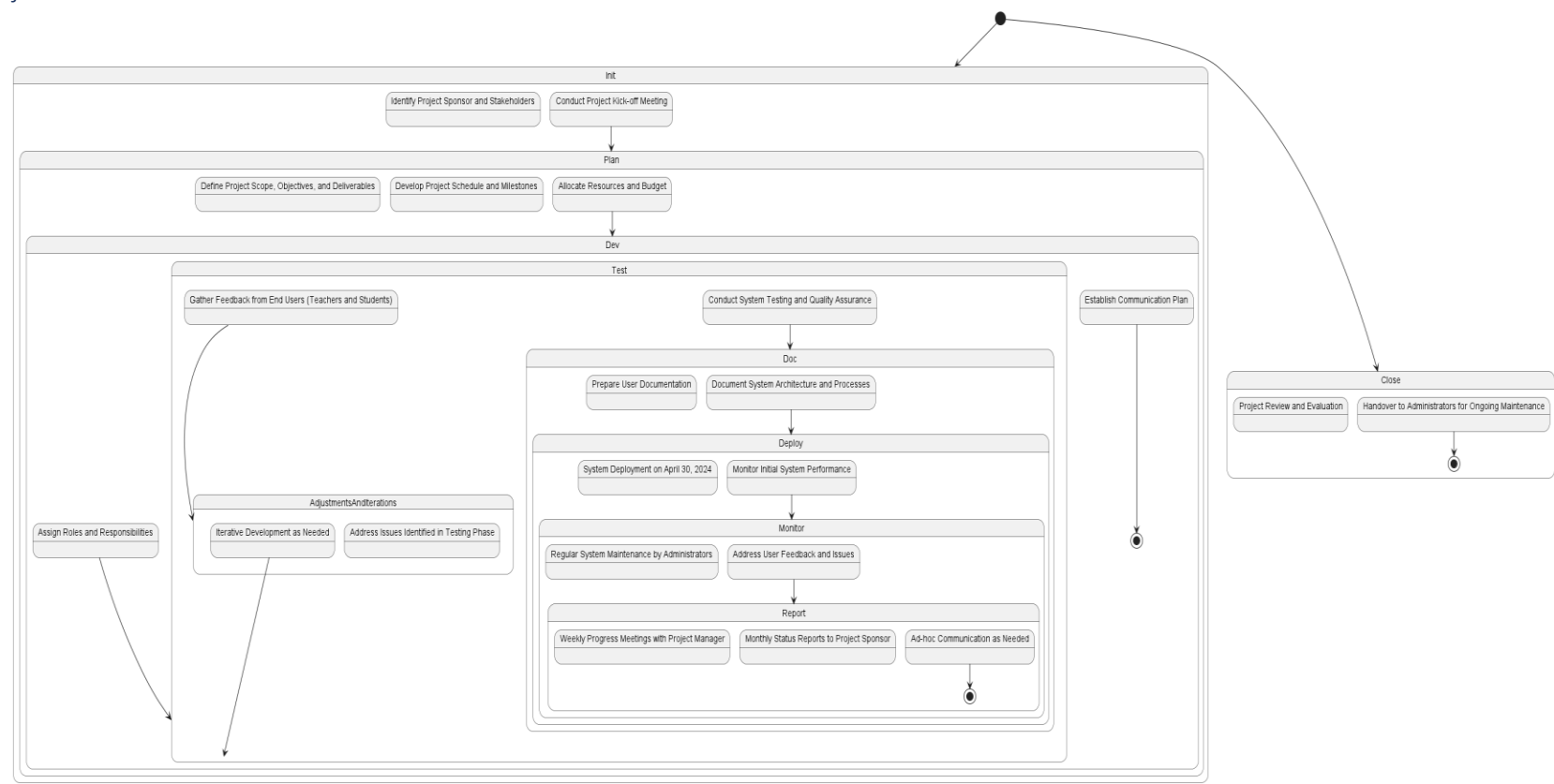


Figure 3: Flow Chart