CSC 325 SOFTWARE PROJECT MANAGEMENT

QUESTION ONE

[30 MARKS]

a. Define the following Project management terminologies;

i. Deliverables

[1 Mark]

ii. Milestones

[1 Mark]

iii. Risk mitigation.

[1 Mark]

b. Kenya Airways is in the process of developing a flight Control software for its new Boeing 787 Max 9 series planes. This is one of the biggest Software project the organization is undertaking since its inception. It is known that many IT projects undertaken usually fail. The organization is therefore keen on hiring a firm that has experts in handling software projects successfully so as to deliver this project within the set timelines and budget.

i) What do you understand by the term project?

[2 Marks]

ii) Does this undertaking qualify to be called a project? Explain.

[5 Marks]

iii) How will project management help in the success of this project.

[5 Marks]

iv) Identify and explain the stakeholders that will be directly involved in and affected by this project.

v) Site any three factors that may cause this project to fail.

[6 Marks]

[3 Marks]

e. Discuss any THREE Indicators of a successful project.

[6 Marks]

a.

i. Deliverables: Deliverables refer to tangible or intangible products, services, or results that are produced or provided as part of a project. They are the outcomes or outputs of the project activities and are typically specified in the project scope and objectives.

ii. Milestones: Milestones are significant events or achievements in a project that mark the completion of a phase, the accomplishment of a key task, or the attainment of a specific goal. They serve as checkpoints to track progress and measure success throughout the project lifecycle.

iii. Risk mitigation: Risk mitigation is the process of identifying, assessing, and implementing strategies to reduce or eliminate the impact of potential risks on a project. It involves proactive measures to minimize the likelihood of adverse events occurring and to mitigate their consequences if they do occur.

b.

i. A project is a temporary endeavor undertaken to create a unique product, service, or result. It is characterized by a defined beginning and end, specific objectives, and allocated resources.

ii. Yes, the development of flight control software for Kenya Airways' new Boeing 787 Max 9 series planes qualifies as a project. It is a temporary endeavor with a clear objective to develop a specific product (flight control software) within a defined timeframe and budget. It involves unique activities and requires the coordination of resources to achieve its goals.

iii. Project management will help in the success of this project by providing structured processes, tools, and techniques to effectively plan, execute, monitor, and control project activities. It will ensure that the project is completed within the set timelines and budget while meeting quality standards and stakeholder expectations.

iv. Stakeholders directly involved in and affected by this project may include:

- Kenya Airways executives and management: Responsible for overseeing the project, providing resources and support, and making key decisions.

- Project team members: Developers, engineers, and other personnel involved in designing, developing, and testing the flight control software.

- Boeing representatives: Collaboration with Boeing is essential for integrating the software with the aircraft systems and ensuring compliance with aviation regulations.

- Pilots and flight crew: Stakeholders who will use the flight control software and rely on its functionality for safe and efficient operation of the aircraft.

v. Factors that may cause this project to fail include:

- Technical challenges: Developing complex software for aircraft systems may encounter technical difficulties or complexities that delay progress or compromise functionality.

- Scope creep: Changes in project requirements or scope without proper management may lead to scope creep, resulting in increased costs, delays, and resource constraints.

- Budget overruns: Inadequate budget allocation or poor financial management may result in budget overruns, impacting the project's ability to deliver on its objectives.

e. Indicators of a successful project include:

- Achievement of project objectives: A successful project achieves its stated objectives, delivering the intended outcomes or results within the defined scope, timeline, and budget.

- Stakeholder satisfaction: Stakeholders, including customers, sponsors, and end-users, are satisfied with the project deliverables and the overall performance of the project team.

- Adherence to quality standards: A successful project meets or exceeds quality expectations, delivering products or services that meet specified requirements and industry standards.

- Effective communication: Communication among project team members, stakeholders, and other relevant parties is clear, timely, and transparent, facilitating collaboration and alignment towards project goals.

- Efficient resource utilization: Resources, including human, financial, and material resources, are effectively managed and optimized to support project activities and minimize waste or inefficiencies.

- Timely completion: The project is completed within the planned timeframe or within an acceptable deviation from the schedule, ensuring timely delivery of project outcomes and benefits.

QUESTION THREE [20 MARKS]

a. A software development farm has been selected to develop Kibabii University Management System. The firm contracted to undertake the a Software project in Kibabii University should anticipate some uncertainties and plan on how to control them so as to successfully manage and deliver the software.

i. Differentiate between a risk and risk management.

[2 Marks]

ii. What are some of the risks the firm should anticipate in this project?

[4 Marks]

iii. How can the project manager overcome these risks?

[4 Marks]

b. Risk management has two major components: Risk Analysis and Risk Management. Discuss the activities that are involved in each component.

[6 Marks]

d. Discuss staff selection factors the project manager will use as a basis for hiring staff for a Software project..

[4 Marks]

a.

i. Risk vs. Risk Management:

- Risk: Risk refers to the potential occurrence of events or circumstances that could have a negative impact on the project objectives. Risks can arise from various sources, including uncertainty in project requirements, technical challenges, resource constraints, and external factors such as changes in market conditions or regulatory requirements.

- Risk Management: Risk management is the process of identifying, assessing, prioritizing, and controlling risks throughout the project lifecycle. It involves proactive measures to mitigate the impact of potential risks and maximize opportunities for project success. Risk management aims to minimize the likelihood of adverse events occurring and to minimize their consequences if they do occur.

ii. Some risks the firm should anticipate in the Kibabii University Management System project may include:

1. Technical risks: Challenges related to software development, such as system integration issues, compatibility issues with existing systems, or the need for specialized expertise.

2. Requirements risks: Uncertainty or changes in project requirements, scope creep, or conflicting stakeholder expectations may impact project deliverables and timelines.

3. Resource risks: Insufficient human resources, skills shortages, or delays in procuring necessary equipment or tools could affect project progress and quality.

4. Schedule risks: Delays in project milestones, dependencies on external factors, or unforeseen events such as natural disasters or changes in regulations may impact project timelines and deadlines.

iii. The project manager can overcome these risks through various strategies, including:

1. Risk identification and assessment: Conducting a thorough risk assessment to identify potential risks and their potential impact on the project objectives.

2. Risk mitigation planning: Developing risk mitigation strategies and contingency plans to address identified risks, including allocating resources, establishing alternative approaches, or negotiating with stakeholders.

3. Risk monitoring and control: Continuously monitoring project activities and risk indicators to identify emerging risks and taking timely corrective actions to mitigate their impact.

4. Communication and stakeholder engagement: Maintaining open communication channels with stakeholders to keep them informed about project risks, mitigation efforts, and progress, and soliciting their input and support in managing risks.

b. Risk Analysis and Risk Management involve the following activities:

Risk Analysis:

1. Risk Identification: Identifying potential risks that may arise during the project lifecycle, considering internal and external factors, project scope, objectives, and stakeholders' interests.

2. Risk Assessment: Evaluating the likelihood and impact of identified risks on project objectives, using techniques such as qualitative assessment (probability and impact matrix) or quantitative analysis (Monte Carlo simulation).

3. Risk Prioritization: Prioritizing risks based on their severity, considering their likelihood and impact, to focus resources and attention on managing high-priority risks first.

Risk Management:

1. Risk Mitigation Planning: Developing strategies and action plans to mitigate or reduce the impact of identified risks, including risk avoidance, risk transfer, risk reduction, or risk acceptance.

2. Risk Monitoring: Continuously monitoring identified risks and their associated mitigation measures throughout the project lifecycle, tracking changes in risk factors and assessing the effectiveness of risk responses.

3. Risk Response Planning: Preparing contingency plans and response strategies to address unforeseen risks or changes in risk factors, ensuring the project remains on track to achieve its objectives.

d. Factors the project manager will use as a basis for hiring staff for a Software project include:

1. Technical expertise and experience: Assessing candidates' qualifications, skills, and experience in software development, including programming languages, development methodologies, and tools relevant to the project requirements.

2. Team compatibility and collaboration: Evaluating candidates' ability to work effectively in a team environment, communicate clearly, and collaborate with colleagues, stakeholders, and clients.

3. Problem-solving and adaptability: Seeking candidates who demonstrate problem-solving skills, adaptability to changing requirements or technologies, and a proactive attitude towards overcoming challenges.

4. Cultural fit and organizational values: Considering candidates' alignment with the company culture, values, and work ethic, as well as their potential contribution to the team dynamics and organizational goals.

QUESTION FOUR [20 MARKS]

a. In regard to the Kibabii Odel platform site with an example three main categories of outputs for

quality control? [4 Marks]

b. Describe the project management activities in the order in which they must happen stating the deliverable(s) that come out of each activity. [8 Marks]

c. Software cost estimation is an activity that will be carried out at various stages of" Software project development process. Explain specific points at which cost estimates will be required. [4 Marks]

d. Discuss some of the software cost estimation techniques the "project manager may use and when each is applicable. [4 Marks]

a. Three main categories of outputs for quality control in the Kibabii Odel platform site could include:

1. Functional Testing:

- Example output: Test cases and test results documenting the verification of functional requirements, such as user authentication, course enrollment, content access, and assessment functionalities.

2. Usability Testing:

- Example output: Usability reports and user feedback summarizing the ease of use, navigation, and overall user experience of the platform, along with recommendations for improvement.

3. Performance Testing:

- Example output: Performance metrics and analysis reports measuring system response times, scalability, and reliability under various load conditions, identifying bottlenecks and areas for optimization.

b. Project management activities and their corresponding deliverables in sequential order include:

1. Project Initiation:

- Deliverable: Project charter, defining project objectives, scope, stakeholders, and initial resources.

2. Project Planning:

- Deliverables: Project management plan, including scope management plan, schedule, budget, resource plan, risk management plan, and communication plan.

3. Project Execution:

- Deliverables: Work packages, project team assignments, progress reports, and interim deliverables as outlined in the project plan.

4. Monitoring and Controlling:

- Deliverables: Performance reports, change requests, issue logs, and updates to project documentation and plans as needed to ensure project objectives are met.

5. Project Closure:

- Deliverables: Project closure report, lessons learned documentation, final project deliverables, and formal acceptance from stakeholders.

c. Software cost estimation is required at various stages of the software project development process, including:

1. Project Initiation: Initial cost estimation is needed to develop a budget and secure funding for the project during the initiation phase.

2. Project Planning: Detailed cost estimation is required to create a comprehensive project budget and allocate resources effectively during the planning phase.

3. Change Management: Cost estimation may be necessary when evaluating change requests or scope modifications to assess their impact on the project budget and timeline.

4. Progress Monitoring: Cost tracking and re-estimation may occur throughout the project lifecycle to monitor actual expenditures against the budget and forecast future costs accurately.

d. Software cost estimation techniques the project manager may use include:

1. Expert Judgment: Involves consulting industry experts or experienced professionals to provide insights and estimates based on their knowledge and expertise. It is applicable at the early stages of project planning when historical data or quantitative methods are not available.

2. Analogous Estimation: Relies on historical data from similar projects to estimate the cost of the current project. It is applicable when there are past projects with comparable characteristics or requirements.

3. Parametric Estimation: Uses mathematical models and algorithms to calculate cost estimates based on predefined parameters and variables. It is applicable when there is sufficient data available to establish correlations between project attributes and costs.

4. Bottom-Up Estimation: Involves estimating the cost of individual project components or work packages and aggregating them to determine the total project cost. It is applicable when the project scope is well-defined, and detailed cost breakdowns are required for accurate estimation.

QUESTION FIVE [20 MARKS]

a. The project manager for developing and changing a Library borrowing system in Kibabii University has realized that the project team is going slow and may deliver the Software behind schedule.

i) What problems could the team be facing?

[3 Marks]

ii) As a project manager, how would you solve the problems?

[3 Marks]

What are some of the skills you must have in order to solve the problems during project management?

[2 Marks]

b. Discuss the Triple point constraints in project management.

[6 Marks]

c. Discuss six resources needed in software development projects

[6 Marks]

a.

i) The team could be facing several problems that are slowing down the project progress, including:

1. Lack of clear goals or objectives: The team may not have a clear understanding of the project scope, requirements, or objectives, leading to confusion and uncertainty about their tasks and priorities.

2. Poor communication: Ineffective communication among team members, stakeholders, or with the project manager can result in misunderstandings, delays in decision-making, and coordination issues.

3. Resource constraints: Limited availability of resources, such as skilled personnel, technology, or funding, may hinder the team's ability to execute tasks efficiently and meet project deadlines.

ii) To solve these problems as a project manager, the following steps can be taken:

1. Clarify project goals and expectations: Clearly communicate the project objectives, scope, and requirements to the team, ensuring everyone understands their roles and responsibilities.

2**. Improve communication:** Facilitate open and transparent communication channels among team members, stakeholders, and with the project manager. Encourage regular meetings, status updates, and feedback sessions to address concerns and resolve issues promptly.

3. Address resource constraints: Assess resource availability and allocation, identify any shortages or bottlenecks, and take proactive measures to address them. This may involve reallocating resources, seeking additional funding or support, or adjusting project timelines and priorities as needed.

To solve problems during project management, the project manager must possess various skills, including:

1. Leadership: Ability to inspire and motivate team members, provide direction, and make informed decisions to overcome challenges and achieve project goals.

2. Communication: Effective communication skills to convey ideas, instructions, and feedback clearly and concisely to team members, stakeholders, and other project stakeholders.

3. Problem-solving: Analytical and critical thinking skills to identify root causes of problems, evaluate alternative solutions, and implement effective strategies to address issues and mitigate risks.

4. Negotiation: Skill in negotiating with stakeholders, resolving conflicts, and reaching consensus to overcome obstacles and achieve mutually beneficial outcomes.

5. Time management: Ability to prioritize tasks, allocate resources efficiently, and manage project schedules to ensure timely completion of deliverables and milestones.

6. Adaptability: Flexibility and adaptability to respond to changes, uncertainties, and unexpected challenges in the project environment, adjusting plans and strategies as needed to stay on track.

b. The Triple Constraint, also known as the Project Management Triangle, consists of three key constraints in project management:

1. Scope: Refers to the specific deliverables, features, and functionalities that need to be included in the project. Any changes or expansions to the project scope can impact project timelines and budgets.

2. Time: Represents the project schedule or timeline, indicating when project activities and deliverables are expected to be completed. Time constraints define the project's deadlines and milestones.

3. Cost: Refers to the financial resources allocated to the project, including budgets for labor, materials, equipment, and overhead expenses. Cost constraints define the project's budgetary limits and financial constraints.

The Triple Constraint highlights the interdependency between these constraints, where changes to one constraint may impact the other two. For example, increasing the project scope may require more time

and resources, leading to cost overruns or delays. Similarly, accelerating project timelines may require additional resources or a reduction in scope to stay within budget constraints.

c. Six resources needed in software development projects include:

1. Human resources: Skilled personnel, including developers, programmers, testers, project managers, and other professionals, are essential for designing, developing, testing, and deploying software.

2. Technology resources: Hardware, software, development tools, and infrastructure necessary to support software development activities, such as computers, servers, databases, integrated development environments (IDEs), and version control systems.

3. Financial resources: Funds allocated for project expenses, including salaries, equipment purchases, software licenses, training, travel, and other operational costs associated with software development.

4. Information resources: Access to relevant data, documentation, requirements, specifications, and project artifacts needed to support software development activities and decision-making processes.

5. Time resources: Scheduled time allocated for project activities, including planning, design, development, testing, deployment, and maintenance phases of the software development lifecycle.

6. External resources: Support services, partnerships, and collaborations with external vendors, suppliers, consultants, or contractors who provide specialized expertise, additional capacity, or resources to complement the project team's capabilities.