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Course: Masters in Information Technology		
Unit code: ICT504		Unit title: IT Project Management
Assessment Name: Assessment-3		
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Lecturer-in-Charge: Dr. Azadeh R. Tabesh		Tutorial Group/Tutor:

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Unit Code and Name: ICT504 - IT Project Management
Assessment - 3
Instructor's Name: DR. Azadeh R. Tabesh

Title: Development of an Online Learning Management System for ABC University

Students Name: Shivani, Harsh, Sumit, Sahil
Student ID: S20241662, S20242090, S20241893, S20241859

Abstract –

This report has outlined the project management plan for the development of an Online Learning Management System for ABC University. The project is designed to address the university's issues with online course management, student monitoring, and communication between students and lecturers. The work has involved establishing project objectives, scope, and Deliverables scope, developing a work breakdown structure and a Gantt chart, and creating a project network to establish the critical path. It also examined Cost estimation, Rresource allocation, and risk management strategies. The project's attention is based on Agile methodologies based on Scrum to guarantee that project administration is performed in an iterative and adaptable manner. A comprehensive product backlog has been established for the program and sprint planning arranged. A vital dangers, including information security, user acceptance, and budget limitations, are anticipated and solved using a backup plan. This report is intended to help in developing project management abilities using orthodox principles and techniques that prepare IT students for real-world project management difficulties. The LMS execution would ensure that departmental teaching is more precise, students' commitment is improved, and educational performance is enhanced.

Introduction –

Background of the Organization

ABC University is an established higher learning institute that offers various undergraduate and graduate programs. As part of its objectives to develop more flexible learning platforms for its students, the university wants to expand its program in online education. Currently, there is no single system under which these online courses will be managed, the student progress tracked or communication facilitated between student and instructors. This lack of integration continuity strategies adversely threatens the efficient delivery of online education systems. Therefore, the university needs a custom system that will cohesively integrate these services in a single platform.

Purpose and Scope of the Project

The purpose of this project to design, develop and deploy an online learning management system that will serve the university. This LMS will have critical functionalities such as coursework management, student tracking, and communication (Heagney, (2016)). The scope, as such, will also include integration of the developed system into the university's existing active systems, after which staff and students staff training will be conducted.

Project Management Plan-

Scope Statement, Objectives, and Deliverables:

 Scope Statement- The LMS project aims to provide a central repository of online courses for course management, supervision of student progress, and communication. The system will have the capacity to develop courses, enroll students, keep track of grades, create forums, and real-time chat.

Objectives -

* Develop a user-friendly course management platform.

* Integrate student progress tracking and grade records.

* Incorporate communication tools for students and tutors.

 * Train staff on how to utilize the LMS and students to use it most efficiently as possible.

 Deliverables –

* A completed and functional LMS platform.

* Stored student and course data linked to other areas within the school

* Sessions and materials for training to staff and students

* User documentation and support materials.

**WBS (Work Breakdown Structure) –**

A Work Breakdown Structure (WBS) is an important tool used in project management and it visually and hierarchically deconstructs the project into smaller components. It helps define and organize the entire scope of a project. This is because when the project is divided into small pieces, teams can easily manage activities, assign resources, and monitor progress on different projects (Devi & Reddy, (2012)). Here, is a diagram of our WBS –
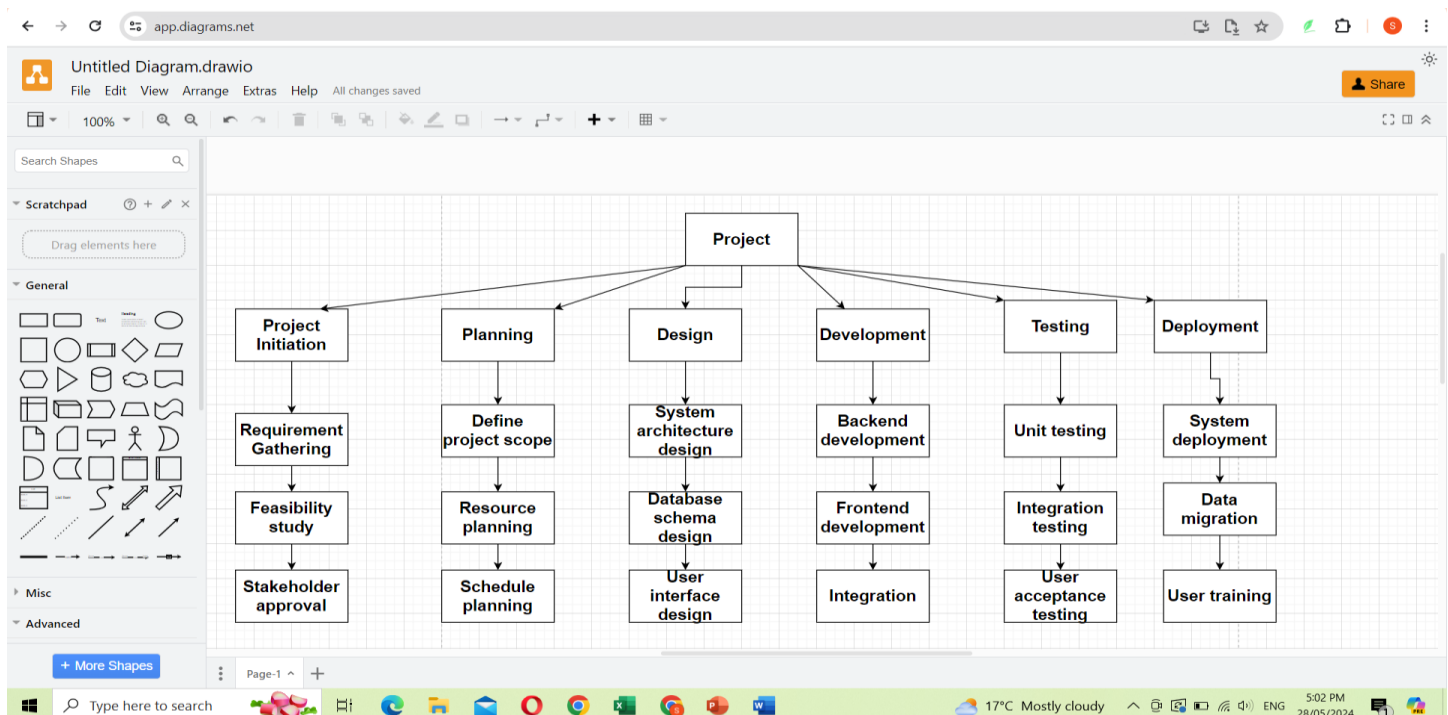
Gantt Chart –

A Gantt chart is a type of bar chart that represents a project schedule. It visually displays the start and end dates of the various elements of a project. Each element or task is represented by a bar, and the length of the bar represents the duration of the task (Sutherland & Canwell, (2004)). Here, is the picture shown below of chart -
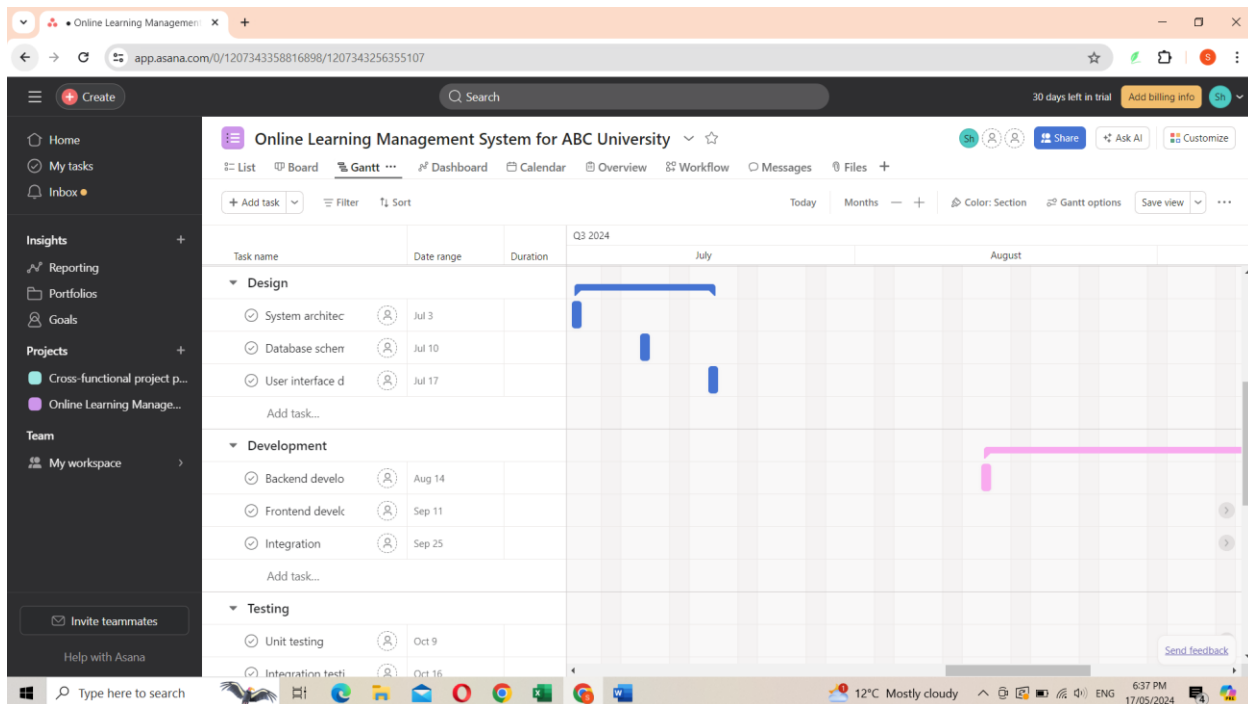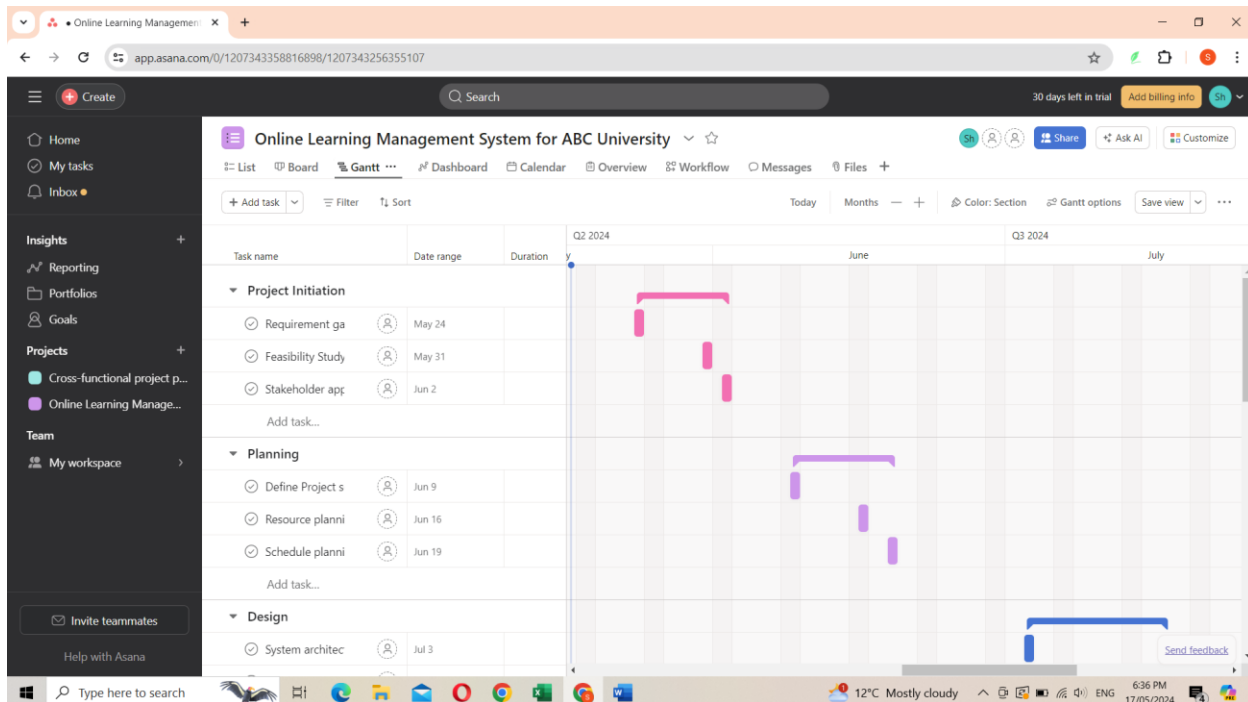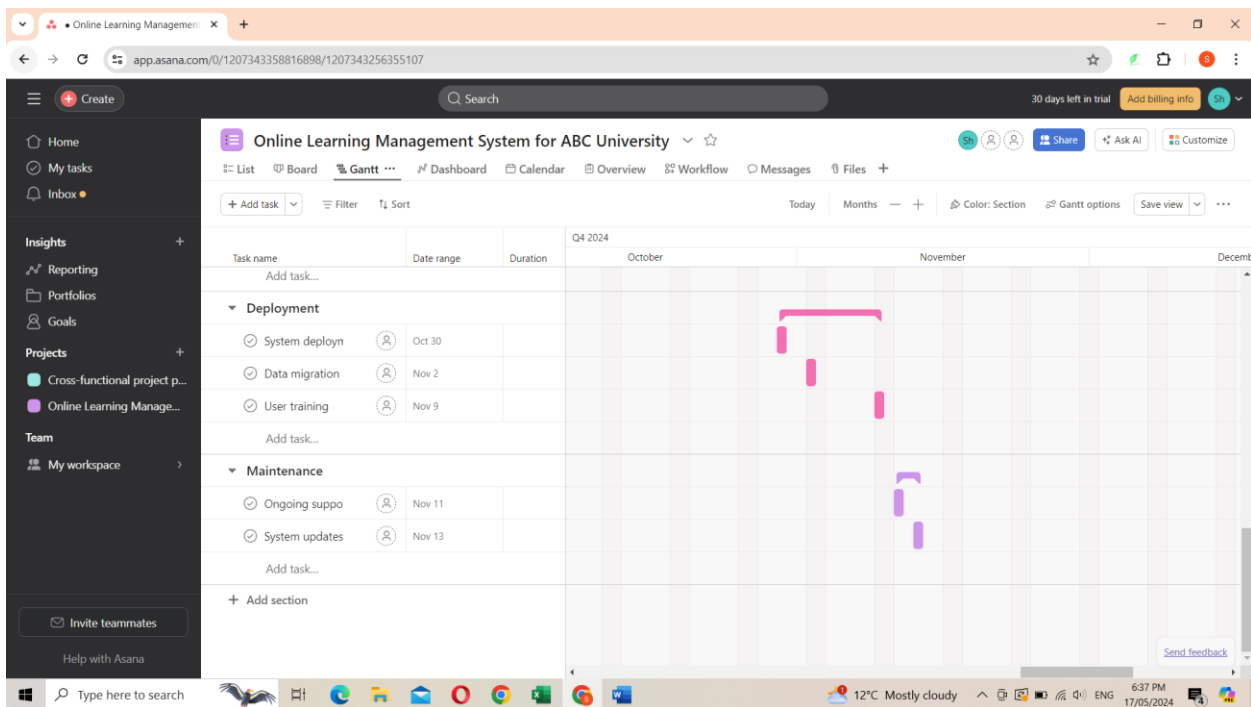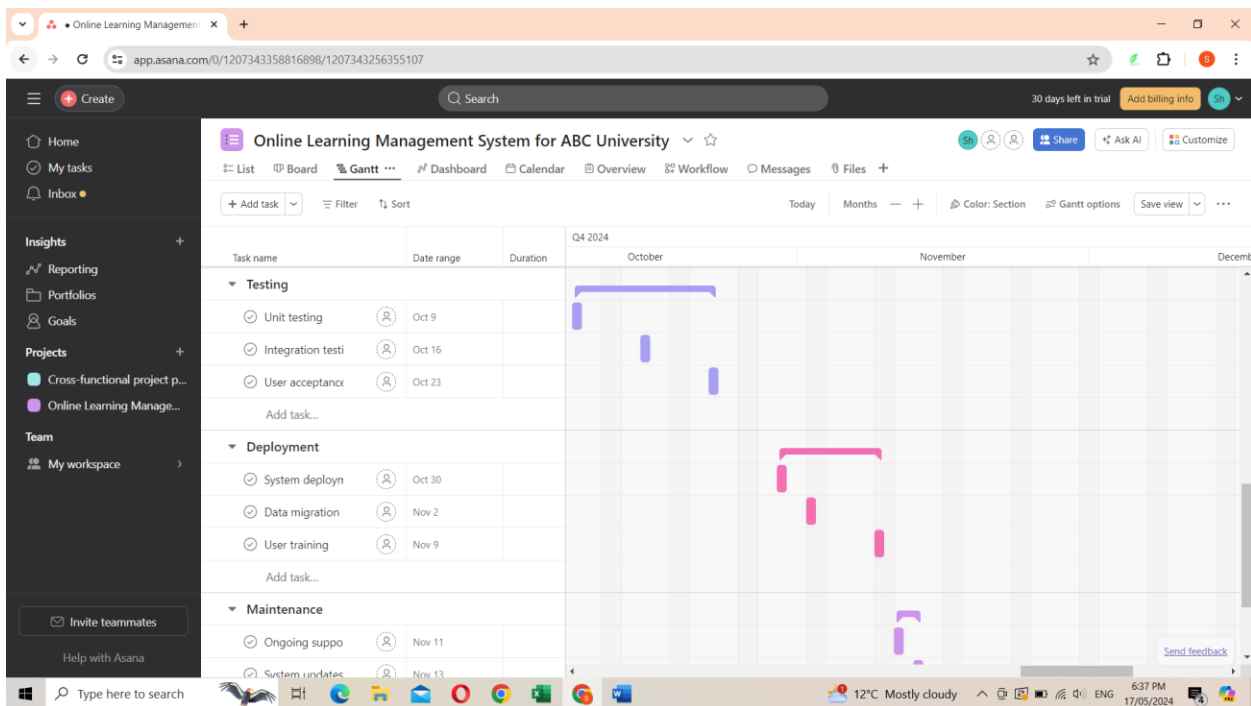
Project Network and Critical Path Analysis-

A Project Network Diagram (PND) is a visual representation of the project's activities and the dependencies between them. It helps in planning, scheduling, and controlling the project. There are different types of

network diagrams, including the Precedence Diagramming Method (PDM), which is most commonly used (Hellgren, & Stjernberg, (1995)).

Developing a project network using the Work Breakdown Structure (WBS). Include using the Activity on Node (AON). For example,

A could be Requirement gathering, a duration of 1 Week,

B could be Feasibility study, a duration of 1 Week, starting after A,

C would be Stakeholder approval, a duration of 2 Days, starting after B,

D would be project scope, a duration of 1 Week.

E would be Resource planning, a duration of 1 Week,

F would be Schedule planning, a duration of 3 Days,

G would be System architecture design, a duration of 2 Week,

H would be Database schema design, a duration of 1 Week,

I would be User interface design, a duration of 1 Week,

J would be Backend development, a duration of 4 Week,

K would be Frontend development, a duration of 4 Week,

L would be Integration, a duration of 2 Week,

M would be Unit testing, a duration of 2 Week,

N would be Integration testing, a duration of 1 Week,

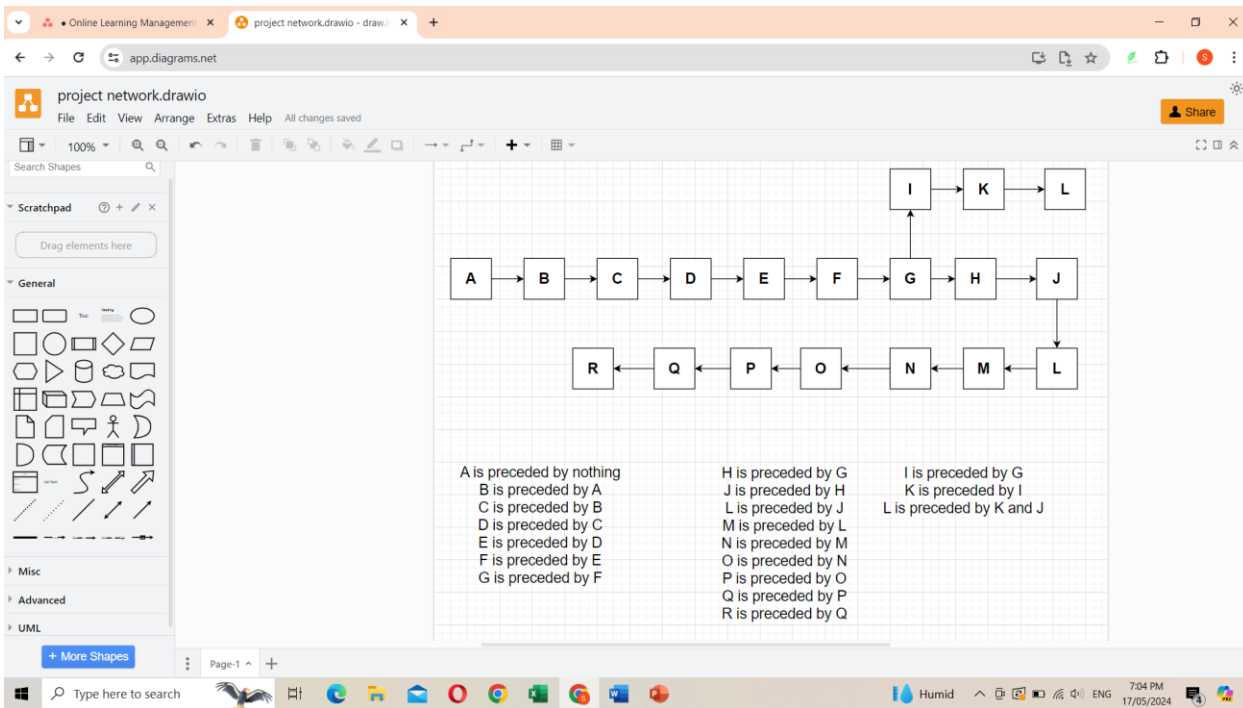O would be User acceptance testing, a duration of 1 Week,

P would be System deployment, a duration of 1 Week,

Q would be Data migration, a duration of 3 Days,

R would be User training, a duration of 1 Week,

S would be Ongoing support, (Starts after deployment, continuous).

Diagram –

Step-by-Step Calculation of the Critical Path-

1. **A → B → C → D → E → F → G → H → J → L → M → N → O → P → Q → R**

- A: Duration = 7, ES = 0, EF = 7, Slack = 0

- B: Duration = 7, ES = 7, EF = 14, Slack = 0

- C: Duration = 2, ES = 14, EF = 16, Slack = 0

- D: Duration = 7, ES = 16, EF = 23, Slack = 0

- E: Duration = 7, ES = 23, EF = 30, Slack = 0

- F: Duration = 3, ES = 30, EF = 33, Slack = 0

- G: Duration = 14, ES = 33, EF = 47, Slack = 0

- H: Duration = 7, ES = 47, EF = 54, Slack = 0

- J: Duration = 28, ES = 54, EF = 82, Slack = 0

- L: Duration = 14, ES = 82, EF = 96, Slack = 0

- M: Duration = 14, ES = 96, EF = 110, Slack = 0

- N: Duration = 7, ES = 110, EF = 117, Slack = 0

- O: Duration = 7, ES = 117, EF = 124, Slack = 0

- P: Duration = 7, ES = 124, EF = 131, Slack = 0

- Q: Duration = 3, ES = 131, EF = 134, Slack = 0
- R: Duration = 7, ES = 134, EF = 141, Slack = 0

2. **G → I → K → L**

- I: Duration = 7, ES = 47, EF = 54, Slack = 0
- K: Duration = 28, ES = 54, EF = 82, Slack = 0

Critical Path Analysis-

The critical path for this project, assuming the earliest start and finish times, as well as zero slack, is:

1. A → B → C → D → E → F → G → H → J → L → M → N → O → P → Q → R
2. Additionally, G → I → K → L merges into the main path at L.

Project Duration-

The total duration of the critical path is:

- A (7) + B (7) + C (2) + D (7) + E (7) + F (3) + G (14) + H (7) + J (28) + L (14) + M (14) + N (7) + O (7) + P (7) + Q (3) + R (7) = 141 days

Therefore, the critical path duration is 141 days. This ensures that all activities with dependencies are covered, and no delays occur in the project schedule.

Resource Allocation:

Human Resources:

The following individuals are involved in the project:

1. A project manager who supervises the project and ensures that the project progresses and achieves milestones.
2. A business analyst who helps to determine requirements and feasibility studies.
3. System architect who will assist in determining the architecture of the system.
4. A database administrator who helps to prepare and determine the database schema.
5. Developers who help in the backend and frontend of the project.
6. Qa testers: by making unit, integration, and user acceptance testing.
7. IT support staff who will manage deployment and support after deployment.
8. Trainer: He or she will conduct user training to the newly installed system.

Technological Resources:

1. Servers: the LMS is hosted in the server.
2. Software License: Development tools and database management systems.
3. Network infrastructure : to ensure there is a good connection.

Budget Constraints:

Decide if the project is time constrained (has to be done by a certain date) or resource constrained (limited budget). In this project, I assume that the project is resource constrained due to a limited amount of funding that is available.
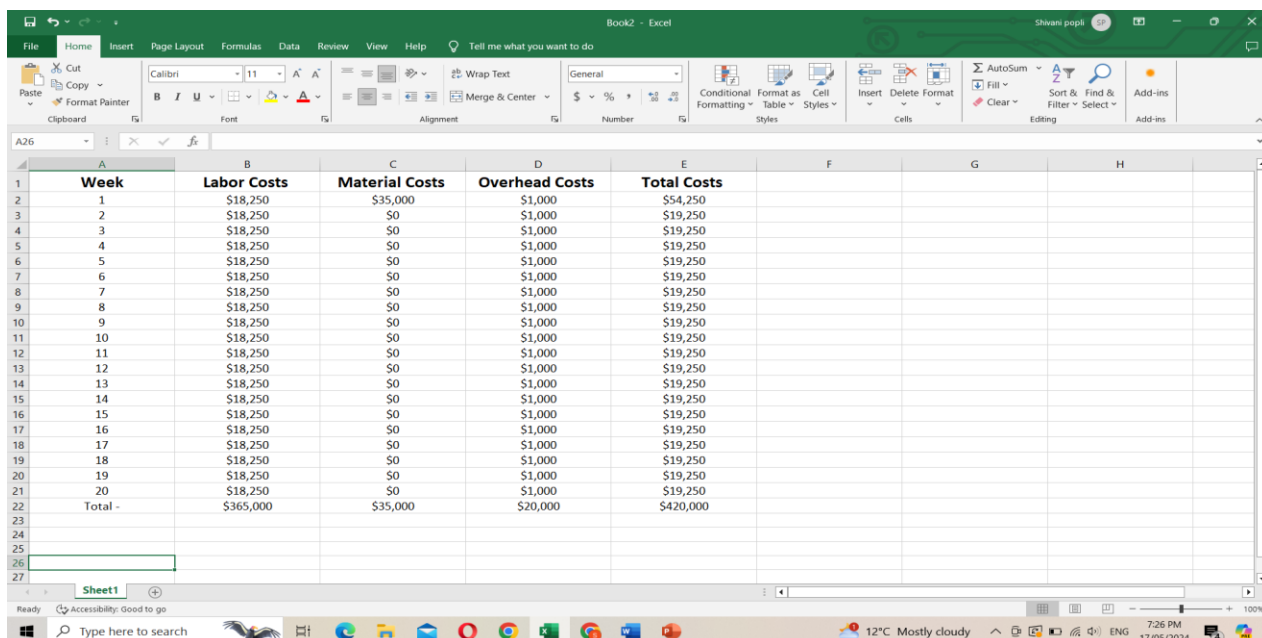
Approach to Resource Allocation:

I will prioritize critical activities on the critical path to make sure there are no delays. I will assign experienced personnel to high-risk tasks to avoid some issues before they come. I will use time management tools to make sure I see the time for each task and make sure no resource is under or overused. I will also make sure that all the team members have the knowledge and equipment to undertake their tasks.

Cost Management –

Time-phased budget table is the distribution of total project costs across the project schedule (Hansen, Mowen, & Heitger, (1997)). This table will, therefore, show how costs are to be distributed over the course of the project schedule based on the project activities. Since the project is scheduled for 141 days, I will therefore demonstrate how costs will be spread for all the activities based in the duration given. I will assume that labor costs will be evenly distributed for each activity's duration, while material and overhead costs will be allocated as is necessary. Therefore:

Time-Phased Budget Table –

Week	Labor Costs	Material Costs	Overhead Costs	Total Costs
1	$18,250	$35,000	$1,000	$54,250
2	$18,250	$0	$1,000	$19,250
3	$18,250	$0	$1,000	$19,250
4	$18,250	$0	$1,000	$19,250
5	$18,250	$0	$1,000	$19,250
6	$18,250	$0	$1,000	$19,250
7	$18,250	$0	$1,000	$19,250
8	$18,250	$0	$1,000	$19,250
9	$18,250	$0	$1,000	$19,250
10	$18,250	$0	$1,000	$19,250
11	$18,250	$0	$1,000	$19,250
12	$18,250	$0	$1,000	$19,250
13	$18,250	$0	$1,000	$19,250
14	$18,250	$0	$1,000	$19,250
15	$18,250	$0	$1,000	$19,250
16	$18,250	$0	$1,000	$19,250
17	$18,250	$0	$1,000	$19,250
18	$18,250	$0	$1,000	$19,250
19	$18,250	$0	$1,000	$19,250
20	$18,250	$0	$1,000	$19,250
Total -	$365,000	$35,000	$20,000	$420,000

Assumptions:

1. Labor costs are allocated evenly over the project duration.

2. Material costs are incurred at the start of the project.

3. Overhead costs are distributed evenly over the project duration.

Breakdown:

Total Project Duration: 20 weeks

Weekly Labor Costs:

- Project Manager: $50,000 / 20 weeks = $2,500/week

- Business Analyst: $30,000 / 20 weeks = $1,500/week

- System Architect: $40,000 / 20 weeks = $2,000/week

- Database Administrator: $35,000 / 20 weeks = $1,750/week

- Developers: $150,000 / 20 weeks = $7,500/week

- QA Testers: $30,000 / 20 weeks = $1,500/week

- IT Support Staff: $20,000 / 20 weeks = $1,000/week

- Trainers: $10,000 / 20 weeks = $500/week

Total Weekly Labor Costs: $18,250/week

Material Costs (incurred at the start of the project):

- Servers: $20,000

- Software Licenses: $10,000

- Network Infrastructure: $5,000

- Total Material Costs: $35,000 (incurred in week 1)

Overheads:

- Office Space: $15,000 / 20 weeks = $750/week

- Utilities: $5,000 / 20 weeks = $250/week

- Total Weekly Overheads: $1,000/week

Rationale –

The rationale behind the chosen estimation method is a time-phased budget that divides the costs over the project's duration. This choice relates to the project scope and complexity due to several factors. Firstly, it is directly correlated with the project's activities and durations. Thus, since a budget is allocated based on the time it takes for an activity to be undertaken, there is a clear understanding of what each cost should include and when it is to be expended. Moreover, the distribution of labor costs is uniform, as the project's scope suggests that for the most part, the costs should remain stable and allocated consecutively due to the efforts made by the project team. Secondly, many materials costs are expended at the beginning. For instance, the servers, software, licenses, and much of the network infrastructure involve one-time purchases when the project begins and no longer require payments. Thus, it is ideal to describe costs for materials in the setup phase. Thirdly, overheads are distributed evenly as they are anticipated. Utility payments, office maintenance, and rent payments are paid on a monthly basis. Fourthly, it should be simple and manageable. Since the project is relatively simple in its complexity, it is easier to utilize a time-phased budget, and it can be adjusted if necessary, based on the speed of work. Third, it is correlated with the project scope and complexity. The project has a viable scope and clearly defined tasks and resources. There are specific roles and tasks for each part of the project, and thus the scope is logical. There is a certain complexity that requires structure, but it is not so grand that a more complicated cost estimate is needed.

Risk Management –

1. The delay of the stakeholders approving –

   The risk is when the stakeholders do not contribute to the project's realization promptly.

   The contingency plan is to frequently hold meetings with the stakeholders to involve them in the project realization and identify any problems at an early stage.

   2. The resource unavailable. –

The risk is when one of the key resources, such as a developer or tester, is not available during the implementation of the project. To find an alternative resource and train at least one team member. Also, the schedule should be drawn up with an indication of the possible arrival of specialists.

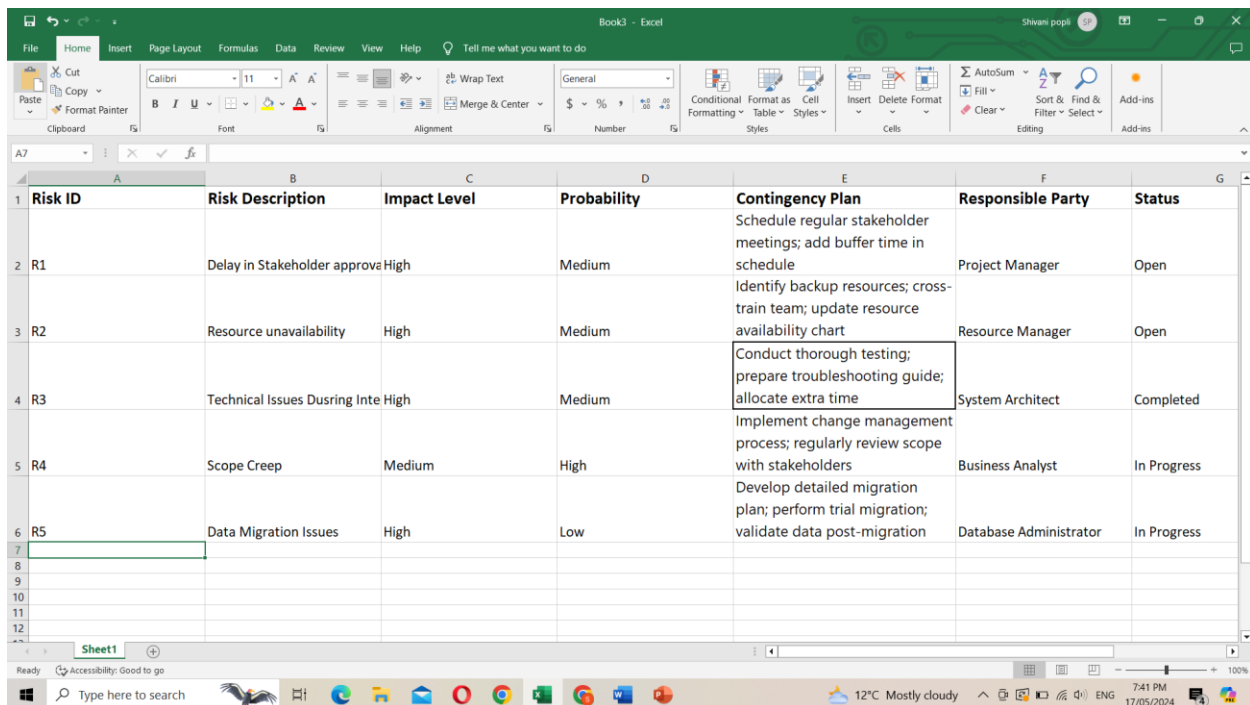3. The technical problems during the integration stage –

The risk is of a technical nature and is related to the availability of components or the failure of individual modules, as well as their cohesion

4. Scope creep –

The risk is a change in the volume of work for the project realization, resulting in the creation of additional works that may be time-consuming

5. Data migration. - The risk of data loss or corruption while implementing the data transfer tool and the inability to continue the project.

Risk Response Matrix –

Risk ID	Risk Description	Impact Level	Probability	Contingency Plan	Responsible Party	Status
R1	Delay in Stakeholder approva	High	Medium	Schedule regular stakeholder meetings; add buffer time in schedule	Project Manager	Open
R2	Resource unavailability	High	Medium	Identify backup resources; cross-train team; update resource availability chart	Resource Manager	Open
R3	Technical Issues Dusring Inte	High	Medium	Conduct thorough testing; prepare troubleshooting guide; allocate extra time	System Architect	Completed
R4	Scope Creep	Medium	High	Implement change management process; regularly review scope with stakeholders	Business Analyst	In Progress
R5	Data Migration Issues	High	Low	Develop detailed migration plan; perform trial migration; validate data post-migration	Database Administrator	In Progress

Agile methodology implementation: Scrum Framework

We will apply the Agile Scrum framework to support an iterative and adaptive approach to project management. This method will be critical in managing the project's complexity, ensuring frequent feedback, and provide your ability to make changes according to the stakeholders.

Product Backlog –

14

One of the most important parts of agile project management, such as scrum, is a product backlog. This list will indicate which activities development team will do to generate an output. It contains deliverables like features, improvements, bug fixes, technical effort and knowledge acquisition (Sedano, Ralph, & Péraire, (2019)).

Sprint Backlog –

A sprint Backlog is a subset of the product Backlog and it includes all the tasks and user stories which have been selected for implementation within that particular sprint. A sprint is a time-boxed period, usually lasting 2-4 weeks, during which a team works to complete a set of tasks. The detailed list of work the development team commits to complete in that particular sprint is called the sprint backlog.

Sprint Organization and Execution Sprint Planning:

The sprint will run for two weeks. Sprint planning is a critical process as it forms the basis of what the team will be doing throughout the Sprint.

All Scrum members, including the Product Owner, Scrum Master, and Development Team, must be present. Significant activities during sprint planning include Review of the Product Backlog: The Product Owner will present the Product Backlog's top-priority items (Sachdeva, (2016)).

Formation of the Sprint Goal: The team has to agree on the Sprint Goal, which is a brief statement of what the team hopes to accomplish during the sprint.

Identifying User Stories: The team decides on which user stories or tasks it can accomplish from the Product Backlog it can select and undertake during the sprint.

Task Deconstruction: The team divides each story into smaller tasks and estimates the time required to complete individual tasks.

Daily Scrum Meetings-

Short, daily stand-up meetings commonly last 15 minutes and are held every day of the sprint. Daily Scrum serves the purpose of synchronizing activities and creating a plan for the next 24 hours.

During the meeting, each SCRUM team member should answer three questions:

1) What did I do yesterday as part of the Sprint Goal?

2) What will I do today as part of the Sprint Goal?

3) Do I have any impediments that make it impossible for me or the team to achieve the Sprint Goal? (Schwaber, & Sutherland, (2010)).

These must be daily so the team can easily identify potential in the case of a block of work on a particular taskighthouse and eliminate them.

Sprint Review -

A Sprint Review is scheduled at the end of each sprint. It is a focus group meeting run by the Scrum Team and its stakeholders (Fowler, & Fowler, (2019)). The main actions that take place at a Sprint Review include:

*Demonstration; the work of the Development Team has been done throughout the Sprint should be showcased. New, improved practical features are demonstrated to give stakeholders an idea of the final product.

*Feedback collection; Stakeholders contribute their comments to the final work that has been presented, which is then used to improve the final Sprint into the next one. In order to introduce modifications after the next Sprint, the Product Backlog must be updated.

Aside from that, the Product Owner is solely responsible for making any changes to the Product Backlog based on the potential feedback and maybe adjusting the priority list.

Sprint Retrospective-

Sprint Retrospective is held after the Sprint Review. It is equally vital for continuous improvement but takes on a different angle as it is devoted to the process and not the product (Ng, Skrodzki, & Wawryk, (2020)). Sprint Retrospective includes the following three roles:

1. Reflection: the team discusses what went well that sprint, what did not, and the reasons for that.
2. Identifying Improvements: during the discussion, the team also highlights actions needed to be taken to enhance the process, tools, or interactions.
3. Action Plan: the final step encapsulates the concrete actions the team will undertake before the next sprint to implement improvements.

Conclusion –

The implementation of the LMS at ABC University will help address major challenges encountered while managing online courses, monitoring students' progress, and enhancing interactions. The use of Agile approach will underpin the initiative with the principles of flexibility and adaptability to help deliver more with speed while allowing for incremental improvements. Additionally, the planning pertaining to the scope, resources, costs, and risks also establishes a solid foundation for successful project completion. The implementation is expected to change the way online courses are delivered, influencing student engagement and, subsequently, their learning achievement at ABC University.

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