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| **Total Marks:** | **04** |
| **Obtained Marks:** |  |

**Software Engineering**

**Assignment # 04 Section-B**

**Last date of Submission: May 16th, 2025**

**Submitted To: Mr. Awais Nawaz**

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**Student Name: Ubaid Bin Waris**

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**Reg Number: 2212416**

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**Q.No.1:**

**Your university has decided to develop a "Campus Bus Tracking Application" to help students track the real-time location of campus buses. The goal is to reduce wait times and improve transportation efficiency on campus. The application will have:**

**• A student-facing mobile app showing live bus locations, estimated arrival times, and route**

**details.**

**• An admin portal to manage buses, schedules, and drivers.**

**• Integration with GPS modules installed in each bus.**

**The university has hired your project team to develop this system within 4months, with a fixed budget and limited resources.**

**What to do**

**As a project manager, your task is to apply all five phases of the Software Project Management Life Cycle to this case study.**

**Instructions:**

**1. Due date & time for the assignment is 16th May 2025 till 11:55 PM.**

**2. You have to submit this assignment on Google Classroom**

As a **Project Manager**, you are responsible for planning, organizing, and overseeing the development of the **Campus Bus Tracking Application**. To manage this project effectively, you will apply all **five phases of the Software Project Management Life Cycle (SPMLC)**:

**Project Initiation**

* **Purpose & Scope:** Understand the need for a real-time campus bus tracking system to reduce student wait times and improve transportation efficiency.
* **Stakeholder Meetings:** Engage with university administrators, transport department, students, and drivers to gather high-level requirements and expectations.
* **Feasibility Study:** Assess technical feasibility (GPS hardware and app compatibility), budget constraints, timeline feasibility (4 months), and operational factors (driver cooperation, maintenance).
* **Project Charter:** Document project goals, scope, stakeholders, fixed budget, and timeline. Secure approval to proceed.

**Project Planning**

* **Work Breakdown Structure (WBS):** Decompose the project into components such as:
  + Mobile app development (live tracking, route details, ETA)
  + Admin portal (bus, driver, and schedule management)
  + Backend services (API development, database)
  + GPS hardware integration
  + Testing and deployment
* **Scheduling:** Develop a timeline with key milestones:
  + Requirements & design (Weeks 1–2)
  + Development (Weeks 3–6)
  + Integration & testing (Weeks 7–10)
  + Deployment & training (Weeks 11–12)
* **Resource Allocation:** Assign roles (developers, testers, UI/UX designers, DevOps), procure GPS units, and plan server resources.
* **Risk Management:** Identify risks such as hardware failure or delays, and develop contingency plans (e.g., backup devices, buffer periods).
* **Communication Plan:** Establish regular progress meetings with stakeholders, weekly status reports, and issue escalation protocols.

**Project Execution**

* **Design:** Create wireframes and UI designs for the mobile app and admin portal based on user needs.
* **Development:** Build the mobile app with features like real-time bus location on maps, estimated arrival times, and route information. Develop the admin portal for managing buses, drivers, and schedules. Implement backend APIs to handle data exchange.
* **GPS Integration:** Integrate and test GPS modules on buses to send live location data to the backend.
* **Environment Setup:** Prepare development, staging, and production environments to support development and deployment.

**Monitoring and Controlling**

* **Progress Monitoring:** Conduct daily standups and weekly reviews to track task completion and resource utilization.
* **Quality Assurance:** Perform continuous testing (unit, integration, system) to ensure accuracy of location data and app reliability.
* **Risk Monitoring:** Track identified risks and new issues, taking corrective actions as necessary.
* **Scope Management:** Prevent scope creep by adhering to agreed requirements; evaluate and manage any change requests carefully.
* **Reporting:** Provide regular updates to the university on progress, challenges, and milestones.

**Project Closure**

* **Deployment:** Launch the mobile app on app stores (Android/iOS) and deploy the admin portal on university servers.
* **User Training:** Conduct training sessions for the transport department on the admin portal and provide user guides.
* **Evaluation:** Collect user feedback from students and staff to assess system performance and usability.
* **Documentation:** Compile all technical documentation, training materials, and project reports.
* **Formal Closure:** Close contracts with suppliers, release project resources, and conduct a post-project review to capture lessons learned.