American International University-Bangladesh (AIUB)

Department of Computer Science Faculty of Science & Technology (FST)

PROJECT TITLE

A Software Engineering Project Submitted
By

Semester : Summer 24-25	Section:	Group Number:	
SL	**Student Name**	**Student ID**	**Contribution (CO3 + CO4)**	**Individual Marks**
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The project will be evaluated for the following Course Outcomes

	Total Marks	
CO3 (PO-g-1) *Select appropriate software engineering models, project management roles and their associated skills for the complex software engineering project and evaluate the sustainability of developed software, taking into consideration the societal and environmental aspects*		
Selection of Software Engineering Models: Process model selection and presents sufficient evidence to support argument for the model selection	[5 Marks]	
Role identification and Responsibility Allocation: Well-planned project with proper role identification and responsibility allocation in the project management activities	[5Marks]	
Formatting and Submission: Submission, Defense, Completeness, Spelling, grammar, and Organization of the Project report	[5Marks]	
CO4 (PO-k-1) *Apply engineering management principles and economic decision making to develop software engineering project management plan.*	Total Marks	
Project WBS and Testcases: Relevant WBS (project task list) and testcases for the proposed project are stated properly.	[5Marks]	
Effort Estimation and Scheduling: Project estimation was described using proper effort estimation or schedules based on available project resources	[5Marks]	
Risk Management: Sufficient and appropriate risks are identified, analyzed, and properly categorized or prioritized.	[5Marks]	

1. PROJECT PROPOSAL

AIUB Lifeline

Background & Problem Context

For most students, university life comes with a lot of pressure such as classes, exams, future planning, and everyday responsibilities all at once. Students are required to manage academic responsibilities, navigate course materials, give examinations, maintain social relationships, and plan for their future all while dealing with personal and real-life challenges. As one of the leading private universities in Bangladesh, AIUB hosts a diverse and dynamic student body that frequently experiences these pressures.

In this context, students face many problems that are not academic issues. These factors include consideration that students are not able to locate lost belongings on campus, they cannot easily find consistent lecture/handwritten notes, they are unaware of the faculty's consulting hours, and there is no go-to space for academic related questions and accessibility of faculty provided materials. Today, students are using informal channels like Facebook groups, WhatsApp chats and word of mouth to serve their needs. They generally work and, typically, lack responsible moderation, and they unaccountably fail to deliver uniform access or good information to all students. The problem exists as there is no unified, organized platform exclusively centered for the AIUB students. It can cause additional stress, miscommunication, and missed opportunities for academic and other forms of personal support. That's why we think it's time for a clean digital solution that aggregates the core student support services into a user-friendly system.

Importance of the Problem

Because of the following issues, students waste a lot of valuable time searching for important resources and a lot of times end up with wrong and outdated materials. Students also find it difficult to navigate their lost belongings from home. This platform will solve a lot of problems which in turn will benefit the stakeholders of the university.

Project Objective

In this technology driven age, not having a single modern platform at a leading private university such as AIUB is conspicuous. Plugging this gap is an opportunity to establish a new and modern platform that can enhance academic achievement along with student life in general.

By introducing this platform, the university will truly transform into a modern university justifying the leading university of Bangladesh tag and going on to achieve more great achievements in the future.

Our goal is to build one easy-to-use app that brings together everything students and teachers need in one place:

- Enhancing academic collaboration,

- Reducing communication gaps,
- Seamlessly access essential latest materials and schedules,
- Promoting a supportive campus ecosystem.

Proposed Solution

We propose "AIUB Lifeline", a web application which will have the following features:

Basic Functionalities of the Proposed Solution:

1. **Lost and Found:** Students will be able to report and search for missing personal belongings through a secure and centralized platform. The platform will have options to upload images and provide detailed time and place of the item so that it would be easier to locate the missing belonging.
2. **Sharing Lecture and Handwritten Notes:** Through this platform the students will be able to upload and search for handwritten notes as well as lecture notes. Students will be able to search the notes by sorting them by course code, instructor, course name and department.
3. **Authorized Material Approved by Faculty:** Authorized scholarly material such as class notes, tutorial sheets, question papers, and practice sets shall be provided by the faculty to the students. There will be fewer unauthorized uses of sources and higher content accuracy.
4. **Faculty TSF Section:** There will be a designated section showing the available consulting times of every one of the faculty members. This will make it easy for students to schedule appointments, clear their questions, or receive study help efficiently.
5. **Q&A Platform:** There will be an academically moderated discussion forum where students will be able to post academic questions, receive answers from peers or instructors, and up vote useful responses. Questions will be labeled by subject, course, or topic for easier discovery and searching.

Target Group & Benefits

Target Users:

- **Primary:** undergraduate & graduate students.
- **Secondary:** Faculty members.

Benefits:

- Students will be able to manage their time in a better way which will help them academically.
- Teachers will be able to save a lot of class time by just providing the platform and students will be able to collect everything from that platform such as faculty TSF, latest lecture notes, handwritten notes etc.
- University can manage its online services at an organized and planned manner which will reduce cost and time.

Feasibility & Appropriateness

- It falls squarely within the purview of the Software Development Life Cycle (SDLC) as it encompasses system planning, design, documentation, and evaluation. Code implementation isn't required here.
- It addresses problematically defined problems by customized features designed specifically for AIUB student's purposes, rather than giving universal solutions.
- If the system is effective at AIUB, it can be easily modified for other universities that also experience the same issues. That makes it not only beneficial now but also a sustainable and flexible solution.

Selected Software Development Process Model

The chosen process model for this project is **Scrum**. Scrum is an agile framework that focuses on iterative development, adaptability, and continuous feedback. It is particularly well-suited for projects where some requirements are clear while others evolve over time, which matches the nature of **AIUB Lifeline**.

Analysis of the Project Environment

The environment of this project is a mixed environment. Some of the requirements like Lost & Found and Faculty TSF are well understood and relatively static. Other details such as the layout of the Q&A tool or how the notes will be sorted will also be subject to change on the back of user feedback. This makes Scrum a good fit, because it will make the platform stable by regular sprint reviews and backlog refinements.

Team Size, Communication & Feasibility

Scrum is ideal for small, cross-functional teams, which is the project's smallest possible scale. It roles out a clear separation of concerns (Product Owner, Scrum Master, and Development Team) as well as accountability and focus. We have daily stand-ups, and sprint reviews, which all but ensures that communication is clear. The incremental release of increments is what makes the project viable to meet its goal of having functional system within a reasonable timeline.

Flexibility of the Model

Scrum is a real adaptive framework and that is one of its greatest strengths. Backlog prioritizations can be shifted should the project scope increase. If there are new technologies that come out, you can refactor architecture in future sprint. If suggested changes are indicated through student input, we can make these without the flow of development being disrupted. This will allow the project to be completed on time.

Contribution to Scientific Results

The project contributes to Software Engineering by recording how a lean approach can be used to address real world student support problems. The documentation of the project's requirements, backlog prioritization, sprint results, and feedback loops would be useful for further studies and case studies in the context of academic technological solutions.

Evidence Supporting Model Selection

Scrum is chosen because:

- It allows incremental progress that students and faculty can test early.

- It thrives in environments where not all requirements are fixed from the start.

- It emphasizes collaboration between stakeholders, which is essential in a university setting.

- It reduces the risk of delivering an incomplete or unusable product.

Risk & Uncertainty Management

Scrum minimizes risks by iterating constantly. In sprint planning a lot of the risks can be called out, In daily standup there will be a discussion session about the risk and then the areas will be reviewed where there might be risks. Rather than save problems until the end, Scrum raises concerns that arise early, which helps reduce the risk of project failure.

Alignment with Project Schedule

Scrum breaks the work into periods, called sprints (usually 2–4 weeks). In every sprint we deliver a feature which can be measured constantly. It also guarantees the feature to be delivered on time and that deadlines are more reachable, since the project is divided into smaller digestible pieces.

Justification of the Chosen Model

Scrum is much more appropriate compared to Waterfall, XP or any other model. Scrum is not a traditional model such as Waterfall which expects the requirement not to be revisited after it is complete wherever in Scrum, changes are inevitable. XP is not suited because it needs a strict environment where stakeholders such as students and faculty members always need to be available, which will not be possible for this platform.

Scrum strikes as the right fit because it has a practical structure which ensures all the stakeholders actively engage with the platform without disrupting the projects flow. This makes it the most suitable model for developing **AIUB Lifeline**.

Roles, Responsibilities, and Distribution

Main Roles Involved

- **Product Owner**: Oversees the vision of the project, prioritizes the backlog, and represents stakeholder interests.

- **Scrum Master**: Facilitates Scrum ceremonies, removes obstacles for the team, and ensures that the Scrum framework is followed.

- **Development Team**: A cross-functional group of designers, developers, and testers responsible for delivering increments of the product.

Responsibilities in Key Stages

- **Requirements Gathering**: The Product Owner leads this phase by engaging with students, faculty, and other stakeholders to document needs, while the Scrum Master ensures smooth communication. The Development Team assists by analyzing technical feasibility.

- **Design**: The Development Team takes primary responsibility for wireframes, system architecture, and UI design. The Product Owner reviews and approves based on alignment with user needs.

- **Implementation**: Developers within the team write and integrate code, supported by designers for interface elements. The Scrum Master ensures that impediments are resolved quickly.

- **Testing**: QA members of the Development Team verify each increment through functional testing and user acceptance testing. Feedback is collected from stakeholders for improvements.

- **Deployment**: The Development Team ensures the system is deployed smoothly. The Product Owner confirms release readiness, and the Scrum Master coordinates retrospective feedback.

Distribution and Justification
Responsibilities are distributed according to expertise to ensure efficiency:

- The **Product Owner**, with strong communication and organizational skills, focuses on aligning the platform with student and faculty needs.

- The **Scrum Master**, experienced in agile processes, ensures discipline in following Scrum and maintaining momentum.

- The **Development Team**, comprised of members skilled in web development, database management, UI/UX design, and quality assurance, collaboratively handle design, implementation, and testing.

This allocation ensures that each phase of the project is handled by individuals best suited for the role, leveraging their skills while maintaining accountability. It provides a balanced structure where management and technical aspects are both equally prioritized, thereby maximizing the probability of successful project delivery.