



American International University-Bangladesh (AIUB)

Department of Computer Science

Faculty of Science & Technology (FST)

TrekMagnet: Your Ultimate Adventure Companion

A Software Engineering Project Submitted
By

Semester: Fall 2023		Section: D	Group Number: 10	
SN	Student Name	Student ID	Contribution (CO1+CO3)	Individual Marks
01	Fahim Mahmud Bhuiyan	20-42970-1	25%	
02	Riyad, Md. Fardin Amin	19-41690-3	25%	
03	Chowdhury, Abdul Muntakim	19-40168-1	25%	
04	Md. Raihanul Haque Chowdhury	20-42078-1	25%	

Submitted To,
DR. S.M. Hasan Mahmud
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The project will be evaluated for the following Course Outcomes

CO1: <i>Analyze</i> the impact of software engineering models over various contexts of software development to assess societal, health, safety, legal and cultural issues.	Total Marks	
Project Background Analysis and Feasibility (needs, goal, benefits, etc.)	[5 Marks]	
Analysis the impact of societal, health, safety, legal and cultural issues	[5 Marks]	
Review of existing Studies and Relevant Example	[5 Marks]	
CO3: <i>Select</i> appropriate software engineering models, project management roles and their skills in the context of professional engineering practice and solutions to complex engineering problems in a software development environment	Total Marks	
Appropriate Process Model Selection and Argumentation with Evidence	[5 Marks]	
Evidence of Argumentation Regarding Process Model Selection	[5 Marks]	
Submission, Defense, Completeness, Spelling, grammar and Organization of the Project report	[5 Marks]	

Description of Student's Contribution in the Project Work

Student Name: Fahim Mahmud Bhuiyan

Student ID: 20-42970-1

Contribution in Percentage (%): 25%

Contribution in the Project:

- Contribution Description 1: Project Proposal
- Contribution Description 2: Software Development Life Cycle

Fahim

Signature of the Student

Student Name: Riyad, Md. Fardin Amin

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Contribution in Percentage (%): 25%

Contribution in the Project:

- Contribution Description 1: Project Proposal
- Contribution Description 2: Software Development Life Cycle

fardin

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Student Name: Chowdhury, Abdul Muntakim

Student ID: 19-40168-1

Contribution in Percentage (%): 25%

Contribution in the Project:

- Contribution Description 1: Project Proposal
- Contribution Description 2: Software Development Life Cycle

chowdhury

Signature of the Student

Student Name: Md. Raihanul Haque Chowdhury

Student ID: 20-42078-1

Contribution in Percentage (%): 25%

Contribution in the Project:

- Contribution Description 1: Project Proposal
- Contribution Description 2: Software Development Life Cycle

Raihanul

Signature of the Student

1. PROJECT PROPOSAL

1.1 Background to the Problem

- There must be a tour itinerary or travel guide for each tour. Anybody who wants to travel wants to do it in a secure and convenient manner. In our nation, travelers typically encounter a variety of issues when visiting any tourist destination, including difficulties with ticket purchases, hotel reservations made in advance, and tour guide reservations. However, there are currently no reliable internet assistance resources available in our nation where consumers may quickly obtain comprehensive instructions. In order to aid in making the customers' trip simple, secure, and worry-free, this project will help in offering comprehensive assistance to the consumers.
- The travel software "TrekMagnet" assists travel agencies with booking, package customization, and itineraries for travel items including hotels, flights, and transfers as well as automating sales and financials to boost reservations and income. The consumer must reserve a trip guide that contains a comprehensive travel guide with someone else's duty if they wish to visit a tourist destination or make their journey simple, safe, and worry-free. In order to satisfy clients, the quality of the guide is crucial. Traveling with a knowledgeable guide may be more enjoyable and valuable. The converse is true with a poorer guide, which leaves consumers frustrated and disappointed.

1.2 Solution to the Problem

- An intelligent marketing approach includes giving customers smart help. Each person may easily find their preferred trip and guide by using our system. Every tourist attraction in our nation is included. Registration is required before using our system or becoming a guide. Registration is also required before being a user of our system. Anyone may use our project to make hotel reservations, create up travel guides for their preferred destinations, hire tour guides, purchase bus or flight tickets, and make restaurant reservations.
- Costs are reduced since it is possible to conduct travel guidance demos in various time zones without incurring additional travel expenses, costly presentations, or in-person meetings. You'll save time and money by using "TrekMagnet". The major objective of this system is to offer comprehensive facilities with a variety of amenities for travelers.
- On the internet, there are many travel-related websites. Many of them, however, are absent since certain websites only function as part of a specific system, such as a ticketing system or a hotel reservation system. However, our method will function for bundles so that clients may make use of a website's full range of advantages. Customers will thus find it simple to use this system, which allows them to reserve hotel rooms, purchase airline or bus tickets, hire a guide for their preferred tourist destinations, and have access to all the necessary information.

1.3 Feasibility to the Problem

- The TrekMagnet feasibility analysis examines a wide range of parameters to determine the project's viability. In terms of the project's history, it answers to the rising need for a centralized adventure companion platform that caters to the different interests of hiking, trekking, tours, and climbing lovers. The project intends to meet this demand by

creating a user-friendly platform that facilitates the planning, monitoring, and sharing of adventure activities. The overall aims include developing a dynamic platform, cultivating a lively community, and providing a smooth user experience.

- Technical feasibility is ensured since essential technologies are easily available and linked with the team's experience. Operational feasibility is regarded as feasible with good design and infrastructure, assuring scalability and performance. The predicted return on investment and the anticipated demand for adventure-focused platforms justify the economic viability. The project's timeframe adheres to industry norms, including iterative development, flexibility to change, and frequent progress.
- Potential dangers are mentioned, such as technological problems, user uptake, and competition. Comprehensive technological research, powerful marketing efforts, and uniqueness through distinctive features and community emphasis are all part of mitigation techniques. To maintain regulatory compliance and to promote a healthy and inclusive society, legal and ethical concerns are highlighted. Key performance indicators such as user interaction, good reviews, feature adoption rates, and community growth are used to define success measures.
- The feasibility analysis, in essence, highlights the TrekMagnet project's connection with user demands, technological feasibility, economic sustainability, adherence to ethical standards, and readiness to face any problems. The project's success will be determined by its ability to fulfill user expectations, get favorable feedback, and accomplish set milestones within the timeframes stated. This study serves as a strong basis for the project's start-up and continuous development.

2. SOFTWARE DEVELOPMENT LIFE CYCLE

2.1 Process Model

- The scrum model is applied in this design. This architecture was chosen since the project's requirements are unstable. The project is also big, making the scrum approach appropriate.
- When all requirements are understood, the waterfall model is used. However, the specifications for our project might change every day. Therefore, we decided to employ the SCRUM model since it allows for continual improvement and allows for the addition of requirements at daily SCRUM meetings.
- Our project is a challenging, object-oriented project. The risk and uncertainty associated with the waterfall paradigm are substantial. Since this project will continue after a given period of time, the waterfall model is inadequate.
- The prototype model is complex and expensive. If a requirement changes, we must adjust each step. On the other side, the SCRUM methodology is more cost-effective and less time-consuming.
- It allows us flexibility in execution, and each demand for our project is unique. This model does not have a boss. However, a scrum master oversees each individual job throughout the scrum meeting.
- This concept is not applicable to systems that can't be appropriately modularized. All phases of the life cycle must involve the customer. It is not intended for smaller projects since, in such circumstances, the cost of adopting automated tools and processes may surpass the total project budget. for recognizing business requirements, relies on great team and individual performances. RAD can only be used to build systems that are modularizable. needs developers and designers with extensive experience. a strong

reliance on modeling abilities. The designers have to be really talented. Strong teamwork is required, Needs developers with advanced skills. RAD incompatibility exists with some apps. The RAD paradigm is inapplicable to smaller projects. Reduced features as a result of time boxing, which occurs when features are postponed to a later version to complete a release quickly. Because RAD built applications start as prototypes and progress into completed products, there is a reduction in scalability. There is no paperwork to back up what has been done since it is difficult to track progress and difficulties that are common. It's not suited due to the considerable technical danger.

- Even though Extreme Programming (XP), an agile methodology with a focus on engineering practices and customer collaboration, is also used for projects of this kind and has a broader scope than just coding practices and necessitates a higher degree of flexibility in feature development and project management, it might not be as well-suited to projects of this kind.
- Due to a few drawbacks, we don't employ the V-model. The client does not see the final result in either model until almost everything is finished. The V model is an enhancement since it enables the development team to validate the product at various levels during the specified phases. Which is the main reason why the V model was rejected. Because it will seriously affect the project if the client cannot review it. It will also be quite challenging to repeat the job if the customer wants to modify something.
- Iterations consist of rigorous, non-overlapping phases. Not all needs are acquired upfront for the whole life cycle, which might lead to expensive system architecture or design concerns. For skill analysis, highly qualified resources are needed. Additional resources could be needed. For smaller jobs, it is not appropriate. We avoid using the iterative approach because of these.

Some key reasons why Scrum is the preferred model for TrekMagnet:

1. **Flexibility:** Scrum enables flexibility in adjusting to changing needs, which is essential in the IT business where user expectations and trends may change quickly. Similar trends may be seen in the outdoor adventure sector, where new locations and equipment are always being developed.
2. **Iterative Development:** Scrum's iterative approach enables the progressive development of features, ensuring that the most important parts are provided first and offering value to consumers as quickly as feasible.
3. **Customer-Centric:** Scrum stresses the demands and feedback of the customer, which is necessary for developing a user-centric adventure companion app. The product is kept in line with customer expectations through frequent evaluations and revisions.
4. **Collaboration:** Scrum promotes close coordination amongst multidisciplinary teams. To create the finest adventure companion, developers, designers, adventure specialists, and user input analyzers collaborated to create TrekMagnet.
5. **Regular Inspections:** Regular Sprint Reviews and Retrospectives provide you the chance to assess the product's development and take immediate action to fix any problems.
6. **Participation of Stakeholders:** Scrum includes stakeholders in the development process, ensuring that the app reflects the goals of the business and the demands of its customers.

For a project like TrekMagnet, where needs may change and user pleasure is of the utmost importance, Scrum's flexibility, customer focus, iterative development, and emphasis on collaboration make it a good fit.

2.2 Project Role Identification and Responsibilities

The TrekMagnet project's Scrum structure assigns specific duties to important players. The Product Owner directs the project by defining and prioritizing the product backlog, interacting with stakeholders, and making feature and release choices. The Scrum Master ensures that Scrum techniques are effectively implemented, removes roadblocks for the Development Team, and encourages a culture of continuous progress. The Development Team, which includes developers, designers, and testers, works cross-functionally to generate potentially shippable product increments in short iterations. Stakeholders actively contribute ideas and criticism, ensuring that they are in line with the company's aims. The Scrum Team, which includes the Product Owner, Scrum Master, and Development Team, collaborates to establish transparency, inspect and change procedures via frequent ceremonies, and produce incremental value. A Project Manager may coordinate across many Scrum Teams, whereas a DevOps Engineer controls deployment and works with development and operations teams to simplify procedures. This organized method encourages agility, adaptation, and cooperation across the software development lifecycle. The following roles and duties are outlined in the Scrum methodology for the TrekMagnet project:

1. **Product Owner:**

- Define and prioritize the product backlog, taking care to ensure it matches business value.
- Gather and clarify needs in collaboration with stakeholders.
- Make choices about feature priorities and release timing.
- Communicate with the Scrum Team and stakeholders regularly to collect input.
- Participate in Sprint Review sessions and offer feedback.

2. **Scrum Master:**

- Facilitate Scrum ceremonies (Sprint Planning, Daily Stand-ups, Sprint Review, and Sprint Retrospective).
- Assure that the Scrum Team understands and follows the Scrum framework.
- Remove barriers to the team's growth.
- Develop a culture of constant development within the team.
- Work closely with the Product Owner to optimize the value offered by the team.

3. **Development Team (Developers, Designers, Testers):**

- Developers: Write code, implement functionality, and assure technical quality.
- Designers: Designers create user interfaces and experiences that are in line with the demands of the users.
- Testers: Perform testing to guarantee that the program satisfies quality requirements.
- Collaborate cross-functionally to develop a potentially shippable product increment.
- Participate actively in Sprint Planning, Daily Stand-ups, and Sprint Review sessions.

4. **Stakeholders:**

- Participate in Sprint Review sessions and provide advice and comments.
- Collaborate with the Product Owner to identify project priorities and goals.

- Ascertain if the product is in line with the broader corporate goals.
- Engage in regular communication with the Scrum Team to address questions and share insights.

5. Scrum Team (Product Owner, Scrum Master, Development Team):

- At the end of each sprint, collaborate closely to provide a potentially shippable product increment.
- Self-organize to figure out how to complete the tasks in the Sprint Backlog.
- Accept the transparency, inspection, and adaption concepts.
- During Sprint Retrospectives, they review and change their procedures regularly.

6. Project Manager:

- In a Scrum-of-Scrums situation, coordinate among several Scrum Teams.
- Identify and address cross-team dependencies and barriers.
- Ensure that the project's goals and objectives are in sync.

7. DevOps Engineer:

- Control and automate the software deployment process.
- Create and manage Continuous Integration/Continuous Deployment pipelines.
- Monitor system performance and dependability.
- Collaborate with the development and operational teams to simplify procedures.

8. User:

- Giving usability comments during user testing.
- Using the program and reporting concerns.
- Using the finished product in its intended manner.

These roles work closely together in the Scrum methodology to produce value progressively in short iterations known as sprints. The Product Owner represents the company, the Scrum Master ensures Scrum processes are followed, and the Development Team produces product functionality increments. Throughout the process, stakeholders, including end users, contribute vital feedback. Regular ceremonies and feedback loops promote constant improvement and adaptability to changing needs.

Rubric for Project Assessment (CO1)

Marking Criteria	Marks Distribution (Maximum 3X5=15)				Acquired Marks
	Inadequate (1-2)	Satisfactory (3)	Good (4)	Excellent (5)	
Background Analysis	No background information regarding the project is given; project goals and benefits are missing.	Insufficient background information is given; project goals and benefits are poorly stated	Sufficient background information is given; the purpose and goals of the project are explained.	Thorough and relevant background information is given; project goals are clear and easy to identify.	
Analysis the impact of societal, health, safety, legal and cultural issues	Student vaguely discuss the impact of societal, health, safety, legal and cultural issues in their project	Student provided with partial relevance to the impact of societal, health, safety, legal and cultural issues in their project	Student fairly provided the analysis to the impact of societal, health, safety, legal and cultural issues in their project	Student comprehensively provided the analysis to the impact of societal, health, safety, legal and cultural issues in their project	
Existing Studies and Relevant Example	Ambiguous representative example.	Partially identify / indicate towards real-life example.	Real-life example is fairly connected towards the definition.	Comprehensively defend with real life example.	
Acquired Marks:					
CO Pass / Fail:					

Rubric for Project Assessment (CO3)

Marking Criteria	Marks distribution (Maximum 3X5= 15)				Acquired Marks
	Inadequate (1-2)	Satisfactory (3)	Good (4)	Excellent (5)	
Argumentation of Model selection with Evidence of Argumentation	Does not articulate a position or argument of choosing appropriate model. Does not present any evidence to support the arguments for the choice of the model	Articulates a position or argument for choosing models that is unfocused or ambiguous. Presents incomplete/vague evidence to support argument for model choice	Articulates a position or argument of choosing models that is limited in scope. Does not present enough evidence to support the argument for the choice of the model	Clearly articulates a position or argument for the choosing software engineering models. Presents sufficient amount of evidence to support argument for the model selection	
Role identification and Responsibility Allocation	The project has poor project management plans for identifying roles and assigning the responsibilities	Identify few roles in the project management where some of the roles are left alone with any project responsibilities	Identify most of the roles in the project management and assign their responsibilities	Well planned project with proper role identification and responsibility allocation in the project management activities	
Submission, Completeness, Spelling, grammar and Organization of the Project report	Project report is not complete and Several errors in spelling and grammar. Present a Confusing organization of concepts, supporting arguments, and real-life example. Sentences rambling, and details are repeated.	Some errors in spelling and grammar. Some problems of organizing the answer in a logical order of defining, elaborating, and providing real-life examples.	Few errors in spelling and grammar. Presents most of the details in a logical flow of organization in definition, details, and example.	Project report is complete and No errors in spelling and grammar. Consistently presents a logical and effective organization of definition, details, and real-life example of the topic.	
Acquired marks:					
CO Pass / Fail:					