



American International University-Bangladesh (AIUB)

Department of Computer Science

Faculty of Science & Technology (FST)

SHIPPING PORT MANAGEMENT

A Software Engineering Project Submitted

By

Semester: Fall_24_25		Section:	Group Number:	
SN	Student Name	Student ID	Contribution (CO3+CO4+CO5)	Individual Marks
	BASAK, DIPA	22-47192-1		
	GHOSH, AMIT	22-48002-2		
	ASRAFI, MAISHA	22-46195-1		
	DAS, PRITOM	22-48171-2		

The project will be evaluated for the following Course Outcomes

CO3: <i>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</i>	Total Marks	
Appropriate Process Model Selection and Argumentation with Evidence	[5 Marks]	
Evidence of Argumentation Regarding Process Model Selection	[5Marks]	
Analysis of the impact of societal, health, safety, legal, and cultural issues	[5Marks]	
Submission, Defense, Completeness, Spelling, grammar, and Organization of the Project report	[5Marks]	
CO4: <i>Develop a project management plan to manage software engineering projects following the principles of engineering management and economic decision process</i>	Total Marks	
Develop the project plan, its components of the proposed software products	[5Marks]	
Identify all the activities/tasks related to project management and categorize them within the WBS structure. Perform detailed effort estimation correspond with the WBS and schedule the activities with resources	[5Marks]	
Identify all the potential risks in your project and prioritize them to overcome	[5Marks]	

these risk factors.		
CO5: Perform as an effective team member or leader in diverse team settings and solve multi-disciplinary problems in the computer science and engineering domain	Total Marks	
Taking project responsibility: perform assigned tasks on time independently	[5 Marks]	
Contribution to project group meetings, sharing fruitful ideas	[5Marks]	
Positive attitude towards group work, collaboration, compromise, helping others to understand their project work responsibility	[5Marks]	
Showing respect and value towards other team member's opinion	[5Marks]	

Description of Student's Contribution in the Project work

<p>Student Name: BASAK, DIPA Student ID: 22-47192-1 Contribution in Percentage (%): 25% <u>Contribution in the Project: Process Model</u></p> <ul style="list-style-type: none"> ▪ Contribution Description 1 ▪ Contribution Description 2 <p>_____ Signature of the Student</p>
<p>Student Name: GHOSH, AMIT Student ID: 22-48002-2 Contribution in Percentage (%): 25% <u>Contribution in the Project: Risk Mitigation</u></p> <ul style="list-style-type: none"> ▪ Contribution Description 1 ▪ Contribution Description 2 <p>_____ Signature of the Student</p>
<p>Student Name: ASRAFI, MAISHA Student ID: 22-46195-1 Contribution in Percentage (%): 25% <u>Contribution in the Project: Risk Assessment</u></p> <ul style="list-style-type: none"> ▪ Contribution Description 1 ▪ Contribution Description 2 <p>_____ Signature of the Student</p>

<p>Student Name: DAS, PRITOM</p> <p>Student ID: 22-48171-2</p> <p>Contribution in Percentage (%): 25%</p> <p><u>Contribution in the Project: WBS</u></p> <ul style="list-style-type: none"> ▪ Contribution Description 1 ▪ Contribution Description 2 <p>_____ Signature of the Student</p>
<p>Student Name:</p> <p>Student ID:</p> <p>Contribution in Percentage (%):</p> <p><u>Contribution in the Project:</u></p> <ul style="list-style-type: none"> ▪ Contribution Description 1 ▪ Contribution Description 2 <p>_____ Signature of the Student</p>

1. PROJECT PROPOSAL

1.1 Background to the Problem

- Write the background description that helps putting your project into the right context of a problem domain and gives everyone involved a common view of the project.
- What is the root cause of this problem? Why this problem is so important to consider?.

1.2 Solution to the Problem

- Describe what is your project/thesis objective? What solutions are you going to provide to solve the above-mentioned problems?
- What are the solutions you are going to propose to deal with the problem? why is this solution is particularly appropriate to solve the problem? Is the solution feasible to the meet the business objective?
- Describe the basic functionalities of your proposed solution that makes the best use of state-of-art technology and produced a significant result that is likely to have a major impact on societal, health, safety, legal and cultural issues. Provide a deep insight that demonstrate and preset a creative solution to the real-life problem.
- Describe the target group of users of your solution? And how they will be benefited by your proposed solution to the problem?

- Describe the contribution of your project to the development of scientific results that is identified and well documented.
- Provide a literature review on what are the other studies that have discussed the same topic of yours in the literature and explain how your study has utilized and extended the problems of existing studies.
- Provide a description of all the existing studies presented in the problem area. What are the existing software solutions (for project) are available to solve the aforementioned problems?
- What are the existing software solutions are available to solve the aforementioned problem? And how your proposed solution is going to extend them in providing more benefits to the users?

2. SOFTWARE DEVELOPMENT LIFE CYCLE

2.1 Process Model

- Provide an analysis regarding the nature and environment of the software that you are going to develop and select the best suitable method(s) to develop the software.
- Present your arguments based on your analysis about why your selected method(s) is the best choice among all other methods to develop your proposed software.
- Presents sufficient amount of evidence to support argument for your model selection in developing your proposed solution.

2.2 Project Role Identification and Responsibilities

- Identify all the roles/stakeholder in the software/project management activities in software development.
- Describes the responsibilities of the role in the software development.

Text Format:

- Style: Times New Roman
- Size: 12
- Space: 1.0
- Alignment: Justify
- Length: Maximum 6 pages (including cover page)

Rubric for Project Assessment (CO3)

Criteria	Marks distribution (Max 3X5= 15)				Acquired Marks
	Inadequate (1-2)	Satisfactory (3)	Good (4)	Excellent (5)	
Selection of Software Engineering Models	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	
Impact identification					
Formatting and Submission	Project report is not complete and Several errors in spelling and grammar. Present a Confusing organization of concepts, supporting arguments, and	Some errors in spelling and grammar. Some problems of organizing the answer in a logical order of defining, elaborating, and	Few errors in spelling and grammar. Presents most of the details in a logical flow of organization in	Project report is complete and No errors in spelling and grammar. Consistently presents a logical	

	real-life example. Sentences rambling, and details are repeated.	providing real-life examples.	definition, details, and example.	and effective organization of definition, details, and real-life example of the topic.	
Acquired marks:					
CO Pass / Fail:					

Rubric for Project Assessment (CO4)

Marks Distribution (Maximum 3X5=15)					
Marking Criteria	Inadequate (1-2)	Satisfactory (3)	Good (4)	Excellent (5)	Acquired Marks
Project Planning	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.	
Effort Estimation and Scheduling	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	
Risk Management	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:					

CO5 [PO-i-2]: Perform as an effective team member or leader in diverse team settings and solve multi-disciplinary problems in computer science and engineering domain.				
Assessment Attribute/Criteria	Missing/ Incorrect (0)	Inadequate (1)	Satisfactory (2)	Excellent (3)
Taking responsibility	Does not perform assigned tasks; often misses meetings and, when present, does not have anything constructive to say; relies on others to do the work;	Partially performs all assigned tasks; attends meetings irregularly and occasionally participates and hence not reliable;	Performs all assigned tasks; attends meetings regularly and usually participates effectively. generally reliable;	Performs all tasks very effectively; attends all meetings and participates enthusiastically; very reliable.
Contributions	Never provides useful ideas when participating in a group discussion	Rarely provides useful ideas when participating in a group discussion	Sometimes provides useful ideas when participating in a group discussion	Routinely provides useful ideas when participating in a group discussion
Collaboration and Ability to Compromise	Not cooperative, unable to compromise and disrupts the team process.	Sometimes cooperative, and rarely displays a positive attitude.	Usually cooperative, able to compromise and generally display positive attitude.	Always cooperative. Willingness to compromise. Always display positive attitude.
Valuing other team members (Working with others)	Often argues with teammates; doesn't let anyone else talk; occasional personal attacks and "put-downs"; wants to have things done his way and does not listen to alternate approaches.	Seldom listens to others' points of view; occasionally behaves in an oppressive manner; tries to force their own ideologies on other.	Generally, listens to others' points of view; always uses appropriate and respectful language; tries to make a definite effort to understand others' ideas.	Always listens to others and their ideas; helps them develop their ideas while giving them full credit; always helps the team reach a fair decision.

Process Model:

Scrum was chosen as the best technique for the "Shipping Port Management" system over alternatives like Waterfall, V-Model, or Incremental models because of its flexibility, iterative nature and emphasis on stakeholder involvement. A development model that can adapt to changes is necessary due to the dynamic nature of port management, which includes ever-changing trade volumes, technological integration and compliance requirements. Features are continuously built, tested and reviewed according to Scrum's sprint-based iterative methodology, which also enables real-time adjustments depending on stakeholder feedback. Because of this, Scrum is perfect for managing the intricacy and changing needs of a system intended to maximize resource allocation, cargo tracking and vessel scheduling.

Scrum is very good at encouraging developers, stakeholders and end users to work together. This ongoing communication guarantees that the changing requirements of ship owners, port operators and consumers are successfully satisfied. Scrum enables iterative feedback through sprints, in contrast to linear and less adaptive conventional models like Waterfall or V-Model. Functional increments are delivered by each sprint, enabling stakeholders to regularly review and improve features and guaranteeing that the system adapts to operational demands.

Scrum was chosen in part because of its capacity to manage intricate projects with shifting requirements. Changing rules, varying trade quantities and the requirement for technological integration are just a few of the erratic problems faces by shipping ports. Because of Scrum's flexibility, changes can be made mid-development to keep the product current and functional. Research from related port management and logistics projects shows that Scrum lowers development risks, increases user happiness and guarantees the timely delivery of functional components.

Scrum also uses structured roles like Scrum Masters and Product Owners to keep communication open and in line with company goals. Frequent sprint reviews and retrospectives make it possible to pinpoint areas for improvement, which enhances the development process' responsiveness and efficiency. Adopting Scrum guarantees the delivery of a reliable, user-focused system that is customized to meet the particular needs of managing shipping ports. This approach not only improves software quality but also helps the system function successfully over the long run.

Based on the analysis of the shipping port management and its unique requirements, the selected development methodology—Agile, specifically the Scrum framework—is the best choice. Here are the key arguments supporting why Scrum is the ideal approach compared to other methodologies.

Scrum produces usable increments over brief sprints (2-4 weeks), allowing for prompt validation and adjustments. On the other hand, waterfall releases the product solely at the conclusion, which poses a risk of deviating from expectations. In contrast to the strict waterfall model, Scrum

facilitates ongoing feedback and the refinement of the backlog, which makes it well-suited for ever-changing settings.

Scrum promotes teamwork between developers, pharmacists, customer service and delivery staff through daily stand-up meetings and sprint reviews, which helps maintain alignment. In contrast, traditional models such as waterfall typically isolate roles, leading to decreased efficiency.

Scrum engages stakeholders consistently during sprint reviews and demonstrations, ensuring the product aligns with user requirements. The Waterfall approach's postponed feedback can lead to dissatisfaction with the final deliverable.

Sprint retrospectives in Scrum encourage continuous improvement, enhancing team effectiveness and results. Conventional models do not incorporate this iterative reflection, which restricts flexibility.

Test-driven development (TDD) and Scrum together guarantee early and continuous testing, which is essential for shipping port management systems. Waterfall increases the chance of defects by delaying testing.

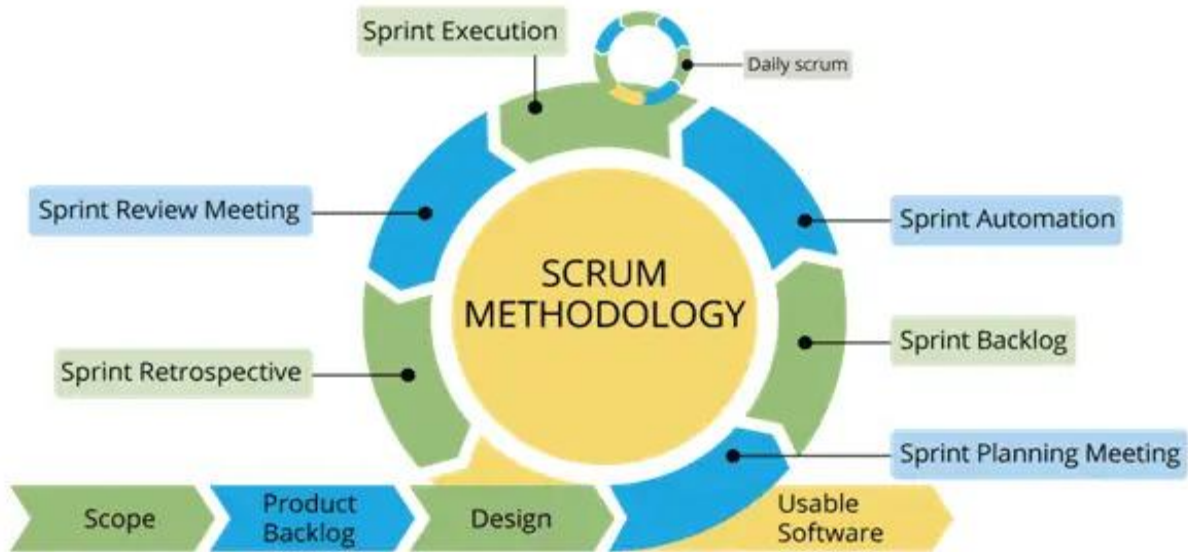
Scrum reduces late-stage risks by identifying problems early through frequent reviews. Waterfall frequently only finds issues during final testing, which raises the cost of fixing them.

Scrum is appropriate for complicated systems since it manages heterogeneous, multi-role teams with defined roles and responsibilities. Such flexibility is absent with models such as the V-Model.

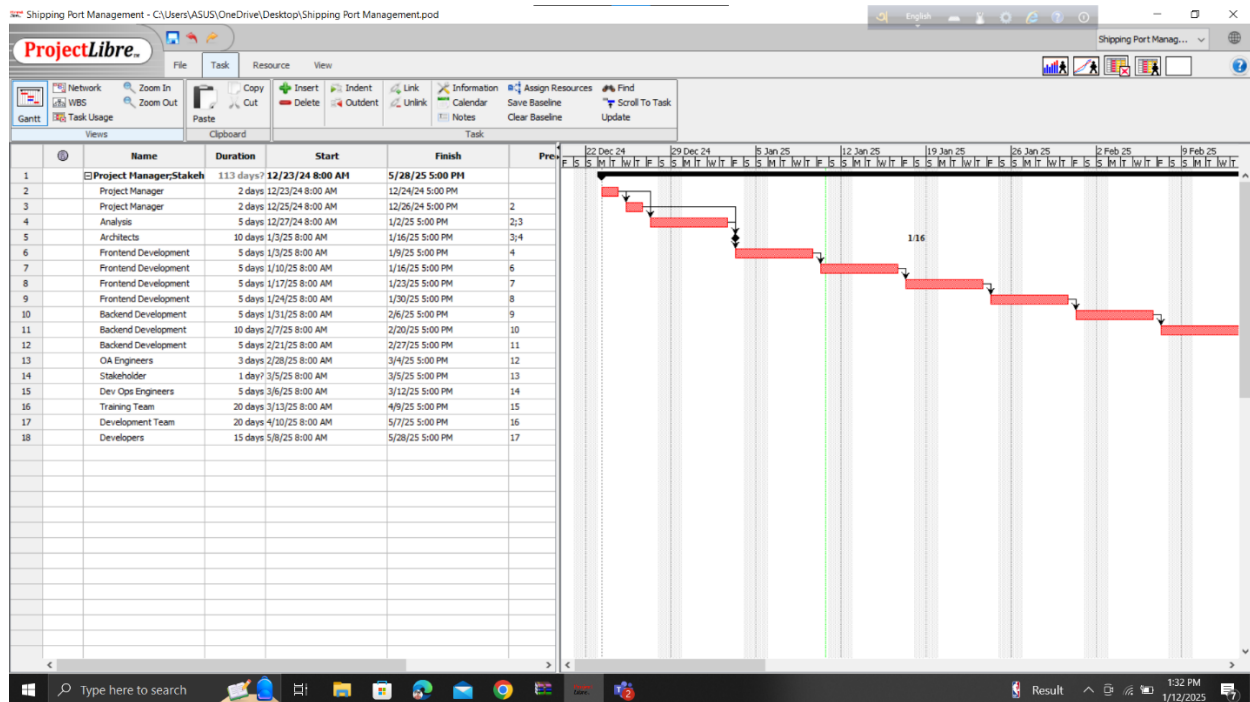
References:

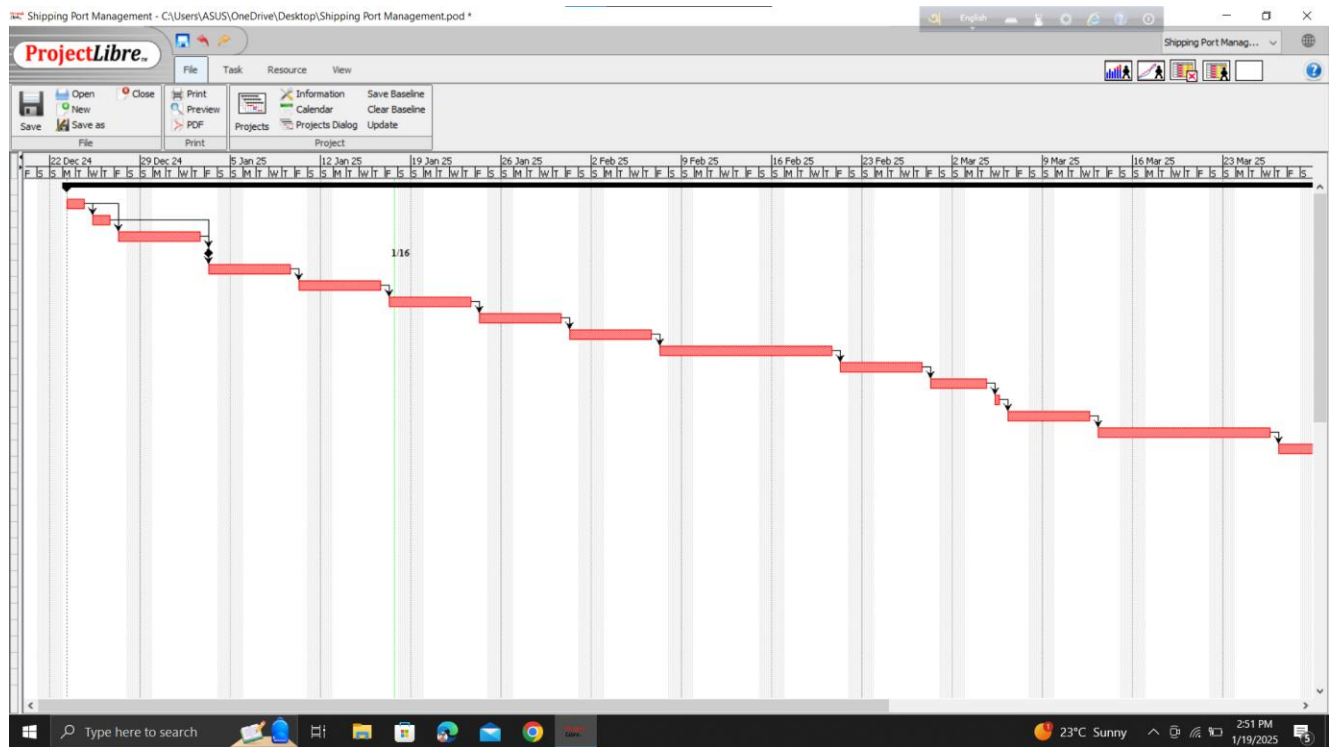
https://www.researchgate.net/publication/283435871_Scrum_Method_Implementation_in_a_Software_Development_Project_Management

<https://medium.com/@jojonicho/how-to-integrate-scrum-inside-of-a-software-development-team-fdec25bf229c>



WBS:





Risk Assessment:

	B	C	D	E	F	G	H
2		Last Updated: 12/29/2024					
3							
4			Impact →				
5			Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
6							
7		Likelihood ↑	Almost Certain (> 1 in 10) 5	Medium 5	High 10	Extreme 15	Catastrophic 20
8			Likely (1 in 20) 4	Low 4	Medium 8	High 12	Extreme 16
9			Occasional (1 in 200) 3	Very Low 3	Low 6	Medium 9	High 12
10			Unlikely (1 in 2000) 2	Very Low 2	Very Low 4	Low 6	Medium 8
11			Rare (< 1 in 10000) 1	Very Low 1	Very Low 2	Low 3	Low 4
12							
13							
14							
15							
16							
17	#	Failure Mode	Risk reduction techniques	LIKELIHOOD	EFFECT of Failure	IMPACT	RISK SCORE
18	1	Size estimate may be significantly low	as needed; communicate change	2	Overload	4	8
19	2	Larger number of users than planned	allocate additional resources if necessary	2	Rush in server	5	10
20	3	Less reuse than planned	code reuse; review during design phases	5	Waste of resources	4	20
21	4	End-users resist system	Provide user training, collect feedback, and iterate on design	2	System error	5	10
22	5	Delivery deadline will be tightened	milestones to manage timelines effectively	4	Tough to deliver on time	3	12
23	6	Funding will be lost	sources or adjust project priorities	3	Assets shortage	2	6
24	7	Customer will change requirements	Establish clear communication channels; document all changes	2	Problem in managements	3	6
25	8	Technology will not meet expectations	prototype before full implementation	1	Failure	1	1
26	9						-
27	10						-

Risk Mitigation:

ACTION ITEMS				
Recommended Actions	Action Owner	Action Due Date	% Complete	Comments
Adjust project scope or budget as needed; communicate change	Materials Engineer	10/20/2024	50%	
Monitor user base closely; allocate additional resources if necessary	Developer	10/15/2024	100%	
Encourage modular design and code reuse; review during design phases	Maintenance Team	11/1/2024	13%	
Provide user training, collect feedback, and iterate on design	Materials Engineer	11/10/2024	30%	
Break project into smaller milestones to manage timelines effectively	Engineer	10/25/2024	11%	
Secure alternative funding sources or adjust project priorities	Owner	10/18/2024	7%	
Establish clear communication channels; document all changes	Customer Engineer	10/30/2024	4%	
Conduct proof of concept and prototype before full implementation	Developer	10/30/2024	9%	