American International University-Bangladesh (AIUB)

Department of Computer Science

Faculty of Science & Technology (FST)

Fish Disease Detector

A Software Engineering Project Submitted

Semester: Spring_23_24		**Section: J**	**Group Number:**	
SN	Student Name	Student ID	Contribution (CO3+CO4)	Individual Marks
1	Kamruzzaman Sony	22-46791-1		
2	Md. Shakil Hossain	22-46885-1		
3	A. M. Rafinul Huq	21-45668-3		
4	Debashish Das	19-40693-1		

CO3: *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	Total Marks	
Appropriate Process Model Selection and Argumentation with Evidence	[5 Marks]	
Evidence of Argumentation regarding process model selection	[5Marks]	
Analysis the impact of societal, health, safety, legal and cultural issues	[5Marks]	
Submission, Defense, Completeness, Spelling, grammar and Organization of the Project report	[5Marks]	
CO4: *Develop* project management plan to manage software engineering projects following the principles of engineering management and economic decision process	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 these risk factors.	[5Marks]	

Description of Student's Contribution in the Project work

Student Name: Kamruzzaman Sony
Student ID: 22-46797-1
Contribution in Percentage (85 %):
Contribution in the Project:

- Contribution Description 1
- Contribution Description 2

_____
Signature of the Student

Student Name: Md. Shakil Hossain
Student ID: 22-46885-1
Contribution in Percentage (5 %):
Contribution in the Project:

- Contribution Description 1
- Contribution Description 2

_____
Signature of the Student

Student Name: A. M. Rafinul Huq
Student ID: 21-45668-3
Contribution in Percentage (5 %):
Contribution in the Project:

- Contribution Description 1
- Contribution Description 2

_____
Signature of the Student

Student Name: Debashish Das
Student ID: 19-40693-1
Contribution in Percentage (5 %):
Contribution in the Project:

- Contribution Description 1
- Contribution Description 2

_____
Signature of the Student

Rubric for Project Assessment (CO3)

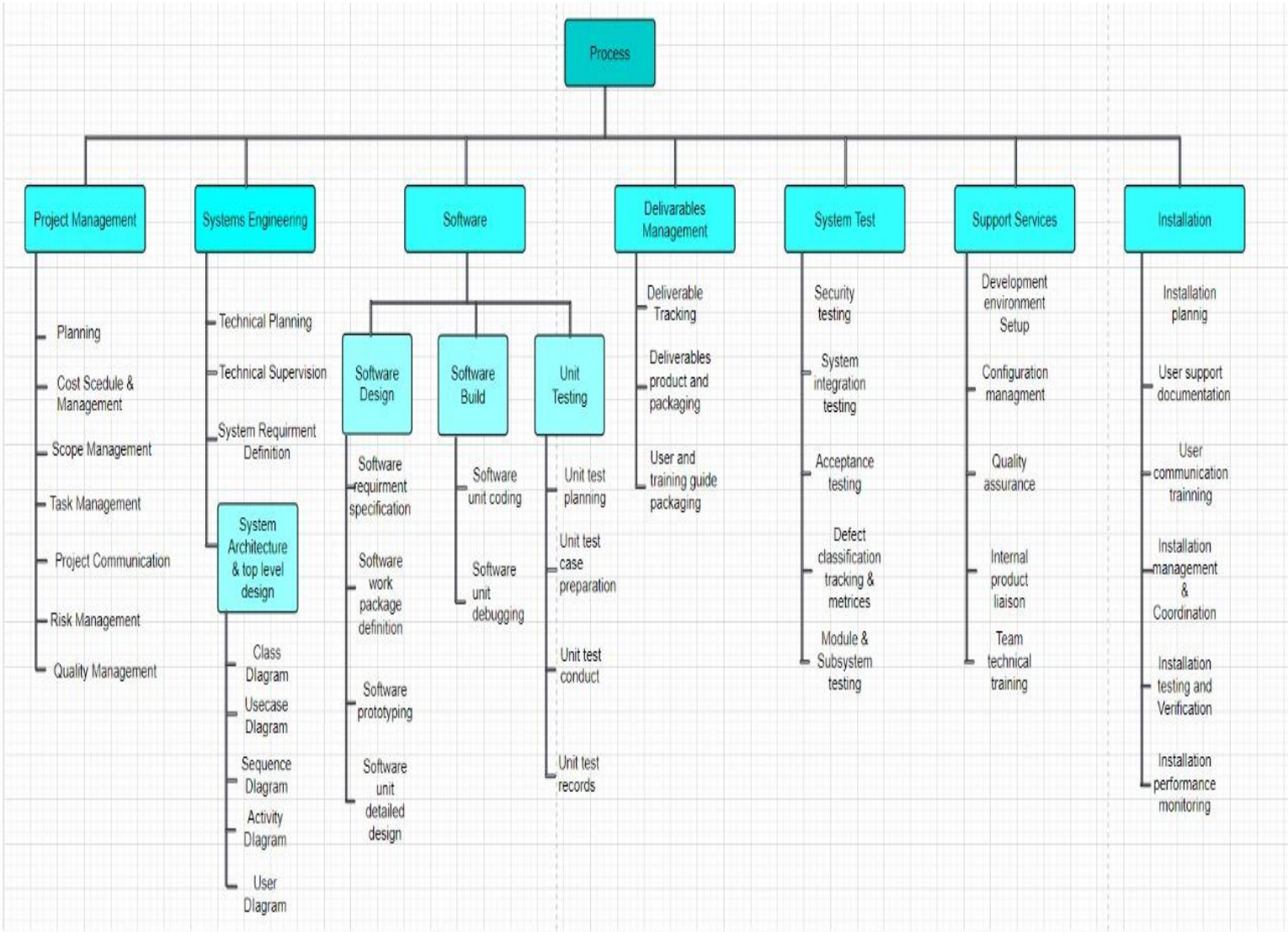
Criteria	Marks distribution (Max 3X5= 15)				Acquired Marks
	Inadequate (1-2)	Satisfactory (3)	Good (4)	Excellent (5)	
Selection of Software Engineering Models	Does not articulate a position or argument of choosing appropriate model. Does not present any evidence to support the arguments for the choice 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 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:	

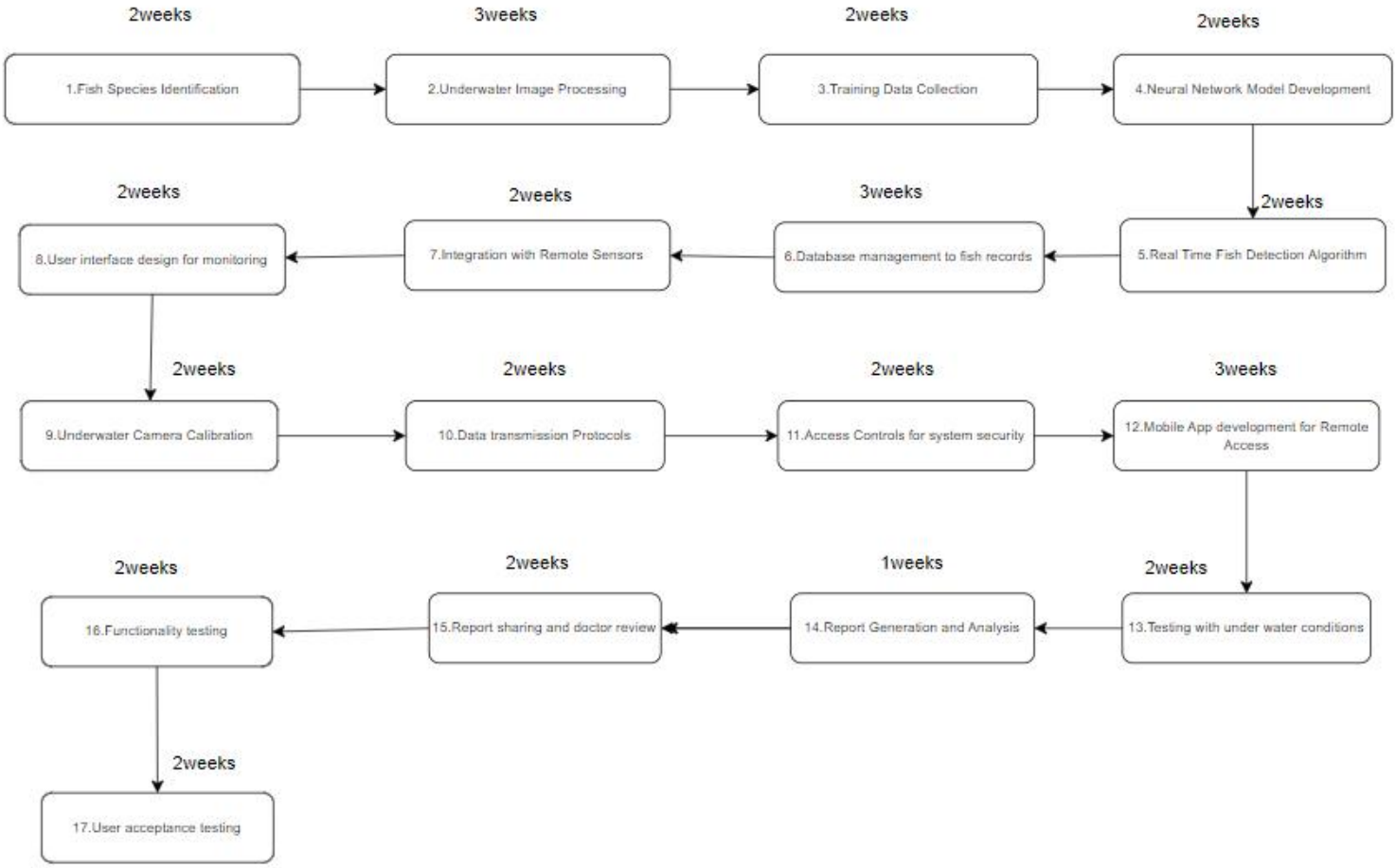
Rubric for Project Assessment (CO4)

Marking Criteria	Marks Distribution (Maximum 3X5=15)				Acquired Marks
	Inadequate (1-2)	**Satisfactory (3)**	**Good (4)**	**Excellent (5)**	
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:	

Work Breakdown Structure(WBS)



Activity Scheduling diagram



Effort Estimation:

LOC (Line of Code) = 6000

Special Skill (B) = 2

Productivity Parameter (P) = 1.5

Project Duration (t) = 4 months

Now,

$$\mathbf{E} = \left(\frac{6000 \times 2^{0.333}}{1.5}\right)^{3} \times \left(\frac{1}{4^4}\right)$$
$$\approx 499.65 \times 10^{6}$$

COCOMO (Constructive Cost Model):

Software Project Type	Coefficient <Effort Factor>	P	T
Organic	2.4	1.05	0.38
Semi-detached	3.0	1.12	0.35
Embedded	3.6	1.20	0.32

As our project is an organic software,
Therefore:

Coefficient$_{\text{<Effort Factor>}}$ = 2.4
Project complexity (P) = 1.05
SLOC-dependent coefficient (T) = 0.38

I. Effort calculation:

$$PM = \text{Coefficient}_{\text{<Effort Factor>}} \times \left(\frac{SLOC}{1000}\right)^{P}$$

$$= 2.4 \times \left(\frac{6000}{1000}\right)^{1.05}$$

$$= 15.75\ person - months$$

II. Development Time:

$$DM = 2.50 \times (PM)^{T}$$
$$= 2.50 \times (15.75)^{0.38}$$

= 7.13 months

III. Required number of People:

$$ST = \frac{PM}{DM}$$
$$= \frac{15.75}{7.13}$$
$$= 2.21$$
$$\approx 3\ people$$

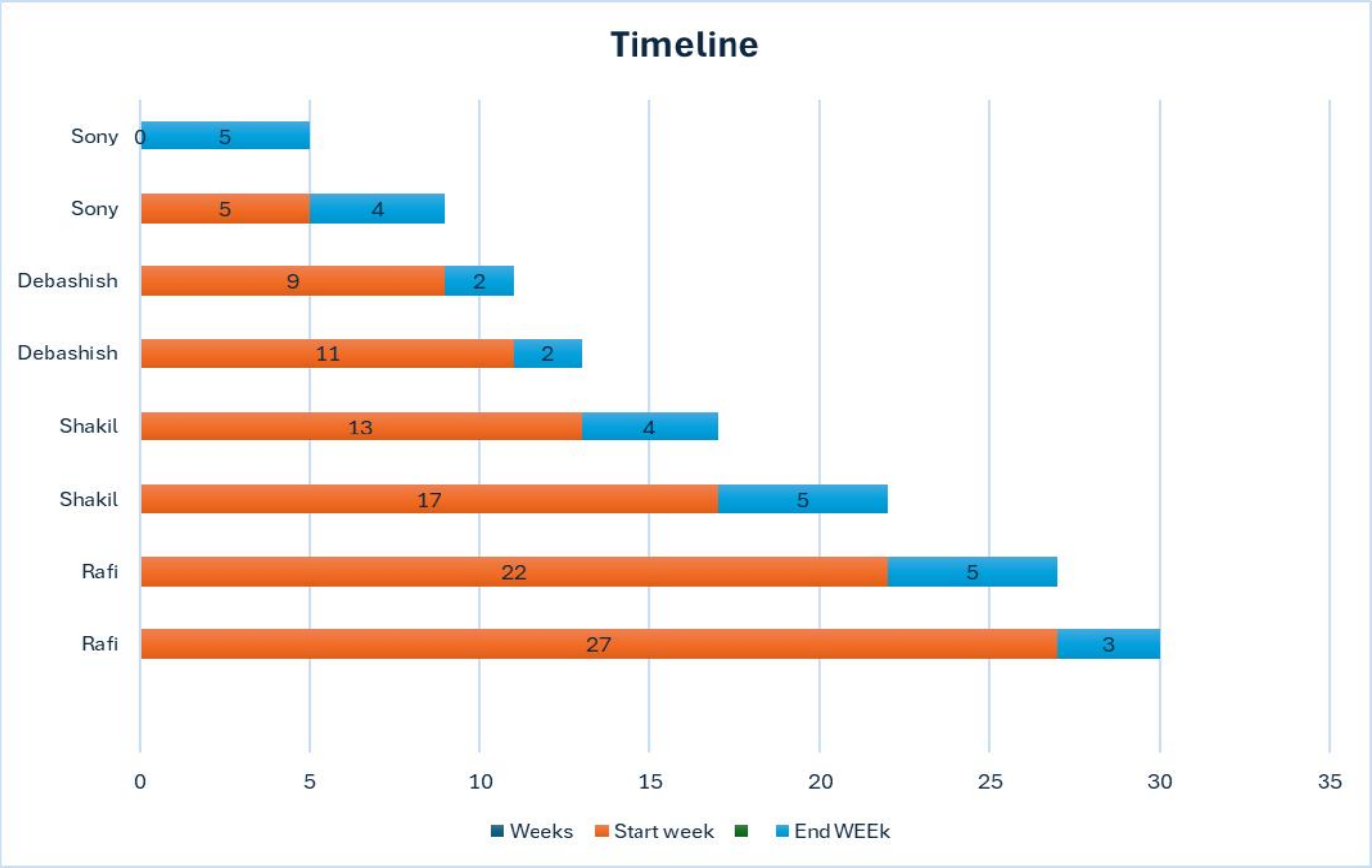


Table 1

A: Planning

B: Setup environment

C: Analysis

D: Design

E: Coding

F: Testing

G: Integration testing

H: System testing

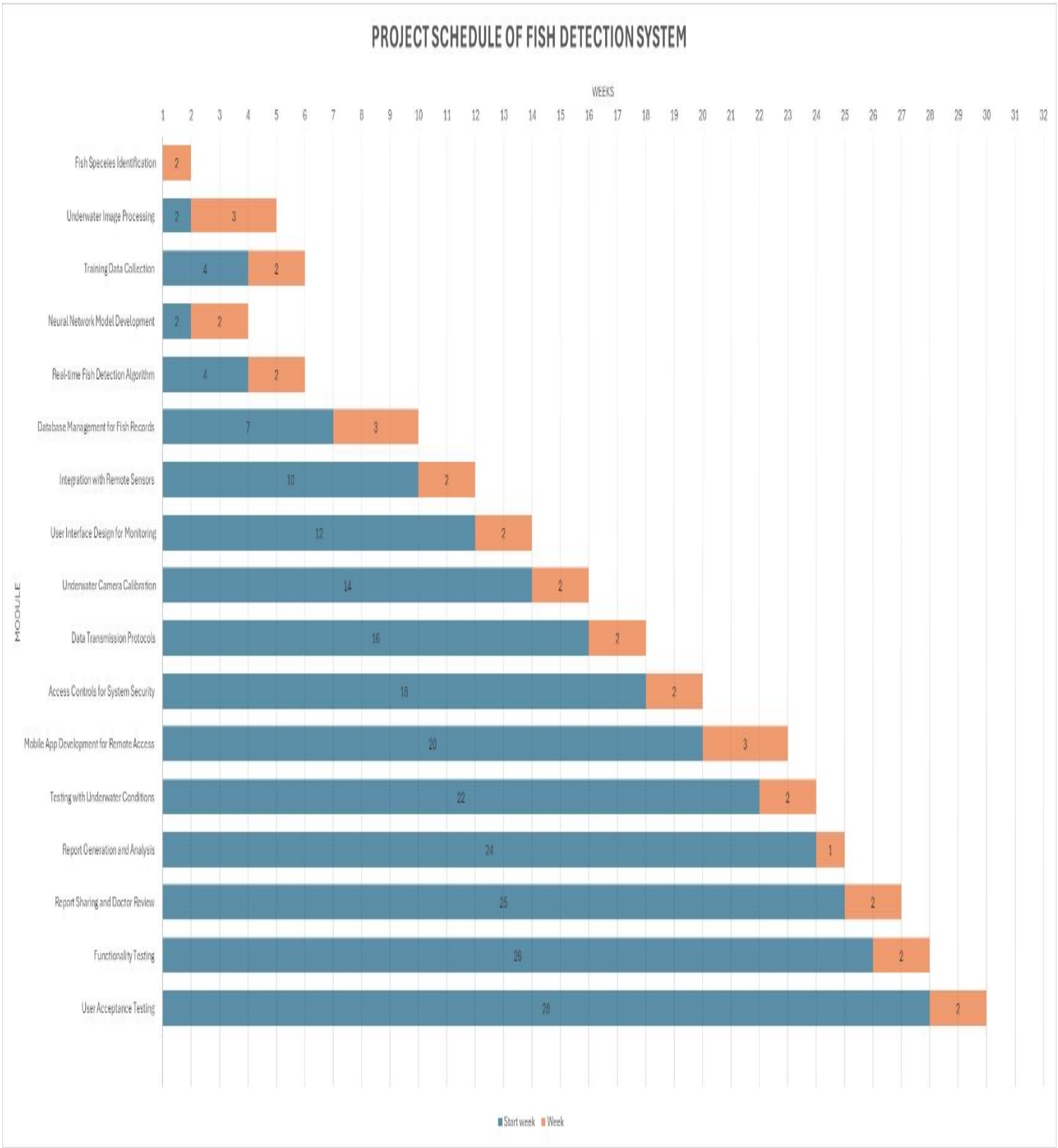

PROJECT SCHEDULE OF FISH DETECTION SYSTEM
WEEKS
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MODULE
Fish Speceies Identification
Underwater Image Processing
Training Data Collection
Neural Network Model Development
Real-time Fish Detection Algorithm
Database Management for Fish Records
Integration with Remote Sensors
User Interface Design for Monitoring
Underwater Camera Calibration
Data Transmission Protocols
Access Controls for System Security
Mobile App Development for Remote Access
Testing with Underwater Conditions
Report Generation and Analysis
Report Sharing and Doctor Review
Functionality Testing
User Acceptance Testing
Start week
Week

Table 2

Table 2

Earned Value Analysis

Schedule weeks = 15.75 * 4 = 63

Effort estimated = 63 * 5

= 315 person-day

Total task = 51

EVA conduct date: 15/02/2024

8 tasks have been completed but the project schedule indicates that 11 tasks should have been completed in that time.

Task	Planned Effort	Actual Effort
1	11.0	12.5
2	12.0	16.0
3	17.0	11.8
4	8.6	10.2
5	5.8	5.0
6	14.0	16.0
7	9.0	10.0
8	7.0	6.5
9	12.8	
10	4.6	
11	8.6	

BCWP

BCWS

ACWP

So here,

BAC = 315

BCWP = 84.4

BCWS = 110.4

ACWP = 8

SPI = BCWP / BCWS = 84.4 / 110.4 = 0.76449

SV = BCWP – BCWS = 84.4 – 110.4 = -26 person-day

CPI = BCWP / ACWP = 84.4 / 88 = 0.95909

CV = BCWP – ACWP = 84.4 – 88 = -3.6 person-day

% Schedule for completion = BCWS / BAC

= 110.4 /315

= 0.350%

[% of work schedule to be done at this time]

% Complete = BCWP / BAC

= 84.4 / 315

= 0.267%

[% of work completed at this time]

Risk Estimation

Risks	Category	probability	Impact	RMMM
User's personal data breach	BU	40%	1	Robust security measures to prevent data breaches and unauthorized access.
Size estimated might be lower or higher than expectation	PS	70%	2	Proper analysis of software size
Number of users might be higher than expectation	PS	30%	3	Scalable architecture and infrastructure to accommodate potential increases in user traffic and demand.
Project budget might exceed expectation	CU	20%	2	Rigorous budget tracking, forecasting mechanisms and reviewing regular expenditures
Lack of User Adoption and Engagement	CU	60%	2	Strategies for user engagement and education.
Developing the wrong user interface	TE	20%	2	Make simple and understanding interface according to user demand
Developing the wrong software functions	TE	20%	1	Thorough analysis of user requirements and expectations
Unauthorized users within the system	CU	50%	1	User verification with NID
Difficulties integrating with existing systems	DE	70%	3	Thorough analysis of existing system architectures and protocols, alongside dedicated resources for compatibility testing and iterative integration
Ineffective Donor Screening	CU	80%	1	Verification with medical documents
Third-Party Dependencies	DE	30%	4	Conduct thorough research, evaluate alternative options, and establish contingency plans
Development deadline will be tightened	BU	50%	2	Prioritize tasks, streamline processes, and allocate additional resources as needed
Scalability Issues	DE	40%	3	Platform must scale accordingly to accommodate increased traffic and usage
Integrating with various healthcare systems	TE	60%	3	Implementing standardized healthcare interoperability protocols, such as HL7 FHIR (Fast Healthcare Interoperability Resources)
Lack of training on tools	ST	30%	2	Providing adequate training and support resources for users and administrators

Lack of up-to-date information	TE	60%	2	Regular updates on server information
Legal Liability	BU	80%	2	Ensuring the platform's terms of use, disclaimers, and liability waivers are properly drafted
Version Control Issues	BU	50%	2	Branching strategies, code reviews, and automated deployment pipelines
Skill gaps within the development team	ST	20%	2	Providing training opportunities, mentorship and hiring additional talent
Natural Disasters or Outages	BU	50%	2	Backup power source for servers

Progress of Project Execution

Activity	Description	Predecessors	Duration (Weeks)	Cost	Work Completed	Money Spent
1	Business meeting	-	2	$500	100%	$500
2	Project Development Planning	1	4	$1000	75%	$750
3	Programming	1,2	5	$3000	90%	$2700
4	Unit Testing	3	2	$500	80%	$400
5	Fixing	4	2	$1000	70%	$700
6	Beta Release	1,2,4,5	1	$500	100%	$500

Table: Startup Project Execution Reported on 15th April