INTEGRATED DESIGN PROJECT

CSE~460

PROJECT PLAN

(GROUP ~HOTEL, SEC~A)

PREDICTIS

201814022: Kazi Rafid Raiyan.

201814026: Angshu Bikash Mondol.

201814029: Tashfia Tasnim.

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201814048: Asima Oshin Putul.

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1 Introduction

1.1 Document Purpose

A project management plan is a formal document that defines how a project is going to be carried out. It outlines the scope, goals, budget, timeline and deliverables of a project, and it's essential for keeping a project on track. A project plan document is the key to a successful project. The purpose of a project plan document is to gather necessary information to execute a project and to control it too. The primary use of the project plan are to document planning assumptions and decisions, facilitate communication and project stakeholders, and document approved scope, cost and schedule baselines.

1.2 Associated Documents

Apart from project planning documents; software requirement specification (SRS), project proposal, project paper, project scheduling and project budget analysis papers etc are attached here along with project plan.

2 Project Scope

2.1 Objectives

1. Making an application based system which will provide anyone to take care of the health of their heart
2. Use of Machine Learning to decide in which heart condition catagory they belong to (Green for healthy heart, Yellow for people with mild heart problem, Red for people with serious heart problem)
3. To give alarm when to go to doctor, will notify a person if user undergoes heart attack or serious angina.
4. Will collect real time data and regulates daily schedule according to the condition of the heart and lifestyle. Also will give reminder if not done accordingly.

2.2 Success Criteria

1. The first step of success depends on collecting dataset that will later be fed to the machine learning algorithm.
2. Collecting various realtime data using sensors is another major requirement for success of our project.
3. Developing proper machine learning model is very essential to predict heart condition of the user.
4. Building database to hold the collected data and also the data history.
5. Interfacing The hardware data with the andriod app.

3 Deliverables

Features:

1. Predicting Risk zone from Pretrained model with real time data.
2. Visualizing real-time data taken from the sensors(e.g. pulse sensor, ECG sensor)
3. Providing Emergency contact and ambulance calling alerts
4. Keeping previous health history.
5. Providing medical consultation e.g. Diet, exercise, sleep time.
6. Keeping profile data in the history.
7. The device is wearable and easy to use.
8. Monitoring The patient to give alarm when abnormality is detected.

4 Project Approach

Our project has been developed using **agile methodology.** The proposed system has many different functionalities. Each functionality is developed one by one, so it is essential to check the result after completion of each functionality. Each step has a significant impact on the next step of the system.(Fig-4)

The agile software development methodology is one of the simplest and effective process to turn a vision for business need into software solutions. Agile is a term used to describe software development approaches that employ continual planning, learning, improvement, team collaboration, evolutionarydevelopment and early delivery. It encourages flexible responses to change.

Fig-4: Agile methodology

4.1 Project team organization

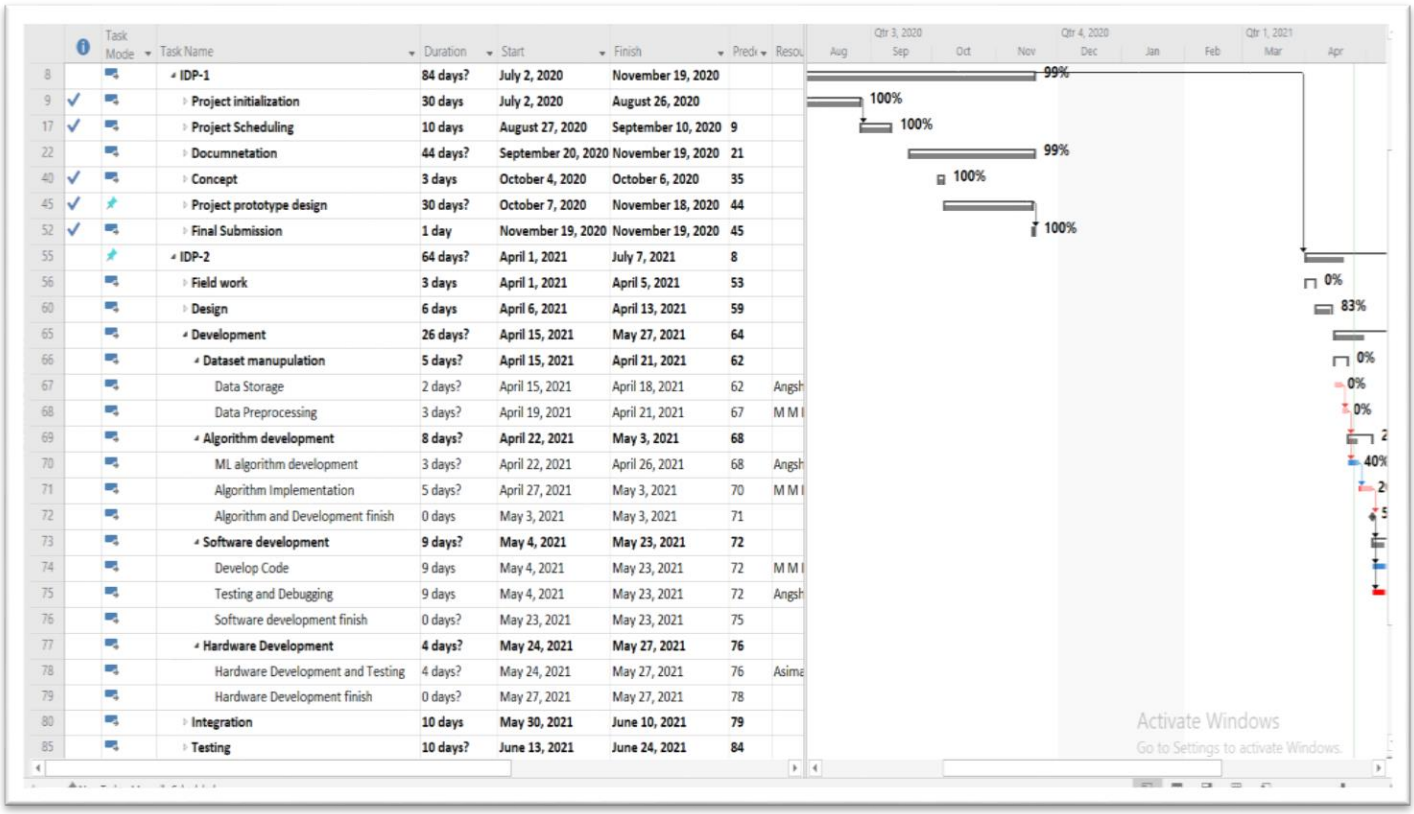
Task name	Resource name
PREDICTIS	
Initiation	
Team member selection	
Idea proposal	Kazi Rafid Raiyan, Rushadul Mannan
Project idea approval	Asima Oshin Putul, Angshu Bikash
Planning	
Initial analysis	
Requirement analysis	Rushadul Mannan, Asima Oshin Putul, Angshu Bikash
Define priliminary resources	Shutonu Mitra, Kazi Rafid Raiyan, Tasfia Tasnim
Detailed planning	
Project features	Shutonu Mitra, Rushadul Mannan, Asima Oshin Putul
Hardware selection	Kazi Rafid Raiyan, Angshu Bikash, Tasfia Tasnim
Documentation	
SRS	
System architecture	Tasfia tasnim, Asim Oshin Putul
System model	Shutonu Mitra, Angshu Bikash
Determine project scope	Rushadul Mannanm, Kazi Rafid Raiyan
SRS submission	All
Concept	
Hardware interfacing concept	Kazi Rafid Raiyan, Angshu Bikash, Tasfia Tasnim
Machine learning concept	Shutonu Mitra, Rushadul Mannan, Asima Oshin Putul
Prototype design	
Determine software specification	Shutonu Mitra, Tasfia Tasnim
Comprehensive UI design	Rushadul Mannan, Tasfia Tasnim
Review functional specification	Rushadul Mannan, Kazi Rafid Raiyan
Prototype design complete	Tasfia Tasnim, Asima Oshin Putul
Design	
Incorporate feedback into functional specification	Asima Oshin Putul, Tasfia Tasnim, Shutonu Mitra

System architecture design	Shutonu Mitra, Angshu Bikash
Workflow design	Shutonu Mitra, Tasfia tasnim, Rushadul Mannan
Dataflow design	Asima Oshin Putul, Angshu Bikash
Final hardware design	Kazi Rafid Raiyan, Rushadul Mannan
Development	
Dataset manipulation	
Data storage	Shutonu Mitra, Asima Oshin Putul, Rushadul Mannan
Data pre-processing	Shutonu Mitra, Tasfia Tasnim, Angshu Bikash
Algorithm development	
ML algorithm development	Kazi Rafid Raiyan, Shutonu Mitra
Algorithm implementation	Kazi Rafid Raiyan, Shutonu Mitra
Software development	
Develop front-end	Rushadul Mannan, Tasfia Tasnim
Back-end connection	Rushadul Mannan, Asima Oshin Putul, Angshu Bikash
Testing and debugging	Rushadul Mannan, Tasfia Tasnim, Shutonu Mitra
Hardware development	
Pulse sensor testing	Kazi Rafid Raiyan, Angshu Bikash, Asima Oshin Putul
Pulse sensor interface	Kazi Rafid Raiyan, Angshu Bikash, Tasfia Tasnim
ECG sensor testing	Kazi Rafid Raiyan, Shutonu Mitra
ECG sensor interfacing	Kazi Rafid Raiyan, Shutonu Mitra
Blood pressure sensor testing	Rushadul Mannan, Asima Oshin Putul, Tasfia Tasnim
Blood pressure sensor interfacing	Rushadul Mannan, Tasfia Tasnim
Integration	
Hardware interfacing	Kazi Rafid Raiyan, Tasfia Tasnim, Angshu Bikash
Test module integration	Rushadul Mannan, Shutonu Mitra, Asima Oshin Putul
Testing	
Develop test plan using product specification	Rushadul Mannan, Asima Oshin Putul, Tasfia Tasnim

Test modular code	Rushadul Mannan, Shutonu Mitra, Angshu Bikash
Review modular code	Kazi Rafid Raiyan, Tasfia tasnim
Modify code and hardware based on modular code test	Kazi Rafid Raiyan, Angshu Bikash
Testing complete	Tasfia Tasnim, Asima Oshin Putul, Rushadul Mannan
Documentation	
Final SRS documentation	Asima Oshin Putul, Angshu Bikash, Kazi Rafid Raiyan
Software testing document	Asima Oshin Putul, Angshu Bikash
Software quality assurance document	Tasfia Tasnim, Rushadul Mannan, Shutonu Mitra
UI development report	Tasfia tasnim, Rushadul Mannan
System development report	Asima Oshin Putul, Angshu Bikash
Experiment design document	Kazi rafid Raiyan , Tasfia Tasnim
Project plan document	Asima Oshin Putul, Tasfia Tasnim
User manual document	Asima Oshin Putul, Shutonu Mitra
Final document submission	Rushadul Mannan, Asima Oshin Putul, Angshu Bikash
Deployment	
Determine final deployment strategy	Tasfia Tasnim, Asima Oshin Putul, Shutomu Mitra
Train support staff	Kazi Rafid Raiyan, Angshu Bikash, Rushadul Mannan
Deploy system	All
Closure	

5 Work Plan

5.1 Work Breakdown Structure



	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
8		IDP-1	84 days?	July 2, 2020	November 19, 2020		
9	✓	Project initialization	30 days	July 2, 2020	August 26, 2020		
17	✓	Project Scheduling	10 days	August 27, 2020	September 10, 2020	9	
22		Documnetation	44 days?	September 20, 2020	November 19, 2020	21	
40	✓	Concept	3 days	October 4, 2020	October 6, 2020	35	
45	✓	Project prototype design	30 days?	October 7, 2020	November 18, 2020	44	
52	✓	Final Submission	1 day	November 19, 2020	November 19, 2020	45	
55		IDP-2	64 days?	April 1, 2021	July 7, 2021	8	
56		Field work	3 days	April 1, 2021	April 5, 2021	53	
60		Design	6 days	April 6, 2021	April 13, 2021	59	
65		Development	26 days?	April 15, 2021	May 27, 2021	64	
66		Dataset manupulation	5 days?	April 15, 2021	April 21, 2021	62	
67		Data Storage	2 days?	April 15, 2021	April 18, 2021	62	Angsh
68		Data Preprocessing	3 days?	April 19, 2021	April 21, 2021	67	M M I
69		Algorithm development	8 days?	April 22, 2021	May 3, 2021	68	
70		ML algorithm development	3 days?	April 22, 2021	April 26, 2021	68	Angsh
71		Algorithm Implementation	5 days?	April 27, 2021	May 3, 2021	70	M M I
72		Algorithm and Development finish	0 days	May 3, 2021	May 3, 2021	71	
73		Software development	9 days?	May 4, 2021	May 23, 2021	72	
74		Develop Code	9 days	May 4, 2021	May 23, 2021	72	M M I
75		Testing and Debugging	9 days	May 4, 2021	May 23, 2021	72	Angsh
76		Software development finish	0 days?	May 23, 2021	May 23, 2021	75	
77		Hardware Development	4 days?	May 24, 2021	May 27, 2021	76	
78		Hardware Development and Testing	4 days?	May 24, 2021	May 27, 2021	76	Asima
79		Hardware Development finish	0 days?	May 27, 2021	May 27, 2021	78	
80		Integration	10 days	May 30, 2021	June 10, 2021	79	
85		Testing	10 days?	June 13, 2021	June 24, 2021	84	

5.2 Resources

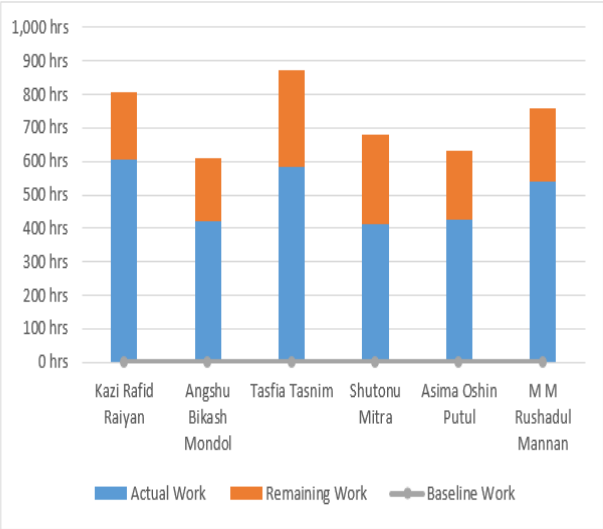
The resource distribution of the project is shown in the attached Gantt Chart.

Resource Overview

RESOURCE OVERVIEW

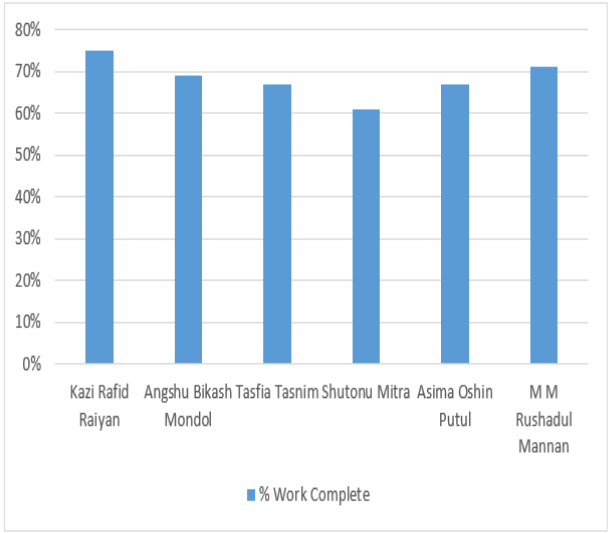
RESOURCE STATS

Work status for all work resources.



WORK STATUS

% work done by all the work resources.



RESOURCE STATUS

Remaing work for all work resources.

Name	Start	Finish	Remaining Work
Kazi Rafid Raiyan	July 2, 2020	July 6, 2021	201.6 hrs
Angshu Bikash Mondol	July 2, 2020	July 6, 2021	185.6 hrs
Tasfia Tasnim	July 2, 2020	July 7, 2021	289.6 hrs
Shutonu Mitra	July 2, 2020	July 7, 2021	267.2 hrs
Asima Oshin Putul	July 2, 2020	July 6, 2021	208 hrs
M M Rushadul Mannan	July 2, 2020	July 6, 2021	219.2 hrs

6 Milestones

Name	Finish
Project idea approval	August 12, 2020
Create work breakdown structure	August 31, 2020
Task management	September 2, 2020
Comprehensive UI design	November 18, 2020
Hardware interfacing	June 2, 2021
Deploy software	June 30, 2021
Hardware selection	September 24, 2020
Requirement analysis	September 20, 2020
Update on project scheduling	September 10, 2020
Revision on objectives and outcomes	August 19, 2020
Team member selection	July 2, 2020
Idea proposal	July 15, 2020
Discussion on project proposal	August 12, 2020
Proper presentation of the project components	October 1, 2020
Machine learning concept gathering	October 6, 2020
Final presentation and demonstration	November 19, 2020
Medical data collection	April 4, 2021
Database design	April 13, 2021
Data storage	April 18, 2021
ML algorithm development	April 26, 2021
Testing and debugging	May 23, 2021
Development test plansusing product specification	June 16, 2021
Distribute to team members	July 6, 2021
Final Project Submission	July 6, 2021

7 Risks, Constraints and Assumptions

This section will discuss initial Risks, Constraints and few Assumptions that were identified during initial project planning. Assessment attempts to identify, characterize, prioritize and document a mitigation approach relative to those risks which were identified prior to the start and during the project time-line. The Risk Assessment will be continuously monitored and updated throughout the life of the project, with further assessments which the Project Manager is allowed to amend. A constraint in project management are the restriction that limits project's desired outcome. Project constraint is one of the important factors that influences the project. It is a determinant factor to decide whether to continue the project or not. Basing on cumulative study, few constraints are identified for future references and address those once needed. To mitigate gaps within the risks and constraints and to allow the project move forward, few assumptions are made for supporting the decision of the stakeholders.

7.1 Risks

The risks of the project areDiscussed in the risk table.

Risks	Risk description	Mitigation plan(what to do to avoid the risk occurring)	Contigency plan (what to do if the risk occurs)	Impact (what the impact will be to the project if the risk occurs)	Likelihood of occurrence(e.g % or high/ medium/low)
1	Inaccuracy of prediction	Increase data points in training dataset	Check for more datasets	Give wrong prediction	Medium
2	Connection loss	Proper fixations of wearable devices	The devices should be fixed correctly	Connection loss will make the real time data collection shutdown	Medium
3	Inaccurate data from ECG sensor	Place the electrodes in the proper place of the body	Check if electrodes are placed in exact place	Receive inaccurate ECG data leading to wrong prediction	Low
4	Inaccurate data from pulse sensor	Place the sensor in the proper place of the body	Check sensor is placed in exact place	Receive inaccurate pulse rate data leading to wrong prediction	medium

7.2 Constraints

7.2.1 Project Constraints

The following represent known project constraints:

1. Dataset for heart disease is very limited. Taking data from Bangladeshi hospitals were not possible due to covid-19 situation.

2. Due to covid-19 situation the integration of hardwares with the software system became complicated.

3. Model buit with the dataset taken from online will not give the best result for Bangladeshi people.

7.2.2 Critical Project Barriers

Unlike risks, critical project barriers are insurmountable issues that can be destructive to a project's initiative. In this project, the following are possible critical barriers:

1. Removal of project funding
2. Unavailability of resources(cloud storage, sensors)

Should any of these events occur, the Project Plan would become invalid.

7.3 Assumptions

The following assumptions were made in preparing the Project Plan:

1. Bangladeshi hospitals might not provide the cardiac patient's data due to privacy.
2. Lockdown due to Covid-19 situation might be extended.
3. Management will ensure that project team members are available as needed to complete project tasks and objectives.
4. Failure to identify changes to draft deliverables within the time specified in the project time-line will result in project delays.
5. Project team members will adhere to the Communications Plan.
6. All project participants will abide by the guidelines identified within this plan. The Project Plan may change as new information and issues are revealed.

8 Financial Plan

A financial plan identifies the project finance needed to meet specific objectives. The financial plan defines all of the various types of expenses that a project will incur(labor, equipment, materials and asministrationcosts) along with an estimation of the value of each expense.A proposed financial plan for the project is tabulated here.

Category	Ser	Items	Qty	Unit cost	Total cost
	1.	ESP8266 (NodeMCU)	1	450.00	450.00
	2.	AD8232 (ECG Sensor)	1	950.00	950.00
	3.	Pulse rate sensor	1	350.00	350.00
	4.	Misc	….	3000.00	3000.00
Total cost					4750.00