



OVERSEE – An AI based Driver State Monitoring System

PROJECT PLAN DOCUMENT

GOLF – SECTION A

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1 Introduction

1.1 Document Purpose:

The primary uses of the project plan are to document planning assumptions and decisions, facilitate communication among project stakeholders, and document approved scope, cost, and schedule baselines. A project plan may be summarized or detailed. The purpose of projects and project management is to achieve strategic goals, systematically and in a controlled manner. ... They define and describe the goals and benefits that are targeted through projects, as well as how project success will be measured.

1.2 Associated Documents

The content of this document is supported by System Development document, Software Requirements Specification (SRS), Project proposal, Gantt chart, resource overview, milestone report from Project Scheduling , Experimental Design document etc.

2 Project Scope

2.1 Objectives:

- To detect drowsiness and inattention of the driver while driving the car.
- Alert the driver as well as the passengers if the driver is drowsy or inattentive.
- To make a dedicated device for the drivers to prevent road accidents.
- Owners of bus and truck drivers can also get it for their vehicle's safety.

2.2 Success Criteria:

- The 1st success would be to detect drivers face from continuous live feed with OpenCV library and to detect facial landmarks using dlib library.
- After that, collecting data from GPS sensor to know the current location and suggest him the nearby restaurants and parking spots.
- Collecting data from accelerometer sensor to detect car is moving or not and pi camera to capture drivers face continuously to determine the current state of the driver.
- Present the UI in a very friendly way so that the driver wouldn't get distracted while driving.
- The alarm should be buzzed whenever it detects any drowsiness ,disgust mood or inattentive state of driver.

3 Deliverables:

3.1 To client:

The clients here are the private car drivers, car owners who drive their own car or any bus or track driver. It is required to find out objects that should be delivered to the client and list them and make documentation. Firstly, we need to collect information from the client to make user requirements and deliver them for feedback. Then, temporary model is created for test analysis. In this we need to list which sensors and hardwires are suitable for the project. And also, how the UI and other features will be so that the drivers would be at highest ease to use this device.

3.2 From client:

To make project properly suitable for client, the developing team needs feedback from the client side. For their better understanding, documentation is essential. Documentation can contain nontechnical terms or technical terms with explanation. Documentation should be delivered frequently to the client for review. Test analysis need to be based on real time activities. After using the updated project and data can be collected from client and find out output accuracy. User can recommend certain changes. Also, the developer team need to give them support for further change in system.

4 Project Approach

The approach we have taken here is agile method. Because The Agile methodology is a way to manage a project by breaking it up into several phases. It involves constant collaboration with clients and continuous improvement at every stage. Once the work begins, teams cycle through a process of planning, executing, and evaluating. it allows teams to adapt to change quickly. The Agile process consists of short, time-boxed iterations known as sprints. Each sprint results in a working product.

4.1 Project Team Organization

| Task Name | Resource Names |
|-------------------|---------------------------------|
| IDP-1 | |
| Initiation | |
| Grouping | |
| Project Proposal | Ifath Ara,Tasnia Iqbal |
| Project Approval | Tasneem Mubasshira,Tasnia Iqbal |
| Idea | |

| | |
|--|---|
| Information Gathering | Ifath Ara |
| Determine Project ideas | Tasneem Mubasshira,Tasnia Iqbal,Ifath Ara |
| Initial Approval | Fariha Fardina Amin,Ifath Ara |
| Project Scheduling | Tasneem Mubasshira,Tasnia Iqbal |
| Study Details of the Idea | Fariha Fardina Amin,Ifath Ara |
| Final Idea Approval | Tasneem Mubasshira,Tasnia Iqbal |
| Final idea Scheduling | Fariha Fardina Amin,Ifath Ara |
| Plan | |
| Micro plan | Fariha Fardina Amin,Ifath Ara |
| Micro plan | |
| Details plan& Allocation | Tasneem Mubasshira,Tasnia Iqbal,Ifath Ara |
| Details Project plan Presentation | Fariha Fardina Amin,Ifath Ara |
| System Requirements Specification | |
| SRS on requirements specification | |
| Software and hardware requirements specification | Fariha Fardina Amin,Ifath Ara |
| Requirement discovery | Tasneem Mubasshira,Tasnia Iqbal |
| Develop Budget | Fariha Fardina Amin,Ifath Ara,Tasneem Mubasshira,Tasnia Iqbal |
| Feedback on software specifications | Fariha Fardina Amin,Ifath Ara |
| Feedback on hardware specifications | Tasneem Mubasshira,Tasnia Iqbal |
| Develop Submission timeline | Fariha Fardina Amin,Ifath Ara |
| Concept Approval | Tasneem Mubasshira,Tasnia Iqbal |
| Analysis complete | Fariha Fardina Amin,Ifath Ara |
| SRS on system modeling | |
| Understanding work flow | Fariha Fardina Amin,Ifath Ara,Tasneem Mubasshira |
| Understanding actors and environment of the system | Ifath Ara,Tasneem Mubasshira,Tasnia Iqbal |
| Construct sytem models | Fariha Fardina Amin,Ifath Ara,Tasneem Mubasshira |
| Model approval | Ifath Ara,Tasneem Mubasshira,Tasnia Iqbal |
| SRS on system Architecture and evaluation | |
| Understanding the arcitecture of system | Ifath Ara,Tasneem Mubasshira,Tasnia Iqbal |
| Plan on system evaluation | Tasneem Mubasshira,Tasnia Iqbal |
| Architecture design | Ifath Ara |
| Architecure approval | Fariha Fardina Amin,Ifath Ara,Tasneem Mubasshira,Tasnia Iqbal |
| UI design | |
| Construction of UI design for software of the system | Fariha Fardina Amin,Ifath Ara,Tasneem Mubasshira |
| Ui design approval | Fariha Fardina Amin,Tasneem Mubasshira,Tasnia Iqbal |

| | |
|---|---|
| Final IDP-1 documentation | |
| Final documentation | Fariha Fardina Amin, Ifath Ara, Tasneem Mubasshira, Tasnia Iqbal |
| Final documentation submission | Fariha Fardina Amin, Ifath Ara, Tasneem Mubasshira, Tasnia Iqbal |
| IDP-2 | |
| Execution | |
| Design | |
| Primary Software Specification | Fariha Fardina Amin, Ifath Ara, Tasneem Mubasshira, Tasnia Iqbal |
| Primary Hardware Specification | Fariha Fardina Amin, Ifath Ara |
| Web app and interface design | Tasneem Mubasshira, Tasnia Iqbal |
| Final Design Documentation | Fariha Fardina Amin, Ifath Ara, Tasneem Mubasshira, Tasnia Iqbal |
| Development | |
| Drowsiness and emotion detection system | Fariha Fardina Amin, PiCam [1], Raspberry Pi[1], Raspberry Pi TFT Touch LCD Module (7 inch) [1], Speaker [1], Ifath Ara |
| Inattention detection system | PiCam [1], Raspberry Pi[1], Raspberry Pi TFT Touch LCD Module (7 inch) [1], Speaker [1], Tasneem Mubasshira, Tasnia Iqbal |
| Speed detection using gps | PiCam [1], Raspberry Pi TFT Touch LCD Module (7 inch) [1], Speaker [1], Fariha Fardina Amin, Ifath Ara, Raspberry Pi[1], Tasneem Mubasshira, Tasnia Iqbal |
| Google map API interfacing | Fariha Fardina Amin, PiCam [1], Ifath Ara, Raspberry Pi[1], Raspberry Pi TFT Touch LCD Module (7 inch) [1], Speaker [1], Tasneem Mubasshira, Tasnia Iqbal |
| Buy Components | Ifath Ara |
| Integration of all systems | PiCam [1], Raspberry Pi[1], Raspberry Pi TFT Touch LCD Module (7 inch) [1], Speaker [1] |
| Validation | |
| Training and Testing | Fariha Fardina Amin, Ifath Ara, Tasneem Mubasshira, Tasnia Iqbal, PiCam [1], Raspberry Pi[1], Raspberry Pi TFT Touch LCD Module (7 inch) [1], Speaker [1] |
| Final documentation | Fariha Fardina Amin, Ifath Ara, Tasneem Mubasshira, Tasnia Iqbal |
| Delivery | Fariha Fardina Amin, Ifath Ara |
| Guiding users | Tasneem Mubasshira, Tasnia Iqbal |

5 Work Plan:

5.1 Work Breakdown Structure:

The structured in which we broke down group and subgroups of work that we have done for Gantt chart in Microsoft Project is given below:

| | Task Name |
|------------------------|-----------------------------------|
| Initiation | |
| | Grouping |
| | Project Proposal |
| Idea | Project Approval |
| | |
| | Information Gathering |
| | Determine Project ideas |
| | Initial Approval |
| | Project Scheduling |
| | Study Details of the Idea |
| | Final Idea Approval |
| | Final idea Scheduling |
| | |
| Plan | |
| | Micro plan |
| | Micro plan |
| | Micro plan |
| | Report Submission |
| | Details plan& Allocation |
| | Details Project plan Presentation |
| Initial SRS Deposition | |
| | Primary Software Specifications |
| | Primary Hardware Specifications |

| | |
|--------------------|--|
| | Develop Budget |
| | Feedback on software specifications |
| | Feedback on hardware specifications |
| | Develop Submission timeline |
| | Concept Approval |
| | Analysis complete and start to buy components |
| Execution | |
| Design | |
| | Primary Software and Hardware Specification |
| | Create Functional Specification |
| | Present frontend development update based on Functional Specification and work with git hub |
| | Obtain approval to Proceed with front-end |
| | Design Complete |
| Development | |
| | Create inattention detection model and set raspberry pi OS and display |
| | Finalizing Drowsiness an emotion detection model and set GPS module,soundbox and accelometer |
| Validation | |
| | Testing an developing accuracy |
| | Documentation |
| | Delivery |
| | Training |
| Closing | |
| | Closing Presentation |

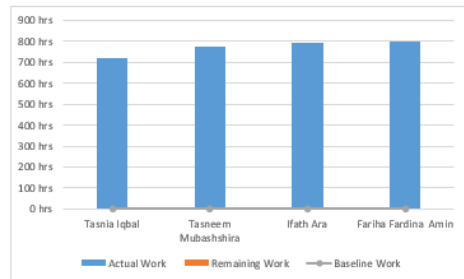
5.2 Resources:

The resource sheet from Microsoft project is shown below:

RESOURCE OVERVIEW

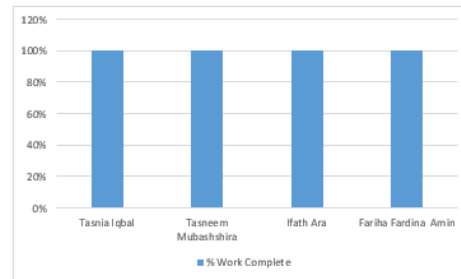
RESOURCE STATS

Work status for all work resources.



WORK STATUS

% work done by all the work resources.



RESOURCE STATUS

Remaining work for all work resources.

| Name | Start | Finish | Remaining Work |
|---------------------|------------|-------------|----------------|
| Tasnia Iqbal | Wed 7/8/20 | Mon 6/28/21 | 0 hrs |
| Tasneem Mubashshira | Wed 7/8/20 | Mon 6/28/21 | 0 hrs |
| Ifath Ara | Wed 7/8/20 | Mon 6/28/21 | 0 hrs |
| Fariha Fardina Amin | Wed 7/8/20 | Mon 6/28/21 | 0 hrs |

6 Milestones

The milestone report from Microsoft project is shown below:

MILESTONE REPORT

LATE MILESTONES

Milestones that are past due.

| Name | Finish |
|------|--------|
|------|--------|

MILESTONES UP NEXT

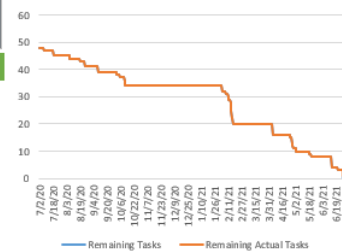
Milestones due in this month.

| Name | Finish |
|----------------------|-------------|
| Closing Presentation | Mon 6/28/21 |

COMPLETED MILESTONES

Milestones that are 100% complete.

| Name | Finish |
|---|--------------|
| Project Approval | Sun 7/19/20 |
| Project Scheduling | Tue 8/25/20 |
| Final Idea Approval | Thu 9/10/20 |
| Report Submission | Mon 10/12/20 |
| Details Project plan Presentation | Thu 2/4/21 |
| Develop Submission timeline | Mon 2/15/21 |
| Concept Approval | Mon 2/15/21 |
| Obtain approval to Proceed with front-end | Mon 4/5/21 |
| Design Complete | Mon 4/5/21 |
| pi camera and soundbox setting and integration with code in pi | Mon 4/5/21 |
| Presenting major project update on 7th week | Mon 5/3/21 |
| Hardware software 80% integration and gps sensor and display connection | Tue 2/16/21 |
| Accelerometer sensor integration | Tue 2/16/21 |
| Overall progress update | Mon 6/14/21 |
| Integrate Disgust mood detection code in raspberry pi | Mon 6/14/21 |
| Total hardware software integration complete | Mon 6/14/21 |
| Final Documentation Update | Mon 6/21/21 |
| Final demo project showcasing | Mon 6/28/21 |



7 Risks, Constraints and Assumptions:

7.1 Risks:

Risk is any unexpected event that can affect the project — for better or for worse. Risk can affect anything: people, processes, technology, and resources. An important distinction to remember is that risks are not the same as issues. We have the following risks in our project.

| Risk of Project | | | | | |
|-----------------|-------------------------------------|---|--|------------------------------|--------------------------|
| Risk number | Description | Mitigation Plan (to avoid) | Contingency Plan | Impact | Likelihood of occurrence |
| 1. | Error in fetching data | Checking of equipment's | Restart the sensors | Wrong result | medium |
| 2. | Failure in integrating all parts | Check every equipment before connection | Set up individual parts | The system will collapse | medium |
| 3 | Sensor burn | Carefully handle every sensor | Replace the sensors with alternatives | The data would be inaccurate | High |
| 4 | Raspberry pi burn | Minimize the amount of data | Check the storage and run the system accordingly | The device will breakdown | Low |
| 5 | Failure in correct device placement | Placement should be accurate to detect face | Remove the whole set up and do it again | The result wont be accurate | medium |

7.2 Constraints:

The project plan has some constraints. that are:

- Due to our device's feature, for the web-app we need internet connection.
- Driver wearing sunglasses can't be detected
- Driver wearing mask can't be detected
- Disgust is not guaranteed to be detected
- For navigating web app internet is must

7.3 Assumptions:

- All the drivers are going to be careful when there is a chance of them being drowsy or inattentive.
- Drivers will know that the device is monitoring them all the time so they would be more cautious.
- Owners of bus or trucks will be able to take care of their vehicles by setting the device on the bus or truck.

8 Financial Plan:

Here is the financial plan of our project. It can increase or decrease in future according to our execution.

| Ser No | Items | Cost (Taka) |
|---------------------|---|-------------|
| 1 | Raspberry Pi | 6220 tk |
| | Pi Cam | 1650 tk |
| 2 | Speaker | 700 tk |
| 3 | Field works (if applicable) | N/A |
| 4 | Conveyance / Data Collection (with breakdown) | 500 |
| 5 | Typing, Drafting, Binding and Paper etc. | 1000 tk |
| 6 | Raspberry Pi TFT Touch LCD Module (7 inch) | 5000 tk |
| 7 | Accelerometer Sensor | 1700 tk |
| 8 | GPS Sensor | 1700 tk |
| Total Amount | | 18970 tk |