Work Agreement

Smart Hydro

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This is a formal work agreement that will go over the fair of work balance for individuals involved in Smart Hydro as well as the goal of the project.

# Group Members

Below will show the members involved as well as the roles that will be allocated to them however, they will all contribute where necessary even if it is out of their role for the greater good of the team. For example, Shravan Ramjathan is listed as a backend developer but when needed, will assist in front-end development or even documentation/research.

|  |  |  |  |
| --- | --- | --- | --- |
| Number | Full Name | Graduating students | Student Number |
| 1 | Shravan Ramjathan | Project Manager/Backend  Dev | ST10247982 |
| 2 | Shivar Tuplah | Backend Dev | ST10256115 |
| 3 | Vidur Girish Somaru | Front End Dev | ST10263794 |
| 4 | Keagen Shaw | Product Manager | ST10067958 |
| 5 | Shaymen Kista | Documentation Lead | ST10312252 |
| 6 | Paayal Rakesh | Research Business Analyst | ST10368727 |
| 7 | Ahmed Vally | Hardware Engineer | ST10251131 |

Source: Team Role subject to change

## Roles and responsibilities

Project Manager

Will oversee planning, organizing, communicating and resources to ensure project completion. This also entails creating schedules for the team to follow as making sure that they are being met. This also has to do with making sure everything is up to standard.

Backend developer

Will be tasked with maintaining the source code of the project as well as maintaining business logic ensuring functionality of the system. Deals with the server-side logic and dealing with databases management.

### Frontend developer

They are tasked with the look and feel of the application that the clients will work with. They will be tasked by implementing a modern easy to use design on the application as well as making sure the UI works with the server-side logic.

### Product manager

They oversee managing the overall theme and campaign of the project. Communicating with the project manager to make sure that clients’ needs are being met, and that quality is up to standard.

### Documentation lead

They are responsible for ensuring each part of the project is being documented, from requirements to changes, meetings etc. They will collaborate directly with the project manager and the research members for what is going on.

### Research Business Analyst

They will be responsible for gathering information that can steer the development of the project. They will also be helping the developers to get an insight on things for example, dependencies, technologies, etc. By having someone dedicated to research it also helps speed up the documentation process by making decisions easier.

### Hardware engineer

They will be responsible for ensuring the sensors work as well as make sure that the tunnel system is properly implemented. They will help the developers in terms of communicating with the micro-controllers and assist with testing the physical components of the tunnel system like the camera for example.

# Purpose

The purpose of this project is to ensure that we can automate the farming process not only for commercial scaled use but also to allow for farmers in the rural area to be able to have access to affordable, easy to maintain tools.

The job that we will aim to fill within this development cycle will be to complete the ongoing project of Smart Hydro by firstly working with the system ensuring that we are able to optimize the already programmed code base. The previous iteration of the mobile application was not able to be deployed since it took up a great amount of storage space on a device, which would not be desirable to logistically suitable to cater for everyone’s needs or devices.

From there once we can optimise the app down from the current state, the next step will be to take the project further and develop the next phase of it. This will be our ongoing development trying our best to use the machine learning model provided by the Post Graduate student who is training a model that will be able to detect whether there are traces of bugs or not.   
Our main goal will be to implement this system within the project and create further QoL (Quality of Life) updates to the project.

# Communication

In terms of how things will be announced to the team, we will be using WhatsApp as our primary source of pinging messages to the team but regarding meetings we will be using Microsoft Teams. Teams will serve as our central place of posting updates for documentation/events. Everything will be formally announced here, and reminder emails will be sent out to the group followed by back up messages on WhatsApp to make sure everyone is on the same page.  
  
In terms of meetings, we will go for a hybrid strategy involving in-person meetings with the team as well as the sponsor and having teams’ meetings. Every meeting, a different member will be assigned to do minutes of meetings to make sure everyone is involved at every stage.

Decision making

Tasks will be spread evenly across the team according to external commitments, deadlines and quality of work will not only be checked by Project Manager but by the whole team.   
Every individual has a fair right to give their thoughts on changes or features and it will be upon voting in which decisions will be made besides the project managers vote. The project manager (Shravan Ramjathan – ST10247982) will then take these ideas/suggestions into account and try to go with the option that best suits the teams’ goals as well as the projects requirements.

There will be meetings set in place to make bigger decisions where things will be finalized and hereby documented.

# Workload distribution

This will be meticulously set out by the project manager, who will consider for any commitments or obstacles that the team will encounter along the way as a group and as individuals.

This will be handled in the following thought process:

1. Who is available at x time and who is not?
2. What are the strengths and weaknesses of the individuals?
3. What tasks can be carried out within this time frame?
4. What is the priority level for this task?
5. If its urgent and a greater task, split it amongst a few members.
6. Avoid giving set tasks to individuals, rotate it so that everyone has equal input.
7. Account for unforeseen issues to help stay on schedule.
8. Create secondary deadlines that are achievable. Whoever is on task needs to get the work done by the secondary deadline before the real time of requirement.

The real distribution of work

This will be handled using GitHub projects, where a member of the group will be assigned to do a specific task in a certain period. This will be as follows:

* An issue is drawn up and uploaded to GitHub projects for a specific repository to document work.
* An iteration (time frame) will be assigned
* A label will be assigned (for example, documentation)
* A description of what is expected for the issue
* Where the work needs to be pushed on GitHub
* Physical work done will still be documented in terms of what has been done and who was involved. This will be in the documentation repository.

This will be some of the ways in which it will be handled and are subject to change.

# Timelines

In terms of timelines, this will be broken down into multiple phases based on the priority of the work. Here are the details below:

## Phase 1 - Gathering requirements

Weeks 1-3 (24 Mar – 13 April)

For this phase we will have short bursts of gathering requirements as well as research for the Smart Hydro project.

* During this phase, research and design will be tasks that will be iterated for the assigned member to carry out.
* Planning will be reviewed the team as well as project manager.
* No submission is final till the go ahead is given by at least 5 members.
* Gather the flaws of the previous codebase/architecture to build on
* Documentation will commence as research and designs for the system are put in place

## Phase 2 – Optimize existing codebase

Weeks 4-7 (14 April– 11 May)

During this phase a small team will be put in place to rapidly deconstruct the existing codebase. This is what to expect within this phase:

* Breaking down the logic of the current codebase.
* Taking the requirements from phase 1 into account for optimization.
* Creating basic pseudo code for the flow of logic from the old code base.
* Restructuring the code to make it easier to implement features.
* Iterations will be done to help cover all corners.

## Phase 3 – Acquire all materials needed to build the tunnel system

Weeks 8-10 (12 May – 1 June)

Here based on the research and design, we will need to take the research and acquire the materials needed for the tunnel. This will allow for us to buy the required materials, and this can help with building the tunnels system. Sensors and microcontrollers will also be gathered in this period

* Initially all members will be involved with gathering materials.
* 2 teams will be made to be put in rotation for the handling of the materials.
* Everything will be logged in the documentation to help trace back events.

## Phase 4 – Building the tent and integrating sensors

Weeks 11-12 (2 June– 15 June)

Here we will focus all the attention purely to getting the tunnel system up and running. This is where we will have rotations of teams ensuring that we get the tunnel up and running and physically installing the sensors as well as most of the required equipment to make the project work.

* We will rotate in between the morning and afternoon with 2 teams that will constantly rotate.
* We will make sure it is always monitored by people minimising risks.

## Phase 5 – Testing the tunnel system

Week 13 (16 June – 22 June)

Here we will test if there are improvements from the old tent system and look for weaknesses rounding up the physical structure of the tent.

## Phase 6 – Integrating the camera system

Week 14 (23 June – 29 June)

Here we will aim to:

* Integrate the camera system physically into the tent
* Attempt to successfully connect the camera to a demo project
* Test for any small imperfections

## Phase 7 – Manually implement micro-controller functionality

Weeks 15 – 17 (30 June – 20 July)

The main goal is to make sure that all micro-controllers are working as intended. This will be things to expect within this phase:

* Make sure that every sensor is reading correct data, passing it to the controllers.
* Making sure that the monitoring system functions manually
* Document and record our findings

## Phase 8 – Integrating automated micro-controller operation

Weeks 18 – 21 (21 July – 17 August)

Here all the AI models from post-graduate students will be incorporated into the mobile application. Some of the things to expect within this phase will be:

* Take requirements and research into account, integrate needed features as well as additional features.
* Ensure that all the micro-controllers are connected to the application
* Ensure that the user is still able to manually control the system from the application
* Fine tune the flaws from last year’s application
* Finalize the controller logic.

## Phase 9 – Testing the system

Weeks 22 – 24 (18 August – 7 September)

This is where we will do the final testing for the application ensuring that everything works as intended. It will work in the following manner:

* CI/CD testing on GitHub (automated tests)
* Manual testing on site
* Manual testing within the application
* Optimization

This will ensure that all bases are covered.

## Phase 10 – Deployment

Weeks 25 – 26 (8 September – 21 September)

The team will aim to make sure that the application will go live ensuring that everything is deployed smoothly from the database structure to the application and any services used etc.

* The full team of 7 will dissect deployment ensuring everything leading up to this point has been considered and documented.
* Finalizing any small tests left regarding the system.
* Ensuring smooth deployment for the application going live.

## Phase 11 – Quality of life

Weeks 27 – 29 (22 September – 12 October)

Any little tweaks that need to be made after the application will be introduced in this phase as well as any required performance enhancements.

## Phase 12 – Evaluation

Weeks 30-31 (13 October – 27 October)

This will be the overall take from the entire project, in terms of how well we worked towards the goals. This will be broken down into:

* The level and attention to detail in the way the project was carried out.
* The technologies used to make it possible
* If the choices made for creating the system were correct.
* What would be done differently if we could do it over again?
* What will we take from this project going forward?

These are some of the things that will be taken into consideration for the final evaluation.

This timeline plan is subject to changes. Some phases may be taking place during the same period as another phase, if possible, to speed up development.

# Conflict resolution

This will be handled in multiple phases. This allows everyone in the group to understand how things will be handled and the formalities that are in place. This is to minimize any internal conflicts that can get in the way of the focus being the project.

## Phase 1 - Verbal warning

First this will be handled by the project manager having a talk with any parties involved in conflict. Trying to understand both points, which the parties involved must try to compromise if possible as we must not involve personal issues with the group setting as this interrupts everyone.

## Phase 2 – Written warning

If this does not work, It will then move to the next phase where the conflict will be documented only for the groups viewing. This allows the involved parties to understand the seriousness of this and if conflict is not to be resolved, consequences will follow.

## Phase 3 – Group meeting

This is where the entire group will try to get involved by resolving the conflict. This is because at this stage, while the conflict may not involve all members of the group, it will affect the rest of the group’s productivity, hence all members will have a meeting trying to calm the situation down.

# Signatures

This document will be signed counterpart to everyone with the project manager, meaning that you will each sign separately. First being the person this document is addressed to, next signed by the project manager ensuring that the addressed person agreed to the role and project.

This will tie you to be in agreement till the 31st of December 2025.

I, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, hereby agree to all the details that have been mentioned, and I intend to carry out my contractual obligations. I will diligently contribute to the group. I understand the scope of what’s to come and will act in best accordance with the group to ensure completion of the project.

I understand the role I have been appointed and am also aware that I will be required at times to help in other aspects of the group that are out of my roles scope. I understand that this is to allow for each group member to be involved equally within the group.

If I were to slack within the group, I understand that I am responsible for my actions and if I am unable to properly comply with the project manager and the group, I \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, will face the consequences of my actions.

Signature of agreement Project manager

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Your signature) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date of Signature Date of Signature

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(dd-mm-yyyy) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_