

**Deakin University**

Project Title

Project Proposal

Project Sponsor

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# Document Revision History

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| **Date** | **Version** | **Editor** | **Reason** | **Supervisor Signature** | **Client Signature** |
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# Motivation / Problem Description

* *Justify the problem and why we are undertaking this project*
* <https://oceana.org/blog/seaweed-could-be-scrubbing-way-more-carbon-atmosphere-we-expected>
* <https://carboninstitute.org/kelp-and-carbon-sequestration-bringing-terrestrial-carbon-accounting-to-the-deep-sea/>
* *Briefly talk about the problem*
* Climate change is going to be an issue by 2040. We are past the tipping point with the amount of carbon that has been released into the atmosphere and it is no longer viable to just stop carbon emissions, we also need to begin claiming carbon back. Bull kelp is the fastest growing plant on earth, it can reclaim carbon, reduce acidity levels in the water, provide food and shelter for marine life and also provide a viable food source for humans.
* Briefly talk about the vision of this project – the ultimate goal. What would be the main outcome(s) of the project
* this project will create an IoT net workable monitoring system for floating kelp forests. By monitoring their growth we can more effectively reclaim carbon.
* How this project would be different from what is existing, if any.
* (These are advisory points only, feel free to cover all, some, add new points to cover, etc. Same for all heading/points in the below sections.)

# Context

* Background of the problem
* Current state-of-the-art
* <https://www.fastcompany.com/40458564/could-these-robotic-kelp-farms-give-us-an-abundant-source-of-carbon-neutral-fuel>
* <https://theconversation.com/how-farming-giant-seaweed-can-feed-fish-and-fix-the-climate-81761>
* <https://blogs.scientificamerican.com/observations/soil-and-seaweed-farming-our-way-to-a-climate-solution/>
* Gaps/Problems in current solutions
* Factors contributing to the problem
* there is a concept to create frames of kelp farms that float just below the surface and constantly pushed down by the weight of the kelp to keep it below the surface but, as anyone who has any experience with SCUBA knows, pressure changes at depth and the amount of buoyancy/water displacement will required will require management, the kelp requires a certain temperature of water to remain healthy so an independent pump with its own buoyancy control will also be required, weight monitoring sensor will be useful for knowing when forests should be harvested/managed, location tracking will be important for management during storms and other emergencies.
* What else you need to tell us?

# Value Proposition

* What are the benefits of adopting this solution in terms of:
  + Commercial
  + Social
  + Technological
  + Operational

# Core Idea/User Stories/Requirements

* What is the core idea of your solution? Eg use Natural Language Processing to automate document summarisation, use a chatbot to assess a user’s understanding of the subject matter, etc
* Use pressure, temperature & location sensors to automate the health of kelp farms

# Target Deliverables

The following goals have been identified as dependencies that need to be addressed early in the life cycle of the project.

1. A something something that:
   1. Does this
   2. And this too
   3. And that
   4. And this
2. A thingy encapsulating:
   1. Stuff
   2. Hopes
   3. Dreams

*Notes:*

* *If any.*

# Roadmap

The roadmap to the execution and delivery of this project is detailed subsequently.

## Execution Strategy

* Explore the input data provided and confirm if acceptable for the focus of Proof of Concept
* Incrementally,
  + Build and deliver a docker container with blah blah functionality (to permit the client team to explore integration & validate it fits within the target deployment environment)
  + Refine the docker container and provide updates to (client name) with incremental features
* Prepare research report
* Provide knowledge transfer

## Sprint 1

**Goals** (these are examples)

The goal of Sprint 1 is to deliver scope document and work with (client name) to agree on the acceptance criteria and priority for the deliverables. These can be decomposed to:

* Project success criteria
* Problem domain clarification
* Visual depiction of the workflow in a flow chart of the processes that this project will automate
* Draw the system design for the project
* Determine what physical system will be created and how it will interact with the application

**Target deliverables**

* Workflow flowchart that has been agreed upon by all parties
* Scope document (this document) that has been agreed upon by all parties
* Communication and delivery expectations that has been agreed upon by all parties
* Set up the back-end of the app and its interaction with any necessary API’s

## Sprint 2

**Goals** (these are examples)

The goal of Sprint 1 is to deliver the end to end infrastructure so we can start collaboratively planning the interfaces to enable integration efforts to commence on (client name)’s side. These can be decomposed to:

* Get an end to end solution working
* Collaboratively create an output data format / schema (in collaboration with client)
* Prepare a suitable environment within a docker container to encapsulate and execute the transformation process

**Target deliverables**

* A docker container encapsulating the transformation engine
* An invocation script that accepts the input folder, output folder and invocation parameters
* A deployment document that describes how to install and use the solution

## Sprint 3

**Goals** (can be amended based on how Sprint 2 goes)

The goal of Sprint 3 is to build upon the Increment in Sprint 2, namely by adding:

* Error logging
* Input/Output Validation
* Transformation logic

**Target deliverables** (can be amended based on how Sprint 2 goes)

* A docker container encapsulating the transformation engine
* An invocation script that accepts the input folder, output folder and invocation parameters
* A deployment document that describes how to install and use the solution
* List of errors and associated meaning
* Sample dataset to validate the transformation engine reported results

## Sprint 4

**Goals** (can be amended based on how Sprint 3 goes)

The goal of Sprint 3 is to…

* bang
* pow
* smash

**Final deliverables** (can be amended based on how Sprint 3 goes)

* thing 1
* thing 2
* thing 3
* thing n

# Limitations, Constraints and Considerations

The limitations, constraints and considerations of the project are as follows:

The following constraints apply for the PoC and need to be considered when integrating the outputs produced in a larger workflow/pipeline,

* The blah needs to work on AWS as that is technology stack used by (client).
* The transformation engine needs to be in Python as that is technology stack used by (client).
* This project will not focus on UI/UX refinements, instead focusing on implementation of the functionality
* The front end will conform to Web Content Accessibility Guidelines of at least AA.