# System Engineering Milestone 1: System Requirement Specification

## 1 Project Scope

The 3 dimensional location information for automated robots is crucial for their tracking and control. For robots above the ground, their location information can be easily acquired from GPS. However for underwater robots, specialized tracking system needs to be developed because traditional GPS signal cannot penetrate water.

This project will focus on designing a ranging system to obtain geographical location of an underwater robot. The project will be based on a prototype from previous developer where 2 beacons are used to measure the 1 dimensional location. The expected outcome of this project will be an improved prototype that is able to measure 3 dimensional location of the underwater robot with 1 master beacon mounted on the robot and 3 smaller beacons fixed in space. More details about the scope of the project are listed below:

- **Assumptions and Constrains**
  There are a few assumptions described by clients and made in the table research. Some constrains are posed by previous developer of the prototype and some are found during the research of the project scope. Both of them are listed in appendix 1.
- **Context Diagram**
  To roughly delineate the boundary of our project, identify stakeholders, subsystems and their relationships, a context diagram is drawn in appendix 2.
- **Stakeholders List**
  A stakeholder analysis is conducted to rank all stakeholders of this project in a list which can be found in appendix 3.

## 2 Needs List

The description and importance of needs from high-importance stakeholders are researched and listed below:

| ID | Description | Importance | Stakeholder |
|---|---|---|---|
| N1 | Locate underwater robot accurately | Essential | Client |
| N2 | No cross talking between beacons | Highly Desirable | Client |
| N3 | Real time tracking while robot is moving | Bonus | Client |
| N4 | Avoid transmission error via signal encoding and processing | Bonus | Client |
| N5 | Cause no damage to environment | Essential | ANU |

## Appendix 1 Constraints and Assumptions

## Constraints

**C1:** This project will only focus on online services. Surgery, physiotherapy or any other medical services that requires users to meet health practitioners in person will not be designed.

**C2:** The designed RHAS will only serve areas where either telephone or internet is available. Otherwise, it is unrealistic to remotely contact users.

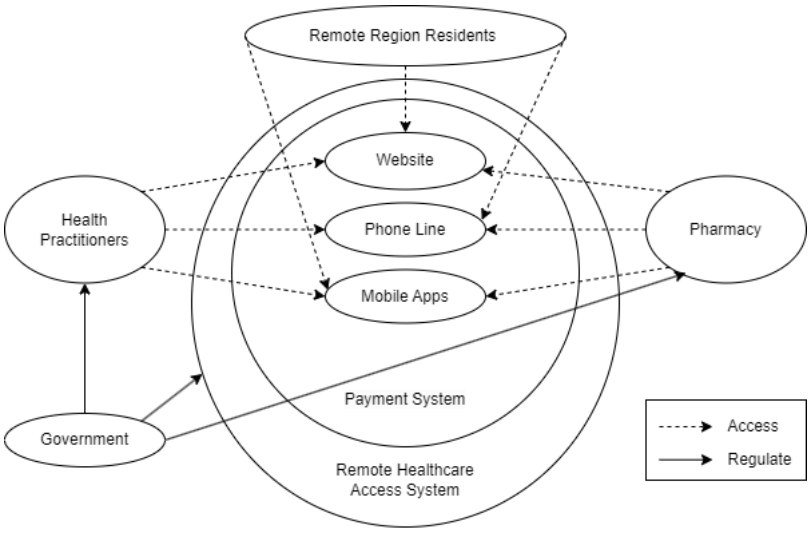
## Assumptions

**A1:** The lack of healthcare resources in *rural and remote area listed in MMM standard* leads to inferior average health condition for residents there.

**A2:** Some of the *rural and remote area listed in MMM standard* do not have access to internet.

**A3:** Health practitioners working in hospitals and clinics are allowed to work in RHAS.

## Appendix 2 Context Diagram




## Appendix 3 Stakeholders List

| Stakeholder | Power | Influence | immediacy | Vested Interest | Importance |
|---|---|---|---|---|---|
| Client | high | high | high | high | 9 |
| Australian National University | high | medium | low | low | 7 |
| Previous Developer | low | high | low | low | 6 |
| Hardware Manufacturer | low | medium | low | low | 5 |