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IoT Enabled Smart Aquaculture System

ID: SB2456

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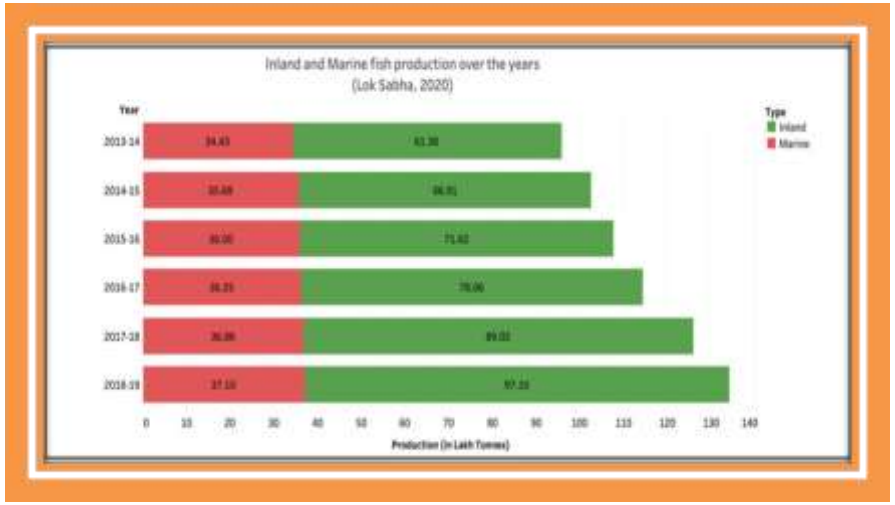
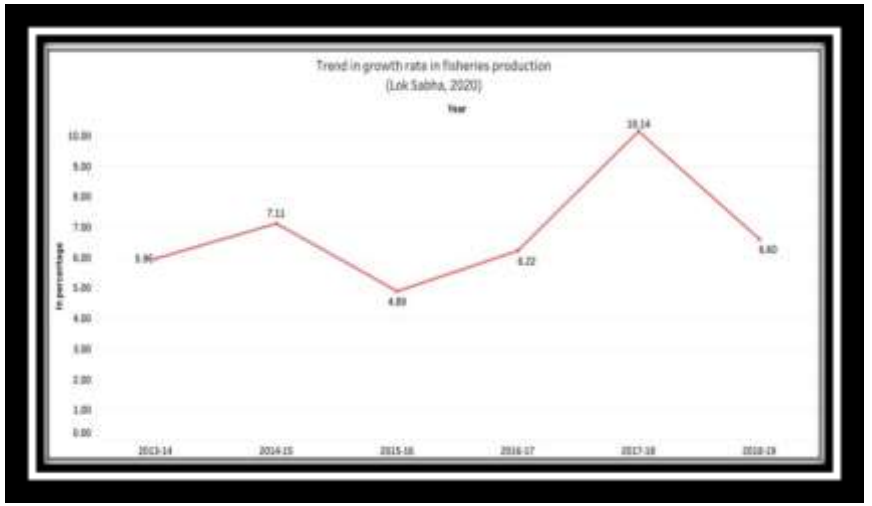
INTRODUCTION





Overall fish production increased by over 38% in six years

Annual average growth rate is only 6.8%

Blue Revolution Mission

- Government has aimed at a **stable increase of around 8%** in annual fish production
- The average **annual growth rate** stands at **6.8% for the last six years**.
- To reach the **target of 20 million tonnes** of fish production **by 2022-23**, the current annual average growth rate **needs to double to around 13.2% per year**.

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PROBLEM STATEMENT

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Problem 1: Water quality is the main factor which contributes to success and efficient management in aquaculture.

Problem 2: The average aquarium fish will not survive more than a day in an oxygen depleted water source.

Problem 3: Decreased the quality of aquatic products

Problem 4: Disease is one of the severe issues which strongly effect on quality as well as aquaculture production. It results from the imbalance among many factors which come from host, pathogen and environment.

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CUSTOMER PAIN POINT ADDRESSED

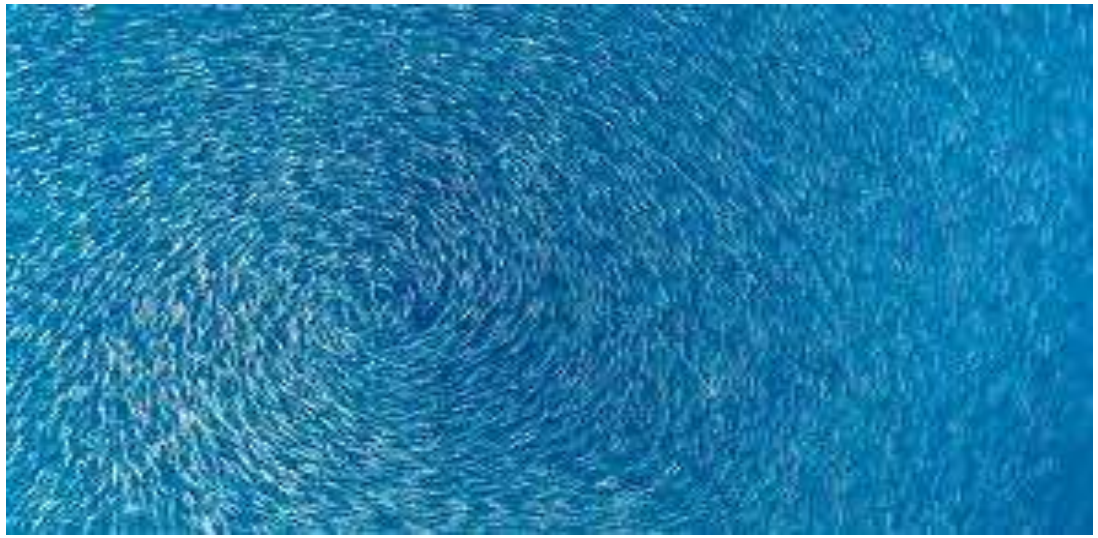
Water quality

Fish Disease

oxygen depletion in water

BRIEF ABOUT THE INNOVATIVENESS

- ✓ **Multiple parameter monitoring** (temperature, pH, turbidity, electrical conductivity, total dissolved oxygen and solids, etc.,) for accurate **water quality assesment**.
- ✓ Significantly **reduce the amount of manual labor** and the use of human resources;
- ✓ **Real time visualizations** of sensors data, issues **alerts** and remote pumps controls.
- ✓ Assist fish farmers in automatically and effectively managing water quality measurements, **timely disease detection**

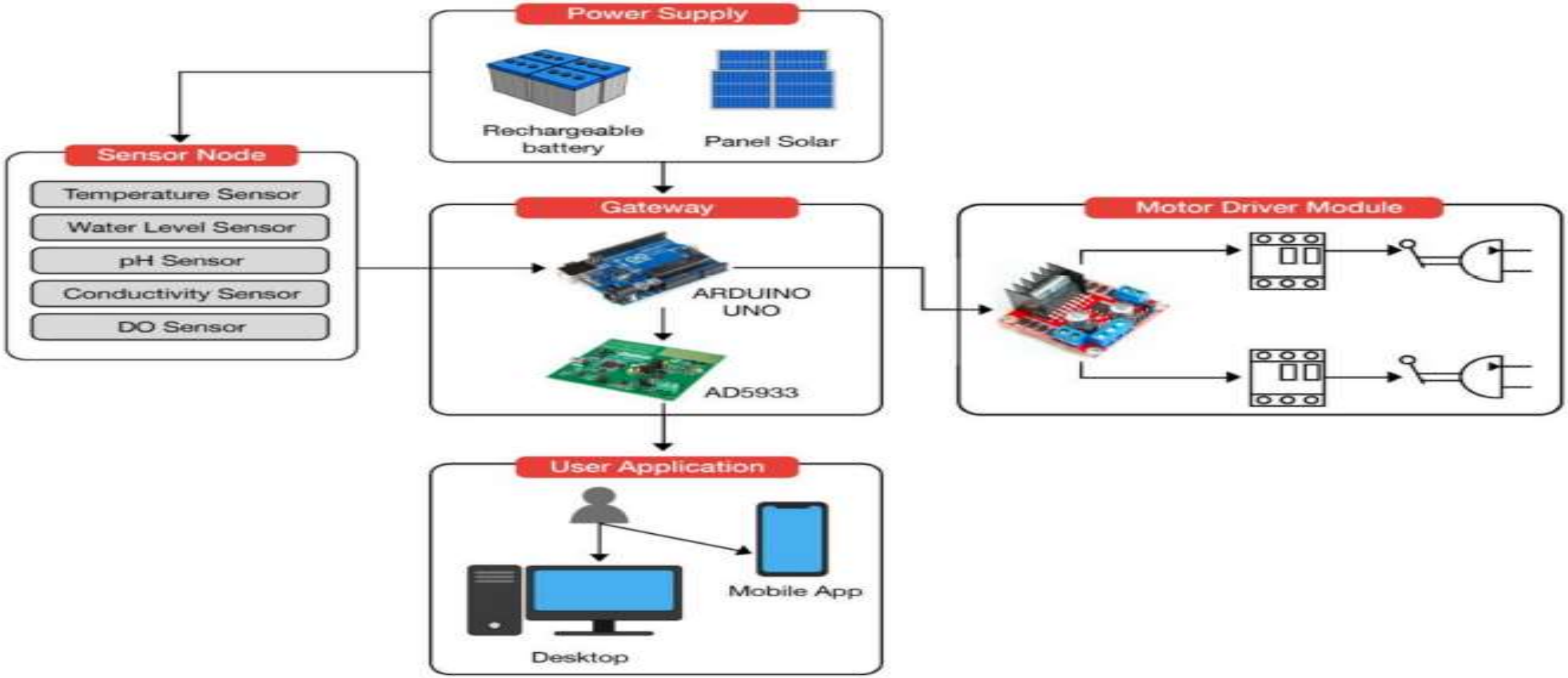


FEASIBILITY

- ✓ Conducted survey about the product demand with local aquarium customers in Madurai.
- ✓ As we have designed our product only with the commonly used sensors and basic electronic components with standard processor, technically the project is feasible.

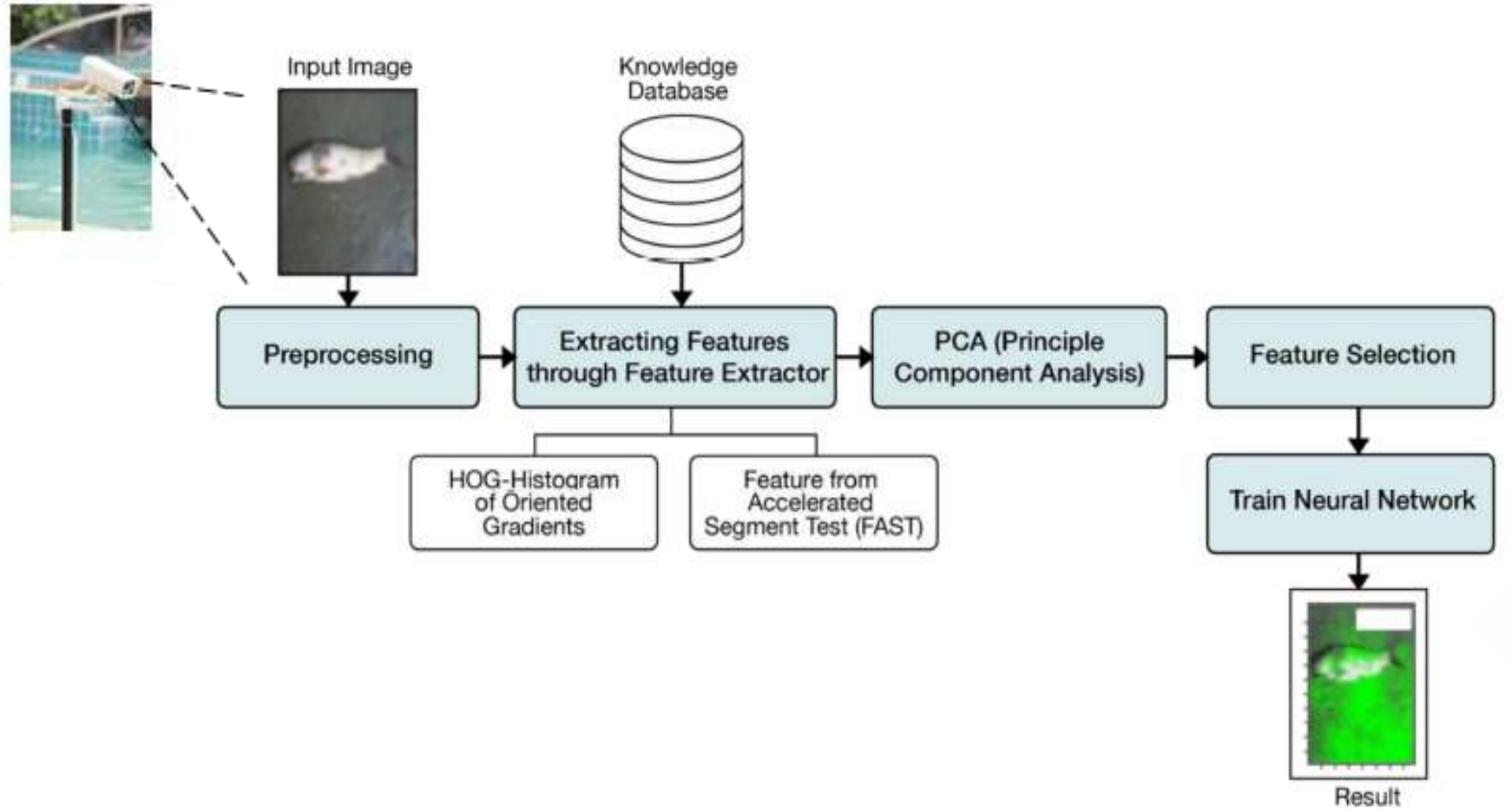
PROBLEM SOLUTION

1. Water Quality Monitoring System



Proposed Solution

2. Fish Disease Management System



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COMMERCIAL VIABILITY

- ✓ As we have used only commonly available low cost components, cost of the device must be affordable. For mass production, the cost of the device might be become cheaper.
- ✓ As the cost is affordable and the target customers are in each and every family of India, commercially our product is viable.

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TECHNOLOGY USED

- The main technology in our proposed system is AI (Artificial Intelligence) & IoT[Internet of things]

Sensors and IoT

- Sensors are used to monitor certain water quality parameters and IoT can be used to integrate all the components with internet for automatic monitoring.

Microcontroller

- The controller interfaces all the electronic components connected to the system and control the parameters.

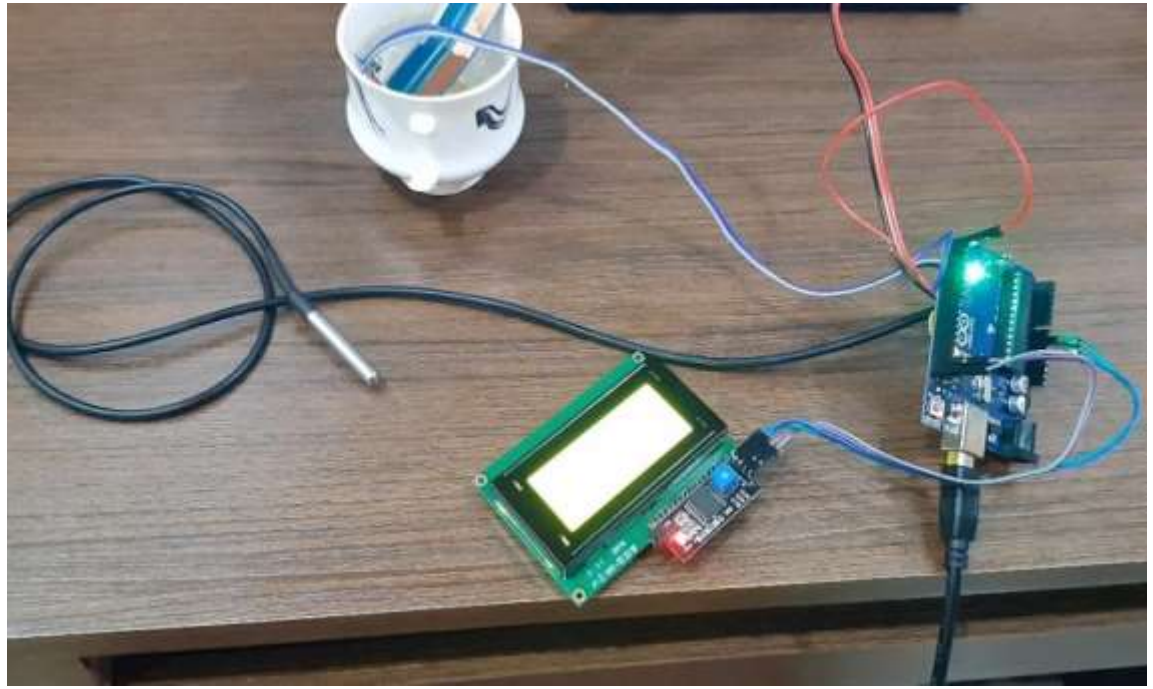
Software

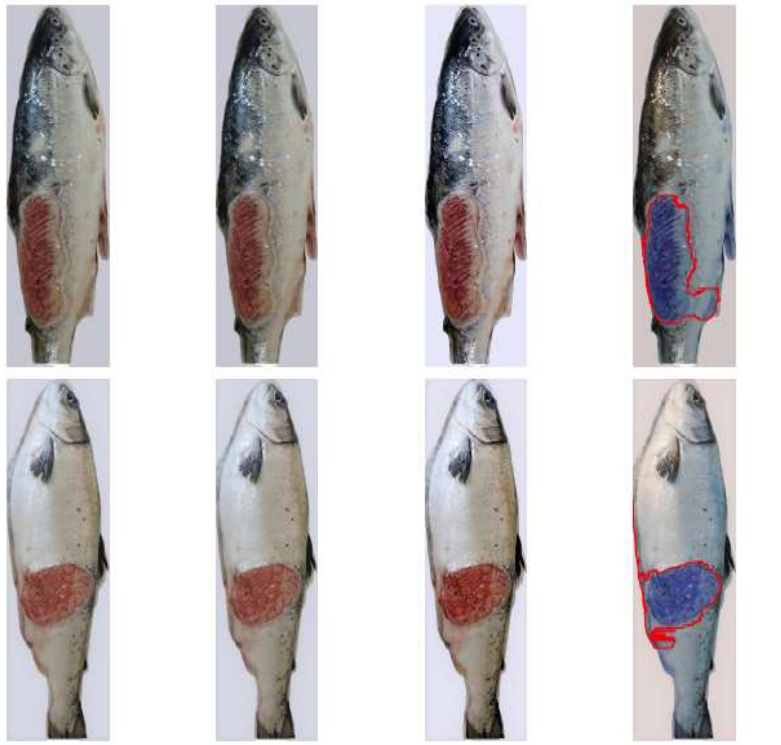
- All the parameters can be monitored through mobile applications built in the mobile phone or it can be viewed in the server system

RESEARCH CARRIED OUT

- ✓Literature has been carried out for identifying the solution for the proposed problem.
- ✓Materials has been chosen and prototype for water quality management has been completed.
- ✓Image processing based fish disease detection has been completed.

PROTOTYPE





(a) Input image (b) Resized image (c) Contrast enhanced image (d) k-means segmented image

Diseases Detection Using Image Processing

SCOPE FOR PATENTABILITY

- Since the proposed idea is pioneer in the field, the scope for obtaining patent is high.

- Document preparation for applying patent is in progress

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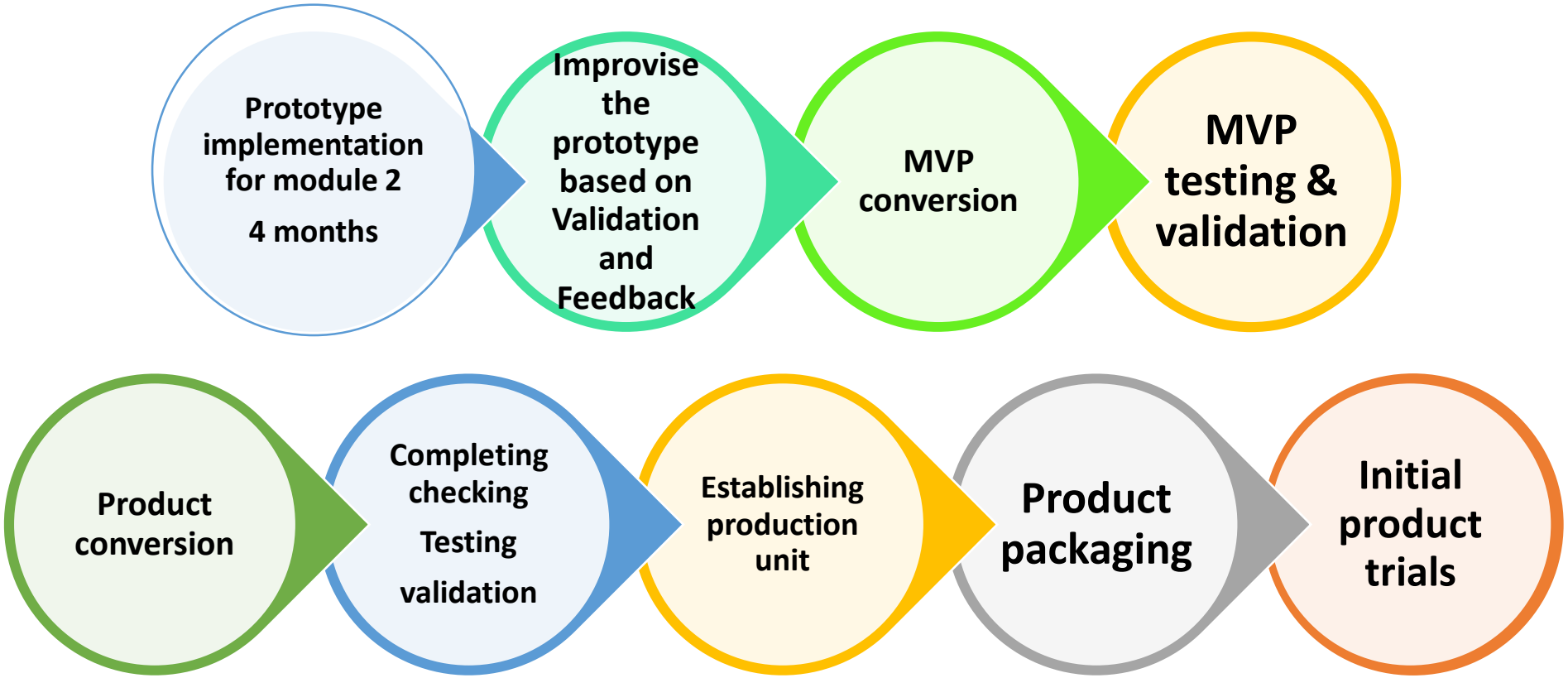
FUTURE PLANS



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DEMONSTRATION VIDEO

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