



Deakin University

AI-OPTIMISATION

Yarra Ranges Tech School (YRTS)

Project Scope

Project Sponsor

YARRA RANGES TECH SCHOOL (YRTS)

Project Team

Team A

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Document Revision History

Date	Version	Editor	Reason	Supervisor Signature	Client Signature
3 rd August 2018	1.0	Tharini Manawadu De Silva	For creating initial document		
24th August 2014	1.1	Tharini Manawadu De Silva	Divided the high level requirement in to parts		
26th August	1.2	Tharini Manawadu De Silva	Add sprint3 requirements.		

Motivation / Problem Description

The Yarra Ranges Tech School seeks the development of a web application to promote learning and understanding of the principles of Data Science and AI-Optimisation problems. The AI should utilise global food distribution and sourcing data to simulate the effects of changing weather patterns, water availability, and increasing population have on global food supply.

The Project address long-term sustainable solutions and address key functions of Affordability and pricing and maximising yield.

The application should allow for visual design and operation to undertake analysing global food supply and promote the role and use of Data Science and AI-Optimisation problems in making informed decisions.

Context

It is difficult to find answers for a specific question related to food and agriculture field. Even if the data is available, its difficult to find a answer for a specific questions.

For example, Google or any other search engine does not provide correct answers to following types of questions.

- Predict future calorie requirements per country
- Predict crop production
- Which country is leader in certain crops

People who are working on food and agriculture fields and those who have sufficient information regarding these field are not integrate their knowledge with the technology to cope up with this problem.

As a solution for this matter the proposed solution is,

Integration

- The final deliverable is based on Google AIY Voice KIT v1.0
- Utilise the Google Assistant SDK
- Handle event ON_RECOGNIZING_SPEECH_FINISHED to return text interpretation of user question
- Utilisation of NLTK Chat http://www.nltk.org/_modules/nltk/chat/eliza.html

Capability of the project as discussed with the client

- Global Food data
- Global calorie data
- Global crop data

Value Proposition

Since there is no exact solution proposed or implemented on global Agribusiness market and leverage Artificial Intelligence to make informed decisions, this product add value to the food and agriculture field.

Basically for farmers to predict their future cultivation strategies and this is very useful for students who are studying in Yarra Tech School as well as all the students who have favor on agriculture field to improve their knowledge.

Core Idea/User Stories/Requirements

Changing weather patterns, water availability, and increasing population have the potential to lead to significant food shortage in the future. We have been tasked with the challenge to investigate the global Agribusiness market and leverage Artificial Intelligence to make informed decisions.

Data Processing

1. Gather Data
2. Checking data whether it is appropriate or not
3. Data is sufficient or not
4. Remove noisy data and prepare data ready to use

Text Analysis

1. Generating algorithm for finding in keywords
2. Check whether the algorithm is working for the data

Speech Analysis

1. Use google API for speech recognition
2. Convert speech to text
3. Convert text to Speech

Connect Chat-bot with the Data and google API

Target Deliverables

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

- 1x Functional Chat-bot meeting context and scope requirements

Roadmap

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

- Configure Raspberry Pi Google AIY Voice Kit to perform it's basic functionalities.
- Configure Raspberry Pi Google AIY Voice Kit to retrieve voice input.
- Connect Raspberry Pi Google AIY Voice Kit with backend.
- Process speech input to recognize the speech.
- Correctly identify the content of the input (Identify the question domain correctly).
- Manipulate data to find the specific answer for the question.
- Generate the voice input base on the generated answer.
- Configure Raspberry Pi Google AIY Voice Kit to provide voice output.

Execution Strategy

- Explore the input data provided and confirm if acceptable for the focus of Proof of Concept

- Incrementally,
 - Build and deliver a Functional Chat-bot meeting context and scope requirements (to permit the client team to explore integration & validate it fits within the target deployment environment)
 - Refine the Chat-bot when needed and provide updates to Yarra Ranges Tech School with incremental features
- Prepare research report
- Provide knowledge transfer

Sprint 1

Goals

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

- Project success criteria
- Problem domain clarification

Target deliverables

- Project Diary.
- Project Scope Document that has been agreed upon by all parties.
- Powerpoint Presentation.
- Communication and delivery expectations that have been agreed upon by all parties.
- Website with project details.

Sprint 2

Goals

The goal of the Sprint to is to collect data which is relevant to the project and and configure the Raspberry Pi Google AIY Voice Kit to perform it's basic functionalities.

Target deliverables

- Collection of data which relevant to following fields,
 - Global Food data
 - Global calorie data
 - Global crop data
- Configured Raspberry Pi Google AIY Voice Kit.

Sprint 3

Goals

Goals of this sprint decompose as follows,

- Check for collected data whether it is relevance and sufficient.
- Build a text analysis algorithm.
- Use google API for speech recognition
- Convert speech to text

Target deliverables

- Relevant and sufficient data
- Accurate text analysis algorithm

- Accurate google API for speech recognition
- Input speech converted into text format

Limitations, Constraints and Considerations

Using AI technology to select optimal products for both local and export markets.

Input

1. Text based interface to send questions to the Chat-bot
2. Speech input (off by default)

Output

1. Text based responses to questions
2. Speech responses to questions

Hardware

- Raspberry Pi Google AIY Voice Kit for speech input and output