School of Computing

Year 4 Project Proposal Form

SECTION A

Project Title Voice Assistant

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Project Supervisor Name Cathal Gurrin

[Note: It is the student's responsibility to ensure that the Supervisor accepts your project and this is only recognised once the Supervisor assigns herself/himself via the project dashboard. Project proposals without an assigned Supervisor will not be accepted for presentation to the Approval Panel.]

SECTION B

- **General Area Covered**
  The general area covered by my project is a voice-controlled device that interacts with the user through software and hardware. This could be used by elderly to assist themselves with tasks.

- **Idea**
  The idea came to me after one of my friends purchased an amazon echo and was amazed by its functionality as was. I thought it would be a great idea to make my own version of this and that it would really tie in with all the programming/hardware skills I've learned over the past few years. I find the idea of controlling physical devices more interesting then simply writing a piece of code that would output an answer on the screen.

  The voice commands will be retrieved using several different python modules and unix packages. The steps are listed below:
  - Matrix microphone array records voice
  - Python snowboy hotword detector module checks if the hotword is said e.g 'Alexa'
  - Now the device is listening, a Python speech recognition module such as Google cloud speech will then listen for a command such as 'Read the news'.
  - The information will then be retrieved from an API etc or if the command uses the matrix creator, it will run a script that activates the matrix creator sensor.
  - Python text to speech module or similar module will then be used to speak to the user.

  Features:

  Access the news
  - Listen for hotword to be said
  - Listen for the read news command to be activated
  - Run script that retrieves the news from a news API
  - Use a text to speech API to read out the news from the API

  Weather
  - Listen for hotword to be said
  - Listen for the weather command to activated
  - Run script that retrieves data from a weather API
  - Use text to speech API to read out the weather from the API

Play music with Youtube/Spotify

- Listen for hotword to be said
- Listen for the play music command to be activated
- Use speech recognition package to get the song name
- Run a script that will retrieve the song from the designated API
- If song not found, prompt user to try again
- Play song through a music player suitable for the file format retrieved
- Stop playing music when hotword is said or song finishes

- **Programming Languages**
  - Unix
  - Python
  - Javascript / Java

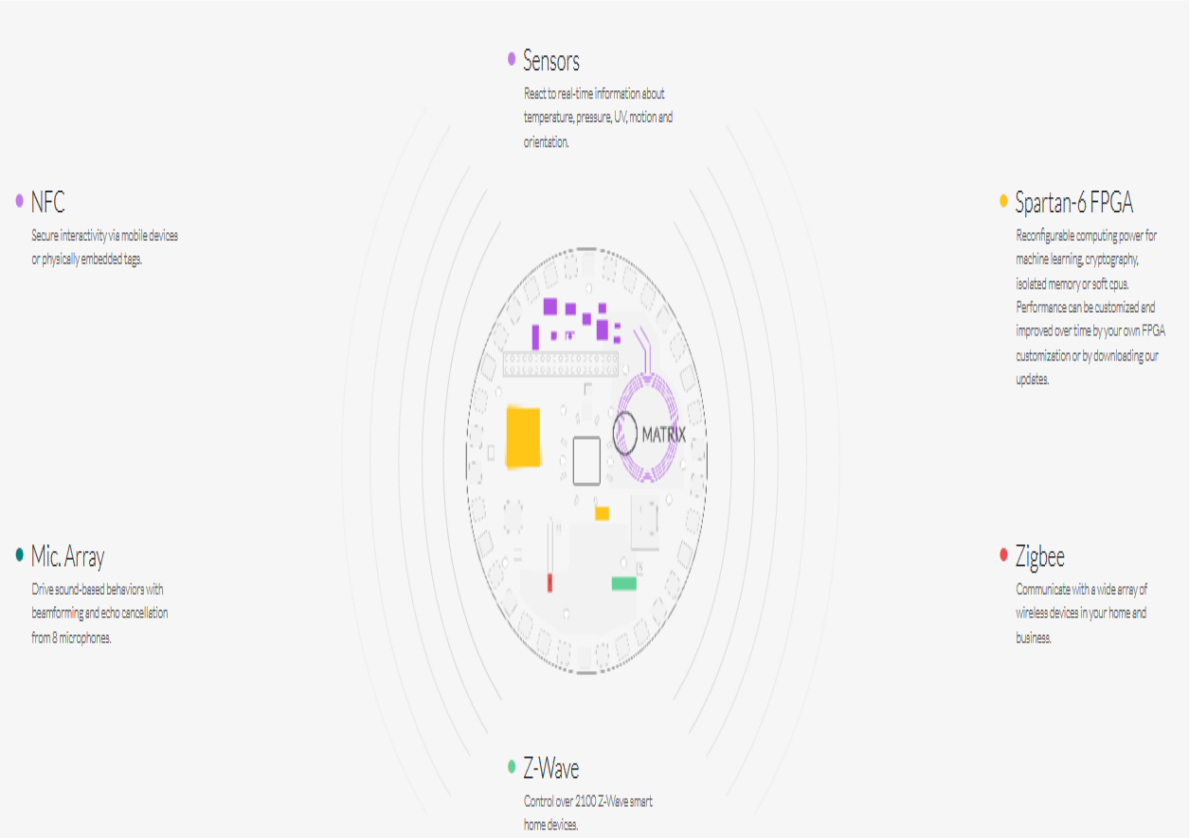
- **Challenges**
  The learning challenges I will have are learning to use the raspberry pi and the matrix creator development board. I would also have to learn how to use different packages/modules and API's to interact with the user.

- **Hardware**
  - Raspberry Pi 3 Model B+
  - Matrix Creator development board
  - Speaker

  Software
  - Noobs OS
  - Matrix OS
  - Python/ Unix packages

- **Special Requirements**
  The Matrix creator development board pictured below is a specialised development board for the Raspberry Pi.

RASPBERRY PI 3 MODEL B



MATRIX CREATOR BOARD