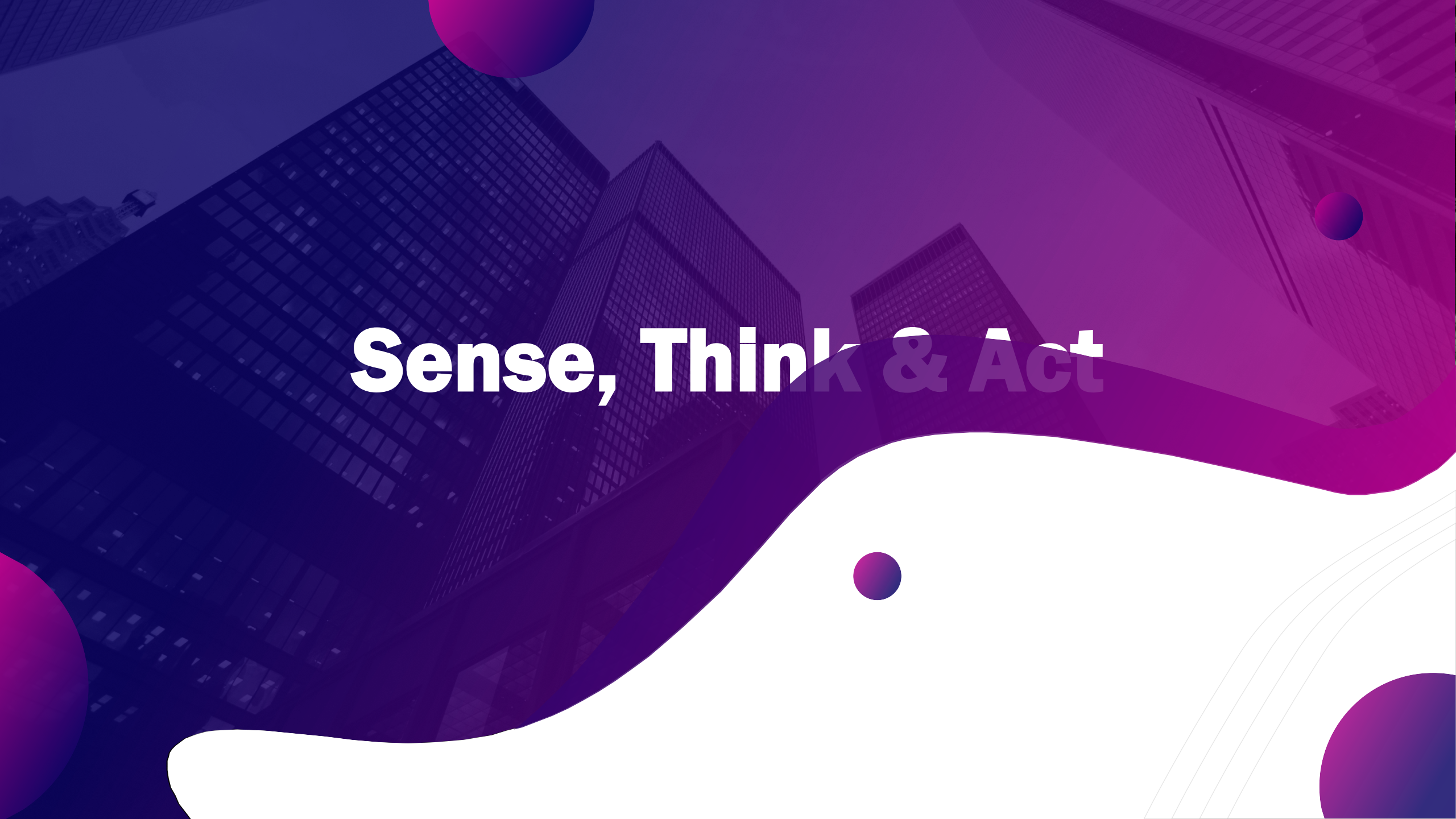
RedXParking

DEMO & PRESENTATION 2


SPRINT 2

SPRINT 2 - GOALS

- Adding pi camera for more accurate detection.
- Integrating Melbourne Open parking data and the sensor data for better user experience.
- Implementing of a php web application.


Sense, Think & Act

Sense, Think & Act

- Sense – Detecting whether there is a vehicle in a parking spot
- Data driven solution to address the issue using the publicly available dataset.
- For the parking spots that doesn't have sensors we implement our own sensors.
- Think – Whether displaying available or occupied for the bay.
- Act – displaying the status of the parking bay

User Stories - Features

User Story	Features	Points
As a designer I would like to have feedback and user requirements so I can design the system a user friendly manner	**Feedback**	**1**
As a software developer I would like to know the hardware design to create the relevant software.	**Hardware design for the relevant software**	**3**
As a user I could like to get frequent updates about the availability of the parking spots while reaching the spot.	**Frequent updates**	**4**
As a hardware developer I would like to know the sensing requirements of the system to create a robust hardware design.	**Sensing requirements**	**2**

User Stories – Features

User Story	Feature	Points
As a hardware developer I would like to know the requirements of the software to make the hardware accordingly.	**Software Requirements**	**3**
As the software developer I would like to know the requirements of the user to create the system diagram	**User requirements for system diagram design.**	**2**
As a user I would like to know about available parking venues and availability of parking spots near the venue I want to go.	**About available parking venues and availability of parking spots**	**5**
As the web developer I would like to know the data transferring protocols to create the web API	**Data transferring protocols**	**1**

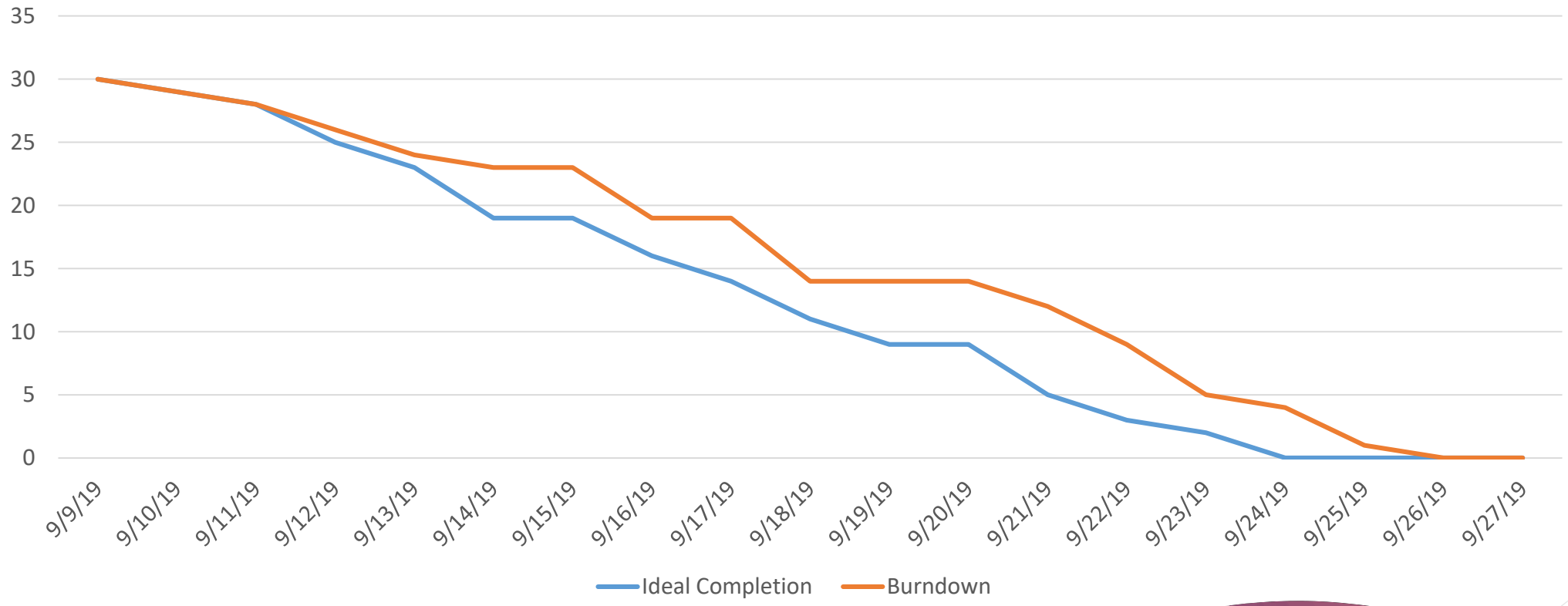
User Stories – Features

User Story	Feature	Points
As the software developer I would like to know the requirements of the pi Camera to implement more accurate motion detection	**Pi camera Requirements**	**5**
As the software developer I would like to get Melbourne Open parking data and the sensor data so that I can implement a system better user experience.	**Melbourne Open parking data and the sensor data**	**4**

Backlog

- https://app.gitkraken.com/glo/board/XW4APgtDJAAPHCC6

Burndown Chart




HARDWARE

HARDWARE

- Arduino platform is used to create the basic protype needed for implementation.

- AtMega328p is used as the base microcontroller for the final design.
- Using ultrasonic sensor for motion detection.

- Raspberry Pi is used to create nodes to json data logging to the central node (Cloud Service)

- Pi camera used to replace the ultrasonic sensor for better detection.


SOFTWARE

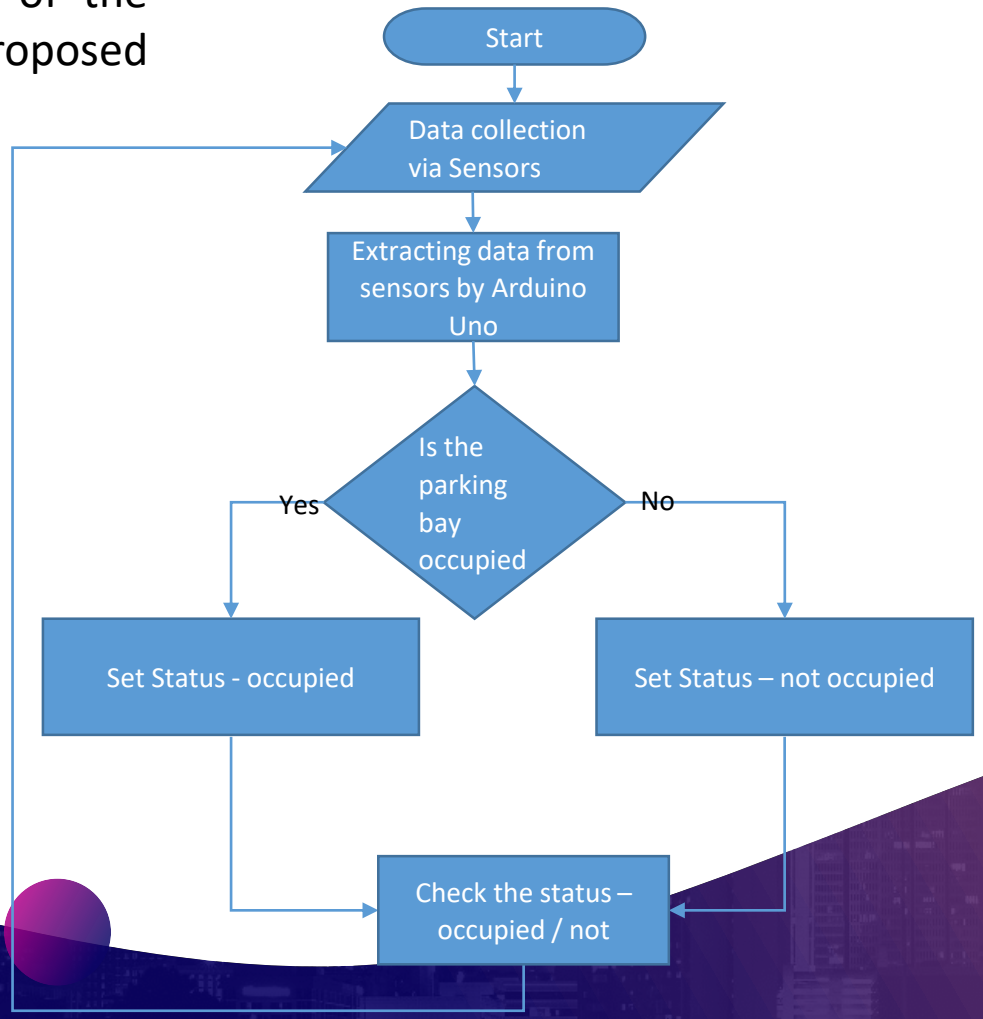
SOFTWARE

- Our server consist of two application layers (data service backend, responsive front end)
  - **Backend** is consisted of necessary software to log data to an SQL database and responsive front end UI for all consumer devices
  - **Frontend** is consisted of user web app and documentation for the application.
- Prototyping of the hardware will be done with Arduino(Pseudo C) language and python will be used in raspberry pi
  - **AtmelStudio** will be used along with C language to make a more robust hardware design.

PROPOSED SYSTEM

PROPOSED SYSTEM

Following is a diagram of the mechanism of the proposed system.

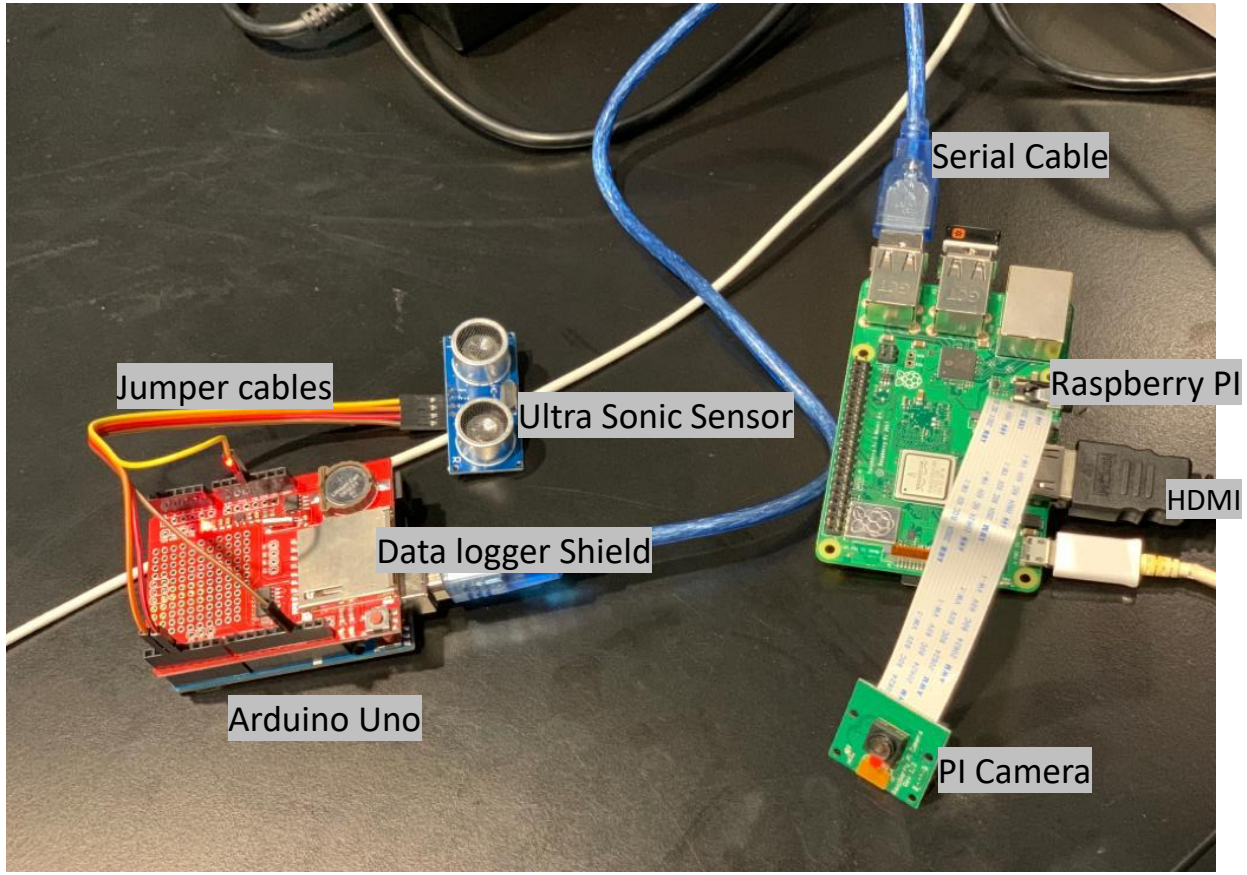


A Smart parking System which will display the status and availability of the parking bays in the respective location.

GIT HUB LINK

https://github.com/SheronSuditha/RedXParking

PHOTOGRAPHS AND DIAGRAMS OF HARDWARE SETUP.



CHALLENGES FACED

- Facing major technical issues such as breaking down of a computer in one of the team members in the last moment.
- Some of our equipment malfunctioned making it rough to move on with the task. But completed.
- SSL Certificate issuing errors.

CHANGES TO THE ORIGINAL IDEA

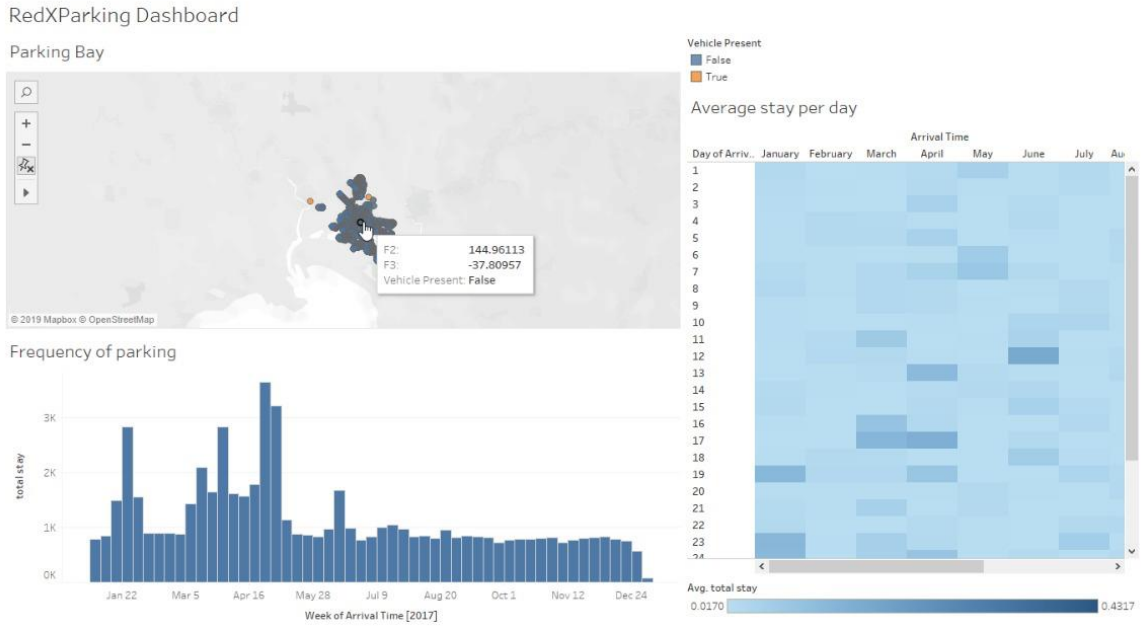
- Using two API platforms Node.js via Express.js and php server.
- Using a camera with object detection to detect vehicle.

Data

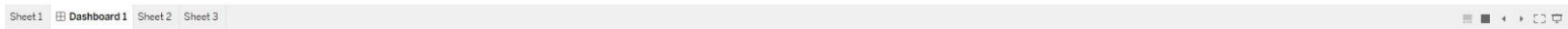
The following diagram is a visualization of the location of the parking bays where some are present as well as some are unoccupied

Sensors in these location will be used to collect data about the parking bay.

Pi camera and PIR motion Sensors will be installed for other locations.



The graph represents the parking locations where the sensors are installed to monitor the status. Noted by Melbourne Open Data



Improvements

- Availability and the status of the parking bay will be displayed on web page.
- Real time data from the in-ground sensors.
- Calibrating with google maps for accurate location for driver.
- Higher accuracy car detection with Pi Camera
- Added real time location information

THE END

REDXPARKING