**FINAL YEAR CAPSTONE PROJECT**

**LOG BOOK**

**Tiered Voting System**

**Submitted By –**

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**Week 1 (1st December – 7th December) ->**

1. Searched for various topics like Automated Fruit Harvester, Tiered Voting System and Automated Toll System.
2. Selected Tiered Voting System as our capstone project topic.
3. Thought about the basic working of our project.
4. Submitted abstract and Data Flow Diagram.
5. Multiple meetings with our guide (Dr. Prabhakar Rao) to discuss various issues regarding voting.

**Week 2 (8th December – 15th December) ->**

1. Developed our project design and figured out the components that are required for our project.
2. Studied about how voting takes place in our country as well as how it takes place in other countries (United States, United Kingdom, Kazakhstan).
3. Concluded with the problems that these countries are facing.
4. Talked to Prabhakar Rao sir about the problems which we can face in this whole journey which we can solve in upcoming days and what all are the risks associated with this type of problem statement.
5. Prepared a 3-4 page report with all our findings (Literature Survey).
6. Went out to buy components and ordered some online.

**Week 3 (16th December – 23rd December) ->**

1. Received all the components. Components are –

|  |  |  |  |
| --- | --- | --- | --- |
| S. No. | Components | Quantity | Cost (Rs.) |
| 1 | Raspberry Pi | 1 | 3000 |
| 2 | Arduino | 2 | 1500 |
| 3 | PI Camera | 1 | 800 |
| 4 | Wi-Fi Module | 2 | 600 |
| 5 | LCD Display | 3 | 600 |
| 6 | Keypad | 3 | 600 |
| 7 | Large Breadboard | 3 | 360 |
| 8 | USB Serial Adapter | 1 | 300 |
| 9 | Small Breadboard | 3 | 130 |
| 10 | Miscellaneous | 1 | 500 |
|  |  | **Total** | 8390 |

1. Watched online tutorial videos and websites to figure out the working of basic components like Arduino, Raspberry PI, display screen and keypad.
2. Made different circuits to learn more about these components.
3. Divided work between ourselves –
4. **Abhilash Gupta** –
5. Setting up Raspberry PI (Installing Operating System, Setting up Python, Installing face\_recognition and other libraries onto Python).
6. Setting up PI Camera with the desired resolution.
7. Making Raspberry PI run as an Access Point.
8. Configuring PI workings with buttons and lights.
9. Writing programs for Face Detection and fetching results from Database on Python.
10. Designing database to store Voting data, Passwords and Security PIN.
11. **Shayan Saha** –
12. Learning basics about both Raspberry PI and Arduino.
13. Setting up display on Raspberry PI to show Password generated.
14. Setting up connection between Arduino and Raspberry PI through WIFI.
15. Data transfer (Passwords) between these modules.
16. Setting up back-end server on PI to match, store and delete passwords.
17. **Sarvansh Prasher** –
18. Designing circuit for Electronic Voting Machine (EVM) on Arduino with help of LEDs.
19. Working with buttons to detect input from the voter.
20. Locking EVM after a single vote or multiple wrong password attempts.
21. Setting up displays and keypads on Arduino.
22. Sending encrypted voting and password data between database on Raspberry PI and Arduino.

**Week 4 (24th December – 31th December) (Holidays) ->**

1. Set up trial circuit for design of EVMs.
2. Tested face recognition library and wrote additional code for interface with button and LEDs.
3. Tried to set up Wi-Fi module on Arduino without any success.

**Week 5 (1st January – 7th January) ->**

1. Designed database to store voter information such as Aadhaar Photograph, Aadhaar Number, Name and Flags (already voted and number of trials).
2. Wrote code on Python to make a web server on Raspberry PI for connection and data transfer with Wi-Fi module of Arduino.
3. Set up Raspberry PI as an Access Point to accept connections from other Arduino.

**Week 6 (8th January – 15th January) ->**

1. Soldered pins on LCD Displays. 2 LCDs working and one is not working.
2. Wrote code on C++ for Arduino to run LCD display.
3. Wrote code on C++ for Arduino to interface keypad and run it along with LCD display.
4. Completed circuit of EVM. Small problems still occur sometimes.

**Week 7 (16th January – 23rd January) ->**

1. Repeated circuit for EVM for 2nd Arduino as well.
2. Added LCD display and keypad on 2nd Arduino as well.
3. Merged all the code for Arduino to support all modules together. Wi-Fi module still not working.
4. Added boot support on Raspberry PI to run Camera as well as web server on startup without user intervention.
5. Removed some bugs in Python code on Raspberry PI.

**Week 8 (29 January – 4 February) ->**

1. Discussed about which component will be required for communication between Arduino and Raspberry pi.
2. Discussed about how we will carry out communication between Arduino and raspberry pi.
3. Discussed and chalked out plans about how we will finish the rest of our project.
4. Studied about how to carry out communication between raspberry pi and Arduino.

**Week 9 (5 February – 11 February) ->**

1. Watched videos and studied about how to set up WIFI module ESP8266.
2. Set up WIFI module ESP8266 through another method.
3. Tried to set up WIFI module ESP8266 for communication between Arduino and Raspberry Pi. Problems were there.
4. Tried to solve the problems in order to establish the connection for communication but still same problems appeared.

**Week 10 (12 February – 18 February) ->**

1. Decided to go for Ethernet shield for communication between Arduino and Raspberry pi.
2. Bought Ethernet Shield and wires.
3. Studied and watched tutorials about Ethernet Shield and how to set it up.
4. Worked on Flask Server on Raspberry Pi to externally use the server on the network.

**Week 11 (19 February – 25 February) ->**

1. Set up Ethernet shield.
2. Worked on Ethernet shield to establish connection between Arduino and Raspberry Pi for communication between them.
3. Developed a PHP backend server application to test communication locally.
4. Connection Established successfully and communication was successful between Arduino (which was interfaced with LCD and Keypad) and raspberry pi.

**Week 12 (26 February – 5 March)**

1. Worked on some suggestions that were given in the previous review (21st January).
2. Prepared a rough draft for Research Paper as per VIT’s instructions.
3. Researched more about some topics that could possibly be included in the paper.
4. Prepared for the review on 5th March.