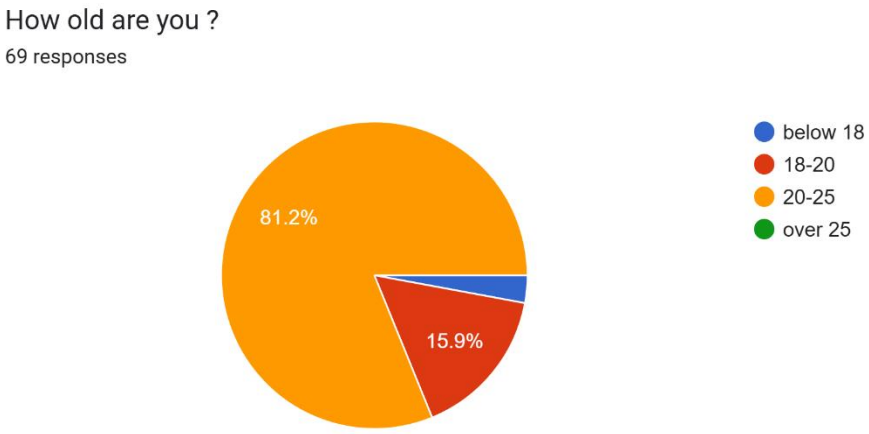
PROJECT TITLE:

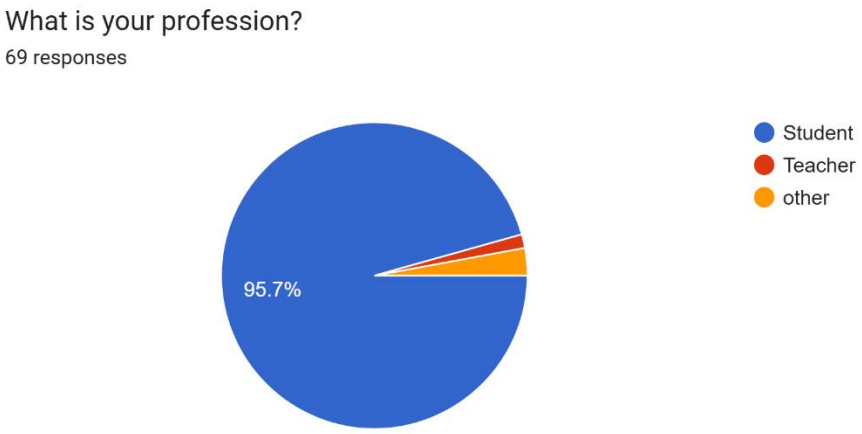
SMS-Based Remote Controlling System Using Arduino and GSM Module.

SURVEY:

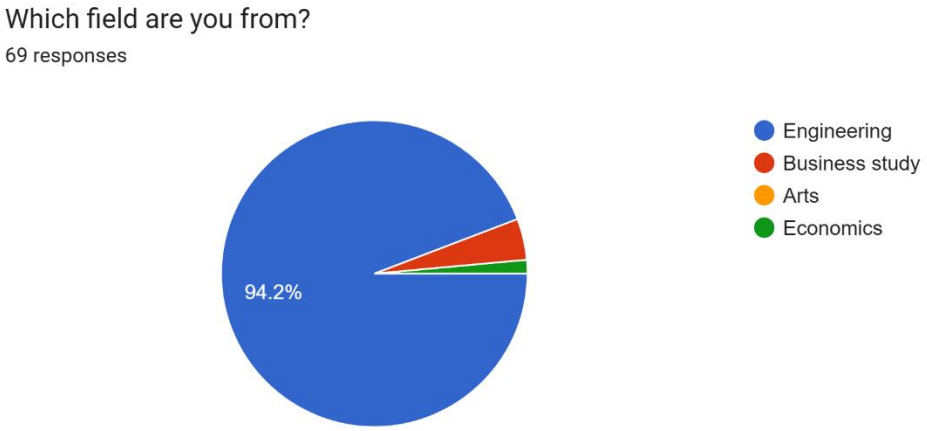
Here we got 69 responses. Respondents are mostly engineering student aged between 20-25.



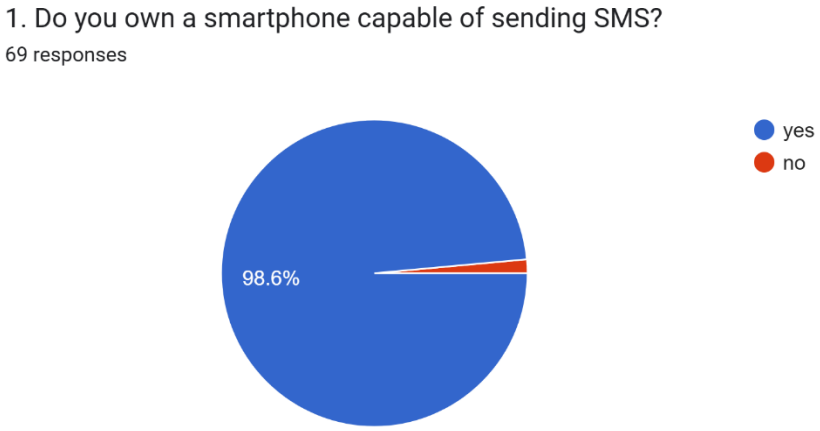
This show highest percentage of survey participants which 81.2% are aged between 20 to 25 years old.



It shows about 95% of respondents are students.



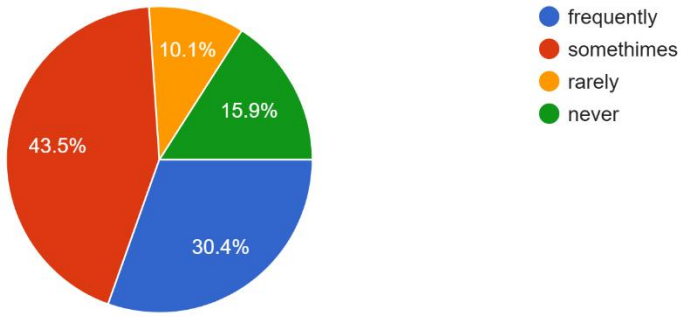
Highest respondents are from engineering fields which is about 94.2%.



From here main questionnaire begins. Most of the respondents which is about 98% have the devices that operates our projects.

2. Have you faced challenges controlling devices remotely?

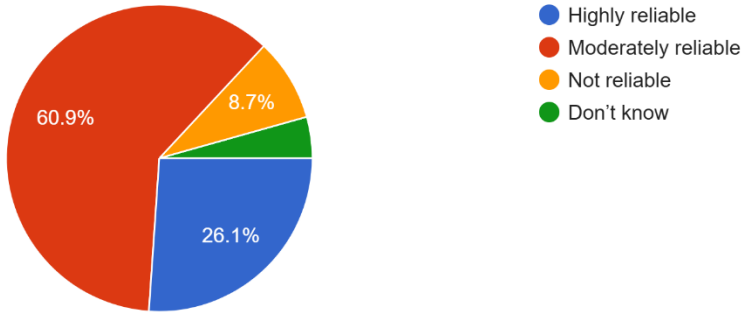
69 responses



This shows most of the respondents are faced problems operating devices remotely.

3. Do you think SMS-based systems are reliable for remote operations?

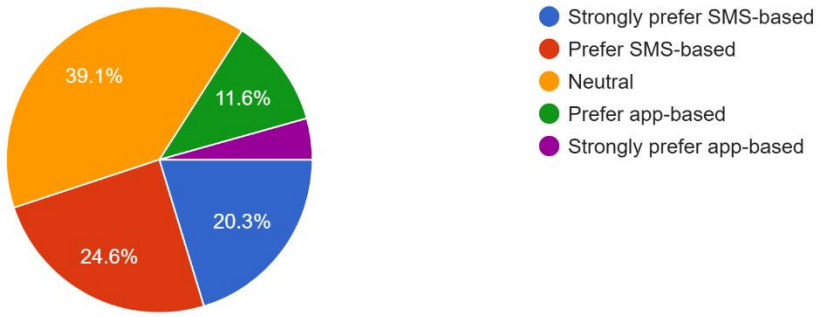
69 responses



About (60+26)86% of respondents think positive about SMS based operations are reliable.

4. Would you prefer SMS-based control over app-based systems?

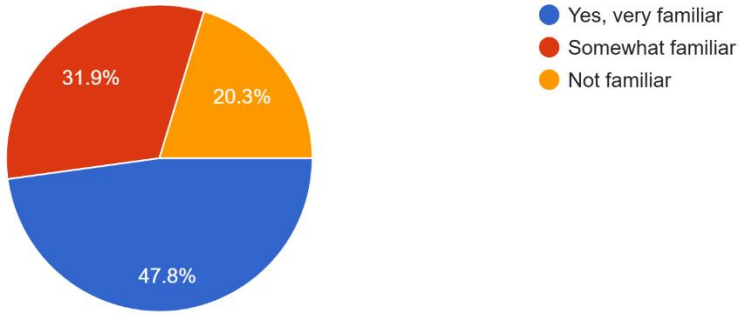
69 responses



SMS-base vs APP-base . Here SMS-based wins via a percentage near about (20+24)44%.

5. Are you familiar with using Arduino or similar microcontroller systems?

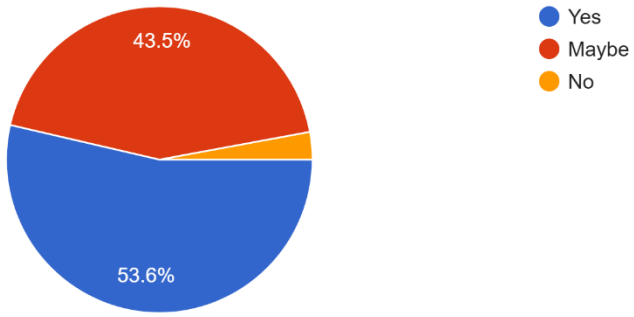
69 responses



Near about (31+47)78% respondents are familiar with our microcontroller.

6. Would you be interested in implementing SMS-based controls at home or work?

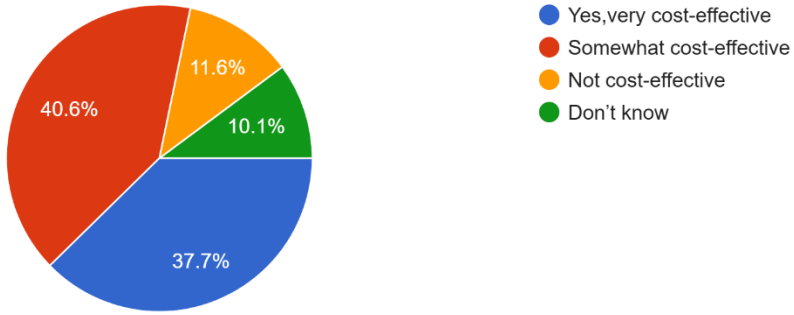
69 responses



A big amount respondents interested to implement sms-based systems that is (53+43)96% including all positive response.

7. Do you consider SMS-based systems cost-effective?

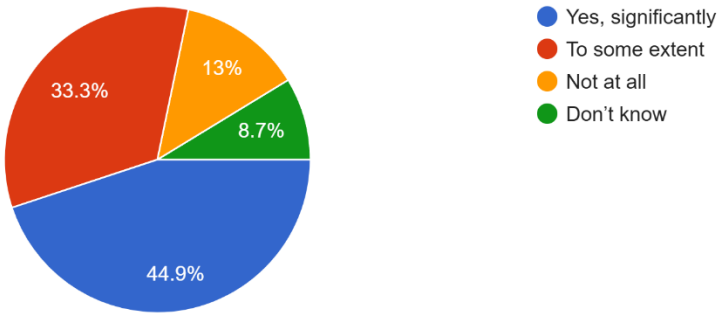
69 responses



About (40+37)87% respondents believe that sms-based systems are cost effective.

8. Do you think SMS-based systems could improve safety in certain scenarios?

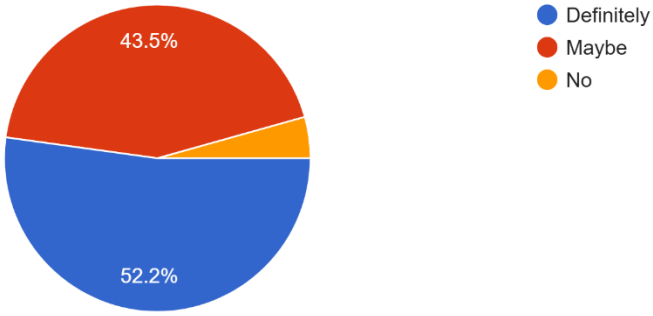
69 responses



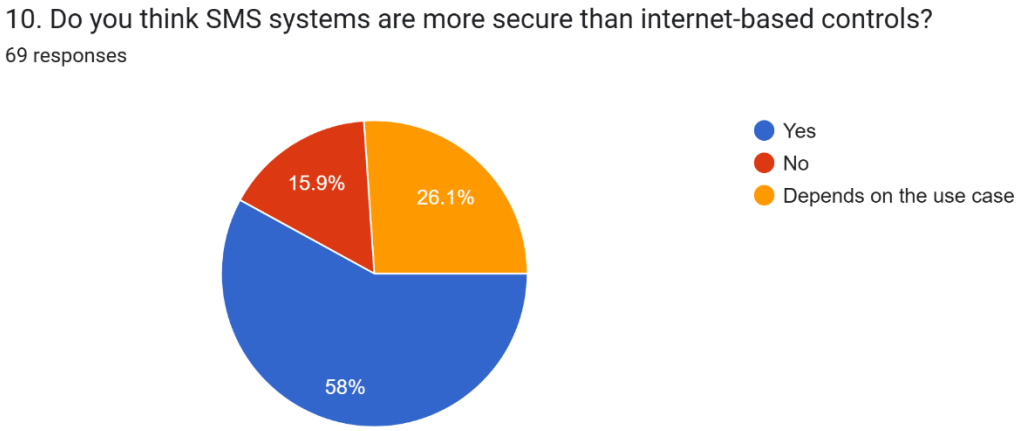
About (44+33)=77% of the respondents are thinking sms-based systems are safe.

9. Would you recommend SMS-based systems for rural areas with limited internet access?

69 responses



SMS-based system is recommended must for limited internet access area. The positive response is about(52+43)95%.



Near about 58% thinks that sms-based system is more secure than internet-basaed.

This whole survey creates a positive scenario about our project and gives us good impression of our works.

AIMS AND OBJECTIVES OF THE PROJECT:

Aim:

- ✓ Design an SMS-based controlling system, which is also extra feature like switch or IR remote control using Arduino and GSM module for remote device operation.
- ✓ Simulate the proposed system to demonstrate functionality and reliability.
- ✓ Implement the system in hardware and analyze its performance under real-world conditions.

Objectives:

- ✓ Design a cost-effective SMS-based system to control devices where internet connectivity is unreliable.
- ✓ Provide a universal solution compatible with basic GSM mobile networks.
- ✓ Create a system that can operate critical devices like irrigation pumps during emergencies.

LITERATURE REVIEW:

SMS-based control systems have been widely studied in the context of embedded systems due to their affordability, accessibility, and reliability in areas with limited internet

connectivity. Below are the key studies relevant to this project, highlighting the existing research and identifying areas for improvement:

1.GSM-Based Home Automation Systems
In the paper *"GSM Based Home Automation System"* by S. Sharma et al. (2022), the authors implemented a home automation system that allows users to control household appliances via SMS. The study highlighted the cost-effectiveness and feasibility of using GSM modules with Arduino for real-time device control. However, the system lacked advanced security features, such as encryption, making it vulnerable to unauthorized access.

2.SMS-Controlled Irrigation Systems
The study *"SMS Based Smart Irrigation System Using Arduino"* by R. Kumar and A. Jain (2021) focused on using SMS for remote control of irrigation systems in rural areas. The researchers used an Arduino Uno and a GSM SIM800L module to activate water pumps based on user commands. While the system performed well in low-network conditions, it faced delays in SMS delivery during peak network traffic. This paper emphasizes the need for robust signal handling in GSM-based systems.

3.Remote Security Applications Using GSM
In *"GSM Module-Based Intrusion Detection System"* by T. Ahmed et al. (2020), the authors proposed a security system for detecting unauthorized access in homes and offices. The system sent SMS alerts to users when motion was detected. The study demonstrated the simplicity and reliability of GSM communication but identified a limitation: the lack of two-way communication for immediate user response. This research is relevant to your project as it highlights the importance of real-time communication.

4.Energy Management Using GSM and Arduino
The paper *"Energy Meter Reading and Control via SMS Using Arduino"* by M. Patel and N. Roy (2019) demonstrated the potential of SMS-based systems for monitoring and controlling energy usage. The researchers achieved efficient two-way communication between users and the system. However, their study did not explore scalability for large-scale implementations. This research provides insights into the integration of Arduino and GSM modules for real-time control and monitoring.

5.SMS-Based Rural Connectivity Solutions
In *"Low-Cost Remote Control Solutions for Rural Areas"* by P. Singh et al. (2021), the authors addressed the challenges of internet connectivity in rural regions by designing a GSM-based communication system. This study concluded that SMS-based systems are highly effective in rural areas for tasks like controlling irrigation pumps and monitoring

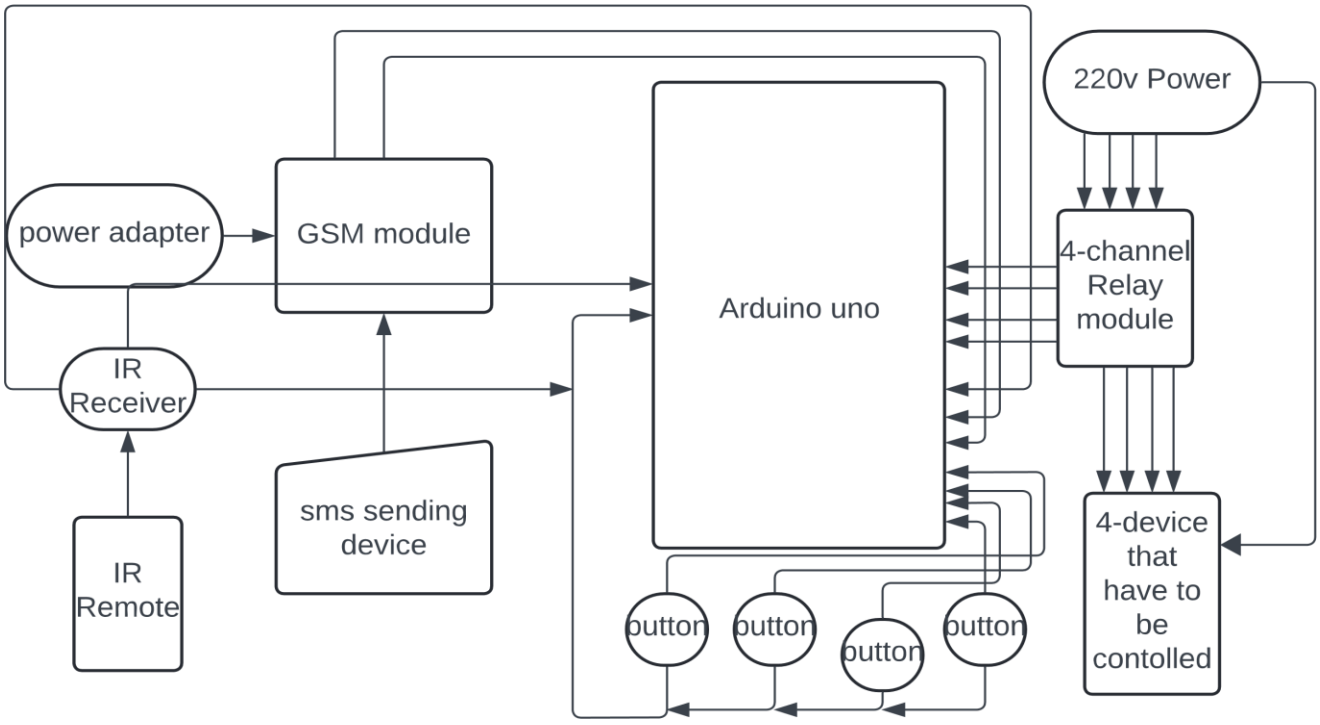
environmental sensors. However, the paper pointed out the need for user-friendly interfaces to ensure widespread adoption.

The reviewed literature illustrates the feasibility and advantages of SMS-based control systems. However, gaps remain in areas such as:

1. Enhancing security and encryption for SMS communication.
2. Addressing delays caused by network congestion.
3. Developing more scalable and user-friendly systems.

This project aims to build upon these studies by implementing a secure, scalable, and efficient SMS-based controlling system using Arduino and GSM modules, IR sensors addressing the identified limitations.

EXPERIMENTAL BLOCK DIAGRAM:



This diagram shows how all components like GSM module, adapter , IR sensor, button, relay ,ARDUINO is inter-connected while working as a controlling system

POSSIBLE OUTCOMES OF THE PROJECT:

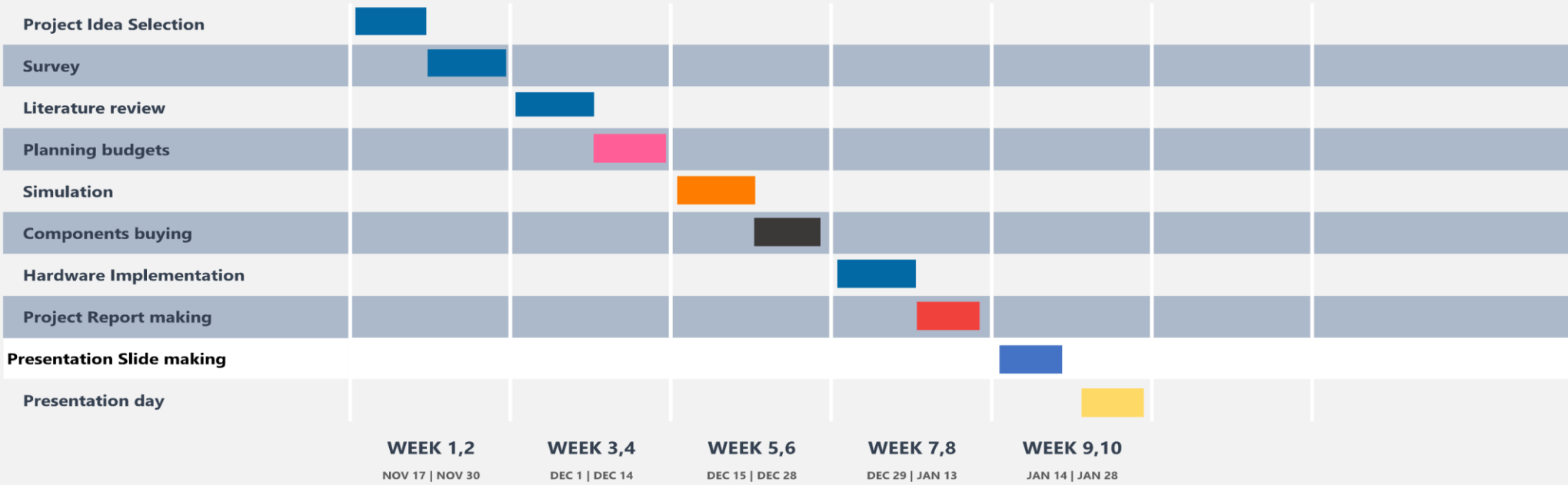
- ✓ **Reliable Device Control in Remote Areas:** The project will provide a practical solution for controlling devices in regions with poor or no internet connectivity, making it particularly useful for rural and disaster-prone areas.
- ✓ **Cost-Effective and Accessible Technology:** By leveraging SMS, the system will demonstrate an affordable alternative to internet-based remote-control systems, ensuring accessibility for users with basic mobile phones.
- ✓ **Energy Conservation:** The project will help users remotely switch off devices that are unintentionally left on, reducing energy consumption and electricity bills.
- ✓ **Improved Agricultural Practices:** Farmers can remotely control irrigation pumps and other agricultural devices, optimizing water usage and improving efficiency in farming operations.
- ✓ **Scalability for Future Applications:** The project can serve as a foundational system, allowing future integration with sensors or more advanced modules to expand its capabilities, likely adding temperature or moisture sensors for smart farming.
- ✓ **Societal Impact:** By addressing the needs of diverse user groups, from urban residents seeking convenience to rural communities requiring basic automation, the project has the potential to enhance societal and cultural practices related to technology adoption.
- ✓ **Contribution to Engineering Education and Innovation:** The project will serve as a learning platform, demonstrating the use of embedded systems and communication technologies in solving real-world problems.

Project Gantt Chart

Micoprocessor and Embedded Systems

Durations

Probable Project Presentation->Jan(19-25)



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