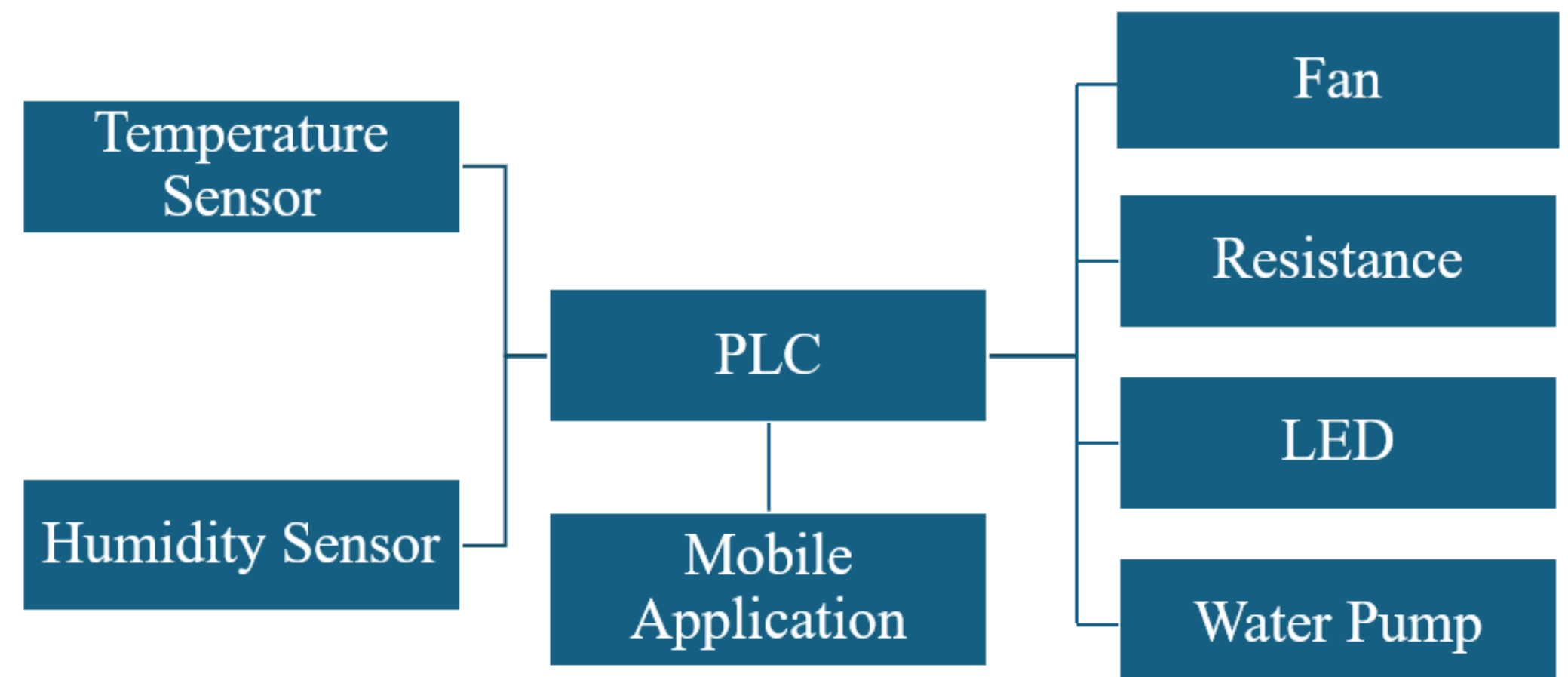# THE DESIGN OF A REMOTE-CONTROLLED AUTOMATION SYSTEM USING MOBILE DEVICES

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SUMMARY

This project aims to design and implement an automation system that can be remotely controlled via mobile devices in the agricultural sector. Various sensors and actuators have been used to precisely monitor and control environmental factors such as temperature, humidity, light, and irrigation in a greenhouse environment. The system is controlled using Siemens S7-1200 PLC and TIA Portal software, with Firebase Realtime Database and Node-RED enabling remote access for users.
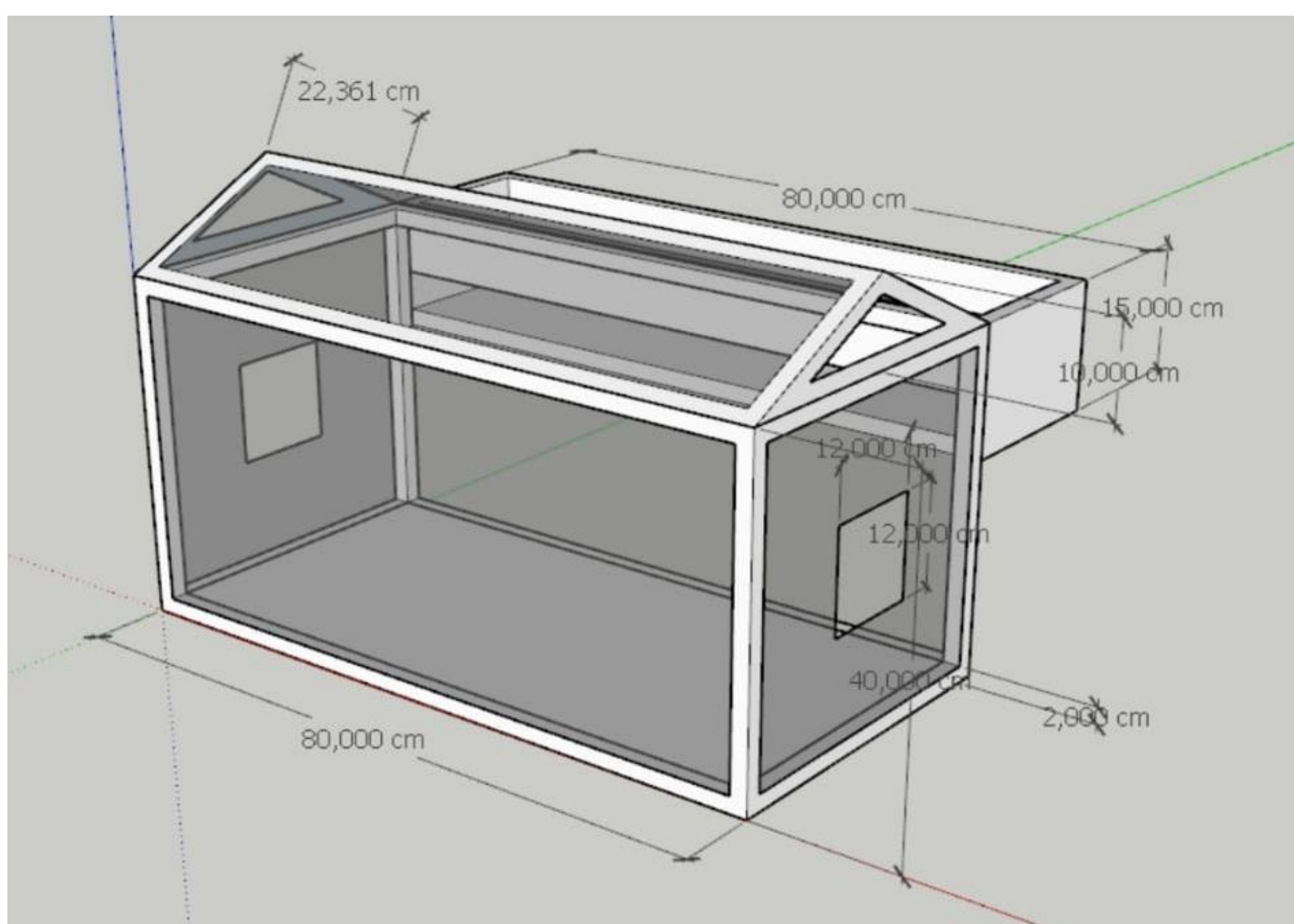
PURPOSE

The aim of this project is to create a greenhouse automation system that can be controlled remotely.

DESIGN REQUIREMENTS

The environment must be safe and suitable for electrical connections.
The materials chosen for the cabin should be durable, lightweight, and insulated.
The mobile application and the PLC should work synchronously.

## FIREBASE CONFIGURATION

METHOD

The system utilizes temperature and humidity sensors to monitor environmental conditions within the greenhouse. We integrated a fan, resistance, LED lights, and a water pump to regulate these conditions. Communication between the system components is facilitated using Node-RED and Firebase, allowing real-time data synchronization and remote control.
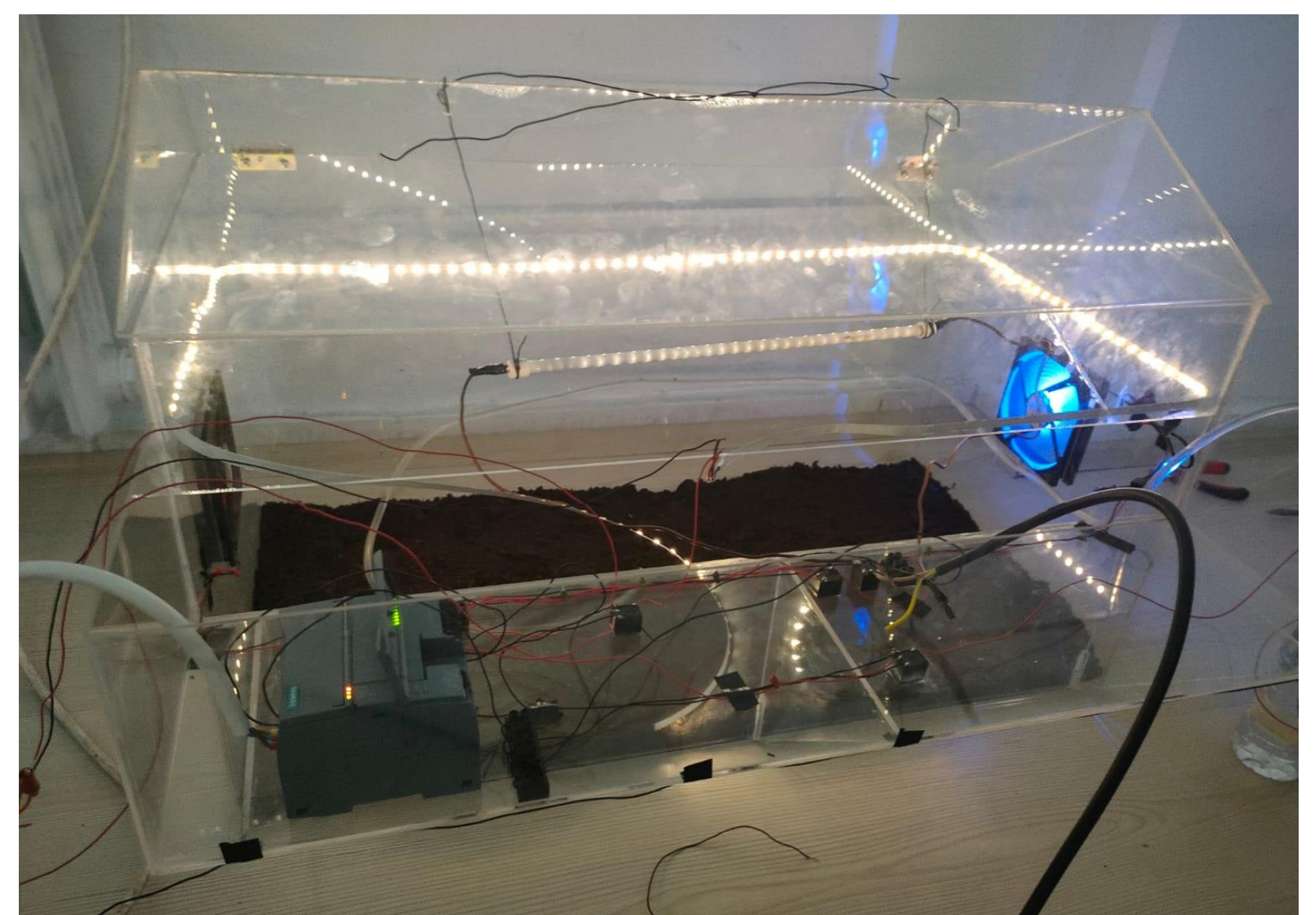
CONCLUSIONS and RECOMMENDATIONS

The TIA Portal code was tested in a simulation environment and functioned correctly, demonstrating the system's potential effectiveness. The actuators used in the project operated as expected, ensuring the proper control of environmental conditions. However, the sensors did not function correctly, which impacted the system's ability to monitor temperature and humidity accurately. Additionally, communication with the mobile application could not be established, highlighting a critical area for further development and troubleshooting. Despite these challenges, the project shows promise and provides a strong foundation for future improvements.