



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Low Fidelity Prototype project: Part 1

Course/Section: SECP1513/05

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1. Introduction

After the Internet, the Internet of Things (IoT) is seen as an innovation and financial wave in the global data sector. The Internet of Objects (IoO) is a clever system that connects all things to the Internet with the purpose of exchanging data and conveying it through data detection devices in accordance with agreed-upon conventions. It achieves the goal of sharply identifying, discovering, following, watching, and supervising objects. It is an enhancement and extension of an Internet-based system that expands connection from human to human to human and things or things to things. In the IoT worldview, numerous articles encircling us will be coupled into systems in certain shapes. It is a present correspondence paradigm that conceptualizes a near future, in which the things of regular day to day presence will be equipped with microcontrollers, phones for computerized correspondence, and rational convention stacks that will make them prepared to communicate with each other and with the clients, turning into a crucial component of the Internet. The IoT idea, consequently, aims for making the Internet even more immersive and inevitable.

Building management systems are the foundation of every structure. These technologies allow occupants to monitor and manage the building's day-to-day operations and functioning. Building management systems were innovative in transforming the way building operations were carried out in their early days. A computer-based control and management system might handle the operational components of a building autonomously. This aided building managers' work by making it easier for them to conduct their tasks. However, these traditional building management systems presented their own set of issues, necessitating the use of IoT for building management.

2. Content of report

2.1 Problem statement

A contractor is in charge of designing, leading, executing, supervising, and inspecting a building construction project in general. Regardless of the project's scope, the duty extends from the beginning to the end. Furthermore, a contractor also needs to ensure health and safety on the construction site by establishing appropriate procedures and developing worker awareness.

Unfortunately, there are also reports on the death of workers in construction sites because of the heat. For example, a 50 -year -old construction worker was found unconscious in Tokyo Big Sight and died and heat stroke is suspected to be the cause of death of a worker at the Tokyo Olympic construction site in 2019(harian metro, 2019). The problem here is a contractor did not know the exact temperature of the day to determine whether it is convenient to do work or not.

2.2 4th IR Technology to solve the problem

Internet of things(Iot) is the right choice to solve the problem. In this case, the type of Iot that we chose is Consumer Internet of Things (CIoT) that refers to use of IoT for consumer applications and devices. By implementing Iot in this problem we came up with this solution called smart weather reporting system which was created to make it easier to report weather data via the internet. The system is equipped with temperature, humidity, and rain sensors that can monitor the weather and deliver real-time weather updates.

The contractor now can examine weather statistics online at any time using their smartphone without relying on the weather forecast agency's data. It is because this system is automated and always-on that uses WIFI connection to deliver data from a microcontroller to a server. This system also can warn the contractor when the temperature exceeds the threshold value that has been set by the contractor. So, the contractor managed to avoid an accident by informing the workers to stop working for a while.

2.3 Potential client

The potential client that wants to use this technology is building contractors since they need to ensure the safety of the workers in the construction site. They can detect the change of weather conditions using this technology then can prevent an unexpected accident from happening.

3. Architecture planning and design

Hardware:

1- Sensors: such as Temperature and Humidity Sensor (DHT11), Barometric Pressure Sensor (BMP180), LDR and Raindrop Module.

2- Microcontroller: to process Analog voltages from the sensors and convert them to Digital data such as Arduino UNO

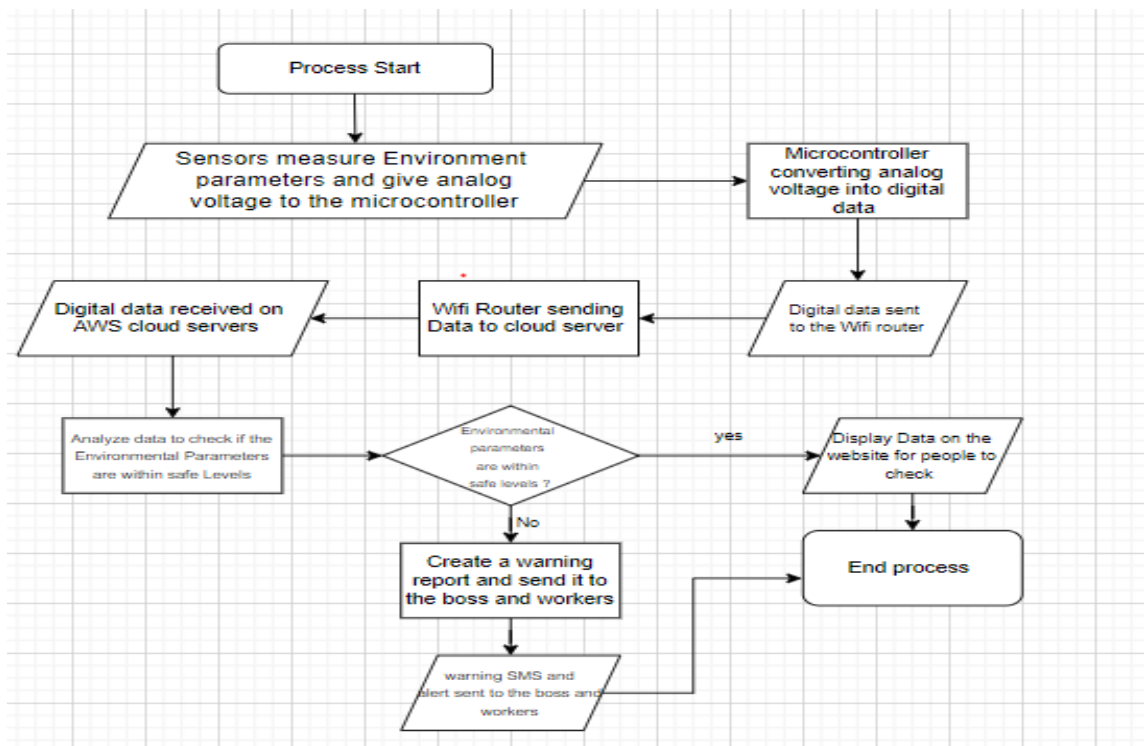
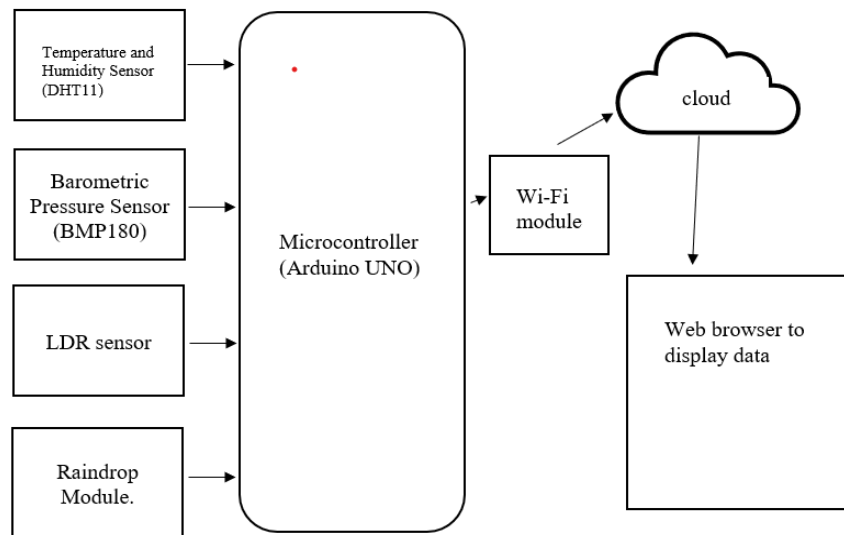
3- Wi-Fi Router to send the Processed Data to the server.

4- End user output device (Smartphone, Laptop, Tablet etc....).

Software:

1- Digital data processing software in the Microcontroller such as: Arduino IDE.

2- AWS cloud computing platform to analyze sent data and decide If to send a warning or not.



The flowchart diagram above shows how a smart weather reporting system works from getting the data from the sensors until the end of the process.

4. Conclusion

By further indulging in the technology and the features provided by the cloud computing services, building operations can be controlled and managed electronically by a computer system. Having access to this kind of information simplified the work of building managers in order to become more organized in their line of work and further speeds up the construction efforts while also accounting for the possibilities and consequences of the application.

Though it is clear that the weathering report system is indeed a breakthrough technological advancement, it also comes with its own limitations. A group of researchers and meteorologists has also suggested that there is a limit on how far into the future we can predict the outcome of the weather to 5-6 days tops for reliable results. There is also an occurrence which is called the butterfly effect that may affect the outcome of the results generated by the weather report system.

A layer of air is created when turbulence in the atmosphere forms clouds, causes storms, and pushes around cold fronts. The layers build on each other and grow larger. Even the tiniest disturbance in one layer, such as a thin ply of paper can cause ripple effects on other layers, resulting in fundamentally different weather patterns. We can only predict the weather meaningfully so far out because of all that variation and uncertainty.

Despite the limitations of the weather report system, its benefits far outweigh the downsides. In the end, this invention of the weather forecast has improved the lives of a lot of people. In case of a change in climate, such as the falling of snow or rising temperatures, people can take proper precautions to cope with the situation. As construction does not happen during a rainy day, the building contractors can plan accordingly into the future to maximize their workforce and save on equipment that would otherwise need to be replaced.

As a result, we can conclude that in order to maximize our efficiency at work, we need to implement this weather reporting system during our workday.