IoT Based Monitoring of University Classrooms

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This paper presents the design of the wireless communication architecture, the implementation of IoT technology in educational institutions and the system hardware based on customised micro-controller and wireless communication processors. The study involves the security threats involved in current practices and proposing a solution using IoT. The conventional method of recording attendance using RFID cards has proven to be insecure and prone to proxies. This paper provides a smart attendance system using IoT based sensors, and Raspberry Pi to collect data. The IoT devices are embedded into the existing education environment for data to be collected, transmitted through WiFi using MQTT protocol and store data in local server. The collected data is then accessible to the management with real time insights and attendance pattern. There are many advantages for educational institutions and their stakeholders in using IoT-based attendance tracking systems. Firstly, it promotes accuracy and reliability by eliminating the possibilities of proxy attendance. Secondly, it promotes a sense of accountability among students and promotes consistent attendance, which is directly related to better academic performance. The proposed solution was tested in several different courses in real time over a period of time and the results were compared to the actual attendance data collected through traditional methods. The Raspberry Pi and sensors are used together to collect, process, share, and store data. The need for students to carry an RFID tag and automated the attendance system is eliminated. The IoT system is equipped with BME280 sensors integrated into a Raspberry Pi Zero W on a single-piece breadboard. The sensors are used to capture measurements such as pressure, temperature, and humidity. The Raspberry Pi Zero has an implemented Micropython script that uses the Micropython-bme280 library driver to read continuous sensor values. The proposed monitoring was tested in several different courses in real time over a period of time and the results were compared to the actual attendance data collected through traditional methods.