

AUTHENTISCAN: Prototype Design of Novel, Compact, Cost-Effective, Portable, Sustainable IOT-Enabled Biometric Attendance Tool

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Abstract:

This research aims to design a novel IOT-enabled, portable attendance tool kit hardware prototype using Fingerprint-based Biometric technologies instead of conventional RFID based technologies. This research contributes in the development of efficient and secure attendance management system suitable for educational institutions, businesses, and other organizations. The main objective for such implementation is to incorporate all the features like portability, lightweight, and reliability within the IOT-enabled compact attendance tool kit comprised of nodeMCU ESP8266, R307 fingerprint module and LCD display. This portable module is connected to the server using wireless connections for transferring the input fingerprint data. This secure device is capable of providing better accuracy and efficiency in tracking and managing attendance records. The system employs a centralized database for storing a maximum of 1000 entries as well as processing attendance data to provide real-time monitoring and generate comprehensive reports for administrators. The attendance details are obtained from the device and are showcased on the website of the organization. The novelty of the IOT enabled proposed device lies in enhanced features like portability and cost effective in comparison with other attendance tool kit available in the market.

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I. Introduction

There are various traditional approaches that has been used in taking attendance in various sectors of organizations, schools, colleges etc. Among which, Roll call and handwritten manual attendance are of primary approaches in past few decades. Attendance plays a major role in academic sectors as well as in other organizations to evaluate the performance of students or employees. The above-mentioned traditional methods associated with students or employees does not yield a better result to assess the performance of the stakeholder. In literature [1] an appropriate, dependable, affordable, efficient, and cost-effective access control system in addition to an attendance system for attendance tracking in educational institutes was proposed. There are other systems mentioned in the literature [2], where a monitoring system was studied for online tracking. The system is developed as an efficient and user-friendly solution for attendance management. A new paradigm for tracking student attendance utilizing Global System for Mobile (GSM) and Radio Frequency Identification (RFID) communication technology based on the Internet of Things (IoT) has been noted in other literature [3]. Based on Internet of Things technology, the proposed model has both hardware and software components. The hardware part consists of parts like GSM module, RFID tag, EM-18 RFID reader. An application programming interface (API) is a piece of software that allows information to be

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