Development of an RFID-based Attendance and Location Logging System Using an Online Scheduling SQL Database for PSHS-MC Batch 2018

ABSTRACT

A Radio Frequency Identification (RFID) card reading station and online Structured Query Language (SQL) schedule database were developed to address the inefficiency of traditional schedule keeping and attendance checking methods for schools under the K-12 program. This system improves accessibility and documentation of data for Philippine Science High School - Main Campus (PSHS-MC). The RFID station was made using a capacitive touchscreen as the display and intuitive interface, a WIFI module to connect to the online database, and an Arduino UNO as the main microcontroller (Aydin, Coskun, Ok, & Ozdenizci, 2011). The online database was populated with PSHS-MC data, and the web application were made using CodeIgniter, a framework for HyperText Preprocessor (PHP) and SQL. The fully searchable forms include the: Main Schedule form, that tracks current time period and class status, the Student Tracker Form, that loads the current time status, class and location, and weekly schedule of selected students, and the Attendance Records Form, which displays all RFID-scanned attendance records. Lastly, the entire application was uploaded onto the web domain: www.accesspisay.com. The RFID station was integrated to upload attendance data to the database using the WiFi module. A sample of students tested and answered user experience and usability surveys for the system (Nielsen, 1995). According to the survey, the system performed well overall when it came to functionality, ease of use and aesthetics. The system proves to be an effective means of digitizing and automating records for Philippine-Science High School Main Campus.

BACKGROUND

- Lack of school digitilzation
- Difficulty in on-campus student location
- Flawed attendance checking

OBJECTIVES

- To construct an NFC card reading station
- To create student schedule database with web-accessible user interface using mySQL & PHP
- To integrate the NFC system with the online database
- To assess the functionality and usability of the RFID System

SIGNIFICANCE

- Complete digitalization of school system
- Ease of student or faculty tracking and location
- Analysis and improvement of class planning and schedule construction
- Accessibility and convenience of schedule data

METHODOLOGY

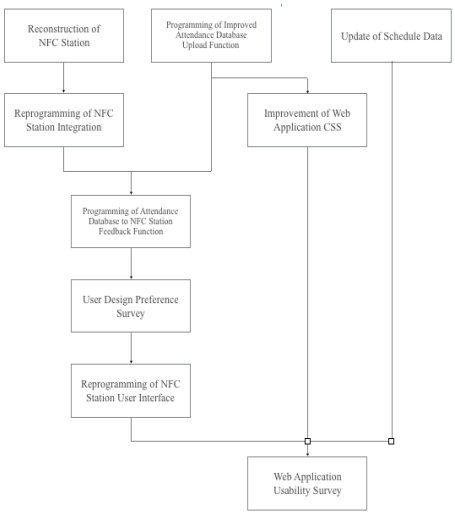

Figure 1. Process Flowchart

RECOMMENDATION

For further improvement, increase sample size of of the usability surveys for more accurate results. Include data from the entire school population, not just Specialization Years Program students. Also, use a larger and more sensitive touchscreen to make the station easier to use.

BIBLIOGRAPHY

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RESULTS AND DISCUSSION

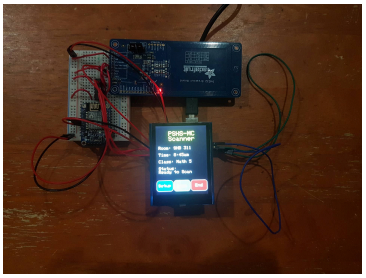

Figure 2. RFID Station Complete Prototype

The touchscreen user interface and the RFID card scanner are fully operational, and the WiFi module functions to upload attendance and location data to the online database (Figure 2).

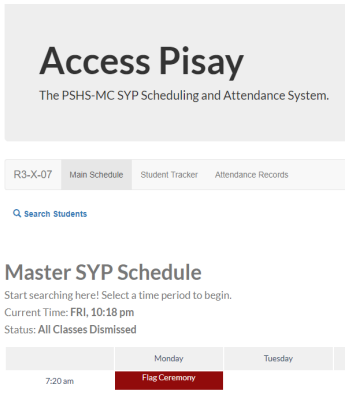

Figure 3. Main Schedule Form, Header and Navigation Bar

The web application, named "Access Pisay", has three main forms (Main Schedule, Student Tracker, and Attendance Records). All the forms have search functionality. The Main Schedule form displays the current time period, and the respective status of all classes (Figure 3).

Figure 4. Student Tracker Form

The Student Tracker form for a specific student. The orange block indicates the ongoing period. Details including name, ID number, current status (in class/on break/not in school), and location (if possible) are all displayed (Figure 4).

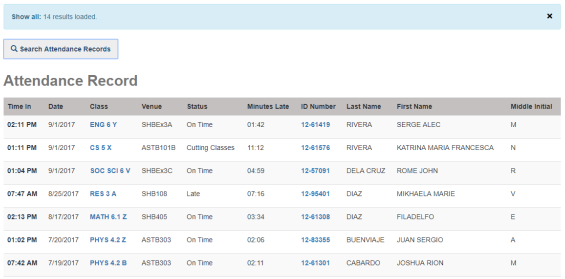

Figure 5. Attendance Record Form

The Attendance Record form shows all instances of attendance in table form. Records can be searched for based on properties: Time in, date, class, venue, late status, number of minutes late, ID number, and student name (Figure 5).

CONCLUSION

The system is functional, able to display student schedules and class details, as well as scan RFID cards and upload attendance. It also passes the standards of usability, according to survey.