RFID GATE MONITORING SYSTEM FOR BASIC EDUCATION OF BALIUAG UNIVERSITY WITH SMS NOTIFICATION

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Abstract

In the past or recent years, most schools use the traditional way of letting their pupils of going to school. Identification Card is used for detecting the identity of the student if he or she is enrolled in the school he or she is entering. The ID is updated every school year which results to more cost for the enrollees, more resources, more time and energy being wasted by just creating another ID. The ID that is being created will take a few weeks before it can be released to the students, some old pupils can enter the school even though they still use their old ID. But with the help of the Radio Frequency Identification, this can be changed since the Radio Frequency Identification can be used up to the final year of the pupil. The pupil will just simply scan his or her RFID to a dedicated module in the entrance gate of the school. It will then fetch the needed data to display to a screen so that the security guard can see if the student that is in the screen matches the student who is holding the RFID card. Once the security guard is verified that it didn't match, a text message will be sent to the student's guardian or parents that his or her child has arrived the school safely with the exact time of his or her arrival. Furthermore, the parents will also be informed if their child is not attending his or her class in the school on that day, since the students will then have a hard time attempting to cut classes because of the RFID. The system is also helpful for the teachers to have an accurate attendance of his or her pupils because the system will also automatically check the students' attendance.

Keywords: Identification card, RFID, system, attendance

Identification Card is used for detecting the identity of the student if he or she is enrolled in the school he or she is entering. The ID is updated every school year which results to more cost for the enrollees, more resources, more time and energy being wasted by just creating another ID. The ID that is being created will take a few weeks before it can be released to the students, some old pupils can enter the school even though they still use their old ID. But with the help of the Radio Frequency Identification, this can be changed since the Radio Frequency Identification can be used up to the final year of the pupil. The pupil will just simply scan his or her RFID to a dedicated module in the entrance gate of the school. It will then fetch the needed data to display to a screen so that the security guard can see if the student that is in the screen matches the student who is holding the RFID card. Once the security guard is verified that it didn't match, a text message will be sent to the student's guardian or parents that his or her child has arrived the school safely with the exact time of his or her arrival. Furthermore, the parents will also be informed if their child is not attending his or her class in the school on that day, since the students will then have a hard time attempting to cut classes because of the RFID. The system is also helpful for the teachers to have an accurate attendance of his or her pupils because the system will also automatically check the students' attendance.

The proponents of the project suggested to have an event registration feature where some selected pupils are required to attend the said event and check their attendance. Thereby, the proponents of the projects suggested to have a report generation feature where the system will generate a report of all the attendees of the events that day. Moreover, the proponents of the project also suggested that the faculty members should not accept any text message being sent by student's guardian or parents. The proponents of the projects suggested that there should be an event attendance report generation feature for the system to generate an attendance report for the number of students who would attend the event on that day and time.

Project Context

Even with the current technology, there are still a lot of schools that use the manual process which is at the start of the class the teacher will still call the names of the pupils or probably require pupils to submit a piece of paper their name written on it in which it is time consuming. There are times that the pupil may forget to sign the attendance and they will be assumed and marked absent. Worse, they can also cheat their friend's attendance even though they are not there. The suitable solution for this problem is to design a system that will record attendance automatically.

Being a parent is somewhat difficult because they would need to go to their job early and go home late. Especially when they have a child who is going to school on his/her own; the first thing they will worry is whether there might something happened to them or if they will arrive at the school safe and sound. The suitable solution for this problem is to design a Gate Monitoring System that will send a message to the children's parent/guardian whenever their child or children have already arrived and left school.

The proponents will use Visual Basic as a Graphical User Interface (GUI) to make inserting database simpler and easier. The proponents choose this GUI because of its simple interface so that the users will have no much problem using the system. The pupils or their guardians will have to fill up the registration form to input their information along with their guardian's contact information. This is needed to be done right at the enrollment day so that when the classes start everything is ready to go. This project will help the children's parents and the school Guard to track the pupils whenever they go to school.

Purpose and Description

The main purpose of this project is first, to eliminate the chance that if a pupil forgets to bring his or her ID and

would use another student's ID instead. Second, these will immediately text the parents/guardians of the said pupil that their child/children had already arrived at the school. Third, to reduce and eliminate the printing of ID's every school year. Last, to be one of the school/university that uses RFID system.

Eventually, in order to improve the community facility, the proponents created an RFID gate monitoring system. The proponents will use RFID scanner and RFID cards to scan and register the pupil's records or info of their RFIDs. The system is composed of; first a registration form for the registration of the RFID cards of the students and the professors. Last, for attendance report generation window for the list of the people who would enter and exit the gate of the university.

Objectives of the Project

The objectives of this project are the following:

- Eliminate the chance of using another ID in case a pupil forgets his own
- Immediately, send a message to the parents/guardians that their child/children had already arrived at the school
- To be one of the school/university that uses RFID system

Significance of the Study

Students

In rare cases, professors may overlook the attendance of a particular pupil, resulting in absences that the pupil cannot prove otherwise. With a computer-handled attendance system, the problem with evidence would be eliminated.

Parents or Guardians

The added security of knowing whenever the student is inside the campus provides relief for the parents/ guardians. It will also establish an image or idea that the institution as a safe place to enroll in the area as a bonus.

Professors

Attendance checking will be easier for the teachers as the system will generate a report based on how many students attended the class on the event.

Scope and Limitations of the Project

This project covers the Basic Education of Baliuag University and will only focus on the students and personnel who study and are employed at the Basic Education of Baliuag University.

The project will only focus on Basic Education of Baliuag University; hence other department of the university will not be part of this project. Importantly, a room to room attendance system is also not covered by the project.

Data Flow Diagram

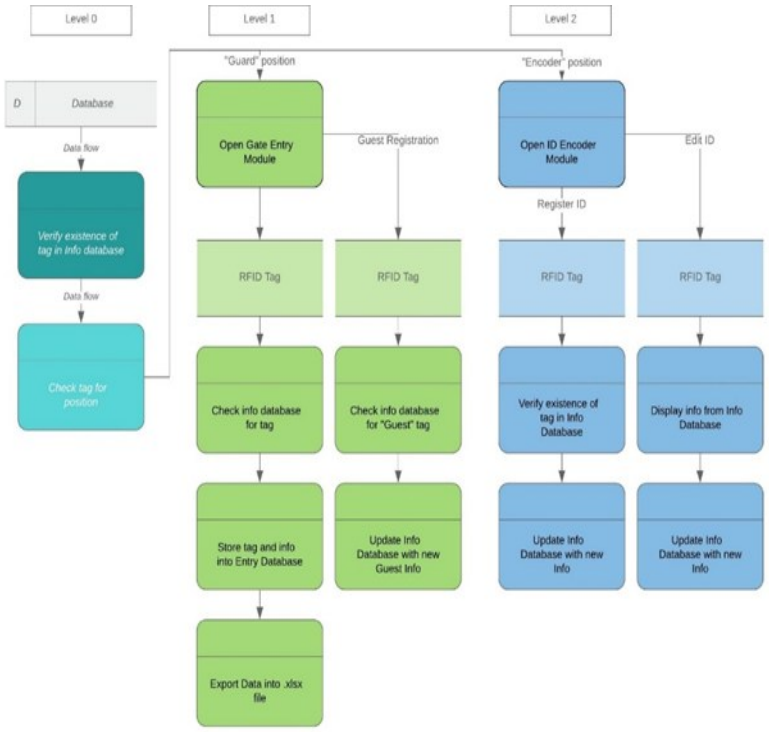

Figure 1. Data Flow Diagram

Methodology

This chapter presents the information gathered by the researchers for the project. The analyses, system designs, work, and implementation plan, and the location where the study is conducted is also included.

Requirement Analysis

Baliuag University needs to better safeguard its community from various threats. Also, with the world craving transparency and privacy from companies, governments, and

other organizations, educational institutions are no different. Certain concerned parties, for example, parents, that are part of the institution have the right to know what goes on within the school.

The proponents, with their thoroughly gathered information, have concluded that Baliuag University requires an ID System that provides security for its community, an innovation of event attendance, and notifies parents of their children when going inside the campus and out of campus. Privacy is not ignored as the System has an authorization security feature where certain people cannot access all modules, despite being a single package, to prevent the system from being disrupted by unauthorized personnel.

User Need Analysis

A student's attendance is always unclear to parents. They never know when their children truly go to school or no. Also, students concerned with security have no idea if anyone can simply go inside the campus unauthorized. The Office of Student Affairs also has a problem whenever students enter the school without their IDs. Simply listing down offenders is a slow process that, at times, can clog the entrances to the campus, slowing down lines, in the case of a rush hour.

Guards are sometimes overwhelmed by the number of students entering the school that they have trouble verifying every single soul that comes through the gate. Meanwhile, not everyone in the Bookstore has proper knowledge about the manipulation of databases.

The project proponents are given the task of making a system designed to remedy the problems described above with a proper UI and user-friendliness to make system operation easier on non-IT users.

Locale

The researchers carried out their study in Baliuag University, an educational institution covering pre-school up to college located in Gil Carlos Street, Baliuag, Bulacan.

Population

Baliuag University's Basic Education has a total of 674 pupils enrolled at the time of writing this study, with at least 10 teaching and non-teaching. The institution's, Elementary and Kindergarten has a minimum of 20 and a maximum of 30 students per section. Thereare at least 2 guards per campus gate.

Source of Data

The proponents have performed plenty of information gathering to get more data about Baliuag University. The proponents obtain information and data that made the project more progressive through the use of the following:

Gathering Information – The proponents asked the information of the pupil so that the proponents can input their data in the project. The information that the proponents got to the pupils is Student Number, Name, Parents Name and Parents Contact Number.

Taking ID Pictures – The proponents ask the students if it is okay if they take the photo of their school ID's so that the proponents can display their id pictures on the screen.

Survey Forms – The proponents demonstrated how their system works and asked for the evaluation of the users involved in the project.

Environment

These are the information that the proponents gathered from Baliuag University that helped the proponents in analyzing and studying its entry system and SMS notification. This section tells about the population of Baliuag University.

Requirement Specification

This segment of the documentation is about the required specification of computers that should be used when using the system, which is properly working and efficient. The researchers used the Visual Basic language, xampp, phpMyAdmin and SMS gateway for the proposed project.

Results and Discussion

This chapter consists of data acquired from the proponents' analysis and explanation of the results based on given survey or evaluation forms. It also answers the problems stated in the beginning chapter of this study.

The system was evaluated by 91students, 4 non-teaching staff, 2 professors, 2 guards, and 1 representative of OSA all from Baliuag University. The respondents answered each item in the evaluation form which composed of 14 questions. The results of the evaluation are as follows:

I. Functionality

Table 1. The system accurately uploads information to the database.

	Frequency	Percentage
Excellent	71	71%
Very Good	20	20%
Good	7	7%

Table 1. Continuation

	Frequency	Percentage
Needs Improvement	2	2%
Poor	0	0%
Total	100	100%

On the first question, 71% rated excellent for the accuracy of the information to the database. Second, 20% rated it very good while 7% rated well and 2% thinks that the accuracy needs some improvements while no one rated the accuracy as poor.

Table 2. The system updates database accurately.

	Frequency	Percentage
Excellent	49	49%
Very Good	41	41%
Good	7	7%
Needs Improvement	3	3%
Poor	0	0%
Total	100	100%

The results on the second question, showed that most of the respondents with 49% sees that updating database with excellent performance. 41% rated the updates on database very good and 7% rated it good while 3% thinks that updating database needs an Improvement and no one thinks that updating database has a poor performance

Table 3. The system texts the contact person/s with accurate information.

	Frequency	Percentage
Excellent	69	69%
Very Good	17	17%

Table 3. Continuation

	Frequency	Percentage
Good	12	12%
Needs Improvement	2	2%
Poor	0	0%
Total	100	100%

In the third question, 69% answered the question with excellent. Next 17% rated the accuracy of text messaging very good and 12 % rated it good while 2% thinks that it needs some improvements.

Table 4. The system displays correct information.

	Frequency	Percentage
Excellent	60	60%
Very Good	31	31%
Good	7	7%
Needs Improvement	2	2%
Poor	0	0%
Total	100	100%

In fourth question, Most of the respondents tells that the system displays correct information excellently with 60% while 31% rated it Very Good and 7% rated the display Good while 2% thinks that it needed some improvements while no one rated it poor.

Table 5. The system exports list to a spreadsheet file accurately.

	Frequency	Percentage
Excellent	56	56%
Very Good	34	34%
Good	6	6%
Needs Improvement	4	4%

Table 5. Continuation

	Frequency	Percentage
Poor	0	0%
Total	100	100%

Table five shows that more than half of the respondents rated excellent for the system exporting to a spreadsheets with 56% somehow 34% tells that the accuracy was very good while 6% tells that the accuracy of list was good and 4% thinks that it needs some improvements.

II. User Interface (UI)

Table 6. The UI is easy to navigate.

	Frequency	Percentage
Excellent	65	65%
Very Good	22	22%
Good	12	12%
Needs Improvement	1	1%
Poor	0	0%
Total	100	100%

In table six, 65% of the respondents tells that the user interface was easy to navigate while 22% rated it very good and 12% tells that the UI navigation is good while 1% thinks that the user interface navigation should improve and no one is having hard time on navigating the UI.

Table 7. The UI is easy to use.

	Frequency	Percentage
Excellent	61	61%
Very Good	25	25%
Good	12	12%
Needs Improvement	1	1%

Table 7. Continuation

	Frequency	Percentage
Poor	0	0%
Total	100	100%

In question seven, over half of the respondents tells the proponents that their UI was easy to use with the percentage of 61%. Second 25% of the respondents that the UI is very good to use while 12% answered good and 2% thinks that the UI needs an improvement while no one is having hard time using the user interface.

Table 8. The UI is user-friendly.

	Frequency	Percentage
Excellent	62	62%
Very Good	24	24%
Good	13	13%
Needs Improvement	1	1%
Poor	0	0%
Total	100	100%

In table eight, most of the respondents tell that the UI is user friendly with a total percentage of 62% and 24% rated it with very good while 13% rated it good and 1% thinks the UI needs to be more user-friendly and no one thinks that the UI is not user-friendly.

Table 9. The UI is simple.

	Frequency	Percentage
Excellent	63	63%
Very Good	25	25%
Good	10	10%
Needs Improvement	2	2%

Table 9. Continuation

	Frequency	Percentage
Poor	0	0%
Total	100	100%

In question nine, 63% of the correspondents thinks that the user interface of the system was simple and 25% rated it very good while 10% rated the simplicity of the system good while 2% of the respondents think that the UI was not that simple.

III. Security

Table 10. The system has security features.

	Frequency	Percentage
Excellent	67	67%
Very Good	22	22%
Good	9	9%
Needs Improvement	2	2%
Poor	0	0%
Total	100	100%

In table ten, 67% of the respondents sees that the system has a security features while 22% thinks that the system has very good security features and 9% sees the system has a good security features while 2% thinks that the security of the system needs to be improve.

Table 11. The system has an in-depth level of accessibility.

	Frequency	Percentage
Excellent	59	59%
Very Good	30	30%
Good	9	9%

Table 11. Continuation

	Frequency	Percentage
Needs Improvement	2	2%
Poor	0	0%
Total	100	100%

In question eleven, 59% of the respondents thinks that the system have an in-depth level of accessibility while 30% rated it with very good accessibility and 9% rated it good while 2% thinks that the system accessibility needs and improvement.

Table 12. The database can only be accessed by authorized personnel.

	Frequency	Percentage
Excellent	68	68%
Very Good	17	17%
Good	13	13%
Needs Improvement	2	2%
Poor	0	0%
Total	100	100%

In the last question, 68% thinks that the system's database can be accessed by the authorized personnel only. Second 17% thinks that the database restriction was very good while 13% rated it with good and on the other hand 2% thinks that the restriction of the database should improve for more security while no one thinks that the database can be easily access by anyone.

Recommendations

The researchers would like to recommend the system, RFID Gate Monitoring for Basic Education of Baliuag University with SMS Notification, for use in Baliuag University. The evaluations that the researchers conducted

clearly proved that the proposed system could improve Baliuag University's security and automates some processes of the institution. The system could also improve the communication between parents and the University.

For future improvements, the researchers would like to recommend using a turnstile with the system, as it could prevent entry to those without ID. It is also recommended to find an alternative way to send SMS messages to parents without incurring additional costs for the parents or the school. Furthermore, the proponents recommend improving the system to be an all-in-one ID system to be used for all transactions within the school. Example; integrated library borrow and return, event management, etc.

The results of the study and some elements within the Related Literature and Studies can be used as reference for future researchers looking to improve the system further, or to help them in making a similar project.

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