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# Student's Attendance System Using QR Code

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**Abstract** The purpose of this project is to develop a system that can record the presence of students using QR code. Previously, teachers needed to use paper to record student attendance. There are many problems that arise when teachers use paper as a record of student attendance such as a loss of attendance record and have been taken a long time. The objective of the study is to design a prototype interface of student attendance system using QR code and casing of QR code scanner, to build up the design the prototype interface of student attendance system using QR code and casing of QR code scanner and test the functionality the prototype of interface student attendance system using QR code and casing of QR code scanner. The interface for this system will be integrated with the LabVIEW Software to develop a database. This system can record the attendance of the student to school and a warning letter will be automatically generated when the student does not come to school in 2 days repeatedly. The development process of the Student Attendance System Using QR Code is based on the Prototype Development Model that consists of a five-phase model, that is planning, analysis, design, Prototype development, and testing. The design of casing for QR code scanner was developed using Sketchup software. LabVIEW Software is used to generate interface displays and built-in databases using Microsoft Excel. Overall, the system that has been developed can work well and achieves the objectives set.

**Keywords:** Attendance System, QR Code, Labview

## 1. Introduction

In embarking on a tide of modernity, the use of information and communication technology (ICT) is very widely spread in human daily life. The use of ICT can improve performance and make it as one of the alternatives tools to achieve the person's objective. Developments in the field of technology have changed the way of life and human culture (Naismith et al., 2004). According to Maryono (2007), the presence of information and communications technology, especially computers and the internet have been used by developed countries such as the United States and Japan.

A blend of education and technology is the key to leading a new era in a country, especially we are now in this era of information technology (Alsagoff,2002). Education is the heart of the nation. Through education, students or pupils are taught and educated not only to be a productive workforce, but to be a person's that obey the national legislative and faithful to obey their country (Radzali, Ghani and Kenayathulla, 2018). Nowadays, many researchers in the field of academic and industry have begun to explore the potential of mobile technologies and equipment to support life (Liu et al, 2003).

Student's attendance system using QR code is a system that is very important in managing information about student's attendance to school and ensures no student truancy (Chen, 2009). Attendance system that is used at the present time is manually where for the attendance system, the class teacher will record the attendance of its students into the attendance record book (MD. Athan, 2009). Student's attendance system used nowadays is still carried out manually where at each school day, the class teacher would call and note the attendance of the student to the student's attendance record book. This process directly wasted the valuable students time learning, this also will give burden to teachers and potential to carelessness where the teachers would wrongly calculate the number of days students came to school (Mohd Athan, 2009).

In addition, the symptoms of truancy are increasing (Disciplinary Unit, Ministry of education Malaysia (2009). Truancy is often associated with parental factors, teacher's teaching, less interaction between teacher and pupil, the classroom is not conducive, negative influence and environment as well as the number of students in a classroom (Siong and Said,2007). Next is, if the class teacher could not be presenting themselves to the school, there will be problems in taking the student's attendance because the student's attendance record book will typically take home along with the class teacher (Williams et al, 2000).

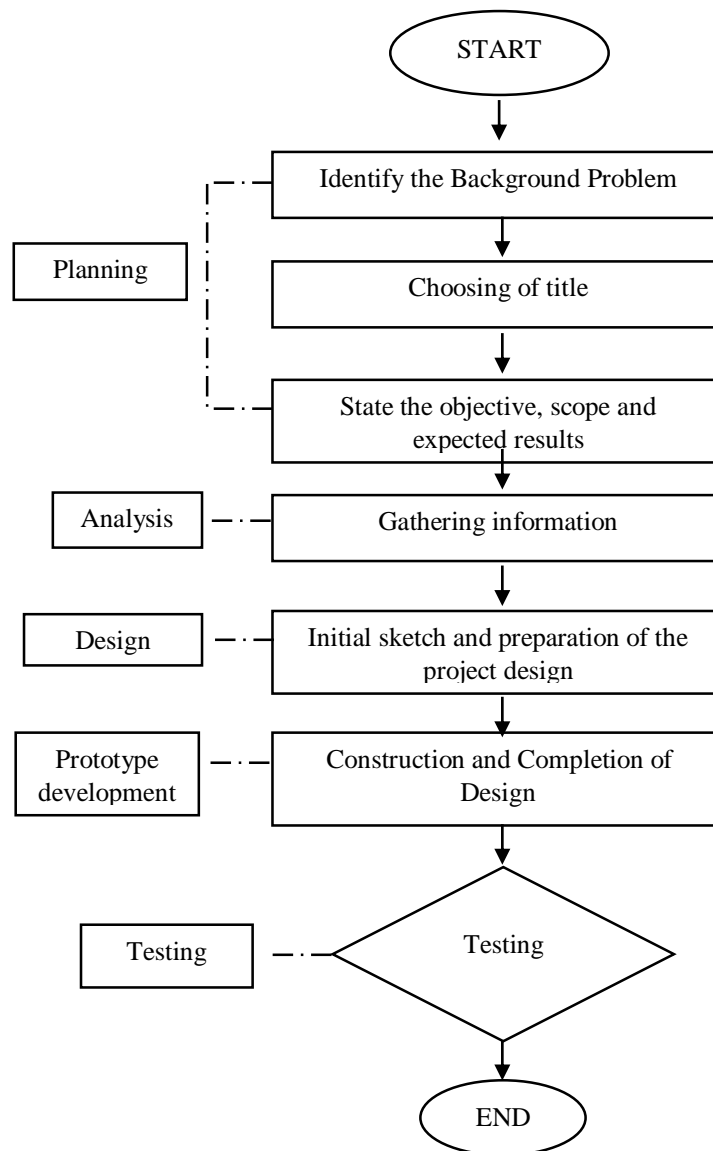
As a result, the manual system has caused many problems and it is very alarming to all parties, so that Student's Attendance System Using QR codes (Quick Response) should be developed to ensure that all the problems can be overcome and it will not be repeated in the future.

## **2. Methodology**

This product development used the adaptation from the prototype model. This prototype model has five phases, it is namely planning, analysis, design, prototype development and testing. This model is suitable for the development of this product prototype because it can give the real picture about the product and the operational of the product.

### **2.1 Hardware, software and application developments**

Figure 1 shows the flow chart that shows the development process using the prototype development model. Hardware that is used in this system is QR Code Scanner. Its function is to detect and scan the student's QR Code.



**Figure 1: Development process flowchart**

### 3. Results and Discussion

After running all the analysis, Researchers found there are still various problems with the prototype that was developed. The purpose of this analysis was carried out to ensure that the design of the prototype developed is able to achieve the objectives that have been set out by the researchers.

The overall objective of the prototype has been reached. However, there are still a lot of lack of identifiable after doing engineering analysis. Weakness and lack of improvement are for future researchers.

#### 3.1 Results

- Analysis of hardware

Figure 2 shows the QR code scanner that are used in this project and Figure 3 shows the specification of QR code scanner. In this project, the QR code scanner functions as a controller that controls the whole system. In addition, this QR code scanner was programmed to receive information from the QR code scanned and the information will display the interface attendance system on LabVIEW. The model for QR Code scanner is RD4600.



**Figure 2: QR code scanner RD4600**

<b>Processor</b>	IOTC 0370 CHIP
<b>Interface</b>	RS-232 (9.6~115.2Kbps) USB 1.1 (HID-KBW, HID-POS)
<b>Image Sensor</b>	752×480 CMOS
<b>Symbologies</b>	2D: PDF417, Data Matrix, QR Code 1D: EAN-13, EAN-8, UPC-A, UPC-E, ISSN, ISBN, Codabar, Code 128, Code 93, ITF-6, ITF-14, Interleaved 2 of 5, Industrial 2 of 5, Standard 2 of 5, Matrix 2 of 5, GS1 Databar (RSS-Expand, RSS-Limited, RSS-14), Code 39, Code 11, MSI-Plessey, Plessey
<b>Scan Mode</b>	Sense mode
<b>Resolution</b>	10 mil
<b>Light Source</b>	White LED
<b>Scan Window</b>	38.3mm*60.4mm
<b>PCS</b>	≥30%
<b>FOV</b>	Diagonal: 85°, Horizontal: 63.7°, Vertical: 70°
<b>Ambient Light</b>	0 ~ 100,000 LUX
<b>Power Consumption</b>	1.75W (max.)
<b>Power Adapter</b>	Output: DC5V, 0.5A, Input: AC100~240V, 50~60Hz
<b>Notification</b>	Beep
<b>Dimensions</b>	78.6mm(L) X 66.88mm (W) X 61.65 mm(H)
<b>Weight</b>	300g
<b>Operating Temperature</b>	-10℃ to + 50℃
<b>Storage Temperature</b>	-20℃ to + 60℃
<b>Humidity</b>	5% - 95% (non-condensing)
<b>Certification</b>	FCC Part15 Class B, CE EMC Class B

**Figure 3: Specification of QR code scanner RD4600**

- Analysis of power supply

There are three pieces of software that was used in the development of the student's attendance system using QR code. All this software is needed to ensure the system is running smoothly and information received and can be processed, stored with more structured and systematic (Table 1).

**Table 1: Software used**

No	Software	Use
1	Labview	As an Interface of The Student's Attendance System Using QR Code.
2	Microsoft Excel	As A Database to Record All of The Information About the Student's Attendance.
3	Notepad	As A Database to Record the Information of Student During Registration

- Analysis the functionality of the product

Analysis for testing the functionality of a product that has been developed is being made by the researchers themselves before testing is made in a real situation against users. The analysis is divided into two, firstly is the functionality of QR code scanner and the functionality of the student's attendance system interface. Table 2 shows the testing functionality result.

No	Testing the Functionality	Results
1	Qr Code Scanner	Works Well and Can Scan the Qr Code
2	Interface of Student's Attendance System	Works Well and Can Display All the Information That Scan by Qr Code Scanner
3	Register Mode	Works Well
4	Attendance Mode	Works Well
5	Attendance Recorded Using Microsoft Excel	Data of The Student That Has Been Scan Is Successfully Recorded in Microsoft Excel.
6	Warning Letter Generate	Warning Letter Can Generate Automatically When Students Don't Come to School Twice.

**Table 2: Testing functionality result**

- Analysis the functionality of the product towards user

Testing is one of the compulsory process carried out in the development of a product or system. This process is very important because the purpose of this testing is to test the functionality of products as well as reducing as many as possible errors if any on a product that has been developed. In the development of this project, researchers conducted a testing of the functionality of the product at Sekolah Kebangsaan Seri Hartamas, Kuala Lumpur. This testing has been done on the three classes that have been selected. Table 3 below shows the classes that have been chosen.

**Table 3: Choose class**

No	Class	No of Students
1	4 Sabar	34 Persons
2	3 Amanah	38 Persons
3	5 Sabar	40 Persons

Figure 4 above is the attendance data that have been recorded during the testing. The data is for one of the three classes, it is for class 4 Sabar. All of the class's teachers were satisfied with the attendance system developed by researchers. Teachers also have said that the products developed can function properly and meet the objectives set by the researcher.

DATE	TIME	NAME
Friday, 9 November, 2018	10:18 AM	AARON JADEN GEORGE
Friday, 9 November, 2018	10:18 AM	ADREAN MIKHAIL PIN BIN SHARIZAL
Friday, 9 November, 2018	10:19 AM	AHMAD FARISH BIN FAIZUL
Friday, 9 November, 2018	10:21 AM	AKSHATA ALAGAPPAN
Friday, 9 November, 2018	10:21 AM	AMARNATH RATNALINGAM
Friday, 9 November, 2018	10:21 AM	AMIR AMSYAR BIN DEDI SYARIPUDDIN
Friday, 9 November, 2018	10:21 AM	AMIRUL FAYYADH BIN AZRUL
Friday, 9 November, 2018	10:21 AM	AMMAR BIN KHAIRUL FAIZ
Friday, 9 November, 2018	10:23 AM	CLARISSE LIM HONG YI
Friday, 9 November, 2018	10:23 AM	EISHA DANIA BINTI EZAMUDDIN
Friday, 9 November, 2018	10:23 AM	EMMA LYN ZAIN
Friday, 9 November, 2018	10:24 AM	ERINA ARTIN VAQARI
Friday, 9 November, 2018	10:24 AM	HARLEEN KAUR A/P TEJA SINGH
Friday, 9 November, 2018	10:24 AM	IMRAN ZIKRI MIKAIL BIN MOHAMMAD FAISAL
Friday, 9 November, 2018	10:24 AM	IZAZ ZAFRI BIN IDLAN ZARIZI
Friday, 9 November, 2018	10:24 AM	JONAN BIN AZHAR
Friday, 9 November, 2018	10:24 AM	KASHIKA KRISAN
Friday, 9 November, 2018	10:25 AM	KASHWINI ESWARAN DINESH
Friday, 9 November, 2018	10:25 AM	KAYSHAV KUMARESON
Friday, 9 November, 2018	10:25 AM	KAYZAFRUL BIN KAMARUL ZAMAN
Friday, 9 November, 2018	10:25 AM	MOHAMMAD IRFA HAKIM BIN MOHAMAD FAIZAL
Friday, 9 November, 2018	10:25 AM	MUHAMMAD ARAFAT BIN MOHAMMAD AMAN
Friday, 9 November, 2018	10:25 AM	MUHAMMAD REDZA BIN MUHAMMAD RAVIN
Friday, 9 November, 2018	10:26 AM	NUR SYAFIQAH BATRISYIA BINTI MOHAMAD SAIFUL BAHARI
Friday, 9 November, 2018	10:26 AM	PHAEVIAN DAVID
Friday, 9 November, 2018	10:26 AM	RAISSA BINTI MOHD RASHDAN
Friday, 9 November, 2018	10:26 AM	RAKESH A/L SATHABALAN
Friday, 9 November, 2018	10:26 AM	SHAMAN ROY SINGH A/L AMERJIT SINGH
Friday, 9 November, 2018	10:26 AM	SOFEA LUQMAN
Friday, 9 November, 2018	10:27 AM	TEH HAN CHIHNG
Friday, 9 November, 2018	10:27 AM	THAQIF WAFIQ BIN SAIFUL
Friday, 9 November, 2018	10:27 AM	TISHAN ANDRAY SELVAKUMAR
Friday, 9 November, 2018	10:27 AM	UMMAR AISY BIN ROSHASLAN
Friday, 9 November, 2018	10:27 AM	ZION LIM XIU MING

Figure 4: Data recorded on testing day

### 3.2 Discussions

In developing the student's attendance system using QR code, various studies and references have been carried out by researchers to obtain a product that meets the desired characteristics. The use of this system will facilitate the teachers in the process of recording student's attendance. The project development process has gone through several steps according to the Prototype Development Model. Once all components and materials have been obtained, the researcher has carried out the project's development work carefully.

To answer the objectives of this study, the analysis was done and it shows the objectives set for this review was successfully achieved by researchers to understand the theory of design, design criteria, the basic design and method selection Design materials. According to Jalil (2001), design methods and processes are systematic and accurate will make the product successful. Before the process of design, researchers have collected information and identify deficiencies in Student's Attendance System Using QR code.

Therefore, a student's attendance system using QR codes will help teachers in schools to record the attendance of students. Student's attendance system using QR codes and QR code scanner case was developed by taking and considering the safety and ergonomic use. This system is only used to take attendance students only. Therefore, researchers have added another function so that the system has an interest in other aspects . Teachers can print a warning letter and give it to the students that haven't attended school two times or three times in a week.

This function is built to make the work of teachers easier. As a result of this system design, researchers hoped that this system can give an initiative to parties involved in recording the presence of students and be able to manage this attendance with more systematic. Attendance is important for shaping the discipline of a student. If the school takes it easy to the matter of attendance, the probability for students truancy is high. It is because students will assume the schools will not take decisive action against those who often do not attend school.

#### 4. Conclusion

In conclusion, from the observation, there are many constraints faced by the current attendance system in terms of implementation efficiency, information management, time and so forth. It should therefore be a tool and developed a new system to record the attendance to enhance the application of technology utilization ahead of the new millennium in line with the will of the state in promoting the world without boundaries. Overall, the main objective of the researcher to develop the product of the student's attendance system using QR code has been achieved.

The researchers are confident and believe that the student's attendance system using QR code will help teachers in the process of recording student's attendance to school. However, some things can still be improved, especially from aspects of the QR code scanner housing design where size and shape can still be changed. Some of the strong suggestions and improvements obtained from the questionnaire and expert confirmation need to be considered in fulfill the needs of the users and facilitating future research.

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