

Makalah Penelitian

## Sistem Informasi Absensi Mahasiswa Berbasis QR Code dan Firebase

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### ABSTRACT

In today's digital era, student attendance systems have become a crucial aspect of education management. This research aims to design and build a QR Code and Firebase-based student attendance information system at UNITAR Penang, Malaysia. This system is expected to improve efficiency and accuracy in the attendance process. The method used in this research is the Agile software development method, which allows for iterative and incremental development.

**Keywords:** QR Code, Firebase, Student Attendance, Information System, UNITAR Penang, Malaysia.

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### INTRODUCTION

Attendance is a crucial component in education, serving to record student attendance. With technological advancements, conventional paper-based attendance systems are becoming obsolete. Students at UNITAR Penang, Malaysia, require a more efficient and timely system. Therefore, this study designed a QR Code-based and Firebase-based attendance system that is easily accessible to students and lecturers.

### METHODS

The research method used in the Agile software development method, which consist of several stages:

1. Planning  
Identifying user needs and formulating system objectives.
2. Design  
Designing the system architecture, including the user intergace and database.
3. Development  
Implementing the system using appropriate programming languages and technologies (*e.g., Javascript, Firebase*).
4. Testing  
Testing the system to ensure that functions work properly.
5. Implementation  
Deploying the system in a *real-world* environment at UNITAR Penang, Malaysia.

### Results and Discussion

The development system has several key features:

- QR Code Generation: Lecturers can create a QR Code for each meeting, which students can then scan upon attendance.
- Data Storage in Firebase: Attendance data is storage in *real-time* in Firebase, making it accessible at any time.



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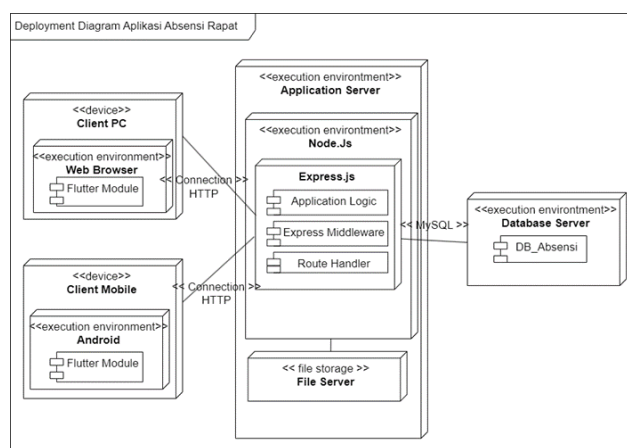
-Attendance Notifocation: Students receive an attendance notification after scanning.

**System Advantages**

Time efficiency the attendance process is faster than manual methods. Data accuracy reduces recording errors that often occur with manual methods. Accessibility attendance data can be accessed in real time by lecturers and administration.

**System Disadvantages**

Technology dependence using this system requires a device and an adequate internet connection. Security issues potential for misuse if the QR Code is not properly protected. User limitations student who are not familiar with technology may have difficulty using the system.



**Figure 1. Process Attendance QR Code-Firebase Set Method**

Attendance system with QR Code Firebase Javascript Programming and Schnorr.

**Table 1. Student data of Attendance UNITAR Penang, Malaysia**

No	Name	Class	No	Lecturer	No
1	Aizat	2	12	Lenni	3
2	Noor Hafizah	4	13	Hong Keng Cheong	2
3	Siti Nazwah	5	14	Chee kong liam	2
4	Khairul Amin	3	15	Abdullah	4
5	Tiam Leong	4	16	Shah	2
6	Carlina	4	17	Lenni	1
7	Galang	3	18	Wan Amir	3
8	Yogen	2	19	Andullah	2
9	Damar	3	20	Wan Amir	2
10	Dayyah Syafiah	2	21	Shah	1
11	Naandini	2	22	Hong Keng Cheong	1
	Sum	34		Sum	23

Source: data UNITAR Penang, Malaysia 2023/2025



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The data collection technique using questionnaires and instruments to measure laboratory management carried out is a questionnaire of 25 questions and is given a score of 1-4. Decision system that will be processed on the system is as follows:

**Table 1. Attendance Firebase**

No	Inariabel	Indikator	No.Pertanyaan	Anumber of Questions
1	Planning	Attendance Program Planning	1,2,3	2
		Planning Practice Activities	4,5	4
	Students	Attendance security for students	6,7,8	3
		Secure attendance	9,10	4
2	Issues	Less issues for students n Lecturers	11,12	3
			0	0
		0	0	
		0	0	
		0	0	
3	Supervision and Evaluation	Supervision of the Principal	13,16	3
		Evaluation of attendance work programs	17,18,19	5
	Sum			24

**Table 2. Criteria for Attendance Management Questionnaire Value**

No	Percentage Interval	Criterion
1	85-100	Excellent
2	75-84	Good
3	65-74	Enough
4	0-64	Less

**Table 3. Average Value of Science Attendance Management**

Aspects of Attendance Management		Grade
Planning	82.81	Good
Organizing	83,91	Good
Implementation	82.89	Good
Supervision/Evaluation	82,66	Good
Average	83,07	Good



## Explanation of Results

The use of QR Code make it easier for students to record attendance without having to manually fill out attendance list:

### School of Foundation and General Studies

FOUNDATION IN COMMERCE		
NO	NAME	MATRIC NO
1	FLORANCE SIA JIA CHIENG	MC1309FC4163
2	LEEM YU XIANG	MC1303FC3038
3	MUHAMMAD FARIS BIN HISHAM	MC1309FC4261
4	NEW QI YING	MC1306FC3685
5	NUR IZZATUL IZZAH BINTI IBRAHIM	MC1309FC4220
6	SHARIFA SHARMINI ALI BINTI MUKHTAR ALI	MC1306FC3192
7	TAN JO LING	MC1302FC2150
8	NUR FATHIN AMIERA BINTI ABDUL AZIZ	MC1309FC4563

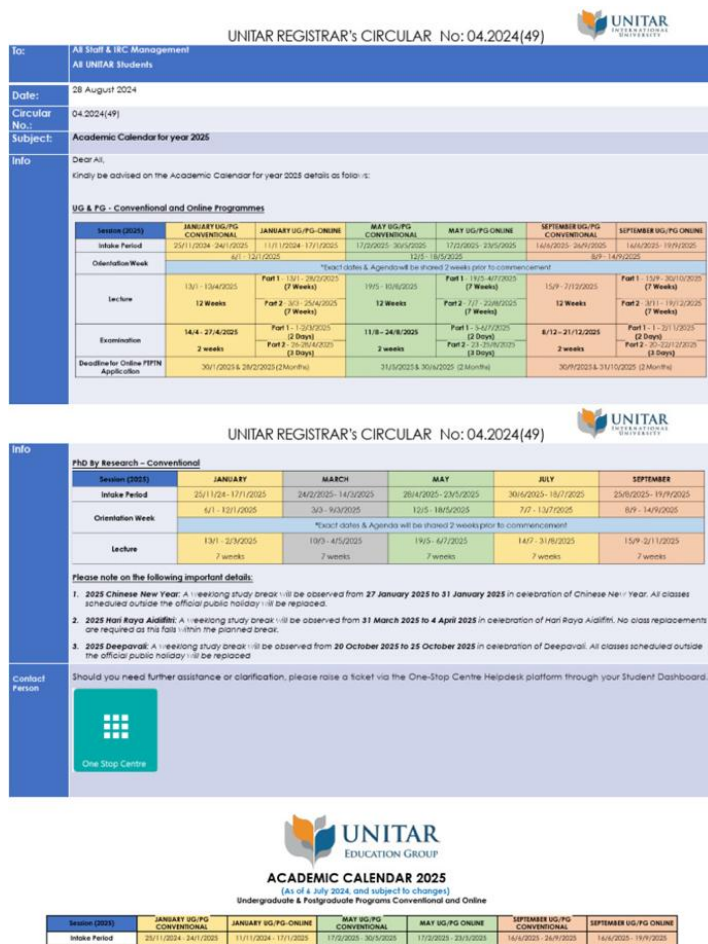
FOUNDATION PROGRAMME IN MANAGEMENT		
NO	NAME	MATRIC NO
1	ABIGAIL ASRINA BT AMIRUDDIN	MC1309FC4153
2	AISHWINI A/P THRUMAKUNASAGRAN	MC1309FC4202
3	ALFFI FAUZI BIN MUSTAPA KAMAL BASHAH	MC1306FC3607
4	ANTHONY A/L MICHAEL	MC1306FC3336
5	EVA AIZAD BINTI LOKMAN	MC1306FC3270
6	IMRATUL NAJWA BINTI ABDUL LATIF	MC1306FC3565
7	IZMEER BIN AZMI	MC1303FC2981
8	JAZZLAN HUGHES MAULA JUHARIS	MC1309FC4412
9	JESICAH A/P PHILIP GEORGE	MC1306FC3131
10	KANESHAN RAYAN A/P SUPRAYAN	MC1302FC2493
11	KETHESVARY A/P SINNATHAMBY	MC1309FC4454
12	KEYNA MAIL	MC1309FC4133
13	KOHSALYAA A/P ARJUNAN	MC1306FC3148
14	KUMAR A/L THEMUDU	MC1306FC3152
15	LOGESWARY A/P MOGHAN	MC1306FC3145
16	NAAVIEN A/L S VIJAYA KUMAR	MC1306FC3555
17	NAGENTHRA RAO A/L SIMMADIRI	MC1306FC3140
18	NANTHINI A/P ALAGAN	MC1306FC3694
19	NOR ATIQA BINTI ABU BAKAR	MC1309FC4132
20	NURAIN ATILIA SAHIRA BINTI MOHAMAD AMIR	MC1309FC4142
21	NURUL IZZATI BINTI YUNUS DORA	MC1306FC3473
22	SHARIFAH ASHREENA NABEELA BINTI SHAHRUDIN	MC1306FC3753
23	SITI NURBAZILAH BINTI ABU HASSAN	MC1309FC4159
24	SUNTHARI A/P KUMARAVELU	MC1306FC3184
25	SURIA DEVI A/P SIMANJALAM	MC1302FC2128
26	VICKNESWARY A/P KRISHNAN SAMMY	MC1302FC2760

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BACHELOR OF MANAGEMENT		
NO	NAME	MATRIC NO



**Figure 2. The system improves data accuracy and reduces the risk of attendance fraud**



From the results of General Rules with the average use of Rosetta in this study are as follows:

The resulting rule is as follows:

1. If High Management and Planning = Good
2. If High Management and Organization = Good
3. If Management and Execution is High = Good
4. If High Management and Supervision = Good
5. If Management and Evaluation High = Good

## CONCLUSION

The QR Code and Firebase-based student attendance information system at UNITAR Penang, Malaysia, shows great potential in improving the efficiency and accuracy of the attendance process. Despite some shortcomings, the system's advantages make it a viable solution for implementation in educational settings. Further research is needed to improve the system's security and accessibility.



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