

# Android Application for Event Management and Information Propagation

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**Abstract**—this project intend to solve the problems of propagating news and information, and also alleviate the problem of traditional event managing procedures such as lots of paper work, or long queue at the registration desk. The objective of this project is to develop an android application which provides interesting news and events. Moreover, users will be able to manage their event participation, such as reserving their seats in events, registering at the event site, and so on. More importantly, this application uses QR code to provide an easy way to verify participants' identity in an event.

**Keywords** – android application; event management; QR code;

## I. INTRODUCTION

Smartphone is a common computational device that possessed by the most of people nowadays, which is the inspiration to create an application that its information can be easily reached anywhere, any time. In addition, it would be difficult to manage all event registration manually, because it will take a long time for a long queue of customers to sign their name at the registrations table, also a lot of document to handle. Furthermore, people nowadays prefer convenience for their life. In other words, it is harder for users to open the website than click on an application in their smartphones.

This application focuses on solving problems of event registration and management by using QR code, and also providing news, information of events, and project ideas which are the given senior project topics for university students. First of all, users will be able to reserve and manage their event participation via this application, also receive the QR code to participate in each event after reservation. Additionally, this application provides significant information and news of many interesting events from the event provider. Moreover, the topics for senior projects will be provided as one of this application features. Students who are interested in any topic will be able to get the brief information and project provider's contact information from this application.

In conclusion, this application will help the event providers by using QR code in verification. Moreover, it will provide significant information of each event and project topics to users to be able to reach from anywhere, any time. These are the

main features of this application which will improve the event management and registration for event providers and event participants.

## II. RELATED TECHNOLOGY

### A. Android Operating System [1]

Android is an operating system based on the Linux kernel, and originally designed for smartphones and tablet computers. Android applications can be implemented in Java programming language using the Android Software Development Kit (SDK). The Android SDK provides API libraries and set of developer tools which are necessary to build, test, and debug an android application.

### B. JSON (JavaScript Object Notation) [2]

JSON, a subset of the JavaScript programming language, is a data-exchange format. It is easy for humans to read and write, also easy to be parsed and generated by machines. JSON is an independent text format that is familiar to C, Java, JavaScript, Python, and other programming languages. These properties make JSON an excellent data-exchange language.

### C. PHP (Hypertext Preprocessor) [3]

PHP is a popular open source scripting language which is suitable for web development. Moreover, PHP is different from JavaScript because the code is executed on the server and the output is sent to the client-side which makes the important code unknown. In addition, instead of complicated HTML, the PHP code has special processing commands which allow newcomers to use PHP easily, and also provide advanced features for professionals.

### D. CodeIgniter [4]

CodeIgniter is a framework which provides many remarkable features for programmers who implement their web sites using PHP. Not only CodeIgniter is a free, light, and fast framework, but also contains a specific set of libraries which are basically used such as accessing a database, sending emails, manipulating images, etc., also simple interfaces and logical structures. Moreover, it can generate clean URLs,

which easy to be searched by search-engines using segment-based approach.

#### E. MySQL Database [5]

MySQL is the most widely-used open source SQL database management system, is developed, distributed, and supported by Oracle Corporation. Database Management System such as MySQL server is needed in order to add, access, and maintain data stored in a database which is a structured collection of data.

#### F. QR Code (Quick Response Code) [6]

QR Code is a type of two-dimensional barcode that can be read via smartphones or QR Code readers, directly links to text, emails, websites, phone numbers and even more. As half of the nowadays population possessing smartphones, QR Codes will have a major impact upon society and especially in advertising, marketing and customer service with just one scan.

### III. SYSTEM ANALYSIS AND DESIGN

#### A. System Architecture

This application system consists of two main components which are front-end system and back-end system as shown in figure 1.

- **The Front-end System** is the information-displaying section which queries the data from the remote database and also able to send data to be stored in the database. Moreover, the staff side front-end system will send the participant information to the server to verify their identity.
- **The Back-end System** is the database management section which always interacts with the front-end system. Additionally, it will send the required data to the front-end system whenever the request is sent.

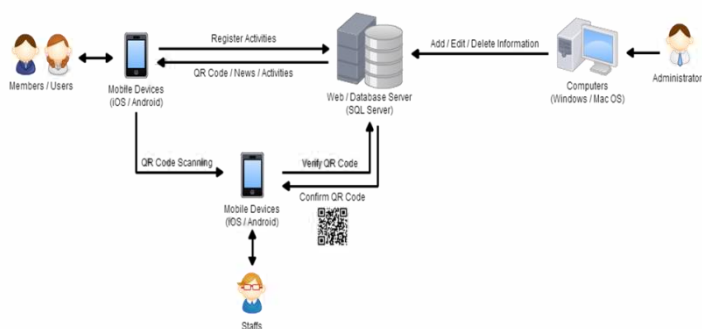


Figure 1: System Architecture

#### B. System Structure

This application consists of six main modules which are Authentication System, Member Management System, News Management System, Event Management System, Project Ideas Management System, and Administrator Management System.

- **Authentication System:** provides security to the whole system by allowing only authorized members to have the right to utilize the preserved features.
  - **Member Registration System:** a system which allows user to be able to register and become a member.
  - **Log-in System:** a system which allows member to be able to log into the application and access the preserved area.
- **Member Management System:** manages members in the back-end system and personal profile adjustment for front-end users.
- **News Management System:** manages information of event news in the back-end system and show it in the front-end.
- **Event Management System:** a system which manages information of an event.
  - **Show Event:** a system which shows event in the interface.
  - **Add Event:** a system which allows administrator to be able to add a new event into the database.
  - **Edit Event:** a system which allows administrator to edit event information in the database.
  - **Delete Event:** a system which allows administrator to be able to delete event information in the database.
  - **Event Registration System:** a system which allows member to be able to reserve their seats in the upcoming events.
    - **QR Code Generation:** a system which generates a unique QR code for each participant in each event.
    - **QR Code Verification:** a system which verifies participant from their QR code.
- **Project Ideas Management System:** manages information of Project Ideas which are the research topics that provided for university students in the back-end system and show it in the front-end.
- **Administrator Management System:** manages the right of administrators according to the priority.

#### C. Data Flow

The data flow of this system is explained in the figure 2. Unauthorized user can provide their information to register as a new member. Members can reserve event participation and receive a unique QR code. Administrators provide information to the system. Lastly, staff can scan QR code at the event site and get verification of participants.

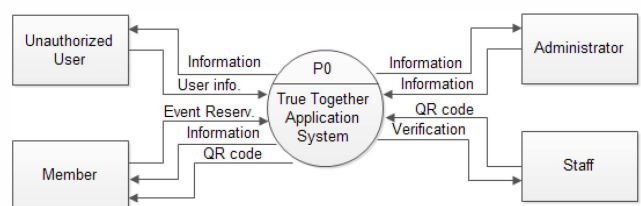


Figure 2: Data Flow Diagram

#### D. User Interface and Layout Design

The examples of the application's user interface are displayed in the figure 3.



Figure 3: Examples of User Interface and Layout

#### IV. IMPLEMENTATION

This application is an android application working simultaneously with database implemented by MySQL Server. This application has two main components which are front-end and back-end system.

- **The Front-end system** is the information-displaying section which queries the data from the remote database in JSON format then displays it in human language.
- **The Back-end system**, a web application implemented by PHP using CodeIgniter, is the database management section which allows administrators to be able to manage information in the database and application.

More importantly, this application uses **QR code** to verify the participant's identity and confirm participation with just one scan which will provide more convenience to everyone involved.

#### V. TESTING

This application is aimed to solve the problems of the slow traditional event-registration procedure, so we performed a test by simulating a scene of 10 participants register into an event using this application and another one which did not then compared the result between these two cases. The result is shown in the table below.

Table 1: Comparison of two cases

	Time (minutes)
<b>This application</b>	1.20
<b>Traditional procedure</b>	1.31
<b>**Note:</b> This test was performed by only one event staff, in the real situation it can be more than one.	

Benchmark is a usability testing method that we chose to test this application's performances to make sure that it is efficient, effective, user-friendly, responsive, and easy-to-understand. The testers of this testing are common people, who are able to use smartphone well. In this testing, we assigned specific tasks to the testers then measured the time that the testers took to accomplish the tasks. In addition, if the testers left a comment, we will add them into our to-be-developed lists to improve this application further. The results are shown in the tables below.

Table 2: Member Registration Task

<b>Task 1: Member registration</b>		
<b>Detail:</b> A task for users to fill in their information into the required fields and receive a new member account.		
<b>Expected time:</b> Less than 120 seconds		
Users	Time (seconds)	Comments
1	88	-
2	95	-
3	104	-
4	107	-
5	91	-
<b>Conclusion result:</b> All testers were able to accomplish the task within the expected time.		
<b>Result implementation:</b> -		

Table 3: Event Reservation Task

<b>Task 2: Event reservation</b>		
<b>Detail:</b> A task for users to choose interested event, see its detail, and click on "JOIN" button to reserve their seats and receive a QR code.		
<b>Expected time:</b> Less than 20 seconds		
Users	Time (seconds)	Comments
1	12	-
2	18	Searching is needed
3	19	Should be able to filter the events
4	16	-
5	14	-
<b>Conclusion result:</b> All testers able to finish the task within the expected time, but some of them had the problem finding their interested event, so they required some aids to solve the problem.		
<b>Result implementation:</b> We implemented the filter function in the area of university and date of event.		
<b>**Note:</b> Users have to log into the system as a member before reserving any event.		

Table 4: Event Registration Task

<b>Task 3:</b> Event registration (QR code scanning)		
<b>Detail:</b> A task for event staff to scan QR code of each participant and confirm their participation.		
<b>Expected time:</b> Less than 10 seconds		
Users	Time (seconds)	Comments
1	7	-
2	8	-
3	8	-
4	7	-
5	8	-
<b>Conclusion result:</b> All testers were able to accomplish the task within the expected time.		
<b>Result implementation:</b> -		
<b>**Note:</b> Event staff is able to use any QR code scanner but have to log into the system as a staff before scan any QR code.		

## VI. CONCLUSION

This application focuses on solving the problems of propagating news and information, also developing the application to satisfy users' desire. Moreover, this application will provide significant information of events in order to be easily reached by users and will be able to manage their event participation. Additionally, this application can be used from everywhere, anytime. More importantly, integrating QR code will provide more convenience to handle events because it able to complete authentication in one scan.

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