

Intellivent: A Business Intelligence Platform for Event Management Using Gamified Mobile Application and QR Code

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ABSTRACT

One way for a company to communicate to their customer and promote their products is by participating or holding an event, like an exhibition or a seminar. For the event holder and organizer, it will be their best interest to gather as much data as they can, however for now some of the company may find it hard to find those data. From the visitor perspective, there may be less incentive on the user to interact and engage more in an event. Intellivent is a platform for event management, which features a gamification using gamified QR code. The gamification can be used as a tool for the event organizer to obtain more data regarding on activity in an event, and the visitor will be rewarded when they engage more in an event. A prototype has been created and tested on Islamic Book Fair 2019 where it is downloaded by 2000 users from the Play Store. Another version is created to be used in SGU Open House and Patjar Merah Malang 2019, a book bazaar that is predicted to gross around 5 Billion Rupiah. The implementation of the first prototype receive a very positive result from both the Event Organizer and the visitor of the event.

Keywords: *Android, Business Intelligence, Gamification, Platform, QR Code*

1. Introduction

In professional business and a company, there are a lot of way for them to directly interact and engage with their current and future customers. Either holding or attending either one of a Meeting, Incentive, Conference, and Exhibition (MICE), may be one way to do it. The government and industry seem to have notice it, as the MICE industry has been growing fast recently (Setyawan, 2018).

Based on several exhibitions experience, a visitor often only visit some of their pretargeted booths or exhibitors before leaving the exhibition, limiting the chance of visitor to engage more with the exhibitor. In this publication, visitor engagement is defined as visitor involvement and participation in a company activity. This happened because there is no benefit when a visitor engages with many exhibitors compared to few or even only one exhibitor.

Similar problems also faced by conferences and seminars. A certain percentage of attendant come late to the event or leave before the event ends. Also, there is no benefit when the attendant interacts or give feedback with the speaker or event holder.

On the other hand, event owners and holders always want more data from an event, but there is not a lot of data to be collected, such as user behaviors, how long a user stay in a venue, how much the user interacts, and so on.

To solve the aforementioned problems, an application with gamification is proposed by the author to increase the interaction between event holder and their participants. Gamification is applying gaming techniques to non-gaming situation, like in this case, an event.

2. Related Works

Gamification has been already used in several other occasions using the almost same principle as in this research. Ugo B et al. implemented gamified QR code and mobile application in Oslo Norsk Telemuseum, using hidden QR code with clues leading to the next hidden QR code. The application is received well, especially by younger audiences.

Fitz-Walter et al. used QR codes and gamification in an application named Orientation Passport. Application features different achievements that can be unlocked by new student entering a school, interactive maps and friend lists for adding new friends. The student found that the application and features is very useful and fun to use.

Su and Cheng used QR codes for a mobile learning system called MGLS (Mobile Gamification Learning System) created for elementary schools student.

3. Methodology

The methodology used in this research is going to be explained in this chapter.

3.1. Research Overview

The research will use the prototyping method as the preferred Software Development Life Cycle (SDLC), as shown in Figure 1.

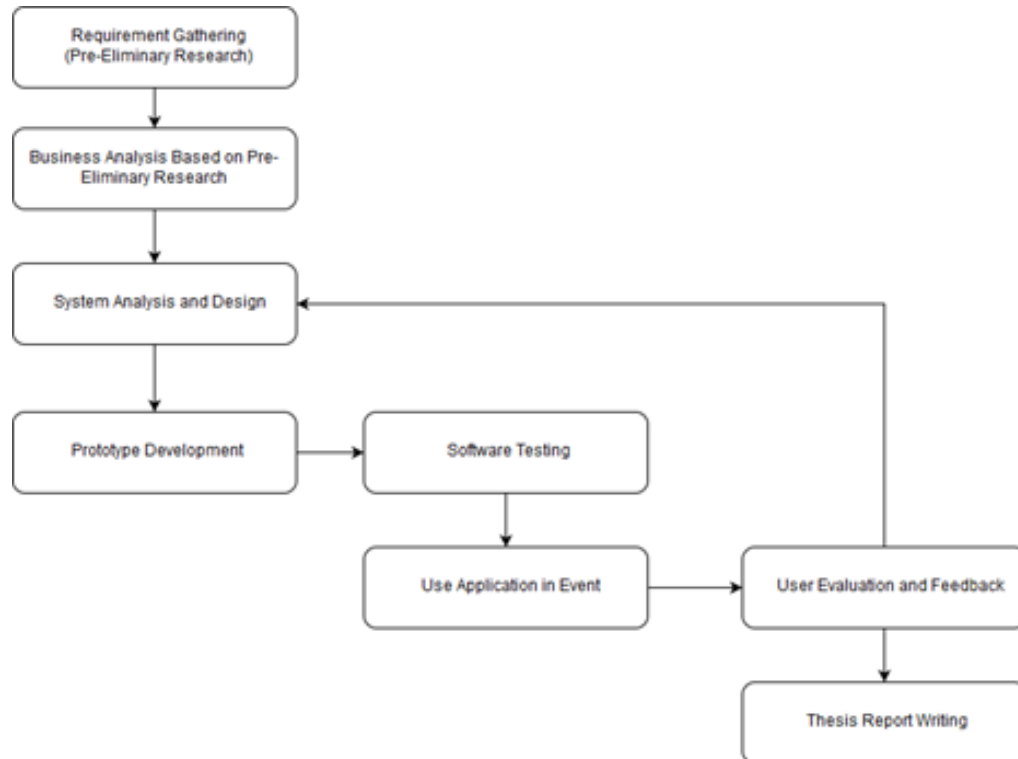


Figure 1. Research Overview

The pre-liminary research will be done first, along with the Business Analysis, which is needed so the problems that are going to be tackled using the solution is clear. After the goals and the problems needed to be solved by the application is clear, the prototype development can be started.

3.2. User Requirement Gathering

The user requirement gathering will be done to understand the opinion and the problems of the future users of the application. The preferred method of gathering requirement is Focus Group Discussion.

3.3. *Prototype Development*

Prototyping SDLC is used in this research. The first part is to do System Analysis and Design, to create the most suitable system to solve the problems. After that, the software will be developed, implemented, and later on evaluated. The evaluation and feedback from the previous implementation will be considered when designing the next prototype. In this research, there are two prototypes created, the first is used in Islamic Book Fair 2019, a 5-day book fair with around 200000 visitors. The second prototype is used in Swiss German University (SGU) open house.

4. **First Prototype Result and Discussion**

This research went through two cycles of SDLC. The first was implemented in Islamic Book Fair (IBF) 2019 on 27th of February to 3rd of March. There are 200.000 visitors visiting the 348 total booths participated by 231 publishers. The event was run by Indonesian Publishers Association or *Ikatan Penerbit Indonesia* (IKAPI). The result of the implementation will be discussed in this chapter.

4.1. *Initial Requirements*

The initial requirements were gathered with a meeting with IBF committees and IKAPI members, Husni Kamil and Tatang T. Sundesyah as the secretary of IBF and the coordinator of the media department respectively. Initial mockup was laid out so the committee members can have an idea of the possible features. The results of the the first meeting is as follows:

1. The mobile application used as a companion application for the visitors in the event. There are several features that is requested in the application, which are interactive maps, surveys, event schedules, exhibitor list and details, and Gamification with QR interactions.
2. A report after the events which contains the data collected from the implementation of the mobile application. There was no limitation for the format of the report.

4.2. *System Analysis and Design*

The system was created in a three-tiered architecture, consisting of a database created by MySQL, Application Programming Interface Service (API Service) created in Node JS Express Framework, and a presentation layer consisted of the Android mobile application and Web Based Dashboard for the report of the event, created in handlebars templating engine.

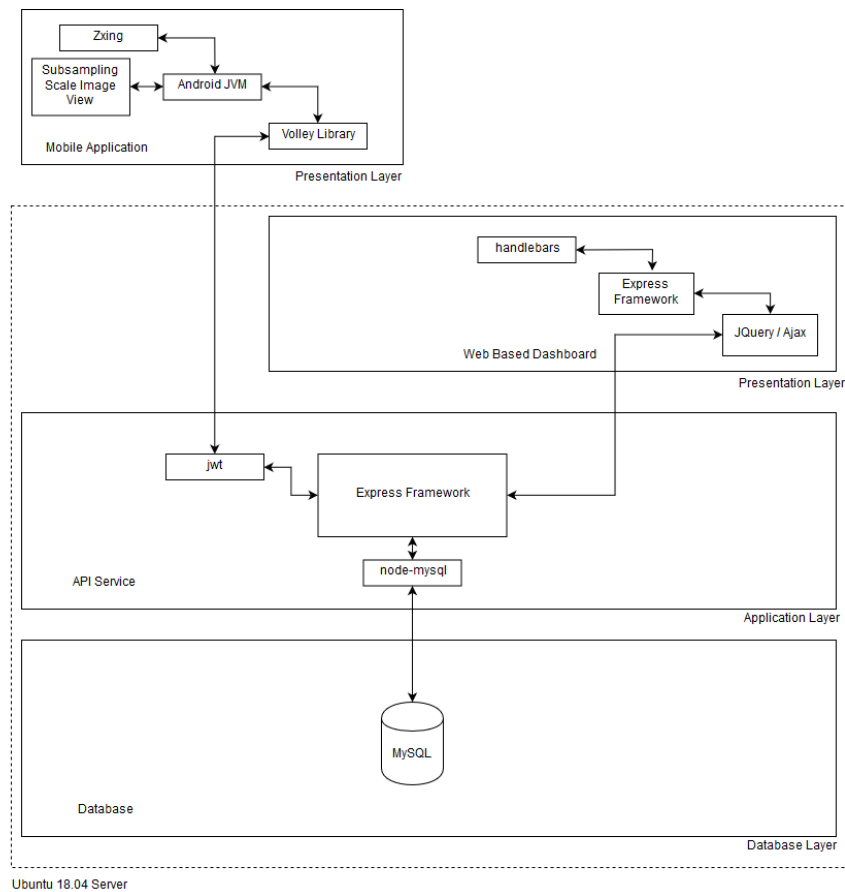


Figure 2. First Prototype Architecture

4.3. Results, User Feedback and Evaluation

There are several results obtained from the first implementation. There are also several feedback channels.

The application was downloaded by 1500 users from the Google Play Store, and it reaches the top chart of the Google Play Store categorical filter, peaking at #3 top free on the second day, and #2 trending on the third day, as shown on Figure 3. On Play Store, it receives an average rating of 4.53 stars out of 5 from 15 users, as shown on Figure 4.

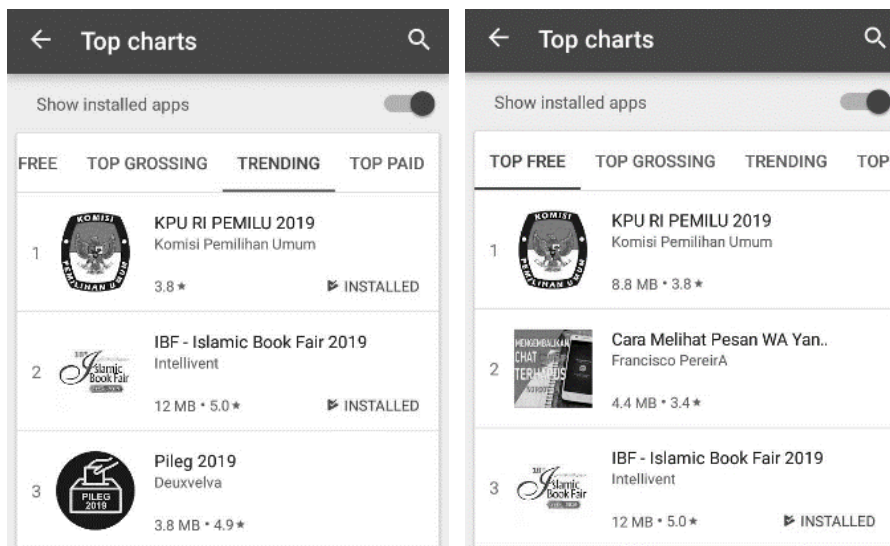


Figure 3. Islamic Book Fair 2019 application on Google Play Store Top Charts

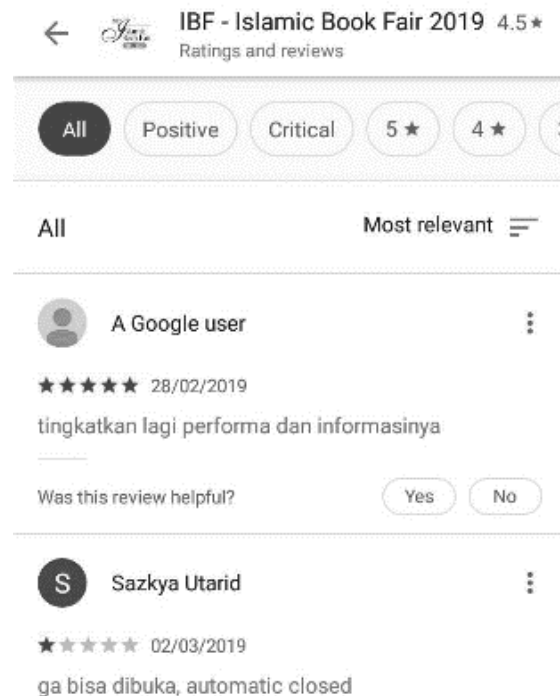


Figure 4. Islamic Book Fair 2019 Google Play Store Review

Besides the Google Play Store, a questionnaire was shared to the visitor based on the questionnaire menu from the application. It was responded by 36 users, and each of the questions was a question to be answered with a Likert scale, ranging from 1 being bad and 5

being the best. Overall, the average points from the survey is 4,65, which is a very positive score.

After the event, a meeting was held with IBF committee members. Generally, the committee really like the report generated from the event, saying that the data obtained and served in such way can be a selling point for the venue. However, from they feel that the application doesn't really increase the user interaction, and that is understandable since only 1% of the user download the application. There are several points discussed from the meeting:

1. There is some problem during the implementation of on IBF because of the short development time. Indeed, the application was created only in a month.
2. Registration handling was a feature that is not implemented on IBF 2019 by the application. From the discussion, it is agreed that if registration of the event was handled from the mobile application, there will possibly more users and more data.
3. The EO wishes for faster reports for the event data, possibly live.
4. As the application came later in the event preparation, there is a little time for advertisement, and also a little time for briefing information to the exhibitors.
5. The committee state that it will be really useful if the application can provide currency and handle transactions.
6. During the 5 days of the implementation, the committee gives some opinion and feedback regarding to the UI and UX of the mobile application.

5. Second Prototype Result and Discussion

The second prototype was used in Swiss German University Open House on 29th of June 2019. The event was a 3 hours event, starting at 9 in the morning until 12, consisting of 2 hour of main event and 1 hour of exhibition. As it is a small event, the targeted attendance for the day was 50, and the event was attended by 45 visitors.

5.1. Initial Requirements

Initial requirements were agreed upon with the Head SGU Open House Christian Santoso. There are several features requested for the application, being registration, gamification, booth list and booth detail, event schedule, maps feature and surveys.

5.2. System Analysis and Design

As seen on Figure 5, there is not a lot of change on the second architecture. The main difference is the use of React Native for developing the mobile application. It was selected to increase the reach of the mobile application, so it can be used by iOS users and Android users. However due to time constraints, the SGU Open House application was not published in App Store.

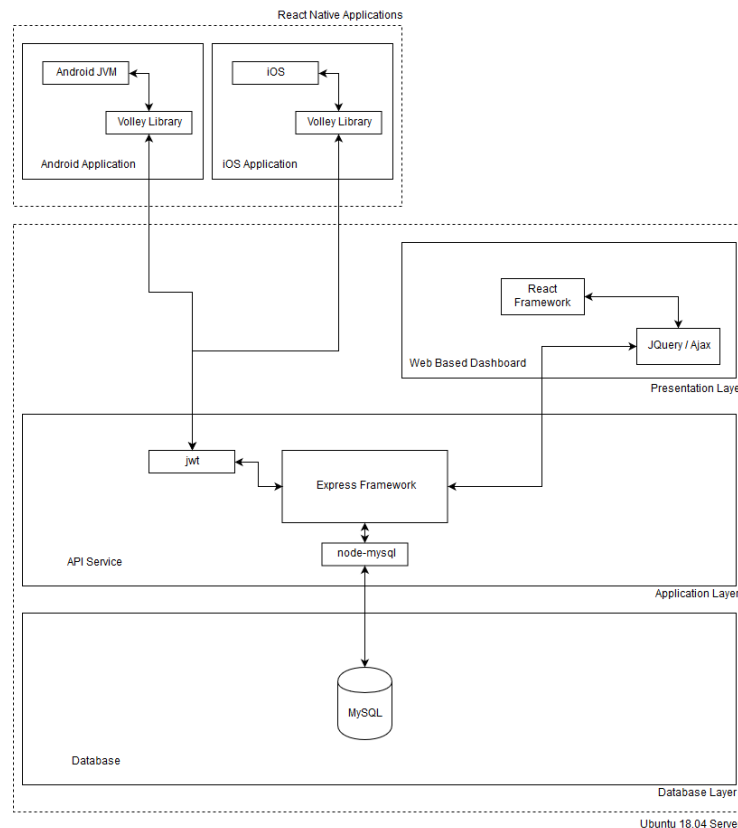


Figure 5. Second Prototype Architecture

5.3. Results, User Feedback and Evaluation

The implementation in SGU Open House made the application more involved with the event compared to the IBF 2019. All the exhibitors and committee members know how to use of the application, and each of the exhibitors were more interested in implementing the application.

The application as downloaded by 40 users. From the participation perspective, the implementation can be considered to be more success than then the first implementation, considering IBF 2019 was far larger and longer than SGU Open House.

6. Conclusion

In Conclusion, the offered application can be used by the event organizers and exhibitor to obtain event data, as said by the committee of IBF 2019. Even though the number of users is low compared to the overall visitor, 1% of user data for the is enough of a sample size to analyze the user behavior.

On the other hand, the application doesn't seem to significantly increase the level of user interaction. Future works should focus and try to increase the level of user interaction and

engagement using the application for the event.

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