



HEROIC BATTLE OF SURABAYA APPLICATION BASED ON ANDROID

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ABSTRACT

The limitation of teaching media that using current method such as book, white board, etc. now have a new problem to get student attention and interest to learn. Meanwhile, within the progress of electronic technology especially mobile device, enhanced access to any information for everyone. Therefore, in this research we like to integrated mobile based learning that cover any learner style (visual auditory kinaesthetic) so can improve student attention and interest to learn. This mobile based learning application will dedicated for learn nation history, especially heroic battle 10 November 1945 in Surabaya. This application will give the information such as battle history, battle historical location information include location photo gallery and tagging information on a Google Map, video, sound, and quiz, to provide a thorough understanding of fascinating history from the events surrounding the battle. And to improve learning process for student and also for more interesting, this application also provides Global Positioning System (GPS) connection to get position of the user and using it to get direction to historical location using Google Map. This application will provide a list of locations that have been visited by the user (by GPS detector) that also unlocked a new feature of this application, so user not only read about the historic sites but also can explore all the historic sites in Surabaya and found fascinating city of Surabaya. For improvement, we proposed a way to download and update content using zip file technology so user not need to upgrade entire application to add content. This result from this research will evaluate using questionnaire to 200 respondents with a variety of ages and educational backgrounds, to found the user opinion about this application.

Keywords: education, heroism, heroic battle, battle of 10 November 1945, Surabaya, Android, GPS.

INTRODUCTION

The rapidly increasing number of user that using mobile devices and other handheld devices (such as smartphones and tablet computers) has changed the lifestyle of many people, especially in the ease of access to information. For example, access to any business information, political information, tourism information, as well as educational information. Education has also entered a new era, where books and other teaching materials, are not presented again using paper media but also in electronic form. Student can easily access that electronic information using computer/laptop or smartphone/tablet PC. So now, learning can be delivered in a more interesting and interactive media and model.

It also become new challenges for education, especially in teaching nation history, where education in paper material is no longer quite interesting, so new teaching media is required, that more interesting and interactive to the student.

Here, we saw an opportunity to present the heroism values in mobile devices application based on android so that can be interesting and interactive to the learner/student. We like to present information especially related to the history of epic heroic battle in the historic events that occurred on 10 November 1945 in Surabaya. For example the information about location of the historical battle with location photo gallery, tagging on Google Map, GPS position of the user, and also the shortest route selection to the location from the current user position. A list of locations that already visited by the user that also detect by GPS locator, quiz, video, sound, and downloadable content using the zip file technology.

This application builds in Indonesian and English, and enriched with multimedia content (text, sound, music, video, animation) and quiz game about historical event of 10 November 1945. With this attractive and interactive application, we expect that these applications will be widely used by mobile device users in Indonesia for teaching history lesson and provide a thorough understanding and fascinating history of the events surrounding the battle of 10 November 1945. And also, to access information about the historical places in Surabaya and to explore these historic sites in Surabaya, as a memento of the heroic battle 10 November 1945. The information of the historic battle is begun to forgotten by young people. Especially with the growth of Surabaya city, the events and the detailed information about these historic sites began to blur.

The heroic battle of Surabaya itself is a battle that took place in Surabaya on 10 November 1945 between the youth and the Indonesian army (that had just declared independence on 17 August 1945) against the British army. This battle triggered by the death of Brigadier General AWS Mallaby in an incident on 30 October 1945. Battle 10 November 1945 later celebrated as Heroes' Day in Indonesia. This battle goes unbalanced considering the equipment used by the British army is much more modern. Nevertheless, the Indonesian army still fought gallantly. The Battle of Surabaya ended with the win of British army after around 3 weeks of the war.

These applications will be constructed using Java programming language, IDE Eclipse, JSON, SQL Lite database on Android, and the MySQL database on the server and using the Google Map API and GPS.



RELATED WORKS

Information about tourism becomes more easily to access via mobile devices, such as tourism application [1] and mobile multimedia tourism [2]. Mostly tourist information explores the natural beauty, the uniqueness of the local culinary and local gift/souvenir shop. In the context of Indonesia country, the existing application tourist guides such as Akbar [3], Shinghal [4], and Busana [5] using Global Positioning System (GPS) to give information about tourist resorts or hotels. However, until now there are still a few applications that explore the history of heroism, such as historic heroism buildings, locations, artefacts, etc. [6].

The aspects of heroism in Indonesian history have been tried to explore in the various forms of media, for example like comics that design to attract young children. One of them is creating by Bungsu [7] that try to visualize heroism of Pattimura (one of Indonesia patriot character) that design for primary school children. On the other hand, Suardi [8], tried to build 3D media on monuments building as the learning medium. The 3D media on the monument shows the moments of heroic battle in the Dutch colonial period that occurred in the Bangsal Bali area. This monument already used by young people in the village Dalung, Badung-Bali as a learning media. Meanwhile, Sebastian [9] tried to design an encyclopaedia of 30 Indonesian independence heroes. This encyclopaedia increases the value of history education for the public, especially young people to increase appreciation of the national hero.

Nurazwan A [10] builds animated multimedia (2D animation) presentation to attract children's interest in learning history. This 2D animation tell story about Antenom heroism (Malay) in fighting the British army. The animation shown in the website and on the CD that distributed on the schools.

On the other hand, Zarwina Yusoff [11] also tries to use augmented reality book to increase the learning interest from the student. The attempt to improvement learning and teaching process using mobile device technology also try to achieve by Handojo like online test on android device [12] and also class attendance process using NFC technology [13], so class no longer teach by current method but also involves new technology.

From the available references, we conclude that the exploration of Indonesian heroism history especially as learning media not yet been explored by using mobile device applications media (smartphones/tablets-PC). We saw an opportunity to create an application that runs on smartphones/tablet-pc that we hope this application might become an interesting tool for young people to learn history. It would be a strategic step to let the heroism spirit spread through a smartphone application which is very easy to install and run on the user's smartphone. This application will use mobile multimedia, photos, games, and interactive quiz to provide an application that interesting for many young people.

BATTLE OF 10 NOVEMBER 1945 IN SURABAYA [14, 15]

This heroic battle of Surabaya (10 November 1945) begin with the arrival of Captain Huijer, Dutch Navy in Surabaya that initiate takeovers of Japanese colonial that had lost the war. However, at the influence of the Indonesian army (led by Sudirman and Doel Arnowo), the Japanese army handed over their weapons to the Indonesian army (Badan Keamanan Rakyat/BKR). Therefore, on 1 October 1945, a fight broke out between Indonesian young people and the Dutch army. Indonesian young people begin to attacked airfields on Morokrempangan and detention camp that located in Darmo residential area. Meanwhile the headquarters of the Japanese Army (Kempeitai) surrounded by Indonesian army that using any weapon start from bamboo spears and other traditional weapon to machine gun. Until, captain Huijer arrested.

On 25 October 1945, British army landed at Tanjung Perak harbor (Surabaya), led by Brigadier General Mallaby along with the 49th Brigade that contained 6,000 elite troops. Mallaby then send one platoon led by Captain Shaw to save Captain Huijer. Allied forces also took over railways office, telephone and telegraph central, hospitals Darmo, and others vital building. The great battle was inescapable between 6,000 British troops with 120,000 Indonesian people and soldier. Due outnumbered, Mallaby asked president Soekarno to persuade Indonesian army commanders to stop battle in Surabaya. Sukarno, Hatta, and Amir Sjarifoedddin finally come to Surabaya to stop the battle. Then a cease-fire occurred between both armies.

However, due to a misunderstanding on 30 October 1945, Buick that carrying Brigadier General Mallaby intercepted by Indonesian militia group when going to pass the Red Bridge (Jembatan Merah). The incident ended with the death of Brigadier General Mallaby. Because of this incident Lieutenant General Christinson, commander of Allied forces in the Netherlands East Indies (AFNEI) send fifth Infantry Division complete with weapon and tanks to Surabaya under the command of Major General Mansergh with approximately 15,000 army troops. On 9 November 1945, the British issued an ultimatum to Indonesian army to surrender all their weapons at 10 November 1945. Then at 11.00 PM on 9 November 1945, Soerjo, governor of Surabaya announced his decision through radio that Surabaya will fight until the end. So, on 10 November 1945 the heroic battle in Surabaya began.

The battle happened on the next 3 weeks. Due the lack of weapon and skill of war, in late November 1945, the entire city of Surabaya has fallen into the hands of Allied Force. Indonesian fighters that still alive join the refugees fled from Surabaya, then create a new line of defence at West site (Mojokerto City) until East site (Sidoarjo City). This heroic battle triggered the resistance in many areas in Indonesia. Right now, this event celebrated as hero day on every 10 November.



ANDROID

Android is an operating system based on Linux for mobile devices that includes an operating system, middleware and applications. Android provides an open platform for developers to create their applications. At the beginning, Google Inc. bought Android Inc., which is newcomers who make software for mobile phones/smartphones. Then to develop Android, Google formed the Open Handset Alliance, a consortium of 34 hardware, software, and telecommunications companies, including Google, HTC, Intel, Motorola, Qualcomm, T-Mobile, and NVidia [16].

Android architecture consists of the Applications, Application Framework, Libraries, Android Runtime and Linux Kernel Architecture as can be seen in Figure-1.

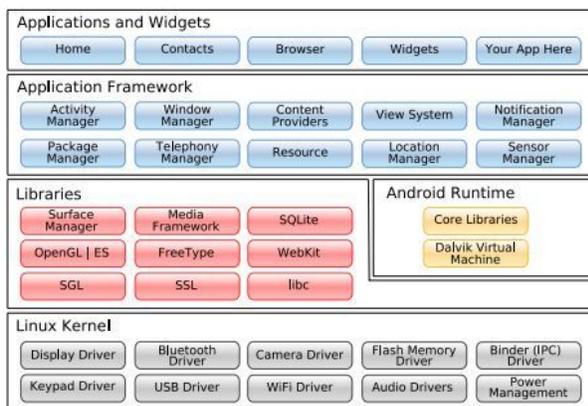


Figure-1. Android Architecture [16].

Android SDK (Software Development Kit)

Android SDK is an API tool (Application Programming Interface) that is necessary to begin to develop applications on Android platform using the Java programming language [16].

Android Development Tools (ADT)

Android Development Tools (ADT) is a plugin for the Eclipse IDE that designed to provide a convenience way to develop Android applications using the Eclipse IDE. By using ADT, user will be easier to make Android application project, create a GUI application, and add a variety of other components. In addition, with ADT, the user can create the Android package (.APK) that used to distribute Android applications [16].

JSON (JavaScript Object Notation)

JSON (JavaScript Object Notation) is a format code for data exchange that worked like XML. JSON is easy to understand by humans because the format is quite simple. JSON was build based on the JavaScript programming language, Standard ECMA-262 Edition December 3, 1999. JSON does not depend on any programming language because it uses a style that is commonly used by programmers, such as C, C ++, C #, Java, JavaScript, Perl, Python and others [17].

DESIGN AND IMPLEMENTATION SYSTEM

In this this system, Android can make a request to the network provider to get the current GPS coordinates. Android build a transaction with a server for example login, register, and download the content. The system architecture design as seen on Figure-2.

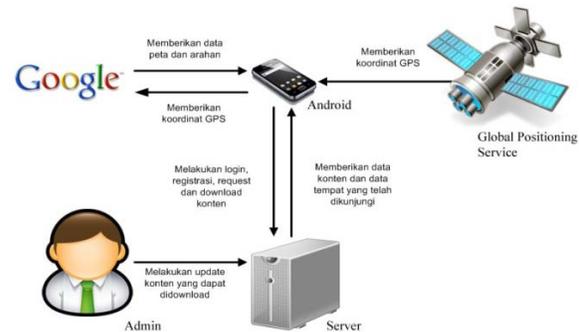


Figure-2. System Architecture Design.

Implementation on Server

Server acts as an intermediary between Android and the database on the server. The whole process view, insert, update, and delete the database is using PHP. Communication between the server and the Android is using HTTP GET method that returns a value in JSON format.

Implementation on Android

On the android device, we implement an application such the history of the battle, historic location information and user location using GPS, etc. We also build a special way to download the update content to the existing content of the application. Usually many application doing update content by download and re-install the application (which would require a large size and time-consuming), especially that the changes usually only occur on the content alone while in the application does not change.

On this application, we like to implement a new way to download update files in a zip file, which is updated content without updating applications that already installed. Download request begins with a list of content available to perform the function that requires a parameter ID CheckUpdate location. CheckUpdate function will sent a variable using JSON format, which parsed and compared to the data content that has been stored in the device, to display a list of content loadlistkonten function invoked. From the list obtained from loadlistkonten function, the user can select the content that will be downloaded. Load function to download content list seen on Pseudocode-1.

Pseudocode-1. Load Function for Download Content List.

```
Return GET ALL FROM TABLE T_UPDATES THAT
location_id IS EQUAL user_locationid.
AND NOT EXIST IN device's database.
```



When a user selects an item to download, DownloadFile function called. This function requires a parameter of the data link download selected content to download a zip file containing the data content (Pseudocode-2).

Pseudocode-2. Download Content.

```
DownloadLink = Selected Konten Download Link;
Data = GET File from DownloadLink
FileLength = GET ContentLength;
While (Count < File Length)
Write Data to DownloadPath;
```

Once the zip file successfully downloaded to DownloadFile function, then the update function to copy the data content to the device and executes the SQL files contained in the zip file that you have downloaded to install the content. Function to download install content seen in Pseudocode-3.

Pseudocode-3. Install Download Content.

```
Extract File (File Path, Destination Path);
Execute SQL (SQL Path);
DELETE FILE;
```

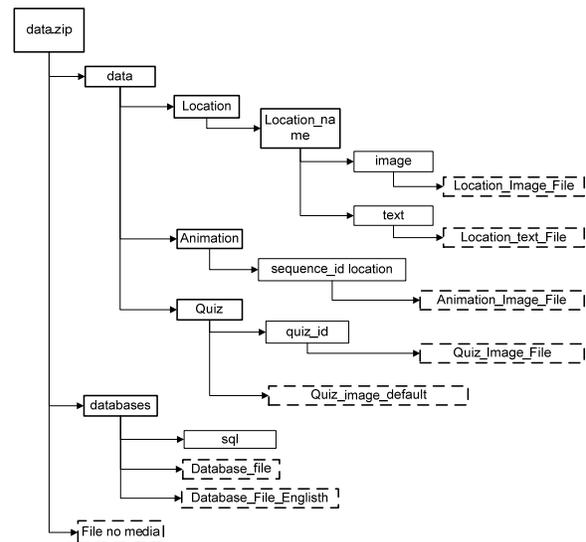


Figure-3. File Zip Structure.

Explanations of each folder are as follows:

- Data folder containing the folder location, animations and quiz. The location of the folder containing all the files from a location, in images and text. Animation folder containing all the files of an animated scene, which build form the images. Quiz folder containing image files from the entire question on the quiz.
- Folder databases that contain SQL database files and folders. SQL folder is a folder that is used as a temporary storage area SQL file that will be used when the application is run.
- No. media files are files that are used so that the image file in the application's internal storage device does not appear in the gallery.

Example SQL executed in the process of downloading the content can be seen in Pseudocode-4.

Pseudocode-4. File SQL Example.

```
INSERT INTO Location VALUES (locationid, location name, location
address, latitude, longitude);
INSERT INTO Image VALUES (imageid, locationid, image path);
INSERT INTO Text VALUES (textid, locationid, text path);
```

System Testing

The system testing applied using various types and specifications of mobile devices such as the Sony Xperia Z, Sony Xperia Arc S, LG G2, Lenovo S660, and Samsung Galaxy Note II to test the reliability of applications in a wide range of devices.

The main page displays the location of the five main menus: history, the history of Surabaya, Surabaya simulating historical battles, downloadable content, and login. After login, the login menu will be removed and the main page will display two additional menu logout menus

and the menu is a place you have visited. Testing the main page can be seen in Figure-4.

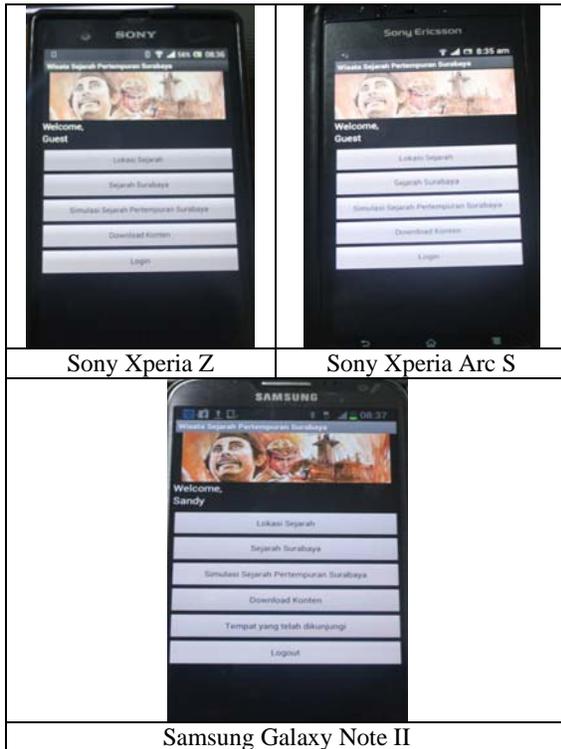


Figure-4. Android Main Page.

Page history locations (Figure-5) show images, stories, and background sound regarding the history of the battle of Surabaya from an existing location.

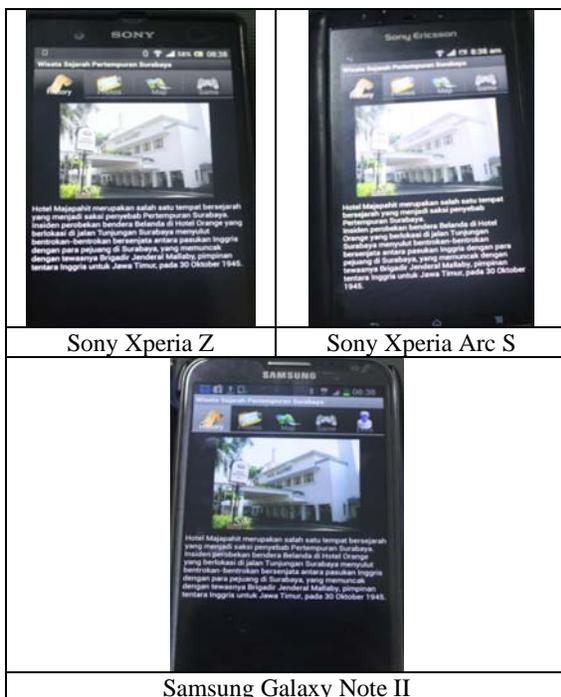


Figure-5. History Location.

Surabaya features a battle simulation (Figure-6) is a page that displays a list of simulations that can be used by user. This page is run historical simulations battle sequence with accompanying captions, images, and sound. Users can select the simulation to run.



Figure-6. Heroic Battle Simulation.

Features historic location map (Figure-7) is a page showing the position of the historic site. User could use this map to detect the user's position using GPS and direction for the user to reach the historic location using Google Map API.

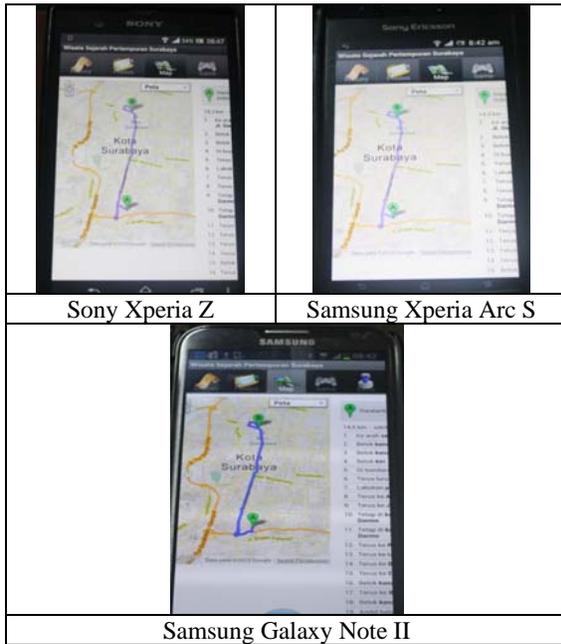


Figure-7. Location Map and User Position GPS.

This application also built in two languages, Indonesian and English. Therefore, the application expected could use by foreigners who visit to Surabaya. In addition, this application also features a gallery of photographs surrounding the historic site, historic photographs, and photographs of heroic Figures (Figure-8).



Figure-8. Photo Gallery.

Features downloadable content (Figure-9) used to display a list of content that could be downloading by user. So, user could choose which content from the server that wants to download. Files that been downloaded will be compressed, so that not consumed too much bandwidth. After this file successfully being downloaded, this file will be automatically extracted to a folder that has been determined on the mobile device, so it will automatically update the content of existing applications without any effort from the user.

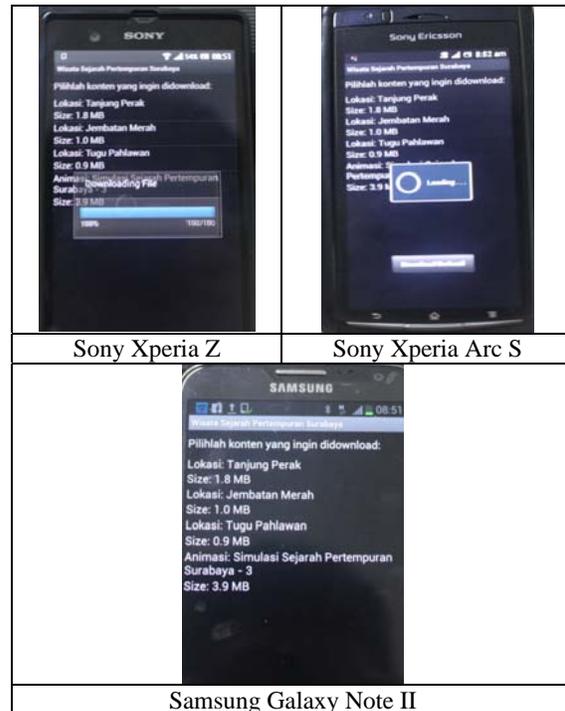


Figure-9. Download Content.

We also try this application to 200 respondents with a variety of ages and educational backgrounds, to found the user opinion about this application (as seen on Table-1). The respondent find that the information (history, places, etc.) it quite interesting (strongly agree-average point=84%). This application also have an interesting colour (strongly agree=80%), attractive and interactive to use (strongly agree-average point=85%). And the important one is that after using this application respondent interested to visit the historical place (strongly agree=87%). Overall, the respondent give a quite good opinion about this application (total strongly agree-average point=83,88%), so we can conclude that this application is quite success to attract people to learn and also to visit heroic battle of Surabaya.

**Table-1.** Questionnaire Summary.

Question Topic	Scale Points (%)				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Informative information				15	85
Informative history				17	83
Interest to learn history				10	90
Interesting colour			2	18	80
Attractive application				16	84
Interactive application				14	86
Good visualization			4	24	72
Interest to visit the place				13	87
Average			3	15,88	83,38

CONCLUSIONS

From this research we could concluded that the application can perform all the functions such as to see the historical location information, featuring galleries, location tagging map, also give the direction to the location based on the position of the user using GPS and Google Map API, run the quiz, download content, perform automatic recording using the GPS locator of the locations that already visit by users. Based on questionnaire from 200 respondents with a variety of ages and educational backgrounds, we found that 83.38% of respondents have the opinion that this application is very interesting and useful for the city of Surabaya. On the next research we like to improve this application with movie and interesting game so that will be more interesting to young people to use this application.

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