



FKEE Staff Publication System

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Abstract: The propose of this project is a development of web-based and mobile application of FKEE staff publication on Android platform, in order to improve accessibility and performance of the system. Currently, Faculty of Electrical and Electronic Engineering (FKEE) have existing system of staff publication information; however it lacks information such as publication list in Scopus, H-index and citations. Therefore, the proposed system aims to have all this features that help the user to access the information of publication easily. This system is managed by admin, for the reasons of security and auditing. Thus, the admin can access the system and edit the information accordingly, while the end user can only search and view the information of publication. The system shows all the information of FKEE staff such as the position, email, and list of publication. To ensure the success of Android application system development, MIT App Inventor 2 is used. On the other hand, the local server must have internet connection with the assistant of Serveo platform for web-based system. Furthermore, the performance of developed system are analyzed using Pingdom for website and ImmuniWeb for Android application. As a conclusion, the system has been successfully developed and some other features can be added in the future for the advancement of the system.

Keywords: publication, web-based, mobile application.

1. Introduction

“Publication” is a technical term in legal contexts, especially important in copyright legislation. An author of a work generally is the initial owner of the copyright on the work. One of the copyrights granted to the author of a work is the exclusive right to publish the work. It is not a dichotomous event: rather it is a continuum [1].

There are many types of publication, which are books, journals, conference papers, newsletters, newspapers and magazines. Based on [2], it stated that journal falls under three categories of scholarly journals, trade publications and

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popular magazines. The scholarly journals are written by academicians for academics. There is also electronic publishing which refers to digital publishing or e-publishing including the digital publication of e-books, digital magazine and the development of digital libraries and catalogues. Electronic publishing has become common among us.

Nowadays the university emphasises lecturer not only to focus on teaching but also to publish the journal in order to sustain their key performance index (KPI) [3]. There are several keys indicating the performance of the lecturer including the student feedback via Sistem Penilaian Pengajaran Staf Akademik dan Kursus (SPARK) system, the research activities on the topic which includes publishing in journal and conference proceeding with the impact factor and number of citations that can be monitored via Scopus and Google Scholar.

Therefore, this system is helpful in finding the list of staff publication of FKKEE in general. It guarantees accurate information on the publication. All the data of publication are updated automatically from the Scopus website. If there is any additional update information of the publication from FKKEE staff, all are updated into the system as well. This system is also implemented on the FKKEE website at <http://fkee.uthm.edu.my/v3> and be able to access it on the Android platform.

2. Research Method

Systematic and theoretical analysis of the method applied to develop FKKEE Staff Publication System were arranged, in order to complete this system, which are necessary for designing a website and Android application [4]-[6]. Thus, the methodology of the website and the Android application design is shown in Fig. 1.



Fig. 1 - The system overview

This project is divided into two (2) phases which are web development and mobile application development. The first phase of this project is focused on the web application design and the database configuration. In this phase, the designed web application can create, delete, edit and update the data and upload new staff information into the database and display it on the web application. The other phase is focused on mobile application development using the MIT app inventor.

2.1 Project Development

This project is divided into two (2) phases in order to achieve the objectives for ensuring the project development could be carried out smoothly [7]. It requires proper planning so that the work performed completes on times. Flowchart on Fig. 2 shows the general process for the website system and Android application. All the process must follow according to the need of the project.

2.2 Database Configuration

The database is a very important element in this project. It is used to store information and organize the data easily, thus it is able to access, manage and update data accordingly. The first step to designing the database is the user need to download XAMPP Apache from the website and install it in the host computer. After that, the XAMPP control panel pops out, then click start for the Apache and MySQL [8]. The admin button of the MySQL is linked to the phpMyAdmin to allow the user to create their own database. Users can create the new database by clicking the “New” button and insert the name of the new database. Next, the user can create the table for the database by selecting the number of column inside the table.

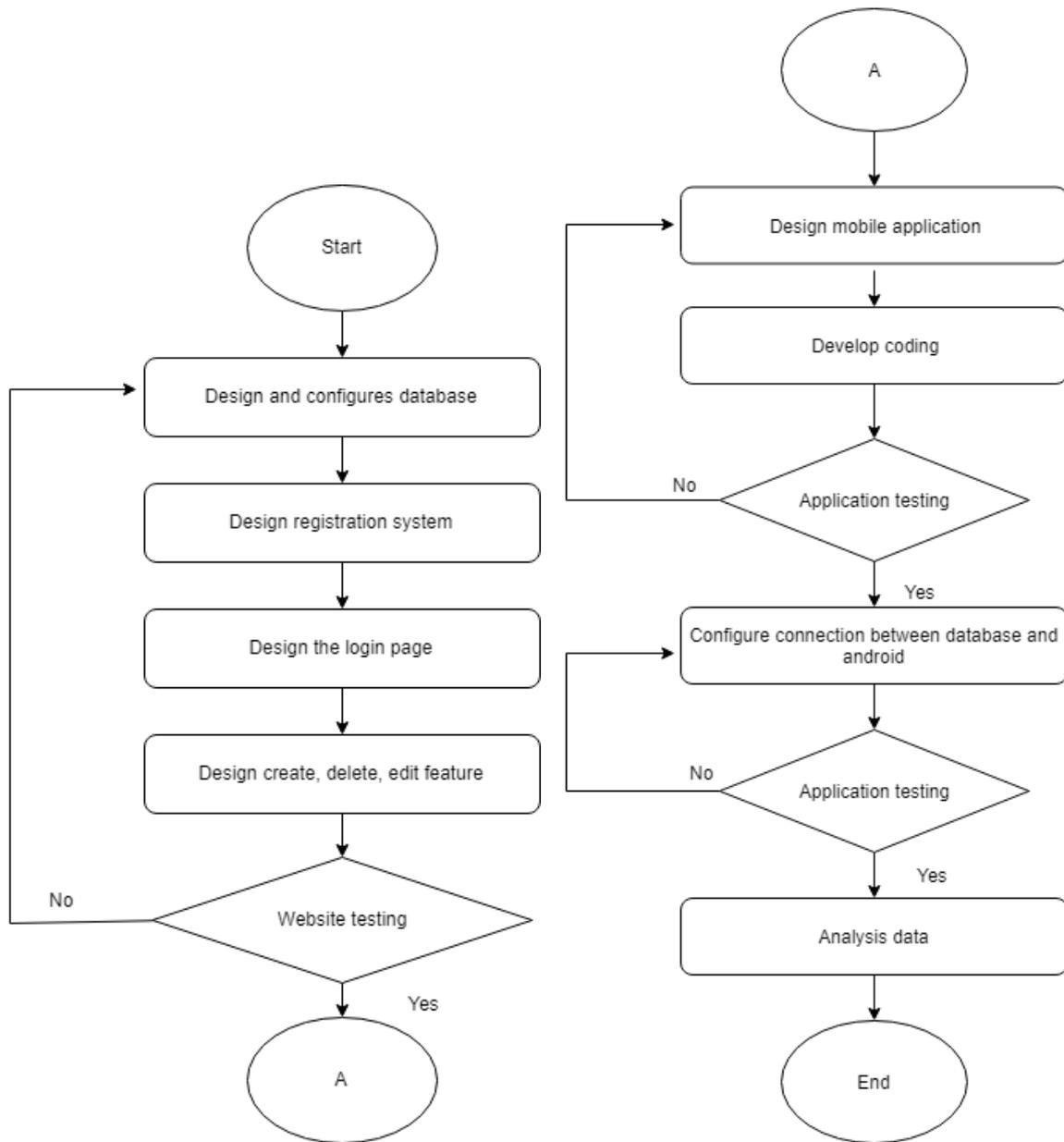


Fig. 2 - Project development process flow

For this project, it required six tables for the system. The first table is used to record the registered user information and the other five tables are to record the data of the staff information. Fig. 3 shows the tables for user information. INT type select for the id is representing standard integer, while VARCHAR meaning is a variable-length non-binary string. The information that inserts into the database is shown in the table. Meanwhile, Fig. 4 shows the admin information in order to access the website system.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	int(11)			No	None		AUTO_INCREMENT	Change Drop Primary More
2	firstname	varchar(256)	utf8_unicode_ci		No	None			Change Drop Primary More
3	lastname	varchar(256)	utf8_unicode_ci		No	None			Change Drop Primary More
4	email	varchar(256)	utf8_unicode_ci		No	None			Change Drop Primary More
5	password	varchar(2048)	utf8_unicode_ci		No	None			Change Drop Primary More
6	created	datetime			No	CURRENT_TIMESTAMP			Change Drop Primary More
7	modified	timestamp		on update CURRENT_TIMESTAMP	No	CURRENT_TIMESTAMP		ON UPDATE CURRENT_TIMESTAMP	Change Drop Primary More

Fig. 3 - User information table

+ Options

id	firstname	lastname	email	password
21	amira	shahirah	amirashahirah@gmail.com	\$2y\$10\$xwZnzcYqGIL0HRdFNVJnvOBzJUY31nEDgxNcrEgFfaO...
20	Nurdin	Ismail	muhammadnurdinismail@gmail.com	\$2y\$10\$JF/9XycY9VWSIBokerPwvuSknoZ5pJW8MIPByB.Sgix...

Fig. 4 - User information

2.3 Multi Login and Registration System

This system is designed to allow the user to complete the process of creating a user registration system. With this system, users are able to create an account, login and logout. There are two types of account which are admin and users. There are different feature between the users and admin account. The software and language used are Adobe Dreamweaver as PHP code editor and MySQL as the database of this system. The first step of this system has created a database for this system with MySQL database. After that add a table call users with four rows and insert the field with following information:

- Id – int ((11) auto increment)
- Username- varchar (255)
- Email-varchar (255)
- Password-varchar(255)
- User_type-varchar (255)

Then, create a folder called mydb insidehtdocs and saved all the text inside this folder. There are several files need to be created for this system. The first file needs to be created is the index.php file. This file is created for the user registration. It contains the input of username, email, password and submits class which name register as a submit button and all the data submitted to the same page.

Next, create code for login that use for the design of login page. Login page is allowed the user to insert their username and password. If the users already registered and the information of users already stored in the database, then the users can access the system. For the users that not yet register, system print out an error message “Login failed. Email or password is incorrect”.

2.4 Design Application on Android with MIT Apps Inventor

MIT Apps Inventor is a platform that let the user design and develop Android application for the Android phone using the web browser and either connected to the phone or emulator [9]. It defined as the block-based programming language that is simplify programming concept with visually intuitive blocks in order to increase access to programming capabilities and further the reach of programming education. This project uses the MIT app inventor to develop an FKKEE staff publication application to search and view the data. The App Inventor serves to store work and help to keep track of the project as shown in Fig. 5.

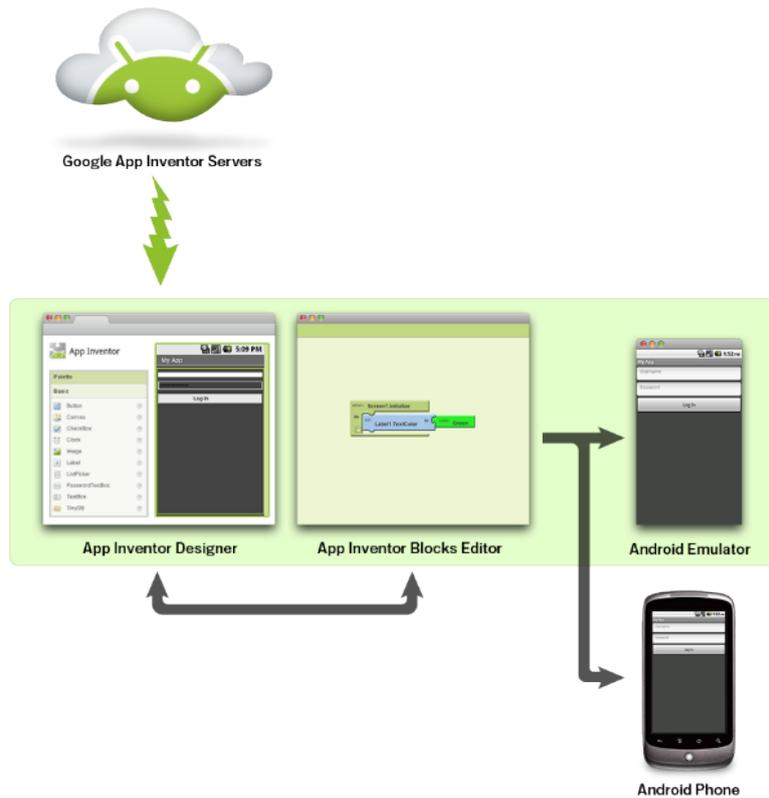


Fig. 5 - Process of MIT App Inventor

Basically, this application developed with three (3) main screens. Screen 1 of this application is the home main screen. This screen has two (2) buttons which are “About FKKE” and “Directory FKKE”. The background for all screen is the same which is FKKE building. Once the user clicks “About FKKE”, it directly goes to screen 2 and once “Directory FKKE” was clicked, system navigate to screen 3. Screen 3 shows the directory of each FKKE staff. It displays the picture, position and name of the staff. If users want to know the details, just click at the picture and it navigates to the staff information. The picture is set as a button and put “ActivityStarter” at blocks in order to start another platform.

3. Results and Discussions

This section discusses the result and finding of the project based on the method that has been described in Section 2. The data that have been obtained through the experiment or process of the project is analyzed. The result of this project is making a website system with a mobile application which is functioning as expected.

3.1 Serveo

In order to access the system, the local server must have an internet connection with the help of Serveo server. It is an SSH server that only functions as a remote port forwarding. When a user connects to Serveo, the user gets a public URL that can be accessed from the internet and displayed the local server.

As an example, for this project, the laptop is installed with the Apache web server. The appearance of the Apache web server is able to be accessed from the outside. However, it does not have a public static IP. With the internet connection and tunnelling on Serveo server, the appearance of the local Apache web server can be accessed from the other platform. The advantage of Serveo is that have no application needed to be downloaded.

By running the command; `ssh -R staffpublication:80:localhost:80 serveo.net`, to set the computer port to communicate to the internet, a public URL appeared and can be accessed by others user.

Fig. 6 shows command prompt output when the command above is inserted. The generated public URL is <https://staffpublication.serveo.net>. Thus, this public URL can be accessed and local Apache web server that has been setup is displayed. Fig. 7 shows display from localhost and viewed from the URL.

```

C:\ OpenSSH SSH client
Microsoft Windows [Version 10.0.17134.706]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Nurdin Saje>ssh -R staffpublication:80:localhost:80 serveo.net
Forwarding HTTP traffic from https://staffpublication.serveo.net
Press g to start a GUI session and ctrl-c to quit.
    
```

Fig. 6 - Command prompt output

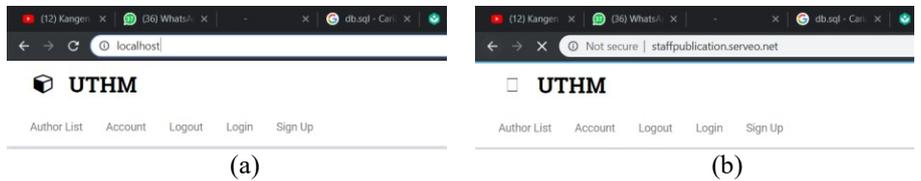


Fig. 7 - Homepage view form (a) localhost; (b) Serveo

3.2 FKEE Staff Publication System Website

FKEE Staff Publication System website is a single authentication system. It is designed for admin to make the change at the system. Fig. 8, shows the registration page and the login page. In order to login the system, the user must sign up at the registration page.

To change email or password, the user needs to update the account page as shown in Fig. 9. After the sign-up process, all the information of the user is displayed at the database as shown in Fig. 10. The admin is allowed to add and delete staff, edit and delete document and edit staff information meanwhile the user can only view the information of the staff [4]. Fig. 11 shows the admin page.

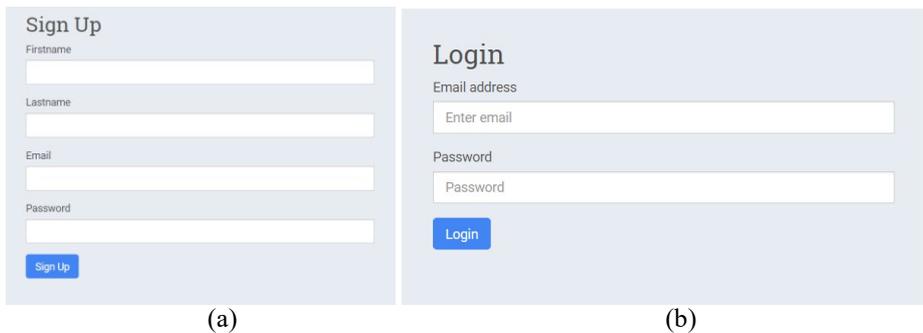


Fig. 8 - (a) Registration page; (b) login page

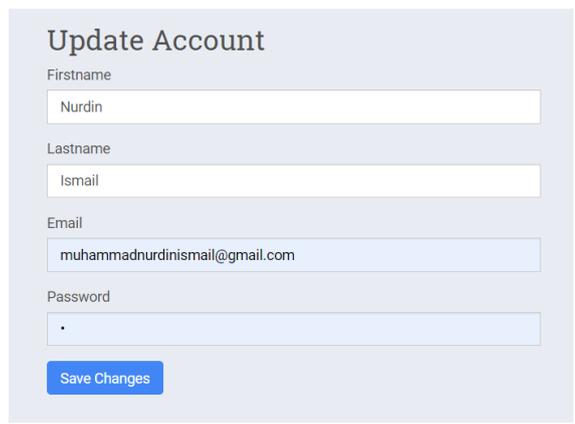


Fig. 9 - Update account page

id	firstname	lastname	email	password
22	nurshahirah	abd rahim	shahirahabdrahim@gmail.com	\$2y\$10\$ImU9fVRhICyZzQMrlvLkR.QtkEL.80DKrwomCHsyXIZ...
21	amira	shahirah	amirashahirah@gmail.com	\$2y\$10\$XwZnzcYqGIL0HRdFNVJnvOBzJUy31nEDgxNcrEgFfaO...
20	Nurdin	Ismail	muhammadnurdinismail@gmail.com	\$2y\$10\$JF/9XycY9VWSIBokerPwvuSknoZ5pJW8MIPByB.Sglx...

Fig. 10 – Database of user information

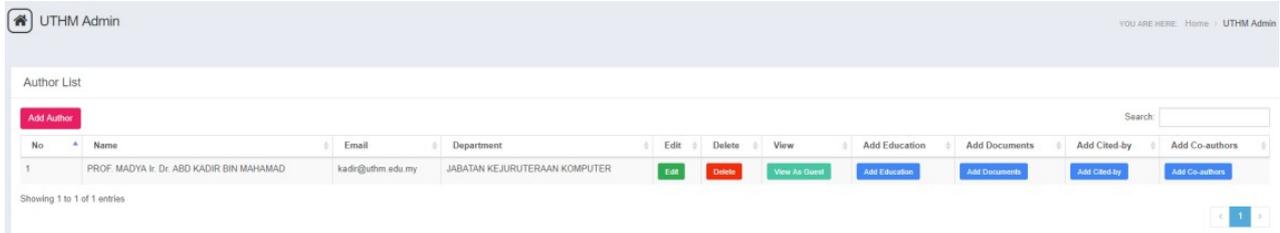


Fig. 11 – Admin page

Staff publication system admin page contains few features that able to make the system more efficient. The first feature is to add staff into the system. Admin is able to add new staff by click on the “Add Author” button on the top left of the admin page. It pops up a new form as shown as in Fig. 12. Information that able to add into the database are the image, name, email address, department, author id, H-index, document by author and total citation. Few of this information is available on the Scopus website.

Fig. 13 (a) and (b) show the page to add education information and document information. On the education information, there are a qualification, university and passing year and once the insert button is clicked, the data automatically saved into the database and appeared at the system. The same for the insert document information, which used the same flow.

Author Information x



Author Image:
 ROSLI.jpg

Enter Name

Enter Email

Enter Department

Enter Author Id

Enter h-index

Enter Documents by author

Enter Total citations

Fig. 12 - Add new staff

Author Education Information ×

NO

Qualification

University

Passing year

(a)

Author Documents Information ×

NO

Title

Author

Year

Source

Cited by

(b)

Fig. 13 - Insert information of (a) education; (b) document

Fig. 14 shows the staff information pages when admin clicks views as the guest. This page appears on the same page if the user views the page of the staff. All the information that inserted earlier displayed at this page. As can be seen, the image of the staff, as well as the education and document, are displayed.



Name	PROF. MADIYA Dr. ROSLI BIN OMAR		
Email	roslio@uttm.edu.my		
Department	JABATAN KEJURUTERAAN MEKATRONIK DAN ROBOTIK		
Author Id	36698316600		
h-index	3		
Documents	15		
Citations	25		

Education

NO	Qualification	University	Passing year
1	DOKTOR FALSAFAH AUTONOMOUS SYSTEM	UNIVERSITY OF LEICESTER	2012
2	SARJANA KEJURUTERAAN ELEKTRIK	UNIVERSITI TEKNOLOGI MALAYSIA	2002
3	SARJANA MUDA KEJURUTERAAN ELEKTRIK (KAWALAN DAN IN	UNIVERSITI TEKNOLOGI MALAYSIA	1999

Documents

NO	Title	Author	Year	Source	Cited-by
1	A review on energy efficient path planning algorithms for unmanned air vehicles	Debnath, S.K., Omar, R., Latip, N.B.A.	2019	Lecture Notes in Electrical Engineering	0
2	Optimal path planning using equilateral spaces oriented visibility graph method	Latip, N.B.A., Omar, R., Debnath, S.K.	2017	International Journal of Electrical and Computer E	3

Fig. 14 - Staff information page

3.2.1 User page

Fig. 15 shows the author list. This page appeared when the user/guest click on the author list button at the initial page. The user has a limited function which can only search for the staff and view the information. When the user clicks on the green button which views detail info, it displayed the page as the same as in Fig. 15.

No	Name	Email	Department	Detail Author Infor
1	Dr. JAIS BIN LIAS	jaisl@uthm.edu.my	JABATAN KEJURUTERAAN ELEKTRONIK	View detail info
2	PROF. MADYA Dr. MAISARA BINTI OTHMAN	maisara@uthm.edu.my	JABATAN KEJURUTERAAN KOMUNIKASI	View detail info
3	PROF. MADYA Dr. ROSLI BIN OMAR	roslio@uthm.edu.my	JABATAN KEJURUTERAAN MEKATRONIK DAN ROBOTIK	View detail info
4	PROF. MADYA Ir. Dr. ABD KADIR BIN MAHAMAD	kadir@uthm.edu.my	JABATAN KEJURUTERAAN KOMPUTER	View detail info

Fig. 15 - Author list page

3.3 FKKE Staff Publication Application

3.3.1 Android application (StaffPub)

StaffPub is an Android application designed for the publication system. It is provided to view the information on the FKKE staff. This application requires internet connection to communicate with the website. The designed application icon is shown in Fig. 16. This icon appeared in the Android device once the .apk file is installed.

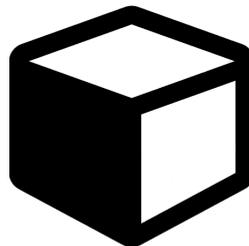


Fig. 16 - Application icon

There are 3 pages for this Android application. The first page is the initial start-up which user can choose two options. First is “About FKKE” and the other one is “Directory FKKE”. If the user clicks on “About FKKE”, it direct to the second page which displays Mission and Vision of the faculty. There is also a back button which directed to the previous page. Next, the third page is “Directory FKKE”. In this page, there are the picture of the staff as well as name and position. The user also can click on the picture to display more information on the staff. Fig. 17 shows the interface of the Android application.



Fig. 17 - Interface of Android application (a) homepage; (b) about FKKE; (c) directory FKKE

3.4 Website Performance

This section is to discuss the performance of website by using Pingdom. This software is well-known as free website speed test tool. Simply head to Pingdom Tools, and enter the URL of website, then click “Start Test”, and wait for the results to roll in.

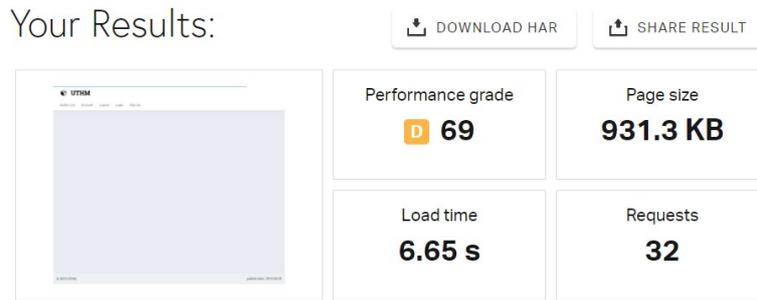


Fig. 18 - Website test result

The performance results from Fig. 18, shows that the website scored 69/100 on Pingdom and the total load time is 6.65 seconds. The total size of combined assets is 931.3 kilobytes and the number of requests is 32. Next, Pingdom also shows the improve page performance as shown in Fig. 19. This section is filled with graded performance. Grade A is good meanwhile grade F is worse which need to improve to get better performance.

Improve page performance

GRADE	SUGGESTION
F 0	Compress components with gzip
F 0	Use cookie-free domains
F 0	Add Expires headers
F 16	Make fewer HTTP requests
A 100	Avoid empty src or href
A 100	Put JavaScript at bottom
A 100	Reduce the number of DOM elements

Fig. 19 - Improve page performance

Meanwhile, Fig. 20 shows an outline of the contents of the website and how it affects the loading time. Things like scripts, images and HTML files are displayed in an order chart along with file sizes and the number of requests.

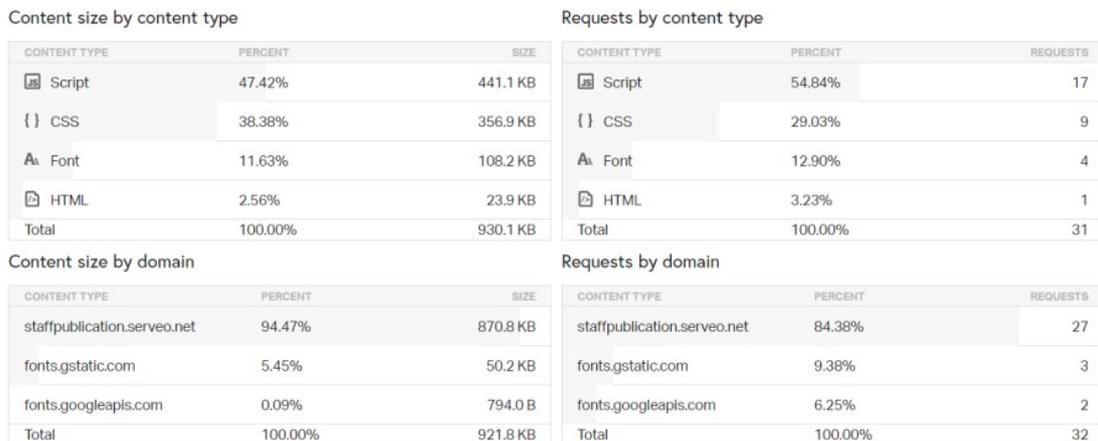


Fig. 20 - Content by type, size and domain

3.5 Android Performance

In order to analyse the Android application capability and performance, the application needs to be tested. ImmuniWeb mobile app scanner is used to get the result. Fig. 21 shows the mobile application audit summary.

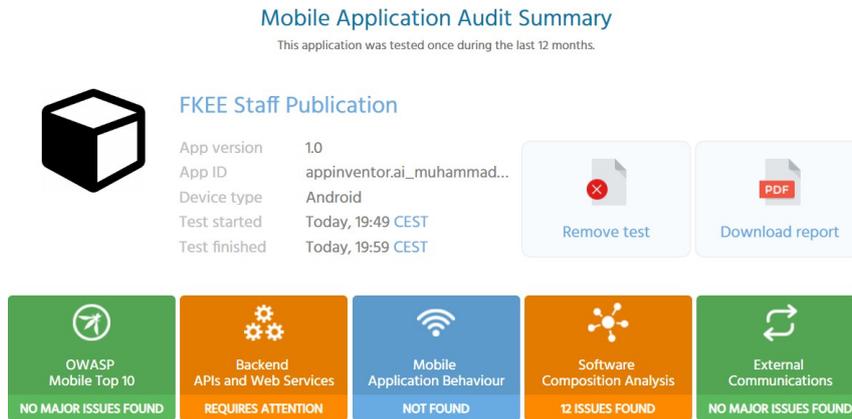


Fig. 21 - Mobile application audit summary

The important part of this test is automated audit revealed as shown in Fig. 22. It indicated 5 warnings, 3 low risks and 1 medium risk for the mobile application. One medium risk which is “usage of unencrypted HTTP protocol”. This risk is detected by SAST analysis. It tells that the mobile application used the HTTP protocol to send or receive data but the design does not provide any encryption of the transmitted data which can be easily intercepted if an attacker is located in the same network [10].



Fig. 22 - Automated audit revealed

4. Conclusion

As a conclusion, there is two (2) important part included in FKEE Staff Publication System which is a web-based system and Android application with a name StaffPub. The website system is designed such that only admin is allowed to login. Guest or user do not have access to the admin section and only can view and search the staff information. The purpose of this system is considered security issues. This is because they have a different role between admin and users. Admin is able to do everything on the system such as manage database, add a new document into system database, edit document information and delete document information. This feature is to prevent others to change the staff information from the system.

StaffPub is an Android application design for viewing purpose. This application is developed by using MIT App Inventor 2 that is a cloud-based which the application is built-in a web browser. It is an easy interface allowed users to

construct a functioning application without prior knowledge of any programming language [11] – [13]. Besides that, there are many tutorial and guide on the official site of MIT App Inventor 2 from the beginner level. All these tutorials are quite detailed and easy to understand. In order to use this application, the user needs to download the .apk file and installed on the Android device. This application does not give features to edit, add and delete the information of the staff. Therefore, admin and user have the same right on the Android application. The only way to edit, add and delete staff data are by using website system.

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