

Simple: Android Based Application for Thesis Defense Assessment

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ABSTRACT: The final thesis defense or proposal defense for electrical engineering students at Sultan Syarif Kasim State Islamic University (te-uin suska) is conducted in a small number of rooms managed by the faculty of science and technology. The scheduling and use of the room for the thesis defense in the electrical engineering study program (te-uin suska) have been arranged regularly, however, the manual calculation carried out shortly after completion of the defense turns out to require quite a long time and often makes the use of the room longer and as a result the schedule for the following students is delayed. This study designed and built application that run on the Android operating system to facilitate the calculation process. The applications developed in this study have been able to perform the fundamental tasks required to expedite the computation process, according to the findings of direct testing conducted using the User Experience Questionnaire (UEQ) approach.

KEYWORDS: Android application, Thesis defense, User experience questionnaire.

I. INTRODUCTION

As a graduation requirement, the electrical engineering study program of Sultan Syarif Kasim State Islamic University (te-uin suska) Riau implements two stages of review for examining student final assignments: the proposal defense and the final defense seminar. Each student must pass both the proposal seminar and final examination regardless of what project path they choose, as they are allowed to select between the thesis or publication tracks. Two examiners and one supervisor will participate in the proposal seminar activity; at the time of the final seminar, the number of examiners increased by one who also acted as chairman of the seminar. The assessment forms for examiners, supervisors, and chairpersons each use a unique form code and a different number of value items. Each value item has a percentage weight that varies depending on the type of form.

At each proposal or final seminar, the scores of the examining team(examining lecturers, supervisors, and chairman of the seminar) must be immediately calculated and informed to students so that students can find out whether they passed, failed or need to repeat. So far, the calculation process has been carried out manually from each examiner and supervisor, including the chairman of the seminar, the user must enter and type the value and percentage weight in the standard calculator application from the android operating system.

Manual calculations take a long time because of the large number of value items that must be typed, so far the calculation relies on the calculator application from the

Android operating system. The time used for manual calculations results in the duration of using the seminar room is longer than it should be and shifting back the schedule for the next student who will have a seminar.

The goal of this study is to create and implement an Android application that will facilitate the swift computation of grades in proposal and final seminar. Android was chosen because it is the most popular operating system used in mobile devices, as well as the most widely used globally [1-3].

The application built will reduce the burden of the calculation mechanism because the user only needs to type the value in the column provided and the application will calculate automatically. The user simply needs to retype the value in the designated column if a specific item changes, rather than entering all the values from the beginning.

II. RESEARCH METHODOLOGY

The following factors should be taken into account while developing Android applications: they should be easy to use and consistent [4], accessible from anywhere at any time[5], and customized as needed [6, 7]. Applications on Android are useful for education including training critical thinking [8], providing new experiences visually [9], and helping in supporting local tourist attractions [10]. Since 98% of the lecturers at te-uin suska use Android devices, the application developed for this study is determined for running in the Android operating system. The following conditions are taken into account when designing the application:

a. Calculating the applicable form types

Te-uin suska, the study program of electrical engineering, has never utilized an application or had a processing system based on mobile devices, Therefore, the planning for the mobile application is based on the existing manual assessment form. There are 11 types of manual forms currently available for the needs of the assessment system in the electrical engineering study program where the possibility of using each type of value form depends on the role, the final project path and the seminar stage to be carried out.

b. User's role

The available forms are categorized based on the role of the form user which is likely to be one of the 3 user roles namely examiner(penguji), supervisor(pembimbing), and chairman(ketua sidang) depending on the type of seminar as shown in Figure 1. Each type of seminar or trial will always have 2 examiners and use the same type of form, thus the form for the examiner is still counted as 1 type only.

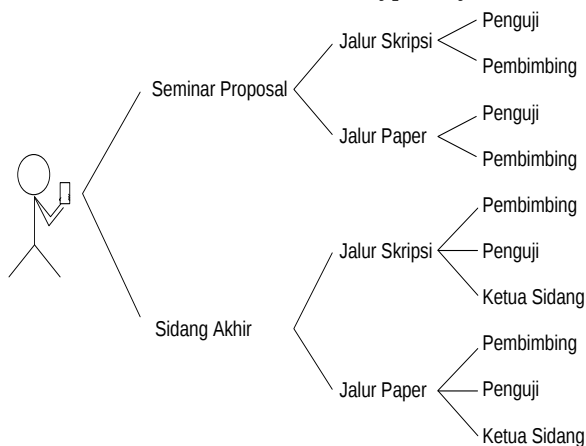


Figure 1. Possible role diagrams

c. Mobile application tool developer

The application was created using MIT App Inventor. MIT App Inventor is a free, web-based platform for creating mobile apps using a visual, block-based programming language. An important note if using mit app inventor is that in one application it is recommended to limit the use of screens to a maximum of only 10 screens even though it is possible to use more than 10 screens but risk the application will cease to operate and become nonfunctional. If each manual form code is displayed using one screen then as many as 11 screens are required in one application, and There is a significant chance that the application will operate strangely or not at all.

The method used so that 11 types of forms can be loaded in one application and not more than 10 screens, is to combine 4 forms loaded on one screen using a vertical arrangement as shown in Figure 2. The form that appears is set alternately by setting true and false values in the visible property as shown in Figure 3.

The main page of the application built in this study consists of 4 vertical arrangements, each of which contains an

application information page(welcome screen), a selection page(proposal defense or final defense), a proposal defense page, and thesis defense page as shown in Figure 2.



Figure 2. multi page settings in a screen

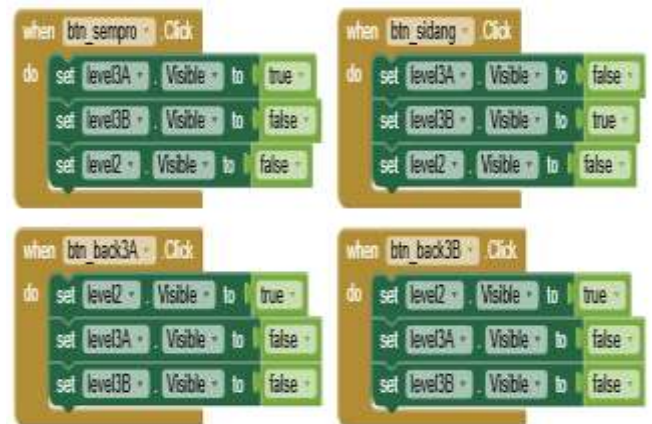


Figure 3. visible property adjustment in one screen

d. Features

The application created for this study is made to make it easy for users to calculate by just entering the value in the designated column. The type of mobile application suitable for this research is native apps in which the application can be installed on gadgets and no need for the internet connection whilst its operation, and the category is education [11]. In the current system, all grades will be recapitulated and copied in a physical form and the final grade will be stored by the final project coordinator on Google Drive. The application does not require data transfer between client and server and no login or password is required because the main function of the application is as a calculation tool.

III.RESULTS AND DISCUSSION

a. Result of application development

The welcome page of the application made in this study is shown in Figure 4. The program was tested on Android versions 6 through 13, and it worked as intended.



Figure 4. welcome page

The menu page for choosing the type of seminar(proposal or final defense) will appear as seen in Figure 5 if the user decides to move forward from the welcome page.



Figure 5. Seminar and trial selection page

The default thesis pathway or paper path, as depicted in Figures 6 and 7, are the two (two) final project mode options that must be offered for each proposal seminar or final trial testing stage.



Gambar 6. Menu page of proposal seminar

The final trial page contains a menu with more options because the role accessed by the user can be the chairman of the trial.



Figure 7. The final trial menu page

Figure 8 displays an example of a form that has been completed by the user. All the user has to do is enter each value item's numerical value in the application's designated column. The user does not have to write the weight number because each value item's percentage weight is permanent. The application will compute the multiplication between the weight and the raw score, and the results will be shown right away in the right column. Additionally, the program computes and shows each category's sub-total to make the data on the form easier to see.

TUGAS AKHIR JALUR PAPER			
	Skor	Bobot	Nilai Akhir
1. PELAKSANAAN SEMPRO (30 %)			
a) Pemahaman mahasiswa terhadap substansi paper	75	10 %	7.5
b) Kecakapan menjawab pertanyaan dan mempertahankan argumen	68	10 %	6.8
c) Kecakapan memanfaatkan waktu secara efektif	70	5 %	3.5
d) Penampilan, Sikap, Etika	70	5 %	3.5
SUB TOTAL			21.3
2. DOKUMEN DRAFT PAPER (70 %)			
a) Relevansi (Kesesuaian dengan bidang ilmu konsentrasi)	80	10 %	8
b) Kontribusi (Signifikansi dan manfaat penelitian di bidang terkait)	75	10 %	7.5
c) Abstrak (Menggambarakan keseluruhan paper : masalah, metode, hasil dan kesimpulan)	80	5 %	4
d) Problem statement (Mengidentifikasi kesenjangan masalah saat ini dengan tujuan yang ingin dicapai)	70	15 %	10.5
e) Metode (Jelas dan detail)	80	15 %	12
f) Hasil (Memaparkan semua temuan penelitian secara lengkap dan dilengkapi analisis merujuk pada literatur)	80	10 %	8
g) Kesimpulan (Memuat temuan penelitian dan pembahasan singkat)	80	5 %	4
SUB TOTAL			54
TOTAL AKHIR			75.3

Figure 8. The form that has been filled out

b. Application performance evaluation

The UEQ (user experience questionnaire) approach will be used to measure the application's performance and viability using assessment factors [12-14] that are more appropriate (decent) for the kind of product—Android applications, however, the original terms of the variables are still written so as not to reduce the actual meaning as shown in Table 1.

Respondents in the questionnaire were te-uin suska lecturers totaling 17 people or 80% of the total number of electrical engineering lecturer members who directly used the application on their devices in the study's finding. Five categories—poor, less, fair, good, and excellent—are used to quantify respondent feedback. The quantification is done in plain language to save respondents time and effort when evaluating the application.

The cumulative sum of the numbers in each column will always be the same since the numbers in the table indicate the number of lecturers who assign the same category value to the same column (scale).

Table 1 shows that the visual design of the application is good, 70.5% of the respondents find it easy to operate the application and fun. The perspicuity scale value is calculated as 94.1%, which means that respondents can easily understand all the functions and navigation available in the application. Since the application developed in this study has never been used in electrical engineering, the novelty value is 100%, which makes sense. The data also reveals that respondents reported that the application's 100% efficiency indicates that it operates swiftly and practically aids respondents in calculations.

The computation functionality is the main focus of this straightforward application, which excludes more complex functions like printing and direct document storage to the drive. The features offered, according to the respondents, were sufficient for the circumstances of the electrical engineering study program at the time. Respondents' suggestions for more sophisticated functionality can be incorporated into the creation of applications for the upcoming edition.

Table 1

Parameter Quality	Visual Design (Simulation)	Functionality (Perspicuity)	Features (Dependability)	Inventive (Novelty)	Processing Time (Efficiency)
Poor					
Less			1		
Fair	4		3		
Good	12	16	11		17
Excellent	1	1	2	17	

CONCLUSIONS

This “simpler” application has been able to meet the needs of a special calculation tool application for final project assessment in the electrical engineering study program. It has been installed and used by lecturers in calculating grades when attending seminars and trials. With a quality rating of “Good” and a visual appearance percentage of greater than 70%, the application has been confirmed and approved by academics. It has also been deemed original and novel by 100% of respondents.

Further development of the application is the addition of features such as digital signatures on the grade form, sending forms to the electrical engineering department drive, digital printing with pdf format, search features based on student names, and so on, nevertheless, to add these features must consider urgency and necessity. The application developed

for this study has so far been successful at resolving the issues that motivated it.

REFERENCES

1. D. Chukwuebuka Joseph Ejiyi, Jianhua Deng, Thomas Ugochukwu Ejiyi, Adetunji A Salako, Makuachukwu B Ejiyi, Chinonso G Anomihe, “Design and Development of Android Application for Educational Institutes,” ICCSIE 2020 *Journal of Physics: Conference Series*, 2021. doi:10.1088/1742-596/1769/1/012066.
2. Aldo Saputra, Teddie Darmizal, Novriyanto, Pizaini, “Development of Electronic Health Record System for Mobile-Based Medical Service Application in Pekanbaru Military Hospital,” *Engineering and Technology Journal*, vol. 9, no. 6 pp. 4268-4275, 2024. doi : 10.47191/etj/v9i06.13, I.F. – 8.227
3. S K. Shah, H. Sinha, and P. Mishra, “Analysis of CrossPlatform Mobile App Development Tools”, 2019 *IEEE 5th International Conference for Convergence in Technology*, I2CT 2019, Mar. 2019, doi: 10.1109/I2CT45611.2019.9033872.
4. H. F. El-Sofany, S. A. El-Seoud, H. M. Alwadani, and A. E. Alwadani, “Development of Mobile Educational Services Application to Improve Educational Outcomes using Android Technology”, *Int. J. Interact. Mob. Technol.*, vol. 8, no. 2, pp. pp. 4–9, Apr. 2014.
5. Carlos A. Villanueva, Kristoffer Camille A Cacayuran, Emely A Munar, "Android-Based Mobile Grade Viewer Application Using PHP," 2021 *IEEE 13th International Conference on Humanoid, Nanotechnology, Information Technology, Communication and Control, Environment, and Management* (HNICEM), 2021. doi: 10.1109/HNICEM54116.2021.9731936
6. Zulfiqar Ali, Roslan Ismail, "Design and Development of Android Mobile Application for Students of Engineering Education in Saudi Arabia," *International Conference on Information Society(i-Society)*, Toronto, pp. 228-233, October 2013.
7. Wawan Gunawan, "Pengembangan Aplikasi Berbasis Android Untuk Pengenalan Huruf Hijaiyah," *Jurnal Informatika*, vol. 6, no. 1, pp. 69-76, 2019.
8. B. Isrokatun I, Hanifah N, Abdul YR, Rosmiati R. Khoerunnisah R, “The Development of Android-Based Learning Mobile App to Practice Critical Thinking Skills for Elementary School Students”, *Pegem Journal of Education and Instruction*, vol. 13, no. 2, pp. 161-172, 2023.
9. Rabihi Awaludin, “Perancangan Aplikasi Wisata Virtual Untuk Pemulihan Ekonomi Kawasan Wisata Pantai Pangandaran di Masa Pandemi,” *Jurnal Sistem Cerdas*, vol. 04, no. 02, pp. 95 - 103, 2021.
10. Muhammad Ammar Robbani, Yusep Rosmansyah, “Rancang Bangun Aplikasi Mobile Virtual Tour Menggunakan Foto 360° dengan Objek Penelitian Museum Nasional,” *Jurnal Sistem Cerdas*, vol 04, no 01, pp. 43 - 55, 2021.
11. Harleen K. Flora, Xiaofeng Wang, Swati V. Chande, “An Investigation on the Characteristics of Mobile Applications: A Survey Study,” *I.J. Information Technology and Computer Science*, vol. 11, pp. 21-27, October, 2014. doi:10.5815/ijitcs.2014.11.03.
12. Martin Schrepp, “User Questionnaire Handbook Ver. 11,” 2023.
13. M.P. Eugenia, L. R. Maghfiroh, "The Lean User Experience (Lean UX) Approach in the Redesign of the SOBAT BPS Application ," *International Conference on Data Science and Official Statistics* , 2023. [Online]. Available: <https://proceedings.stis.ac.id/icdsos/article/download/398/115/3359>
14. J. Nielsen, “Severity Ratings for Usability Problems: Article by Jakob Nielsen,” Nielsen Norman Group. p. 1, 1995.[Online].Available: <https://www.nngroup.com/articles/how-to-rate-theseverity-of-usability-problems/>