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Usability Evaluation of The Android Operating System Using Use Questionnaire

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ABSTRACT

Usability aspects are used as a reference in measuring the level of usability of the Android operating system. Usability is important to use as an instrument to ensure an application can be useful according to user needs. This study aims to evaluate the usability of the Android operating system for users at universities. This study uses a use questionnaire that has aspects of effectiveness, efficiency, and satisfaction. Researchers used questionnaires with respondents at universities using the Android operating system for smartphone devices with 13 attributes of the questions asked. After obtaining the data, further analysis was carried out using the Likert scale method to obtain the percentage of usability values on the Android operating system at the University. Usability measurement results show that all attributes have usability by the user, the average value is above 3, so it can be said that the android operating system used by the user already has a good usability aspect value. This study concludes that the android operating system with users at universities has a good adoption rate caused by easier use, ease to learn, and a good level of user satisfaction.

Keywords: android, operating system, university, usability, use questionnaire

INTRODUCTION

Android is one of the most widely used operating systems in the world. This Linux-based operating system is intended for mobile devices such as smartphones and tablet computers. Android provides an open platform for developers to create various applications for use on mobile devices. The number of users of the Android operating system is certainly influenced by the level of usability that this operating system has. Usability testing is an attribute to assess how easy something is to use. Usability is part of the multi-disciplinary field of Human-Computer Interaction (HCI) (Hertzum, 2020). Usability comes from the word usable which means it can be used well (Barnum, 2020). It refers to how users can use something to achieve a goal and their satisfaction with using it. Usability is very important to ensure an application or system can be utilized properly and provide the right benefits according to its designation. This will encourage the system to be adopted continuously (J R Batmetan, 2018).

High usability has a close relationship with the popularity and high utilization of the system or software by users in achieving their goals. Usability testing has the benefit of collecting feedback objectively from usability such as user satisfaction as well as in terms of the interface and features used (Johan Reimon Batmetan et al., 2019). Usability measurement has several aspects, namely efficiency, effectiveness, and satisfaction (John Reimon Batmetan et al., 2020). Usability has five aspects of usability or five usability attributes, namely: 1) Easy to learn, System quality which indicates whether the system is easy to learn and use in completing certain tasks. 2) Efficiency, the way the system can support users in doing their work, has simple steps to get the same results. 3) Easy to remember (memorability), The ability of the system to be easy to remember, both in terms of features or existing menus and how to operate. 4) Errors and security (errors) Protection and assistance to users against unwanted and dangerous conditions and situations when operating the system, for example: help menu to provide solutions, and confirm file deletion. 5) Satisfaction Refers to a situation where users feel satisfied after using the system because of the ease with which the system has. The more users like a system, the more they are implicitly satisfied with the system in question (Sanderegger et al., 2016). These aspects and criteria will be the reference in this study.

The main problem that occurs is the level of adoption of the Android system with many users at universities in developing countries. The slow rate of internet penetration and the lack of information technology infrastructure have resulted in a low level of information technology adoption. However, the growth of smartphone use is quite high. This happens because the need to communicate and access information is a major need in universities. Smartphones are an important choice because they are cheap and affordable to the public and users at universities in developing countries. The main choice of smartphone users is a smartphone that has high flexibility, is compatible with various devices, is easy to use, and is widely available. Thus, smartphones with the Android operating system are the most widely used choices in universities. Smartphones are widely used in universities to access various applications including m-learning provided at universities (Sumual et al., 2019). Therefore, it is very important to evaluate the usability of the Android

operating system to ensure the right strategy that can be used by universities in providing the right technology, especially mobile-based ones.

This study aims to measure the usability of the Android Operating System at the University. The questionnaire that will be used is the Use Questionnaire which has several aspects according to Ido, namely efficiency, effectiveness, and satisfaction. This questionnaire was made in the form of a five-point score using a Likert scale model. To measure the level of the user agreement on the statement of measurement results, then it is processed by descriptive statistical methods, and an analysis is carried out either on each parameter or on all parameters. The respondents themselves include lecturers, staff, and students at the University. This research is expected to provide a comprehensive evaluation of the usability of the Android operating system used on smartphones.

METHOD

Population and Sample

A population is a group or collection of individuals or objects of research that have certain standards of characteristics that have been previously determined. The number of respondents involved in this study was 28 respondents from a population, namely lecturers, staff, employees, and students at the Manado State University.

Method of collecting data

The primary data collection method was carried out by distributing questionnaires through google forms to obtain data. In this study, researchers used a Likert Scale. The Likert scale is a psychometric scale that is most widely used in research in the form of surveys. This scale is named after Rensis Likert, who published a report explaining the use of this scale.

When responding to questions on a Likert scale, respondents determine their level of agreement with a statement by choosing one of the available options. Usually, five scale options are provided with a format such as 1 = Very Difficult (VD), 2 = Difficult (D), 3 = quite Easy (QE), 4 = Easy (E), 5 = Very Easy (VE).

To get data that are ordinal and scored as in table 1.

Table.1 Value Weight

VD	D	QE	E	VE
1	2	3	4	5

In this study, the initial step taken was to identify the problem, then an initial study/library study related to Usability Testing was carried out.

RESULTS AND DISCUSSION

In this study, researchers distributed questionnaires to lecturers, staff employees, and students at the University which contained 13 questions that already represented the five aspects of usability using google forms media. Users fill out questionnaires that have been distributed based on their experiences (what they see and feel) when using the Android operating system. Each question from the questionnaire has the aim of measuring the level of usability according to user acceptance, which will then be assessed using a Likert scale. These questions have represented the five aspects of usability, including learnability, efficiency, memorability, errors, and satisfaction.

From the questionnaires that have been given to the respondents, the data were analyzed using the Likert-scale model. See table 2.

Index formula % = Total Score / Y x 100%

Y = Highest score likert x number of respondents (Highest Number 5) "Pay attention to the weight of scores"

X = lowest score likert x number of respondents (lowest number 1) "Pay attention to the weight of scores"

Table 2. Presentase Nilai

Answer	Description
0 % - 19.99 %	Very Difficult (VD)
20 % - 39.99 %	Difficult (D)
40 % - 59.99 %	quite Easy (QE)
60 % - 79.99 %	Easy (E)
80 % - 100 %	Very Easy (VE)

The highest total score for the VERY EASY item is 5 x 30 = 150, while the LESS EASY item is 1 x 30 = 30. So, if the respondent's total score is 150, then the assessment of the respondent's interpretation of the Android operating system is the result of the highest score. generated using the Index % formula.

Usability Test Analysis

After distributing the questionnaires to 30 respondents, then a recapitulation of the results of the questionnaires was carried out. See table 3.

Table 3. Usability Value

No	Questions	Percentage value	Description
1	Is the appearance of the Android operating system easy to deal with?	84 %	VE
2	Is the Android operating system easy to operate?	82 %	VE
3	Is the color display on the Android operating system good to look at and not boring?	77.3 %	E
4	Is the menu display on the Android operating system easy to recognize?	80.6 %	VE
5	Is the page application on the Android operating system easy to find?	79.3 %	E
6	Are the applications on the Android operating system easy to read?	82 %	VE
7	Is the application needed easy to download?	77.3 %	E
8	Are the image symbols (icon) easy to understand?	74 %	E
9	Is it easy to access product information on offer?	77.3 %	E
10	Are the specifications of the products offered in accordance with the needs?	68 %	E
11	Are the available payment transaction applications easy to access?	67.3 %	E
12	Is access to information on each page secure?	60.6 %	E
13	Is the menu and display of the android information system easy to remember?	80 %	VE

The table above shows the value of user satisfaction/acceptance (acceptance) for each question item posed. It can be seen that the "Android display is easily recognizable" has a percentage value of 84% (already above 3 / above the middle value) on the Likert scale. This means that the Android operating system is easily recognized by the user in terms of the interface.

If it is adjusted to each usability aspect in table 2, the data says that the Android operating system already has very good usability values, namely, learnability, efficiency, memorability, errors, satisfaction. This is indicated by the value of usability results on the five attributes as follows

a. The attribute value "Easy to recognize android interface" is 84% which indicates that Android already has a Learnability aspect value.

b. The attribute value of "Android's ease of operation" of 82% indicates that Android already has an Efficiency aspect value.
c. The attribute value "Easy to recall menus and displays on Android" of 80.6% indicates that Android already has a Memorability aspect value.
d. The attribute value "Easy Android application is easy to read" is 82% and the attribute "Picture symbols are easy to understand" is 74%, so Android can be said to have minimized the Errors aspect.
e. And from all the attributes that have an average value above 3, it shows that Android has a good Satisfaction aspect.

The results of this study indicate that the android operating system already has a good level of usability for users at universities. This shows that the Android operating system is easy to learn, has a display that is easy to remember, and is also has easy in operating. The Android operating system can minimize errors that appear and ensure security on the pages that are displayed. This shows that usability has an important role in helping users to adopt a technology (I Wayan Yudha Saputra Nancy Runtukahu, 2021). This also shows that usability can be used to ensure the security of information from the user's side so as not to make mistakes caused by low user knowledge (Franco Turangan Krina Mawuntu, 2021) (Christinne M. T. P. Subagyo Yunitha R. Sumarandak, 2021). In addition, the system being evaluated should have a better acceptance rate for usability tests to ensure that the system can be used continuously in the future (Klug, 2017). One indicator that can be used as a reference is eye-tracking which is useful for knowing the point where the user can pay attention and focus on certain areas that have been built on the system (Wang et al., 2019) (Babicsné-Horváth & Hercegfi, 2022). This will build a better user experience so that a system can be built according to user needs and user experience (Hertzum, 2020). University users have diverse but unique needs, experiences, and knowledge bases because they are always related to access to information on unique learning resources. This requires a variety of academic applications that support learning, research, and community service. This makes usability tools very important for continuously evaluating applications that are used both web-based, desktop, and mobile. Mobile devices have become the main choice because they are more flexible, easy to use, and simple (Kuhnel et al., 2018). Therefore, usability testing is important to be applied to various mobile applications at universities (Ahmad & Hussaini, 2021) (Fuller-Tyszkiewicz et al., 2018). The results of this study indicate that the Android operating system has a good acceptance rate with indicators that are easy to remember, easy to learn, and more efficient. This is very important to be used as a basis for planning and implementing various applications at the university which will later be used by students, lecturers, and employees at the university.

CONCLUSION

This study concludes that usability measurements show that all attributes have the usability of the user, the average value is above 3, so it can be said that the android operating system used by the user already has the Usability aspect value and is widely used by the public because Android

is very easy to learn and understand by users. The results of the study concluded that the Android Operating System already has Usability aspects, it is hoped that users can take advantage of this operating system better, to make it easier to support daily activities.

REFERENCES

Ahmad, N. A. N., & Hussaini, M. (2021). A Usability Testing of a Higher Education Mobile Application Among Postgraduate and Undergraduate Students. *International Journal of Interactive Mobile Technologies*, *16*(9).

Babicsné-Horváth, M., & Hercegfi, K. (2022). Methodological Challenges in Eye-Tracking based Usability Testing of 3-Dimensional Software–Presented via Experiences of Usability Tests of Four 3D Applications. *Periodica Polytechnica Social and Management Sciences*.

Barnum, C. M. (2020). *Usability testing essentials: ready, set... test!* Morgan Kaufmann.

Batmetan, Johan Reimon, Mintjelungan, M. M., Manggopa, H. K., Kilis, B. M. H., & Kembuan, D. R. E. (2019). Usability evaluation of adaptive features in e-learning. *5th UPI International Conference on Technical and Vocational Education and Training (ICTVET 2018)*, 127–129.

Batmetan, John Reimon, Komansilan, T., & Mamonto, J. (2020). Pengukuran Usability Sistem Operasi Android Menggunakan Use Questionaire Di Universitas Negeri Manado. *Ismart Edu: Jurnal Pendidikan Teknologi Informasi*, *1*(01).

Christinne M. T. P. Subagyo Yunitha R. Sumarandak, M. E. L. S. (2021). Comparative Study of Antivirus Adoption Rates on Smartphone-Based Operating Systems. *International Journal of Information Technology and Education*, *1*(1), 108–115.

Franco Turangan Krina Mawuntu, D. A. U. (2021). Comparative Study of Android Smartphone-Based Antivirus Performance Using the TAM Method. *International Journal of Information Technology and Education*, *1*(1), 59–67.

Fuller-Tyszkiewicz, M., Richardson, B., Klein, B., Skouteris, H., Christensen, H., Austin, D., Castle, D., Mihalopoulos, C., O'Donnell, R., & Arulkadacham, L. (2018). A mobile app–based intervention for depression: End-user and expert usability testing study. *JMIR Mental Health*, *5*(3), e9445.

Hertzum, M. (2020). Usability Testing: A Practitioner's Guide to Evaluating the User Experience. *Synthesis Lectures on Human-Centered Informatics*, *13*(1), i–105.

I Wayan Yudha Saputra Nancy Runtukahu, G. W. (2021). Measurement of Usability Online Storage in Cloud Computing for University Users. *International Journal of Information Technology and Education*, *1*(1), 36–42.

J R Batmetan, V. R. P. (2018). Higher Education Students' Behaviour to Adopt Mobile Learning.

The International Conference on Innovation in Engineering and Vocational Education,The 2nd ICIEVE 2017, *2*(2017).

Klug, B. (2017). An overview of the system usability scale in library website and system usability testing. *Weave: Journal of Library User Experience*, *1*(6).

Kuhnel, M., Seiler, L., Honal, A., & Ifenthaler, D. (2018). Mobile learning analytics in higher education: usability testing and evaluation of an app prototype. *Interactive Technology and Smart Education*.

Sonderegger, A., Schmutz, S., & Sauer, J. (2016). The influence of age in usability testing. *Applied Ergonomics*, *52*, 291–300.

Sumual, H., Batmetan, J. R., & Kambey, M. (2019). Design sprint methods for developing mobile learning application. *KnE Social Sciences*, 394–407.

Wang, J., Antonenko, P., Celepkolu, M., Jimenez, Y., Fieldman, E., & Fieldman, A. (2019). Exploring relationships between eye tracking and traditional usability testing data. *International Journal of Human–Computer Interaction*, *35*(6), 483–494.