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ANALYSIS OF UI & UX DRIVER MOBILE SYSTEM USING HEURISTIC EVALUATION METHOD

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Abstract— *In the 4.0 era, user interface and user experience are considered key factors in the development of digital products, especially mobile applications. The progress and performance of the application is facilitated by the user interface and user experience applied to the application. Apart from presenting an attractive application appearance, implementing a user interface and user experience for an application makes using the application easier. DMS Mobile is an information system application used by drivers which is an information system application that is easy to use for drivers to run their work activities smoothly. Testing the user interface and user experience with the user experience, in this case the driver, can be a reference for assessing the DMS Mobile application. In this user aspect approach, the researchers carried out an evaluation through a questionnaire which would be answered by respondents from PT drivers. Seino Indomobil Logistic with simple random sampling. From the research results that need to be improved, namely the criteria for User control and freedom and Flexibility and efficiency of use which still have minimal percentages. The results obtained from calculations using the heuristic method are, the age criteria of respondents aged 18 - 25 years have a percentage of 9.2% of the total respondent data, while the second is that the age of respondents is 26 - 33 years with 46.1%, and the age criteria of respondents lastly at 34 – 40 years with 44.7%.To improve it, the author used several steps, namely improving the user interface (UI), and user testing to improve the interface so that it is easier to use.*

Keywords**:** *DMS Mobile , Driver, Evaluation, Heuristic, UI, UX.*

Intisari— Di era 4.0, *user interface* dan *user experience* dianggap sebagai faktor kunci dalam perkembangan produk digital, khususnya aplikasi mobile. Progres dan performa dari aplikasi dimudahkan dengan adanya *user interface* dan *user experience* yang di terapkan pada aplikasi. Selain mempresentasikan tampilan aplikasi yang menarik, penerapan antar muka pengguna dan pengalaman pengguna untuk suatu aplikasi membuat penggunaan aplikasi menjadi lebih mudah. DMS Mobile sebagai aplikasi sistem informasi yang digunakan oleh pengemudi (driver) yang menjadi aplikasi sistem informasi yang mudah dipergunakan untuk kelancaran pengemudi dalam menjalankan aktivitas pekerjaan. Pengujian *user interface* dan *user experience* dengan pengalaman pengguna (user) dalam hal ini adalah pengemudi (driver) dapat menjadi acuan penilaian terhadap aplikasi DMS Mobile. Pendekatan aspek pengguna tersebut peneliti melakukan evaluasi melalui kuesioner yang akan dijawab oleh responden dari driver PT. Seino Indomobil Logistic dengan simple random sampling. Dari hasil yang penelitian yang perlu diperbaiki yaitu pada kriteria *User control and freedom* dan *Flexibility and efficiency of use* yang masih memiliki persentase yang minim. Hasil yang didapat dari perhitungan menggunakan metode heuristic yaitu, pada kriteria usia reponden usia 18 – 25 tahun memiliki persentase 9,2% dari keseluruhan data responden, adapun yang kedua terdapat usia responden 26 – 33 tahun dengan 46,1%, dan kriteria usia responden terakhir pada 34 – 40 tahun dengan 44,7 %. Untuk memperbaikinya penulis menggunakan beberapa langkah yaitu penyempurnaan antar muka pengguna (UI), dan user testing untuk memperbaiki antar muka sehingga lebih mudah digunakan.

Kata Kunci: Pengemudi, DMS *Mobile*, *Heuristic, , Evaluation, UI*, *UX,*

INTRODUCTION

In the current 4.0 era, (ICT) and science are experiencing very rapid developments in the ease with which we can carry out all kinds of activities (Tedd and Large 2020). Almost all organizations, companies and governments carry out activities using Information and Communication Techniques (ICT) which have gone through digitalization in every service. In the last 5 years, its use (ICT) has grown very rapidly in Indonesia. The development of indications for utilizing ICT shows the very rapid development of ICT indications (Sutarsih 2020). In its rapid development (ICT), of course it has an influence on various company sectors, as for important things that require Information and Communication Technology (ICT) with application systems with actual and structured data, one of which is PT. Seino Indomobil Logistic.

PT. Seino Indomobil Logistic is a service and services company in the logistics sector located on Jl. Lt. Gen. M.T. Haryono No. Kav. 8, RW.6, Kp. Malayu, District. Jatinegara, East Jakarta City which continues to develop in the era of digitalization 4.0. The use of information system applications is an important role in carrying out service and service activities in the current era. This application can also be accessed by every registered driver according to the NIK they already have. The application is Driver Management System (DMS Mobile)

DMS Mobile is an information system application used by drivers which must be an information system application that is easy to use and effective for drivers to carry out their work activities smoothly and has informative value (Hartawan 2021). Testing the user interface and user experience with user experience, in this case the driver, can be a reference for assessing the DMS Mobile application. A user interface and user experience that are rated as good will also establish a good correlation between the user and the information system application that is created (Wijaya et al. 2021). Apart from that, the user interface (UI) and user experience (UX) also focus on the user and the user's response to the system can be seen from their emotions, behavior and the value they get from interacting with the system If the user is uncomfortable and has difficulty using an information system application, it can be said that the DMS Mobile information system application has the potential to fail. The user aspect approach can be used in analyzing (UI) and (UX) in the DMS Mobile application (Rahmawan and Krisnanik 2023).

In its application (Wasiati and Sudarmanto 2022), there are 10 principles of Heuristic Evaluation which are usually used as guidelines when examining user needs with standard interfaces, namely, Visibility of system status, Match between system and the real world, User control and freedom, Consistency and standards, Error prevention, Recognition rather than recall, Flexibility and efficiency of use, Aesthetic and minimalist design, Help users recognize, diagnose, and recover from errors and Help and documentation which will later be selected as the basic requirements of the analysis process whether the interface is in accordance with existing principles (Adinegoro, Aziza, and Mufhadhal 2022). Furthermore, to find out more about the problems with this application, usability was carried out by filling out a questionnaire with predetermined respondents. Respondents will answer by choosing between 0 - 1.0 points (bad - excellent) which indicates whether the usability level is good or not. In this research the Heuristic Evaluation method is used to analyze the user interface. So it is hoped that the results obtained from UI/UX analysis will be more focused and specific with related methods and will be able to determine the success of UI/UX (Fitriana, Yanto, and Budiman 2020) .

Based on the description above, researchers conducted research related to Analysis (UI) and (UX) of the DMS Mobile Application using the Heuristic Evaluation method at PT. Seino Indomobil is informative and effective in carrying out work processes.

MATERIALS AND METHODS

The object of this research is the measurement of the UI and UX of the DMS Mobile Application based on the method, namely Heuristic Evaluation at PT. Seino Indomobil Logistics. There are 10 test instruments which are the main components of The testing process is heuristic evaluation, namely :

1. *Visibility of System Status*: emphasizes the importance of providing clear and understandable information to users regarding the system status and activities being carried out.
2. *Match Between System and The Real World*: is a tool to assess whether the application uses language that includes words, phrases and concepts that are close to the user.

3. *User Control and Fredoom*: is a means to assess whether the user can freely use the application, for example no processes are imposed on the user and can be canceled and repeated.

4. *Consistency and Standards*: is a tool to assess whether users do not encounter words and icons with confusing meanings when using the application, which causes user errors.

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5. *Error Prevention*: is a tool used to evaluate how well an application can handle or prevent user errors

6. *Recognition Rather Then recall*: is a tool that helps determine whether the software can minimize the user's memory of the meaning of an image, description, or option.

7. *Flexibility and Efficiency of Use*: this is a tool to increase knowledge of whether the software can speed up work and if there are shortcuts in the process.

8. *Aesthetic and Minimalist Design*: is a tool to see whether the application being created has parts of the menu, information and parts that are not very important for the user's needs.

9. *Help Users Recognize, Diagnose and Recover from Errors*: this testing tool aims to see whether the application can display error messages and provide information to resolve them.

10. *Help and Documentation*: to increase knowledge about whether the software can be used, you don't have to read the user manual and find information easily.

Data collection is a systematic and strategic step whose aim is to obtain the data needed. Data collection techniques are a process in research and are an important part (Andrean Ilham Nur Yahya 2022). Research is best done with data. There is a connection between the data collection method and the research question to be solved. The problem is directional and can affect how data is collected. Data collection as a sample was carried out using several methods (Resa and Wardani 2022).

According to (PILENDIA 2020), interviews are a technique for collecting data by asking several questions related to research to predetermined sources. Interviews in this research were conducted to obtain information and data needed to analyze the DMS Mobile application. Based on the results of the interviews conducted, the author obtained information related to:

1. A more detailed description of the problems faced by DMS Mobile application users

2. Workflow process from the DMS Mobile application

3. Information about problems encountered during the development process related to the UI and UX of the DMS Mobile Application itself.

Interviews in this research were carried out by meeting directly with respondents, where the respondents were drivers or logistics drivers who used this application, by providing questionnaire material to be filled in directly to obtain the necessary information and data (Tristiyanto et al. 2020). For this research, respondents were focused on logistics drivers based on the type of random sampling technique from the drivers that the author found in their room, with a total of 100 respondents (Subhan and Indriyanti 2021).

In this research, the questions given to (respondents) refer to 10 instruments contained in the Heuristic Evaluation method including Visibility of system status, Match between system and the real world, User control and freedom, Consistency and standards, Error prevention, Recognition rather than recall, Flexibility and efficiency of use, Aesthetic and minimalist design, Help users recognize, diagnose, and recover from errors, Help and documentation. The aim of this research questionnaire is to increase knowledge of the assessment of the DMS Mobile application currently running.

A questionnaire is a series of question instruments which are arranged based on the research variable measuring instruments, collecting data using a questionnaire properly, the respondent only chooses the answers that are already available (Sugiyono 2020). For this research, respondents were selected based on the type of sampling technique (sampling technique). The questionnaire was carried out online using media to obtain responses from respondents. The aim of this research is to increase knowledge of the current value of the DMS Mobile application and identify user needs to be used as recommendations for future DMS Mobile application developers (Zibaei and Mesgari 2023).

Data analysis is data that has been processed so that the results obtained are easy for readers to understand (Sutarsih 2020). Data analysis was carried out using data collection techniques. The results of the evaluation of problems or errors found by the evaluator are grouped according to the heuristic evaluation problem. The results are managed using a statistical analysis method using percentages, to find the heuristic evaluation score of the largest or highest problem.

RESULTS AND DISCUSSION

The response from DMS Mobile Application users is that the application is considered to be sufficient in providing clear information on various menus and features, where clear information regarding the use of the application itself is very important for users in carrying out activities in the application.

Criteria for Visibility of system status

Visibility of System Status refers to how well the system provides feedback to the user about what is

happening, the status of ongoing processes, and the overall condition of the system.

In table 1 with the Visibility of system status criteria with 3 specific questions and 76 respondents above, it is obtained that the application must always provide information to the user about what is happening, through responding well within a reasonable time.

Table 1. *Criteria for Visibility of system status*

No	Criteria	Total Score	Percentage
Q1	Visibility of	294	77,4
Q2	System	293	77,1
Q3	status (H1)	307	80,8
	Total Criteria		78,4 Good

Source : (Research Result, 2024)

Criteria match between system and the fact

Match between system and the fact is the match between the system and the fact, referring to the extent of the system or user interface (UI). The goal is to make the system more intuitive and easy for users to understand in their daily use of the system.

Based on the criteria for match between system and the real world with 3 specific questions and 76 respondents above, it was found that the application must have a match between the system and the real world. The application must be able to speak the user's language, with words and concepts that are familiar to the user rather than using application terms with table 2.

Table 2. *Criteria match*

No	Criteria	Total Score	Percentage
Q4	Match between	324	85,26
Q5	system and	344	90,53
Q6	the real world (H2)	350	92,11
	Total Criteria		89,30 Very Good

Source : (Research Result, 2024)

Criteria User Control and Freedom

User Control and Freedom are user interface design principles that emphasize the importance of giving users full power to control and manage their experience when using a product or service.

Based on the user control and freedom criteria with 3 specific questions and 76 respondents above, it was found that the application has an "Emergency Exit" option when the user selects the wrong function accidentally and leaves it in an undesirable condition without having to go through a long dialogue in table 3.

Table 3. *Criteria User Control and Freedom*

No	Criteria	Total Score	Percentage
Q7	User	182	47,89
Q8	control and	156	41,05
Q9	freedom (H3)	182	47,89
	Total Criteria		45,61 Enough

Source : (Research Result, 2024)

Consistency and standards criteria

Consistency and standards criteria refer to user interface design principles that emphasize the importance of consistency in design elements and the use of industry standards. These criteria help ensure that users have experience using the application.

In the consistency and standard criteria with 3 specific questions and 76 respondents above, it was found that users do not have to think whether words, situations and actions that are not the same actually have the same meaning. The standard is closely related to the user's ability to carry out activities with table 4.

Table 4. *Consistency and standards criteria*

No	Criteria	Total Score	Percentage
Q10	Cosistency	296	77,89
Q11	and	311	81,84
Q12	stadndards (H4)	311	81,84
	Total Criteria		80,53 Very Good

Source : (Research Result, 2024)

Error Prevention Criteria

Error Prevention Criteria is a user interface design principle that aims to reduce the possibility of errors by users when using a product or service.

Based on the error prevention criteria with 3 specific questions and 76 respondents above, it was found that the application was designed to overcome user errors in using the application by using the confirmation option in table 5.

Table 5. *Error Prevention Criteria*

No	Criteria	Total Score	Percentage
Q13	Error	269	70,79
Q14	Preventioncriteria	336	88,42
Q15	(H5)	324	85,26
	Total Criteria		81,49 Very Good

Source : (Research Result, 2024)

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Recognition rather than recall criteria

Recognition rather than recall criterion is a user interface design principle that emphasizes the importance of providing instructions or information that is easily recognized or accessed by users.

Based on the recognition rather than recall criteria with 3 specific questions and 76 respondents above, it was found that the application had a clear choice. Each action clearly makes it easier for users to use the application in table 6.

Table 6. *Recognition rather than recall criteria*

No	Criteria	Total Score	Percentage
Q16	Recognisi rather than recall (H6)	270	71,05
Q17		268	70,53
Q18		274	72,11
	Total Criteria		71,23 Good

Source : (Research Result, 2024)

Flexibility and efficiency of use criteria

Flexibility and efficiency of use criteria user interface design principles that aim to provide users with the ability to use a product or service in a way that suits their needs and level of experience.

Based on the flexibility and efficiency of user criteria, specifically with the 3 questions and 76 respondents above, it was found that users must be made easier to carry out their activities more quickly in table 7.

Table 7. *Flexibility and efficiency of use criteria*

No	Criteria	Total Score	Percentage
Q19	Flexibility and efficiency of use (H7)	161	42,37
Q20		128	33,68
Q21		150	39,47
	Total Criteria		38,51 Not Good

Source : (Research Result, 2024)

Aesthetic and minimalist design criteria

Aesthetic and minimalist design criteria are user interface design principles that emphasize the importance of creating an interface that is visually attractive but remains simple.

In the aesthetic and minimalist design criteria with 3 specific questions and 76 respondents above, it was found that the DMS Mobile application has a good appearance and layout in table 8.

Table 8. *Aesthetic and minimalist design criteria*

No	Criteria	Total Score	Percentage
Q22	Aesthetica and minimalist (H8)	307	80,79
Q23		335	88,16
Q24		337	88,68
	Total Criteria		85,88 Very Good

Source : (Research Result, 2024)

Criteria Help users recognize, diagnose, and recover from errors

Criteria Help users recognize, diagnose, and recover from errors (help users recognize, diagnose, and recover from errors) is a user interface design principle that aims to help users overcome errors that occur.

In the criteria of help users recognize, diagnose and recover from errors with 3 specific questions and 76 respondents above, it was found that if an error occurs, the wrong message must be explained in clear language, explaining the problem and providing a solution in table 9.

Table 9. *Criteria Help users*

No	Criteria	Total Score	Percentage
Q25	Help users recognize and recover (H9)	302	79,47
Q26		303	79,74
Q27		229	78,68
	Total Criteria		79,30 Good

Source : (Research Result, 2024)

Criteria Help and documentation

Help and documentation criteria are user interface design principles that aim to provide sufficient help and easily accessible documentation for users.

In the help and documentation criteria with 3 specific questions and 76 respondents above, it was found that in the application there is help and documentation available which contains information about how to use the application in table 10.

Table 10. *Criteria Help and documentation*

No	Criteria	Total Score	Percentage
Q28	Flexibility and efficiency of use (H7)	331	87,11
Q29		353	92,89
Q30		351	92,37

No	Criteria	Total Score	Percentage
	Total Criteria		90,79 Very Good

Source : (Research Result, 2024)

CONCLUSION

In this research, improvements to the UI and UX of the DMS Mobile PT application were carried out. Seino Indomobil Logistic using the heuristic evaluation method. There are points that become conclusions in this research, namely: In the Visibility of system status category, the percentage was 78.4%, the Match between system and the real world category was 89.30%, the User control and freedom category was 45.61%, the Consistency and standards category was 80.53%, the Error prevention category got a percentage of 81.49%, the Recognition rather than recall category got a percentage of 71.23%, the Flexibility and efficiency of use category got a percentage of 38.51%, the Aesthetic and minimalist category got a percentage of 85.88%, the Help users category recognize, diagnose, and recover from errors got a percentage of 79.30%, and the Help and documentation category got a percentage of 90.79%

The User control and freedom category got a percentage of 45.61% and the Flexibility and efficiency of use category got a percentage of 38.51%, which was obtained from PT's IT Helpdesk division. Seino Indomobil Logistic requires efforts to add a data correction/update feature in the order section when carrying out loading and unloading photos, adding this feature so that users can make corrections/updates if the user makes data input errors or mistakes when carrying out loading and unloading photos. Optimizing applications for development parties so that users are more comfortable using applications on various versions of Android.From all respondents who rated it, it can be concluded that the assessment criteria for the DMS Mobile application using the heuristic evaluation method were considered good. However, there are several things that still need to be improved, namely the criteria of User control and freedom and Flexibility and efficiency of us. And next, to increase the User control and freedom category, the author will add the Customization Options menu, Undo and Redo Functionality, Flexible Navigation Mode, Preference Saving, Clear Feedback, Documentation and Help Resources and Shortcuts and Quick Actions. For flexibility and efficiency of use, you will also add a Customizable Interface menu, Keyboard Shortcuts, Contextual Help and Guidance, Predictive Features, Efficient Navigation, and Quick Access.

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