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USER INTERFACE ANALYSIS ON SHOPEE WEBSITE USING HEURISTIC METHOD

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Abstract.

Abstrak. Human and computer interaction is a science that focuses on planning and designing a system so that users can interact and work together according to the needs of the users themselves in the most effective way at every step of their work. The role of the user interface greatly influences the usability of an application or system. Heuristic Evaluation (HE) is considered the best usability evaluation method compared to others because it can find severe problems that other methods cannot detect. Therefore researchers will analyze the user interface on the Shopee website using the HE method. User Interface Analysis on Websites with the HE Method through online questionnaire distribution, from the results of online questionnaire distribution, it can be concluded that the website has deficiencies in terms of auxiliary features and documentation to assist users in using the system. Declared less because it has the lowest rcount (Total) value of 0.587 compared to other counts. Suggestions for research on Shopee user satisfaction analysis using the HE method, the authors convey suggestions that need to be improved in future research, namely that it is necessary to conduct research on Shopee user satisfaction using the HE method in a broader scope.

Keywords. Shopee, E-Commerce, Heuristic Evulation, Utility, User Interface.

1 Introduction

The development of information and communication technology in the Industrial 4.0 era has had a major impact on the teaching and learning process in the world of education, especially in universities (Kurniawan, 2017). Information technology can be accepted as a medium in carrying out the educational process, including assisting the teaching and learning process, which also involves finding references and sources of information (Shahroom & Hussin, 2018).

Interface design is related to interaction design because the two interact to see interactions between interfaces and are part of the system development process. According to the user interface "means the user interacts with the content to achieve some goals" the interface is an intermediary between the user and the content, where the content is adapted to what the user wants (Bakar et al., 2021). Websites are a way to present yourself on the Internet. A website can be likened to a space in the digital realm; anyone in this realm can stop by at any time, everyone can understand the others too, ask questions and answers to others, and provide input or can also find out other things from other products/results (Heny, 2016).

E-Commerce is a very rapidly growing tool for buying and selling products and services through digital networks or devices. As an intermediary for moving products or services between institutions or individuals and institutions (Kasmi & Candra, 2017).

User interface or User Interface (UI) is a system and users interact with each other through commands or techniques to interact with the system, enter data, and use content. User interfaces range from systems such as computers, mobile devices and games to the use of application programs and content (Joo, 2017). A good User Interface design on a website will make visitors want to linger on the website. But on the contrary, a bad User Interface design makes visitors leave the website. The user interface is an important element of a computer-based system or product (Foster, 2021).

The ten dimensions that will be assessed using the Heuristic Evaluation method presented by Jakob Nielsen are as follows: (1) Visibility of the state of the website (2) Conformity between the website and the actual situation (3) Controlling and free of use (4) Standardization and consistency (5) Understanding rather than remembering (6) User flexibility and efficiency (7) Error prevention (8) Aesthetics and minimizing design. (9) Assist the user by understanding, analyzing, and recovering from errors (10) Help and the need for documentation.

According to data from iprice.co.id, in the fourth quarter of 2022, Tokopedia took first place

with an average monthly site visit of 146.427 million. Meanwhile, Shopee is in second place with an average monthly site visit of 96.344 million.

The reason for this research is to be able to evaluate the website from Shopee to get feedback on how the Shopee website can occupy position 2, with monthly visits reaching 96.344 million visits. It is hoped that this research can obtain a stepping stone when redesigning user interfaces on other e-commerce websites in designing user interfaces. Heuristic evaluation is considered the best usability evaluation method compared to others because it can find severe problems that other methods cannot detect. In addition, according to them, the use of this method also found more problems than others, and the cost is relatively cheap.

The advantages of the heuristic evaluation method are that it is relatively inexpensive compared to other evaluation methods, intuitively there is no need to make detailed plans for its implementation, evaluators do not have to undergo usability training. This can be used in the initial development process (Baladina et al., 2018). Shopee is an online buying and selling based on a mobile application that is currently developing in Indonesia (Sastika, 2018). The website from Shopee should occupy the top ranking on the sales website, in fact the website has experienced a decrease in ranking.

2 Literature Review

Experimental Validation Study of a series of Culture-oriented usability Heuristics: Evaluation of e-Commerce websites suggests that culture-driven usability is about making websites an effective means of communication between global website users and local users. Those who advocate incorporating culture into user interface design seem to be conflicted about whether to incorporate objective culture, subjective culture, or both into user interface design. Researchers need to consider that users don't want to spend more than a few minutes learning how to use a website, and an interesting use case could be an e-commerce website.

While overall usability focuses on using metrics related to achieving global task and product goals (i.e. measurement-based usability), the focus on morphological usability is detecting usability problems. It is in the design of interventions to deal with it, reduce or eliminate the impact. This study found that heuristic evaluation is the most widely used method for evaluating usability. When selecting a set of heuristics, there are (generally) two options. general heuristics or specific heuristics. We present a set of usability heuristics with templates that include definitions, relevant cultural aspects, explanations, examples, benefits, and potential problems. This study concludes that it is difficult to imagine how to encourage users from

different cultures to use e-commerce services. The user's demands are becoming more and more stringent, and the scope is greatly expanded. These same users know that the market is watching them closely and that they may need to develop multiple versions of their website in an inexpensive way, using templates or special version control tools.

Therefore, we will increase the requirements. Hofstede stated that these differences were hundreds or thousands of years old but believed that the use of a powerful global communication system would not quickly disappear from traditional culture. As websites continue to evolve around the world, answering these questions and exploring and exploiting these cultural aspects will be a necessity, not an option for successful theory and practice. Research has shown that each of these factors needs to be considered to improve usability, User Experience, and all related areas to provide better services. It is interesting to ask whether our current formal tools are used to create high-quality websites (Díaz et al., 2017).

Another example is the User Interface Analysis of E-Learning Based Websites with the Heuristic Evaluation Method, this research has the intention of evaluating the design of user interface websites based on electronic learning using human factors and an ergonomic interpretation approach, to improve the usability and usability of e-learning based websites. . The results of this study indicate that in general the evaluation of the interface design and ease of use of websites based on e-learning is considered to be quite good, but there are still a number of things that need to be improved, especially those that are in accordance with the characteristics of ease of use and convenience currently available. The process of teaching and learning online and one of the applications for conducting online learning is to use an electronic learning website. The results of the analysis of this study show that the NetAcade Learning website has a better user interface design. The website design is fully in line with the ten theoretical principles to evaluate heuristically. The NetAcad Learning website has a better interface design and is easier to use and offers features and services to make it easier for users to interact with existing websites. However, the website has several deficiencies that need to be corrected and improved (Geasela et al., 2018).

3 Research Methodology

This research will be carried out with several steps in conducting the current research. The stages of the research described help provide an illustration of the research steps from the beginning of conducting research to the last step of conducting research, the steps are shown in Figure 1. Research Steps.

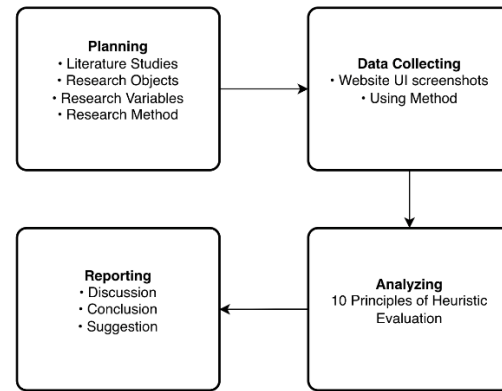


Figure 1. Research Steps

Starting with a literature study to obtain the required data and references, followed by data collection and analysis to provide an overview of the assessment and selection of the methods used. Furthermore, the measurement of the website uses the ten Nielsen heuristic evaluation method by distributing questionnaires, then calculating and recapitulating the average test scores on the website, and ending with a discussion of drawing conclusions and suggestions. Judging from the analysis of Nielsen's strengths and weaknesses, the number of examiners needed in the heuristic evaluation process is three to five people. Heuristic evaluation is not easy because it would be challenging for individuals to find all usability issues in interface design. However, heuristic evaluation has been widely used because one of the advantages of this method is that the process can be carried out quickly and with limited funds to be more effective than other methods.

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What will be achieved from the heuristic assessment is that it can help revise the design in detail and of course more effectively. Evaluating researchers assess the performance of a set of workloads by design and see if they match the criteria for each level. If any discrepancies/errors are detected, the design can be reviewed to correct these issues prior to implementation.

Table 1. Ten Principles of the Heuristic Evaluation Method.

Principle	Information
Status visibility system (feed come back)	Contains status information the current system is message and time appropriate.
Match between application and reality in the field	The application is easy to understand with the language used by the user
Control dan free of use	Consumers have control and freedom of choice
Consistency and standards	SOP used by application of

	course consistent
Error prevention	There are applications that anticipate that no error occurs
Recognition rather than remembering	Users can identify, diagnosing, and solve problems that occur
Flexibility and efficiency of use	The application accommodates advanced users and users who are just starting out Use
Aesthetic and minimalist design	Provide relevant information and display system requirements
Help users recognize, dialogue, and recover from error	Help users in recognizing, dialogue, and correct errors
Help and documentation	system has the documentation relevant and good help features

Source: Teguh, dkk. 2022

The heuristic assessment is later recommended to use design evaluation techniques because it will be suitable and help get or determine usability problems that will appear later. This set of heuristics also describes important areas for mobile phenomena, including the rapidly changing environment, the potential for mobile devices to reduce user workload.

When this evaluation assessment is carried out, software is used which will do research on the storyboard in the application (Kumar et al., 2020). After the object analysis follows the principles of the method used, the next step is to make a complete report in the form of a discussion of the analysis results obtained as well as conclusions and recommendations from the results of the analysis carried out. Table 1 provides information about the ten principles of the heuristic evaluation method along with a description of each principle of the heuristic evaluation method.

This type of research is descriptive qualitative research, which is a research method that is carried out to make a picture or description of the situation by using software that is widely used in the industry because it is a usability discount method that does not require a lot of infrastructure, time and money. In this research the variable that will be used to support this research is the independent variable, namely website user interface design (Rajanan & Rajanan, 2018).

1. The dependent variable: website usability.
2. Control variables: 10 basic principles in the heuristic evaluation method.

The data collected puts the acquisition method in it is the main data because the author directly examines the research object, namely the shopee web user interface.

The process starts from collecting data:

1. Observe the user interface on each part of the website
2. Take a screenshot of the interface of the website that will be researched

3. Questionnaire.

4 Results and Discussion

In this section, an analysis of the website-based Bukalapak application user interface is explained with 10 principles of the heuristic evaluation method, which are as follows:

1. System Status Visibility

Shopee has a main menu when the user first enters the website page. There is a homepage, flash deal, officialstore, trending items, register and login as shown in Figure 2. Shopee has a flash sale where it sells products at an unusual discounted amount. These flash deals occur daily, and to showcase them, the Shopee Website has a countdown timer on the flash sale menu.

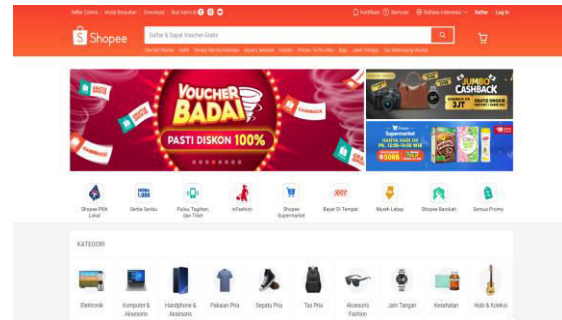


Figure 2. Main Menu

(Source: <https://shopee.co.id/>)

This timer shows the user how much time they have until the current sale ends, or how long it will be until the next sale starts as seen in Figure 3.

2. Compatibility or compatibility between the system and the real world

The Shopee brand representation uses a new branding as bukamall. The appointment was made to show that each seller can sell things like opening a kiosk in a mall with prices and quality goods.

3. User Control and Freedom

This user interface allows users to use filters in their search per category of goods, they have one option to directly select the desired category, when they want to buy goods.

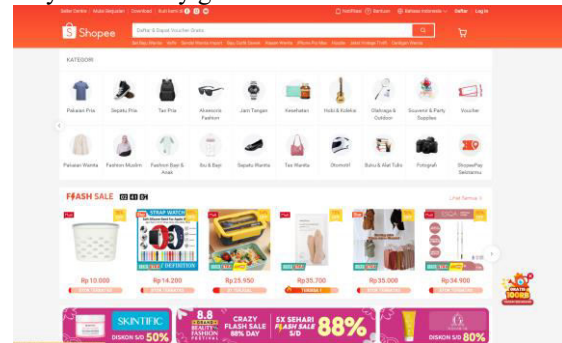


Figure 3. Goods Category

(Source: <https://shopee.co.id/>)

4. Standardization and Consistency

Every seller registered at Shopee is equated as a seller, and every seller's homepage must have seller statistics, the consistency provided by Shopee makes every buyer user feel safe when they want to buy goods.

5. Understanding rather than memory
Virtual Products. Where on this page there are types of products that can be selected based on their respective categories.
6. User Flexibility and Efficiency
Shopee also frees users or customers to choose when logging in or wanting to register as a customer or seller.
7. Error prevention
Every time a user performs an unfinished action, there is a notification or warning to help each user that there is activity that has not been performed at the time of purchase.
8. Aesthetics and Minimalist Design
The design made by Shopee regarding the item description looks very sleek, and apart from that there is a video or image that is presented to support the image description.

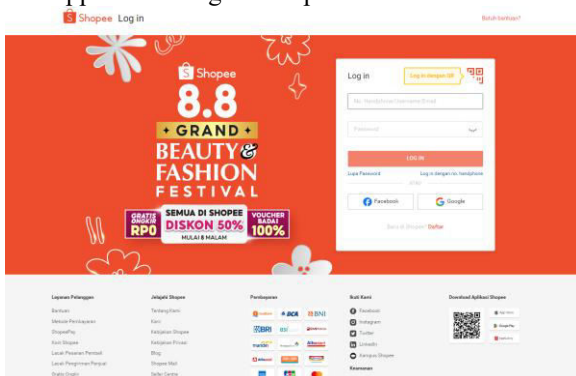


Figure 4. Login Page

(Source: <https://shopee.co.id/>)

9. Assist users with understanding
Register and Login Errors often occur in online-based e-commerce or member systems like Shopee.

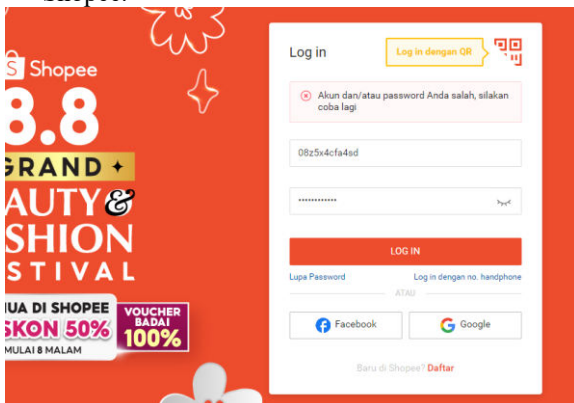


Figure 5. Error Prevention

(Source: <https://shopee.co.id/>)

10. Help and Documentation

The following is a display of shopee assistance, with the terms of assistance embedded by shopee to assist users in using the shopee website.

Questionnaire tests were carried out through Google Forms which were distributed to respondents. The following instrument will be validated with 20 questions by looking for the ten aspects assessed in the Heuristic Evaluation method according to Jakob Nielsen from 33 respondents. The statement that we submitted totaled twenty questions, which are as follows:

HE1A = The application provides clear information to the user regarding the menu used by the user.

HE1B = The application provides clear information to the user regarding the procedure for accessing the menu.

HE2A = This app has clear menu terms in everyday language that are easy to understand.

HE2B = The language used in the application is easy to understand.

HE3A = The application has a cancel message on the check out feature on the submenu, namely when the user enters the wrong product or selects a product, the user can return to the start page.

HE3B users have flexibility in using the app.

HE4A = This application has a consistent and standard header display on every page it has.

HE4B = This application has a consistent and standard content display on every page it has.

HE5A = The application has a notification when the user enters incorrect information.

HE5B = The application has a notification, where logging in with more than 2 computers is not possible.

HE6A = When the user first uses the application, the user can recognize the usable sidebar menu.

HE6B = When the user uses the application for the first time, the user can recognize the function from the menu.

HE7A = The header menu in the application has a clear appearance, allowing users to perform activities more quickly.

HE7B = The feature for serving orders in the application has a clear display, allowing users to carry out activities more quickly.

HE8A = There is no irrelevant information in the application.

HE8B = The menu layout is familiar and easy for users to access.

HE9A users can recognize and understand the information provided.

HE9B = The user can return to the correct state from the error that occurred, through the information provided.

HE10A = This application has a help menu to help users.

HE10B = The application provides clear information to the user regarding the use of the application

From these questions, the authors conducted a scoring system with a linear scale using Google Forms for each question. The scale value is 1 – 5 which has the following meanings:

- 1 = Strongly disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree
- 5 = Strongly agree

we will analyze the questionnaire data, whether the data is valid or invalid with the help of the IBM SPSS application program to test the validity and reliability of the questionnaire results.

1. Validity Test

The validity test is intended to find out how appropriate the author is using the form to carry out a questionnaire to carry out an assessment and obtain research data from users.

In this section, a validity test was carried out with IBM SPSS from the results of a questionnaire of 33 respondents which were stated in the variable "N" = 33.

To find out whether the questionnaire results are valid or not, it can be seen from the rcount or Pearson Correlation of the total for each item obtained from the program results. Explanation in following Pearson

The Validation Test to look for is: a. Will compare the value of rcount with rtable.

- If the value of rcount > rtable = then it is said to be Valid
- If the value of rcount < rtable = then said to be invalid.

B. View significant values

- Significant Value < 0.05 = Valid
- If the value is Significant > 0.05 = Invalid

To find the rtable value with N=33, Sig 5% of the statistical rtable value distribution, the rtable value becomes 0.344. The conclusion will be obtained that the Pearson product moment principle is related to the questionnaire items with a total value, whereas when the decision is made to test the correlation, if it is significant <5% with a positive rcount, the result is valid.

2. Reliability Test

The testing criteria for the reliability test are rcount > rtable with a significance level of > 5%, then the measuring instrument is declared reliable and likewise if the rcount value is < rtable with a significance level of <5%, then the measuring instrument is not reliable. In figure 6, the steps taken in IBM SPSS are entering data questionnaire into the program, then Analyze Scale, then select Reliability Analysis with Alpha model and Descriptive for Scale if the item is deleted.

The questionnaire is said to be reliable if the Cronbach's Alpha value is > 0.344 (rtable) then the

questionnaire is said to be reliable (consistent), whereas if the Cronbach's Alpha value is <0.344 (rtable) then the questionnaire is said to be inconsistent.

	Item-Total Statistics				Cronbach's Alpha if Item Deleted
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	
1a	77.91	163.460	.715		.953
1b	78.00	163.063	.739		.953
2a	77.94	161.934	.732		.953
2b	77.85	161.195	.708		.953
3a	78.15	159.695	.722		.953
3b	78.03	160.343	.720		.953
4a	77.88	166.422	.625		.954
4b	77.91	166.148	.580		.955
5a	77.94	162.996	.752		.953
5b	78.24	160.939	.604		.955
6a	78.06	160.996	.840		.951
6b	77.85	161.508	.833		.952
7a	77.94	159.371	.854		.951
7b	77.85	162.820	.728		.953
8a	78.18	158.966	.695		.953
8b	77.91	162.648	.833		.954
9a	77.88	160.610	.773		.952
9b	78.06	159.059	.789		.952
10a	78.06	163.184	.530		.956
10b	78.09	161.335	.652		.954

Figure 6. Item-Total Statistics

Source: SPSS

It can be seen in the table above that the Cronbach's Alpha value is 0.955 with some N=20, so that the Cronbach's Alpha value is > 0.344 (rtable). Therefore the results of the tests that have been carried out from the questionnaire are said to be reliable (consistent). It can be concluded that the questionnaire is declared reliable for use in research on the Shopee application user interface.

In this section, the authors will test the hypotheses of the 10 items of questionnaire statements that have been described in the previous section. Testing the hypothesis in this journal uses the Pearson validity test where the hypothesis is declared accepted if rcount > rtable. The following are the hypotheses that will be tested in this study based on the correlation of the factors with the items described in section

previously:

1) H1: The learnability factor has a positive effect on the usability aspects of the HE1 and HE2 questionnaire items and on the user satisfaction aspects of the HE4 questionnaire items in the heuristic evaluation of the Android-based Shopee application user interface.

2) H2: The efficiency factor has a positive effect on the usability aspect of the HE7 questionnaire items and on the user satisfaction aspects of the HE3 and HE8 questionnaire items in the heuristic evaluation of the Android-based Bukalapak user interface application.

3) H3: The memory factor has a positive effect on the usability aspect of the HE6 questionnaire items and on the user satisfaction aspect of the HE10 questionnaire items in the heuristic evaluation of the Android-based Bukalapak user interface.

4) H4: The error prevention factor has a positive effect on the usability aspect of the HE9 questionnaire items and on the user satisfaction aspect of the HE5 questionnaire items on the heuristic evaluation of the Android-based Bukalapak user interface application.

Tabel 2. Hypothesis

Hypothesis	Aspect	Validity			Results
		Item	rcount	rtable	
H1: Learnability Factor	Usability	HE1A	0.744	0.344	Valid
		HE1B	0.766	0.344	Valid
		HE2A	0.761	0.344	Valid
		HE2B	0.742	0.344	Valid
	User Satisfaction	HE4A	0.658	0.344	Valid
		HE4B	0.620	0.344	Valid
H2: Efficiency Factor	Usability	HE7A	0.871	0.344	Valid
		HE7B	0.755	0.344	Valid
	User Satisfaction	HE3A	0.757	0.344	Valid
		HE3B	0.754	0.344	Valid
		HE8A	0.736	0.344	Valid
		HE8B	0.675	0.344	Valid
H3: Memorability Factor	Usability	HE6A	0.857	0.344	Valid
		HE6B	0.851	0.344	Valid
	User Satisfaction	HE10A	0.587	0.344	Valid
		HE10B	0.694	0.344	Valid
H4: Error Prevention Factor	Usability	HE9A	0.799	0.344	Valid
		HE9B	0.817	0.344	Valid
	User Satisfaction	HE5A	0.767	0.344	Valid
		HE5B	0.762	0.344	Valid

Source: SPSS

The hypothesis is determined from the correlation between items, then a hypothesis test is carried out based on the results of the validity test that has been done before, the results are obtained in Table 2. Based on Table 2 it can be seen that all hypotheses can be accepted because each item has a value of $rcount > rtable$. To fully discuss each of the following hypotheses with explanations.

The first hypothesis relates to the learnability factor. This hypothesis is accepted because each aspect and item has a $rcount > rtable$ value. In the usability aspect, there are HE1A items with a value of $0.744 > 0.344$, HE1B items with a value of $0.766 > 0.344$ and HE2A items with a value of $0.761 > 0.344$, HE2B with a value and on the user satisfaction aspect there are HE4A items with a

value of $0.658 > 0.344$, HE4B items with a value of $0.620 > 0.344$ so that the first hypothesis can be accepted.

The second hypothesis is related to the efficiency factor. This hypothesis is accepted because each aspect and item has a $rcount > rtable$ value. In the usability aspect, HE7A items are worth $0.871 > 0.344$, HE7B items are worth $0.755 > 0.344$ and in the user satisfaction aspect, there are HE3A items worth $0.757 > 0.344$, HE3B items are worth $0.754 > 0.344$ and HE8A items are $0.736 > 0.344$, HE8B items are worth $0.736 > 0.344$ so the hypothesis both are acceptable.

The third hypothesis is related to the memory factor. This hypothesis is accepted because each aspect and item has a $rcount > rtable$ value. On the usability aspect there are HE6A items with a value of $0.857 > 0.344$, HE6B items with a value of $0.851 > 0.344$ and on the user satisfaction aspect there are HE10A items with a value of $0.587 > 0.344$, HE10B items with a value of $0.694 > 0.344$ so that the third hypothesis can be accepted.

The fourth hypothesis is related to the error prevention factor. This hypothesis is accepted because each aspect and item has a $rcount > rtable$ value. On the usability aspect, there are HE9A items with a value of $0.799 > 0.344$, HE9B items with a value of $0.815 > 0.344$ and on the user satisfaction aspect there are HE5A items with a value of $0.777 > 0.344$, HE5B items with a value of $0.655 > 0.344$ so that the fourth hypothesis can be accepted.

From the four hypotheses that have been carried out, it can be seen that all factors, aspects, and questionnaire items are related to one another for one research purpose, namely to carry out a heuristic evaluation of the Android-based user interface of the Shopee application. Every factor, aspect, and questionnaire item also influences each other and has added value for each aspect. Item HE10A which has an $rcount$ of 0.587 regarding consistency and standard has the lowest $rcount$ value compared to other items but is still acceptable so that it can be said that the consistency and standard of the Android-based Shopee application user interface are still feasible and affect the learnability factor and aspects of user satisfaction. Does not disturb the user while using the application so there is no serious problem with this application.

5 Conclusion

The Shopee website is a relatively safe way of transacting, of course, and has several things that make it easy for its services and features, which have various advantages and are easy to access and every business must have competitors, as well as transactions via the internet. A business can compete to show its superiority, both in terms of services or goods delivered, prices, services,

limitations of the website and features that can be accessed, and guaranteed security when shopping and interacting. The existence of actions to minimize the risks that occur and avoid threats/warnings in business is very important in penetrating the market. According to the journal in the research and data analysis above through the distribution of online questionnaires, with 20 questions given by obtaining 33 respondents from the results of distributing online questionnaires, it can be concluded that of the 10 aspects of the Heuristic Evaluation tested in Shopee has a deficiency in item "10a" which is included in the Help and Documentation aspect, namely in terms of providing help and documentation features to assist users in using the system. Item "10a" is stated to be lacking because it has the lowest rcount (Total) value of 0.587 compared to other rcount (Total) whose value is > 0.600, so the main weakness lies in item "10a" and overall, from this journal it can be seen that the website is not have serious problems in usage and usage access. Suggestions for research, the authors recommend that what needs to get attention in future research is that it is necessary to do research on website user satisfaction using the Heuristic Evaluation method in a broader scope and for further researchers to use methods other than Heuristic Evaluation. For the analysis of user satisfaction, the Shopee website is expected to compete with other e-commerce in increasing comfort, security, efficiency, and competing as the best e-commerce in Indonesia.

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