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Preface

This volume contains the papers presented at ICADEIS 2020: International Conference on Advancement in Data Science, e-Learning and Information Systems 2020 held on October 20, 2020 in Bandung Virtually. There were 39 submissions, Accepted 15, Acceptance rate 0.38 and Reviews 77. Each submission was reviewed by at least 2, and on the 3 program committee members. The committee decided to accept 15 papers.This year, we are honored to have 3 distinguished keynote Speakers, Prof. Jun Seok Hwang from Seoul National University of South Korea: Assc. Prof. Dr. Norfadhlina Mohd Sharef from Universiti Putra Malaysia. and Professor Richardus Eko Indrajit, from APTIKOM Indonesia. We hope that the keynote sessions and the parallel session will add values to your knowledge and research.

The continuous support of computational science and engineering researchers has helped ICADEIS to become a firmly established forum in scientific computing and engineering. This program book, spanning all the traditional as well as the emerging computational Science and engineering areas which come from countries all over the world including Malaysia, Netherland, Thailand, Australia etc. These papers cover areas such as Data Science, Information System, Open Data Government, and E-Learning will be published in IEEE Explore.

I am very grateful to our highly dedicated Easy chair, IEEE Indonesia Chapter, international steering committee and program committee, administrative board of School of Industrial Engineering and System (FRI), reviewers and volunteers for their tremendous support in putting this international conference together successfully. I sincerely hope that ICADEIS 2020 had provided a venue for knowledge sharing and established more research collaboration among us.Thank you.

October 20, 2020
Bandung

Deden Witarsyah Jacob Ph.D.
ICADEIS 2020 General Chair

Keyword Index

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2020 International Conference on Advancement in Data Science, E-learning and Information Systems (ICADEIS)

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Exploring e-Commerce Usability by Heuristic Evaluation as a Compelement of System Usability Scale

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***Abstract*—The use of the System Usability Scale (SUS) questionnaire in the measurement of e-commerce usability has been widely carried out. However, the SUS score is not an adequate measure to express the level of user acceptance and satisfaction. Other evaluations are needed to complement the usability test, including assessments based on expert judgment. The proposed method consists of two stages, the heuristic evaluation stage, which involves expert judgment, and the SUS questionnaire stage based on user perceptions of the e-commerce website. Input from experts is expected to be able to show better the usability issues faced in using the website. Expert and user perspectives are combined to get user input in design improvements. We collect data from experts and users about their perceptions of the usability of Shoppee e-commerce websites. Most users agree that the Shopee site is excellent (grade B-). The results of the examination by the expert stated that the Shopee site was also excellent. Nine out of ten evaluation criteria scored above 72%. The most usability issue is the flexibility and efficiency of the system, especially problems in search engines.**

Keywords—System Usability Scale, Heuristic Evaluation, Usability Evaluation Method, User Satisfaction.

I. INTRODUCTION

An online global competition was an increase since 2016. Chinese companies are offering a lower price of the electronic product compared to Amazon.com. Japanese competing US markets by improving their website in English [1]. Several factors that influence the online competition are whom the buyers are, the distribution channels used, level of consumer loyalty, and consumer satisfaction. The use of the internet and intranet is necessary not only to buy and sell, but e-commerce develops on how to communicate electronically by collaborating through social networks or customer service. Customer satisfaction in using e-commerce is one factor in determining whether the system's functions are usable [2]. The comfort and satisfaction level of using an e-commerce website from the user's side is called usability [3].

Usability is the core idea of Human-Computer Interaction. Variations in Usability Evaluation Methods (UEMs) have been created, proposed and can be categorized into two, analytic and empirical. Analytical UEMs or can be called inspection methods are evaluation techniques that involve experts, including Heuristic Evaluation, Cognitive Walkthrough, Guidelines, and others. Empirical UEMs is based on user experiences, such as Usability Testing or Thinking Aloud, User Performance Test, Remote Usability Testing, Beta Test, Forum Test, Cooperative Evaluation, and Coaching Method. Besides, there is also a usability evaluation involving user statements such as User Satisfaction Questionnaire, Field Observation, Focus Group, Interviews [4]. Some methods are rarely used because they are too complicated and inefficient.

Usability testing and Heuristic evaluations are the most commonly used in the web domain [5]. Both techniques are considered good enough in assessing websites, so practitioners and researchers often recommend using both methods to complement each other [6]. However, that is not the only combination that researchers might consider in assessment, recent studies reveal that the effectiveness of user evaluations can also combine with questionnaires [7].

Questionnaires are the one popular usability evaluation method that is collecting data from respondents. This method contains the subjective assessment of users, so it needs to be combined with other techniques [8], such as heuristic evaluations. The results of feedback from users through questionnaires become the basis for balancing other methods [9]. Among the various types of inquiries, the System Usability Scale (SUS) method is considered a rapid measurement method to find out how people perceive the usability of a computer system [10]. In this paper, we present a case study where a heuristic evaluation is combined with a SUS questionnaire. The purpose is to identify the usability aspects that are covered by each method. In this way, it is possible to determine usability issues with completing each other. This paper is organized as follows. Section 2 reviews the proposed method. Section 3 presents a result and discussion, and Section 4 draws the conclusions.

II. PROPOSED METHOD

We proposed a combination of the usability evaluation process consists of heuristic evaluation and SUS. Heuristic evaluation is an informal method of looking at interfaces and presenting expert opinions about how good an interface is [11], [12]. There are three steps of the heuristic evaluation, i.e., determine the usability heuristics, evaluate the interfaces with heuristic violated, and assign severity for each heuristic violated. The user evaluation consists of four levels: confidential agreement, pre-test questionnaire, a task executes, and a post-test questionnaire (using SUS). The end activity of the two evaluation methods is finding results and usability issues. The SUS method has been freely available and used in system evaluations by fellow researchers and usability engineers since 1986, and in 1996 contributed to usability engineering in the industry. SUS has been incorporated into Morae's commercial usability evaluation tools and is referred to as an "industry standard," although it has never been through a formal standardization process. The SUS questionnaire has the advantage of being an established

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evaluation tool for measuring software quality [13]. Figure 1 shows the usability evaluation process.

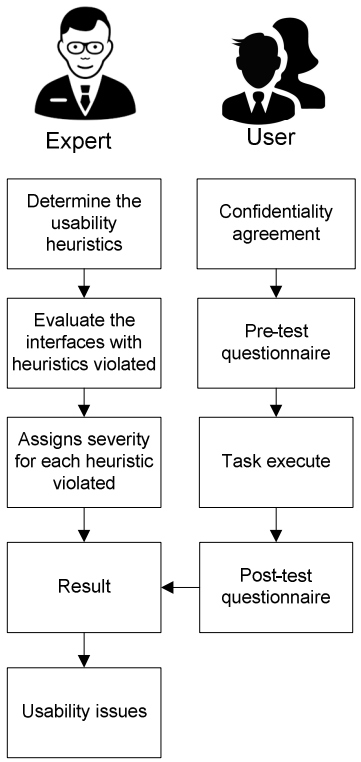

Fig. 1. Usability Evaluation Process.

A. Heuristic Evaluations

In heuristic evaluations, experts carry out systematic inspections of interface designs for usability. The goal of this evaluation is to find usability problems in the design [14]. This study uses three usability specialists who are experienced and qualified postgraduate education. The heuristic evaluation consists of several steps, which are explained as follows.

STEP 1: Researchers and experts determining the usability heuristic. The heuristic evaluation consists of Nielsen's ten criteria, i.e., 1) visibility of system status, 2) match between system and the real world, 3) user control and freedom, 4) consistency and standards, 5) error prevention, 6) recognition rather than recall, 7) flexibility and efficiency of use, 8) aesthetic and minimalist design, 9) help users recognize, diagnose and recover from an error, 10) help and documentation [11].

STEP 2: Experts evaluate the aligned of the interface with Nielsen's heuristic. Each expert works individually to evaluate the interfaces of the most popular B2C e-commerce website in Indonesia (https://shopee.co.id/) with heuristics violated. Evaluations are based on five tasks that represent online transactions [15] i.e., 1) find information about company policies, including shipping and return practices, 2) explore and find products and details easily, 3) find, view, and modify carts, add products to it, and continue to pay, 4) register and view personal information and orders, 5) navigate from page to another successfully. Experts also measure the time needed to complete a task to express efficiency. The task time is calculated by reducing the start and end times, in seconds. The time-based efficiency from expert experience can be expressed as (1).

$$TBE = \frac{\sum_{j=1}^{R}\sum_{i=1}^{N}\frac{n_{ij}}{t_{ij}}}{NR} \quad (1)$$

where

TBE =Time based Efficiency

N = Total number of tasks (goals)

R = Total number of users

n_{ij} = The result of task i by user j; if the user successfully completes the task, then N_{ij} = 1, if not, then N_{ij} = 0

t_{ij} = The time spent by user j to complete task i. If the task is not successfully completed, then time is measured till the moment the user quits the task.

STEP 3: Each of the ten evaluation criteria contains three rules that must be checked. If there are rules that are violated, it will be given a binary value of 0, if not then assigned a value of 1. This case study set seven severity criteria, as illustrated the Table I.

TABLE I. SEVERITY CRITERIA

Values	Usability rules of each criteria
86-100%	Compliance with 3 usability rules
72-85%	Compliance between 2 to 3 usability rules
58-71%	Compliance with 2 usability rules
44-57%	Compliance between 1 to 2 usability rules
30-43%	Compliance with 1 usability rules
14-27%	Compliance between 0 to 1 usability rules
0-13%	Compliance with 0 usability rules

In the final step, each expert evaluator must calculate each usability problem's critical level and make an average of all the other evaluators. Then these results are used to provide additional information from the SUS findings.

B. System Usability Scale

Based on [16], research that focuses on evaluating a set of criteria uses at least 30 respondents. Respondents aged 17-25, participated in this study, with high school and Diploma / Bachelor education qualifications. Before conducting an assessment using the SUS questionnaire, users signing a confidential agreement for evidence. The pre-test questionnaire captures the user's answers about their identity, such as name, gender, age, level of education as part of the study. Like expert respondents, they do the same task, then fill out the post-test questionnaire. This study uses SUS as a perceived usability metric that represents user experience. SUS metrics are widely used in the use of post-test surveys in industrial use studies. SUS has also proven to be a very flexible questionnaire, unaffected by changes in words and language [17]. The SUS is the sum of all score contributions for the ten items multiplied by 2.5, as shown in (2), where U_i refers to the rating of the i-th item. The SUS scores range between 0 and 100 in a 2.5-point increment, where higher values reflect higher user satisfaction.

$$SUS = 2.5 \times \left[\sum_{n=1}^{5} (U_{2n-1} - 1) + (5 - U_{2n}) \right] \quad (2)$$

Based on [17], for websites facing the public, the average SUS score was 67 (grade C), so the values above were considered good enough. Table II represents the Sauro–Lewis curved grading scale (CGS) to constitute an e-commerce website with low, medium, and high perceived usability.

TABLE II. SAURO LEWIS CGS

SUS Score range	Grade	Percentile range
84.1-100	A+	96–100
80.8–84.0	A	90–95
78.9–80.7	A−	85–89
77.2–78.8	B+	80–84
74.1–77.1	B	70–79
72.6–74.0	B−	65–69
71.1–72.5	C+	60–64
65.0–71.0	C	41–59
62.7–64.9	C−	35–40
51.7–62.6	D	15–34
0.0–51.6	F	0–14

III. RESULT AND DISCUSSION

A. Expert Evaluation Result

Based on (1), time-based efficiency can be calculated. Table III shows that task 1 was the most efficient than other jobs (0.091 goals/sec). Information about company policies is usually placed on the bottom page, enough to make it easier for users to search. Consumer activities to find, view, and modify cart, add products to it, and continue to pay are the longest-running activities. The average expert spends about 3 minutes doing this.

TABLE III. SUMMATIVE MEASURES FOR DURATION PER TASK

No	Task	Duration (second)			TBE (goals/sec)
		Expert 1	Expert 2	Expert 3	
1	Find information about company policies, including shipping and return practices	50	18	5	0.091
2	Explore and find products and details easily	51	101	32	0.020
3	Find, view, and modify carts, add products to it, and continue to pay	106	188	180	0.006
4	Register and view personal information and orders	27	109	120	0.018
5	Navigate from page to another successfully	10	212	60	0.040

Task 3, with the longest working time, can explain that in this task interface does not have a breadcrumb trail to help users find the depth level of the web page (see Fig.2). This problem is not in line with the first criteria, visibility of system status. On the shipment pages, it does not have a button or a particular bright color cause sometimes missed choosing a delivery service. All buttons must be categorized based on their importance and results. There seems to be no design standard for call to action (CTA) on the site.

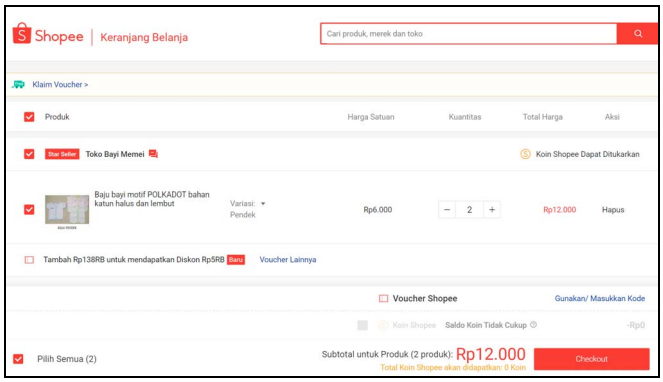

Fig. 2. User interface to find, view, and modify carts, add products to it, and continue to pay

Further explanation regarding each evaluation criteria can be seen in Table IV. The requirements of flexibility and efficiency of use produce the smallest value among the other tests (around 44-57%). The experts argued that this problem because the quick search keyword search page does not display results relevant to the search.

TABLE IV. EVALUATION RESULT

No	Evaluation criteria	Task 1	Task 2	Task 3	Task 4	Task 5	Severity rating
1	Visibility of system status	2.5	2.5	2.5	2.5	2	72-85%
2	Match between system and the real world	2.5	3	3	3	3	72-85%
3	User control and freedom	3	3	3	3	3	86-100%
4	Consistency and standards	1.5	2.5	2.5	2.5	2.5	72-85%
5	Error prevention	3	3	3	2	3	72-85%
6	Recognition rather than recall	1.5	2.5	3	3	3	72-85%
7	Flexibility and efficiency of use	1.5	1	1.5	1.5	1.5	44-57%
8	Aesthetic and minimalist design	3	3	2.5	3	3	72-85%
9	Help users recognize, diagnose and recover from error	3	3	3	3	3	86-100%
10	Help and documentation	3	3	3	3	3	86-100%

The results in Table IV can be clarified using the following radar graph (Fig. 3). Nine out of ten evaluation criteria scored above 72%. Three of which have high scores,

namely compliance with three rules of use. The three criteria are user control and freedom, help users recognize, diagnose, and recover from errors, and support documentation (86-100%). In the criteria of user control and freedom, we set three rules that must be obeyed, namely 1) Is the user able to exit all states such as pop-ups and multimedia? Is the exit state consistent and clear? 2) Is the user able to use the core sections of the website without signing up? 3) Does the user have control over their personal information?

In criteria help users recognize, we set three rules, 1) Is the user presented with error messages (as opposed to no word) when adding incorrect information in a form control? 2) Is the user presented with human-readable error messages that offer useful information on how to rectify the problem? 3) Is the user presented with polite error messages that do not blame the user for the error?

In criteria help and documentation, we set three rules, 1) Is the user presented with clear steps/guidelines to use the product service? 2) Does the user have access to documentation with relevant topics to help reach their goal? 3) Is the user presented with other channels of communication to enquire assistance to reach their goal? The experts agreed to give the highest value of the three criteria with each having three rules above.

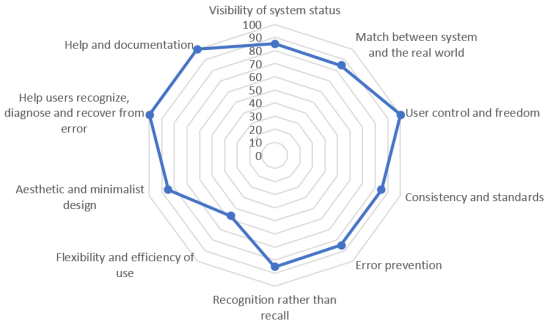

Fig. 3. Heuristic evaluation result

B. *User Evaluation Result*

Although the unofficial translation of the SUS questionnaire into Spanish, French, and Dutch has the same reliability as the original English version, the level of reliability and validity test still need to be tested [10]. A validity test is useful for the validity or suitability of the questionnaire used to obtain data from respondents or research samples. Reliability testing can be done using Cronbach's Alpha test. The reliability test can be done together with all items or question items in the research questionnaire. The basis for decision making in the reliability test is, if the Cronbach's Alpha value> 0.60, then the survey is declared reliable, conversely if the Cronbach's Alpha value <0.60, then the questionnaire is considered unreliable [18], [19]. Based on Table V, the Cronbach's Alpha value is 0.734, or it can be said that the questionnaire is reliable to use.

TABLE V. RELIABILITY STATISTICS

Cronbach's Alpha	N of items
0.734	10

The validity test of Pearson product-moment correlation uses the principle of linking each item's score with the total score derived from the respondent's answer. Question items are considered valid if the correlation value is more than 0.3. Table VI, it can be concluded that each item of questions is adequate because the Person product-moment value is more than 0.3.

TABLE VI. VALIDITY STATISTICS

Item	Person Correlation
Q1	0.645113
Q2	0.373523
Q3	0.706356
Q4	0.58551
Q5	0.722216
Q6	0.588467
Q7	0.496857
Q8	0.370443
Q9	0.347126
Q10	0.536902

Table VII shows the descriptive statistic of the SUS score. The minimum of the SUS score for Shopee website is 60, and the maximum is 90. The mean value is 72.083, with a standard deviation is 7.88. Based on Sauro–Lewis curved grading scale (CGS), this value equals grade B- (Good).

TABLE VII. DESCRIPTIVE STATISTICS OF SUS SCORE

N	Minimum	Maximum	Mean	Std. Deviation
30*	60	90	72.083	7.88

*Valid N (listwise):30

Fig. 4 shows the relationship between academic qualification and SUS Score. The SUS score generated between users with high school academic qualifications and diplomas deviate around 9.72 points. Users with diploma education give higher SUS scores than high school users.

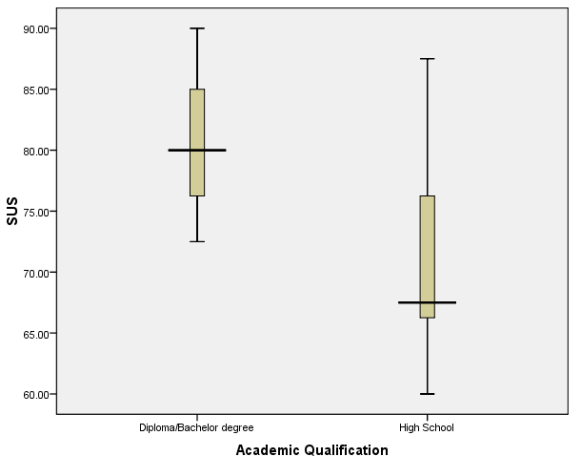

Fig. 4. Relationship between academic qualification vs. SUS Score

Fig. 5 shows the relationship between gender and SUS Score. The perception of male user satisfaction on the Shopee website is higher than female users by 6.29%.

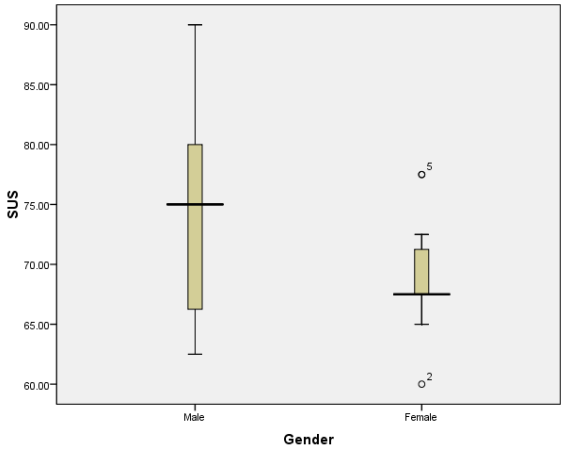

Fig. 5. Relationship between gender vs. SUS Score

C. *Usability issues*

Evaluators then gather to discuss crucial issues that need to be fixed in the design based on the findings of expert and user evaluations. The analysis shows that task 3 requires a considerable amount of time to complete the job. Also, the most severe heuristic criteria are the seventh criterion, flexibility, and efficiency of use. Some issues related to these tasks and tests, among others, the search is less relevant, there is no breadcrumb trail on the interface, there is no hierarchy of buttons that direct users to click something (call to action button). Male users and those with higher education have a more excellent perception of satisfaction with the use of the system compared to female users and those with lower education degrees. Although the Shopee site is the largest B2C site in Indonesia, improvements need to be made for service and user satisfaction. Improvements to the user interface are deemed necessary for progress and future design improvements.

IV. CONCLUSION

Usability is an essential thing in e-commerce websites. Usability is related to efficiency and user satisfaction with an information technology product. Therefore, to add information about user satisfaction and experience, we add heuristic evaluations and measurements using SUS only. As a result, usability problems are more apparent than using just one method. Expert and user perspectives are combined to get user input in design improvements. Most users agree that the Shopee site is excellent (grade B-). The results of the examination by the expert stated that the Shopee site was also excellent. Nine out of ten evaluation criteria scored above 72%. There are only a few problems that need to be fixed, including the flexibility and efficiency of the system, especially issues in search engines. In further studies, it is necessary to add evaluations about the effectiveness of website use, user investigations over the age of 25, and assessments based on usage-based metrics.

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2	0617049001	Condro Kartiko, S.Kom., M.T.I.	Asisten Ahli	Co-Author
3	0630069302	Ariq Cahya Wardhana, S.Kom., M.Kom	NJFA	Co-Author

Untuk melaksanakan kegiatan publikasi ilmiah di International Conference on Advancement in Data Science, E-learning and Information Systems (ICADEIS 2020), pada 20 Oktober Tahun 2020 dengan judul :

Exploring e-Commerce Usability by Heuristic Evaluation as a Compelement of System Usability Scale

Selanjutnya kepada personil yang ditugaskan agar dapat segera menyampaikan hasil pelaksanaan kegiatan.

Demikian surat tugas ini diberikan untuk dilaksanakan sebaik-baiknya dengan penuh rasa tanggung jawab.

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Kepala Bagian LPPM,

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General Chair of ICADEIS 2020

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Deden Witarsyah Jacob, S.T., M.Eng., Ph.D.

General Chair of ICADEIS 2020

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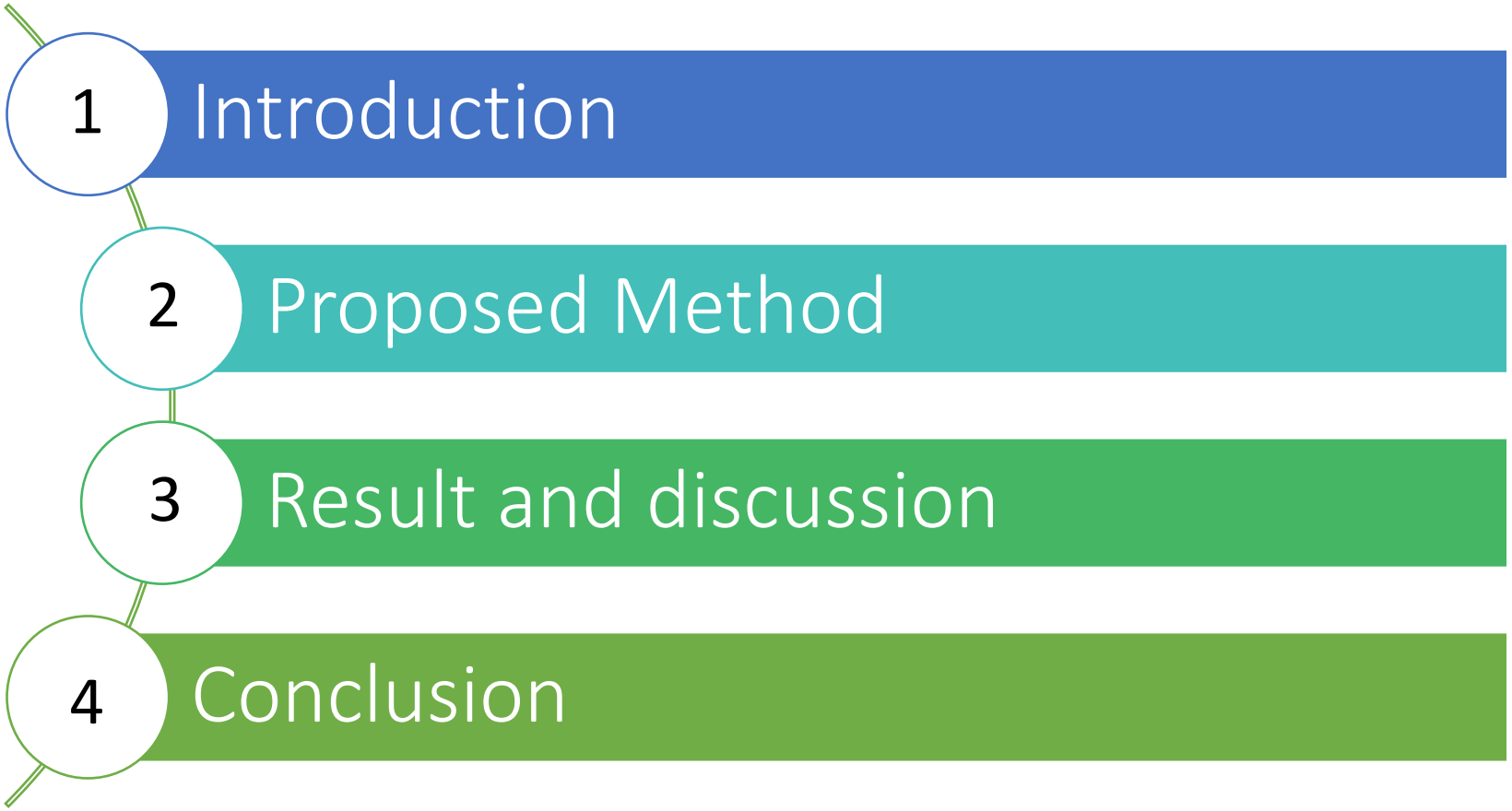
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Introduction

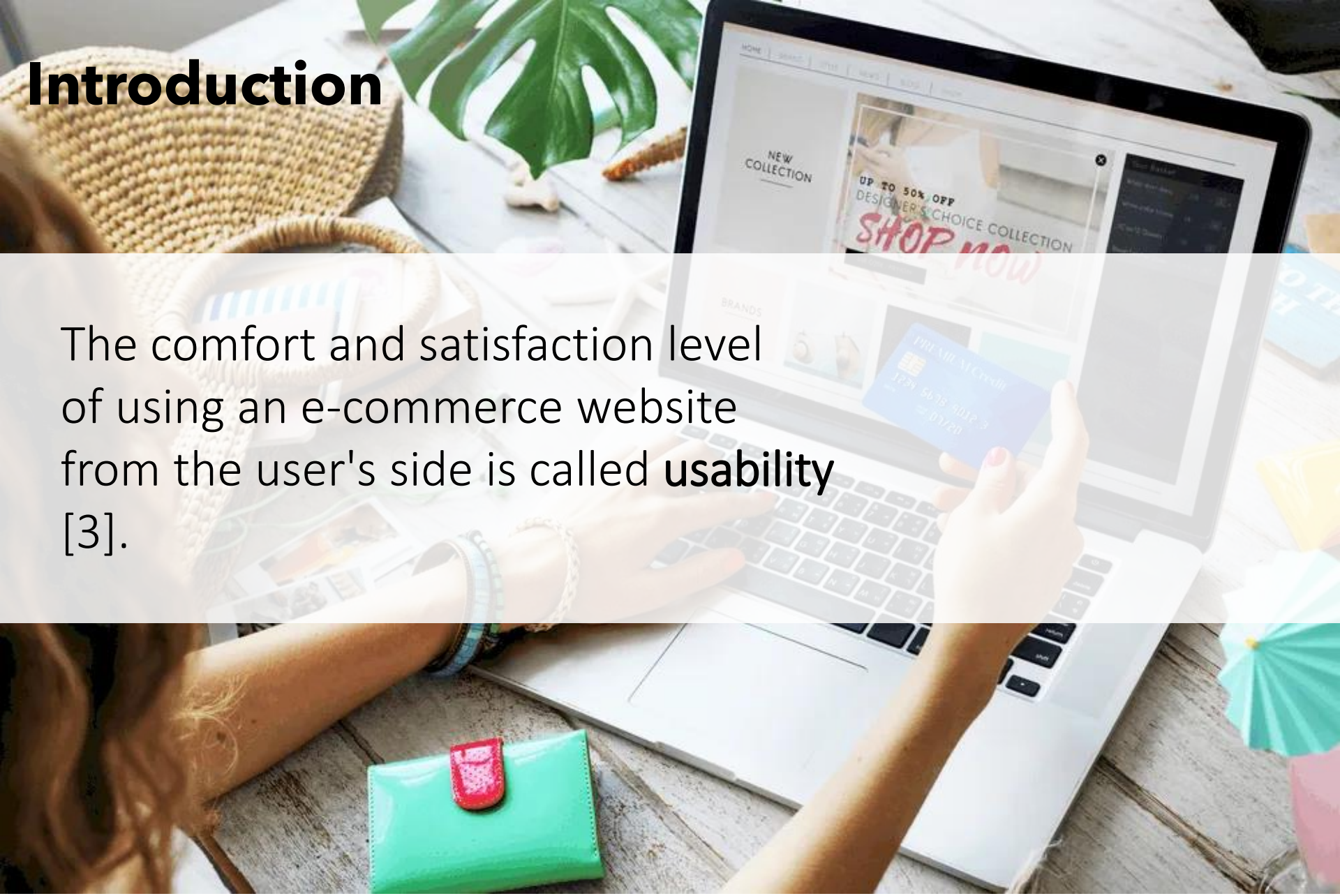
Several factors that influence the online competition are whom the buyers are, the distribution channels used, level of consumer loyalty, and **consumer satisfaction**.

Introduction

Customer satisfaction in using e-commerce is one factor in determining whether the system's functions are usable [2].

[2] A. Sivaji and S. Soo, “Understanding, Enhancing and Automating HCI Work Practices: Malaysian Case Studies,” Procedia - Soc. Behav. Sci., vol. 97, pp. 656–665, Nov. 2013.

Introduction



The comfort and satisfaction level of using an e-commerce website from the user's side is called **usability** [3].

[3] S. Abdallah and B. Jaleel, "Website Appeal : Development of an Assessment Tool and Evaluation Framework of E-Marketing," J. Theor. Appl. Electron. Commer. Res., vol. 10, no. 3, pp. 45–62, 2015.

Introduction

Usability testing and Heuristic evaluations are the most commonly used in the web domain [5]. Both techniques are considered good enough in assessing websites, so practitioners and researchers often recommend using **both methods** to complement each other [6].

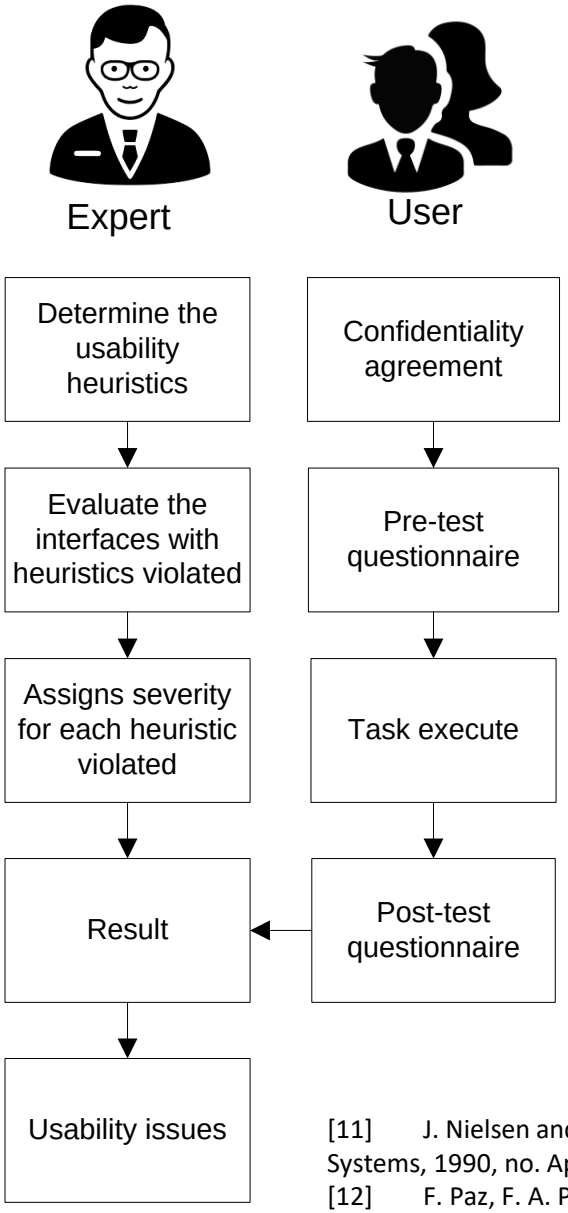
[6] F. Paz, F. A. Paz, D. Villanueva, and J. A. Pow-Sang, “Heuristic Evaluation as a Complement to Usability Testing: A Case Study in Web Domain,” 2015 12th Int. Conf. Inf. Technol. - New Gener., pp. 546–551, 2015.

Introduction

However, that is not the only combination that researchers might consider in assessment, recent studies reveal that the effectiveness of user evaluations can also combine with questionnaires [7].

7] E. B. Devine et al., “Usability evaluation of pharmacogenomics clinical decision support aids and clinical knowledge resources in a computerized provider order entry system: A mixed methods approach,” Int. J. Med. Inform., vol. 83, no. 7, pp. 473–483, 2014.

Proposed Method



We proposed a combination of the usability evaluation process consists of heuristic evaluation and SUS. Heuristic evaluation is an informal method of looking at interfaces and presenting expert opinions about how good an interface is [11], [12].

The SUS method has been freely available and used in system evaluations by fellow researchers and usability engineers since 1986, and in 1996 contributed to usability engineering in the industry. SUS has been incorporated into Morae's commercial usability evaluation tools and is referred to as an "industry standard," although it has never been through a formal standardization process.

[11] J. Nielsen and R. Molich, “Heuristic Evaluation of User Interfaces,” in Conference on Human Factors in Computing Systems, 1990, no. April, pp. 249–256.
[12] F. Paz, F. A. Paz, M. Sanchez, A. Moquillaza, and L. Collantes, “Quanatifying the Usability Trough a Variant of the Traditional Heuristiv Evaluation Process,” in Lecture Notes in Computer Science, vol. 10918, Springer, Cham, 2018, pp. 496–508.

Result and Discussion

heuristic evaluation

SUMMATIVE MEASURES FOR DURATION PER TASK

No	Task	Duration (second)			TBE (goals/sec)
		Expert 1	Expert 2	Expert 3	
1	Find information about company policies, including shipping and return practices	50	18	5	0.091
2	Explore and find products and details easily	51	101	32	0.020
3	Find, view, and modify carts, add products to it, and continue to pay	106	188	180	0.006
4	Register and view personal information and orders	27	109	120	0.018
5	Navigate from page to another successfully	10	212	60	0.040

$$TBE = \frac{\sum_{j=1}^{R}\sum_{i=1}^{N}\frac{n_{ij}}{t_{ij}}}{NR}$$

TBE =Time based Efficiency

N = Total number of tasks (goals)

R = Total number of users

n_{ij} = The result of task i by user j; if the user successfully completes the task, then N_{ij} = 1, if not, then N_{ij} = 0

t_{ij} = The time spent by user j to complete task *i*. If the task is not successfully completed, then time is measured till the moment the user quits the task.

Result and Discussion

heuristic evaluation

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Result and Discussion

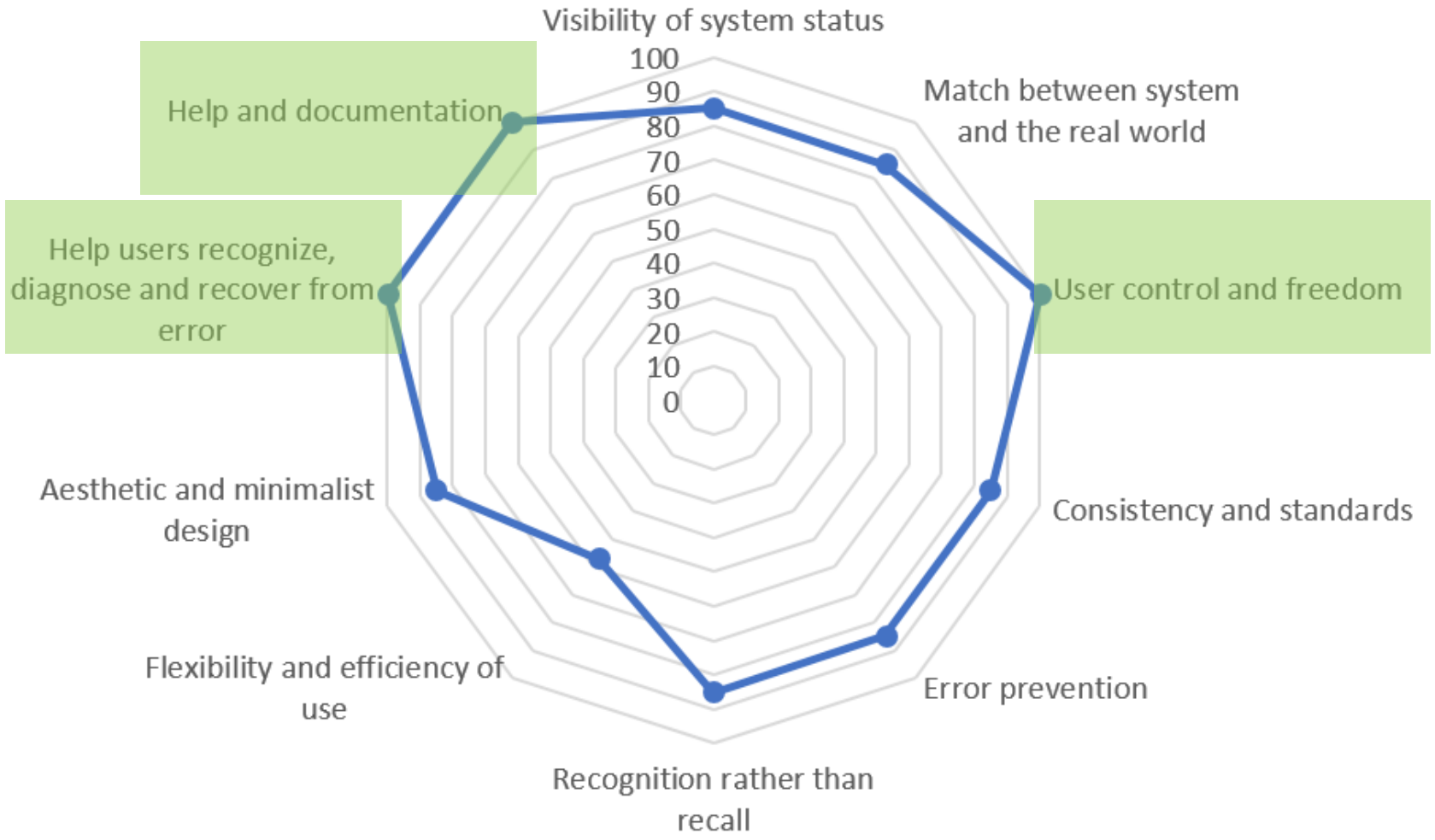
heuristic evaluation

EVALUATION RESULT

No	Evaluation criteria	Task 1	Task 2	Task 3	Task 4	Task 5	Severity rating
1	Visibility of system status	2.5	2.5	2.5	2.5	2	72-85%
2	Match between system and the real world	2.5	3	3	3	3	72-85%
3	User control and freedom	3	3	3	3	3	86-100%
4	Consistency and standards	1.5	2.5	2.5	2.5	2.5	72-85%
5	Error prevention	3	3	3	2	3	72-85%
6	Recognition rather than recall	1.5	2.5	3	3	3	72-85%
7	Flexibility and efficiency of use	1.5	1	1.5	1.5	1.5	44-57%
8	Aesthetic and minimalist design	3	3	2.5	3	3	72-85%
9	Help users recognize, diagnose and recover from error	3	3	3	3	3	86-100%
10	Help and documentation	3	3	3	3	3	86-100%

Result and Discussion

heuristic evaluation



Heuristic evaluation result

Result and Discussion

system usability scale

VALIDITY STATISTICS

Item	Person Correlation
Q1	0.645113
Q2	0.373523
Q3	0.706356
Q4	0.58551
Q5	0.722216
Q6	0.588467
Q7	0.496857
Q8	0.370443
Q9	0.347126
Q10	0.536902

RELIABILITY STATISTICS

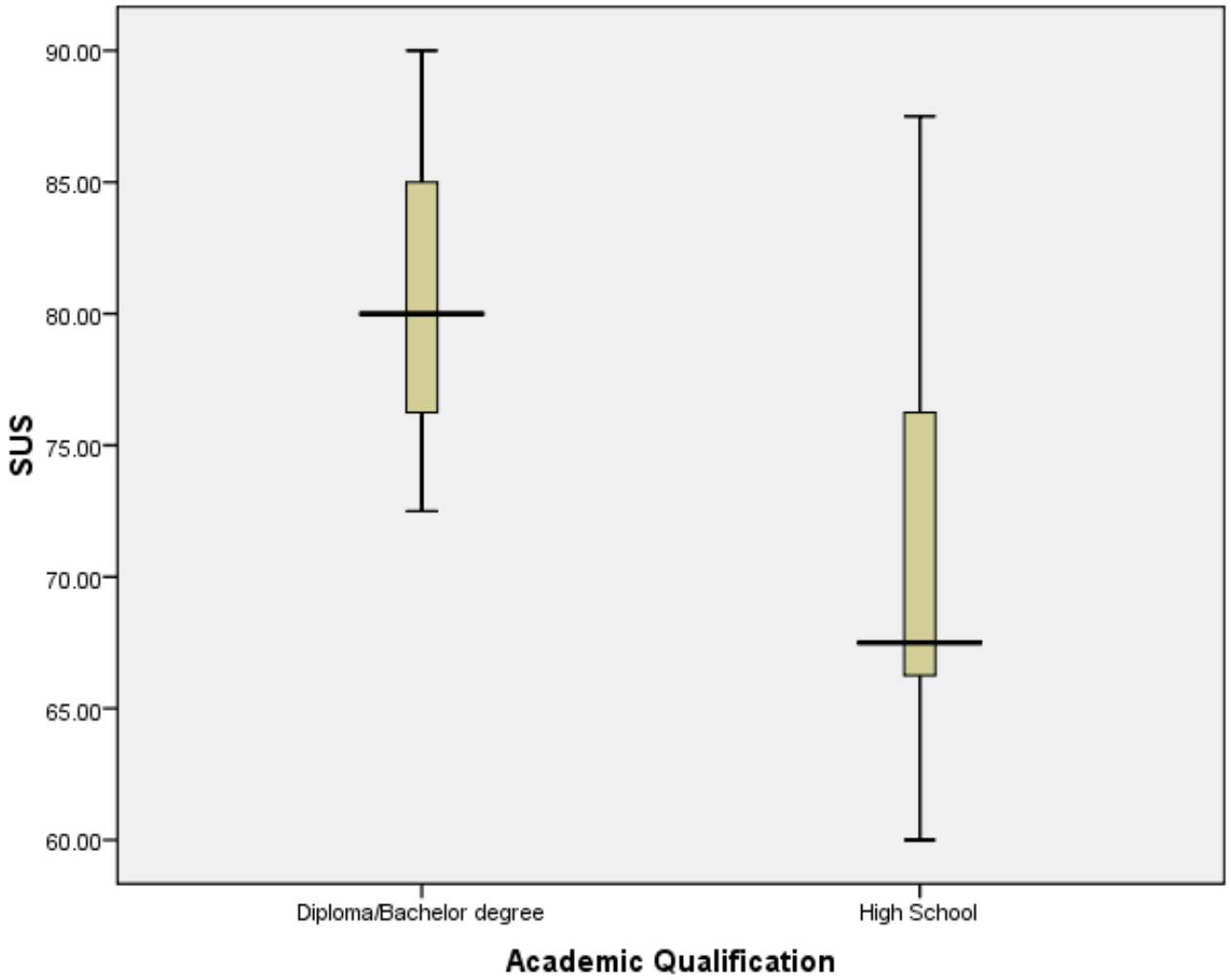
Cronbach's Alpha	N of items
0.734	10

DESCRIPTIVE STATISTICS OF SUS SCORE

N	Min	Max	Mean	Std. Dev
30*	60	90	72.083	7.88

Result and Discussion

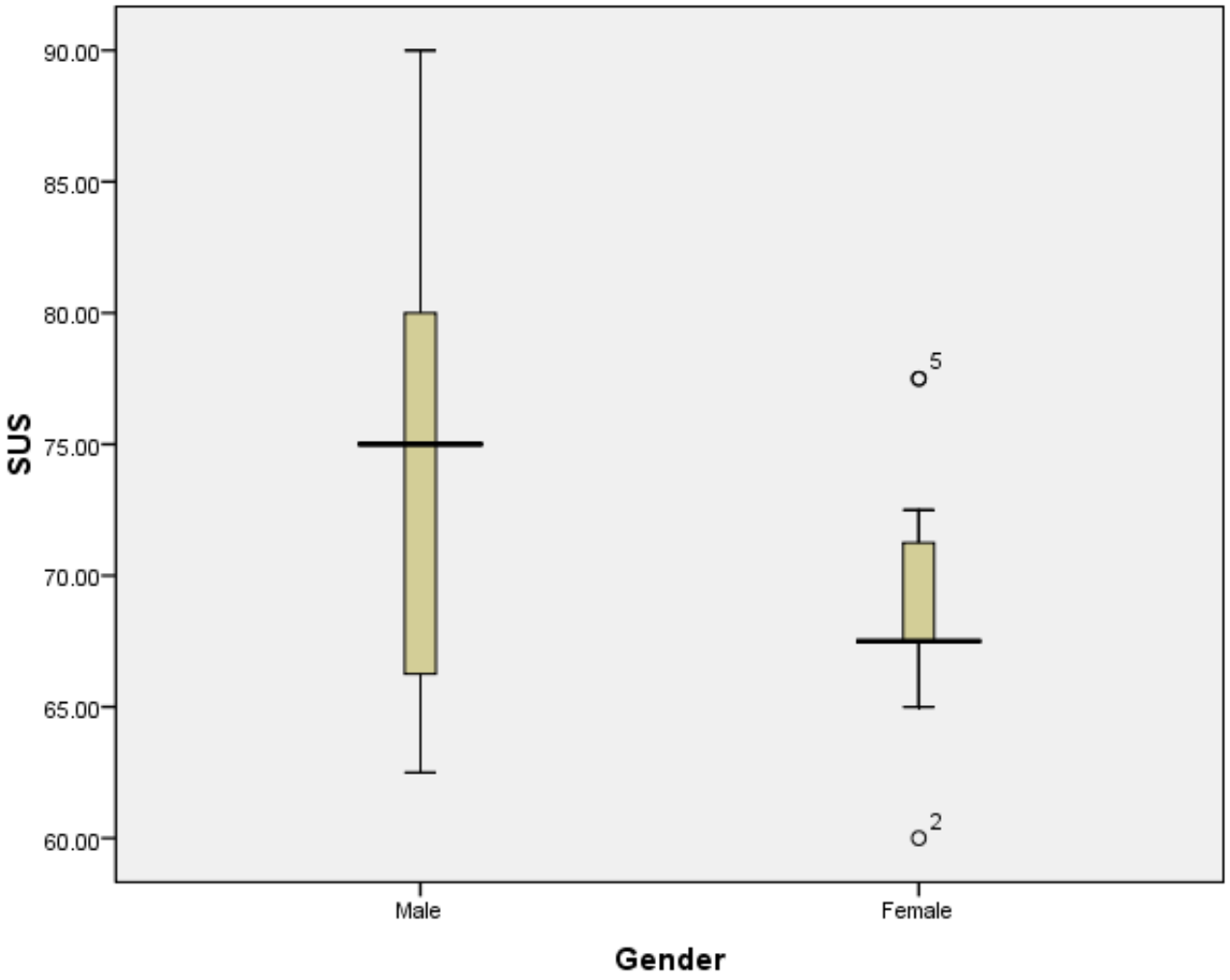
system usability scale



Relationship between academic qualification vs. SUS Score

Result and Discussion

system usability scale



Relationship between gender vs. SUS Score

Usability Issues

heuristic evaluation & system usability scale

Evaluators then gather to discuss crucial issues that need to be fixed in the design based on the findings of expert and user evaluations. The analysis shows that task 3 requires a considerable amount of time to complete the job. Also, the most severe heuristic criteria are the seventh criterion, flexibility, and efficiency of use. Some issues related to these tasks and tests, among others, the search is less relevant, there is no breadcrumb trail on the interface, there is no hierarchy of buttons that direct users to click something (call to action button). Male users and those with higher education have a more excellent perception of satisfaction with the use of the system compared to female users and those with lower education degrees. Although the Shopee site is the largest B2C site in Indonesia, improvements need to be made for service and user satisfaction. Improvements to the user interface are deemed necessary for progress and future design improvements.

Conclusion

Usability is an essential thing in e-commerce websites. Usability is related to efficiency and user satisfaction with an information technology product. Therefore, to add information about user satisfaction and experience, we add heuristic evaluations and measurements using SUS only. As a result, usability problems are more apparent than using just one method. Expert and user perspectives are combined to get user input in design improvements. Most users agree that the Shopee site is excellent (grade B-). The results of the examination by the expert stated that the Shopee site was also excellent. Nine out of ten evaluation criteria scored above 72%. There are only a few problems that need to be fixed, including the flexibility and efficiency of the system, especially issues in search engines. In further studies, it is necessary to add evaluations about the effectiveness of website use, user investigations over the age of 25, and assessments based on usage-based metrics.

Thank You