

ORIGINAL RESEARCH

UI/UX ANALYSIS ON THE GEEK STUDIO WEBSITE USING THE USER CENTERED DESIGN AND USER EXPERIENCE QUESTIONNAIRE (UEQ) METHOD

Reva Rahardian | Gita Fadila Fitriana*

¹ Software Engineering, Telkom Institute of Technology Purwokerto, Jawa Tengah, Indonesia

Correspondence

*Email: gita@ittelkom-pwt.ac.id

Present Address

Jl. DI Panjaitan No.128, Karangreja, Purwokerto Kidul, Kec. Purwokerto Sel., Banyumas Regency, Central Java 53147

Abstract

GEEK STUDIO engaged in photography such as photo studios and rental shooting tools. Based on the results of an interview with the owner of GEEK STUDIO, there is a problem to develop a website profile system that cannot be used optimally because the existing website is still considered less than optimal in terms of user experience (UX) and user interface (UI) so it is less attractive and less comfortable to use. therefore, the researcher will analyze the website which according to the source is still the maximum turning using the UCD and UEQ methods. User-Centered Design (UCD) is one of several design methods where the method is focused on the needs and preferences of its users. UCD is a process that is carried out repeatedly where the design and evaluation are developed from the initial stage to the implementation periodically. Then the User Experience Questionnaire (UEQ) is a method in the form of a questionnaire where the method serves to measure the viewing experience of users of a product. The most basic goal of UEQ is to quickly calculate its user experience through questionnaires. Based on research data that has been carried out by the author, a conclusion can be drawn where the results of the study have produced previous design benchmark values, namely attractiveness 1.11, perspicuity 1.16, efficiency 1.41, dependability 1.31, stimulation -0.76 and novelty -0.96 While in the design afterward, namely attractiveness 2.49, perspicuity 2.20, efficiency 2.26, dependability 2.00, stimulation 2.05 and novelty 2.18, Based on this, it can be seen the improvement of the chart from the benchmark which was originally from bad to above average to excellent overall.

KEYWORDS:

website, information technology, usability testing, interface, user experience questionnaire (UEQ), User Centered Design (UCD)

1 | INTRODUCTION

The technology used today is very helpful for companies in running their business^[1]. The website system is one of the systems that serve to provide information to manage decision selection and run various company and agency operations, the system also includes a series of information technology workers and organized procedures^[2]. GEEK STUDIO photo studio management has problems developing a website profile system, as well as GEEK STUDIO goods and transaction management that can be used optimally because the existing website is still considered less than optimal in terms of user interface and user experience where the appearance looks ordinary and not so that some users still find it difficult to use the website. According to him, he strongly agrees with the analysis of existing websites because of the unattractive appearance and the layout of buttons, columns, and icons that are still not neat. *UI* (Interface Interface) and *UX* (User Experience) are the two most important factors that determine the success of an information system. The design of elements in a website or mobile application can be improved by applying concepts from human-computer interaction theory, which includes visual aspects, appearance, content, multimedia, and men^[3] layout. Besides being useful for management, the use of this website also plays an important role in the current covid pandemic conditions. Because the problem with COVID-19 has now hit many aspects that have been affected^[4]. This pandemic has made it impossible for the transaction process to be done manually, requiring the use of technology and information media^[5]. The implementation of this management website system is useful for the studio because it is more than 20 employees. In website development, it is necessary to pay attention to aspects of Human and Computer Interaction which is one of the processes for communication between users and computers. This includes activities where the user can give commands and communicate with the computer according to his goals or wishes. To guarantee effective interaction, the interface should be preferably designed according to the user's ability of the system, so that the user can operate the computer properly^[6]. Therefore, it must be considered well in terms of *UI* (Interface display) and *UX* (User experience) The interface of the user or commonly called the User Interface is an important factor of the system because it communicates directly with its users^[7]. All elements displayed on the screen, such as reading content as well as operating using a keyboard or mouse, are included in part of the User Interface^[8]. The User Interface oversees connecting the information present in the program to the user through the operating system. So that it can be given the meaning as a mechanism of interconnection or total integration of hardware and software that gives the impression of the user's experience in using a computer^[9]. User-Centered Design (UCD) is a methodology of how to develop a system design that focuses on the needs and preferences of its users. UCD is a process that is carried out repeatedly the design process or evaluation is developed from the initial stage to the implementation repeatedly^[10]. In the User Centered Design (UCD) method, several steps must be taken to ensure that the website system developed is under user needs. These steps include determining the context of use, identifying the needs of users or organizations, providing refined designs, analyzing the design, and evaluating the result. This process can be repeated until optimal results are obtained. The User Experience Questionnaire (UEQ) is a questionnaire form collection technique that has to assess the experience of the experience rather than the user of a type of product^[7]. The most important goal of UEQ is to measure the user experience quickly and precisely with a type of product. UEQ consists of 26 items grouped into six scales: (Attractiveness) product attractiveness, (Perspicuity) ease of use and product recognition, (Efficiency) product efficiency in responding to user input, (Dependability) product accuracy in controlling interactions, level of pleasure when using the product, and (Novelty) whether the product is innovative and creative.

2 | PREVIOUS RESEARCHES

The results obtained by the study are excellent final scores from the calculation of the likert and webuse scales. This shows that the approach using the methods used can provide better results in terms of analysis and interface design and user experience, so that it can make it easier to use on the RenovAction website.

Tengku Khairil Ahsyar, Asri Jakawendra, Syaifullah.^[11] In 2020 the results obtained from the study resulted that the analysis with the User Centered Design (UCD) method succeeded in providing good recommendations for PT. Image of Pekanbaru Sorcerer's Media. Prototypes built on UCD analysis can fix existing problems on three principles without changing the original existing design.

Destiara Kirana Safitri, Andrianingsih.^[12] In 2022 The results obtained by this study show that the implementation of UI / UX design into the Web Front-End for the system for the final project work was successful with the results of performance testing

showing that a average value of testing based on Performances worth (91) is very good, Accessibility (88.7) is average, and Best Practise (95.2) is very good.

Abid Bagus Kurniawan, Ismiarta Aknuranda, Andi Reza Perdanakusuma.^[13] In 2019 the results obtained by the study showed improved results at the level of user experience that before being in neutral values became positive.

Ari Andriyas Praise, Vivi Eng raini. In 2021 The results that have been obtained from research show that by paying attention to user needs, the user interface that has been created is more than user friendly, but it can also be for the attention of visitors who are going to buy.

3 | METHOD

In this stage of the study, a literature study will be carried out and problem identification, followed by determining respondents, data collection, interviews, UEQ questionnaires, data processing, data analysis and drawing conclusions.

3.1 | Literature Studies

In this stage of the literature study, researchers will carry out a literature review analysis of previous research related to Photo Studio website management, User Interface, User Experience, User-Centered Design, and User Experience Questionnaire. Literature studies are carried out to corroborate the problems taken and as a reference in research.

3.2 | Defining Respondents

The respondents taken in this study were determined based on the purpose of the study, namely users from the Photo Studio Management website. This website management is intended for all employees and owners of the GEEK STUDIO photo studio. In the sampling process, however, if there is several populations that are less than 100 people, appropriate saturated sampling techniques are used to determine a representative sample of that population. This is done because it is to minimize errors that may occur in research and ensure that the results obtained can be generalized to a wider population. Therefore, the respondents in this study were 20 respondents. The respondent selection technique to be used uses the saturated sample technique, a technique in determining samples that result in all members of the population being sampled^[9]. The respondents will be given a schedule and a link to take part in the interview, after which, they will fill out the UEQ (User Experience Questionnaire) questionnaire.

3.3 | Data Collection

In the research conducted by this author, the method of collecting all data will be carried out using 2 methods, namely qualitative and quantitative methods. The qualitative data collection method used will go through interviews, while quantitative data is obtained using the UEQ (User Experience Questionnaire) questionnaire method.

3.4 | Interview

In the interview stage, researchers will later conduct a meeting with respondents to submit interviews related to user needs and contexts. The researcher will make observations and record every action carried out by the respondent. Then, researchers will also conduct a sequence of interviews with respondents to get more detailed feedback about their experiences when using the tested product. The results of the tests carried out will then be used for product design improvements and further development. Researchers will ask additional questions for discussion. The following is a list of questions that will be asked in the discussion with respondents:

1. What do you think about this Management website?
2. Are there any problems or obstacles found when you use this photo studio Management website? If there is, what are these obstacles please explain?
3. Do you think there is anything that needs to be improved from the Management website of this photo studio?
4. Is there anything that needs to be added or removed both in terms of appearance and features?

3.5 | UEQ Questionnaire

A questionnaire form from UEQ will be provided after all respondents have finished testing and interviewing new website users. Measurement using the UEQ (User Experience Questionnaire) includes six aspects followed by 26 indicators. UEQ contains a pair of indicators whose statements are meaningfully opposed and evaluates the product on 7 scales^[14]. as in Table 1

TABLE 1 List of UEQ Questionnaires

	-3	-2	-1	0	1	2	3	
	1	2	3	4	5	6	7	
Troublesome	O	O	O	O	O	O	O	Fun
Incomprehensible	O	O	O	O	O	O	O	Understandable
Creative	O	O	O	O	O	O	O	Monotonous
Easy to learn	O	O	O	O	O	O	O	Difficult to learn
Useful	O	O	O	O	O	O	O	Less useful
Dull	O	O	O	O	O	O	O	Fun
Unattractive	O	O	O	O	O	O	O	Pull
Unpredictable	O	O	O	O	O	O	O	Predictable
Fast	O	O	O	O	O	O	O	Slow
Creative	O	O	O	O	O	O	O	Conventional
Blocking	O	O	O	O	O	O	O	Support
Good	O	O	O	O	O	O	O	Bad
Complicated	O	O	O	O	O	O	O	Simple
Disliked	O	O	O	O	O	O	O	Encouraging
Customarily	O	O	O	O	O	O	O	Leading
Uncomfortable	O	O	O	O	O	O	O	Comfortable
Safe	O	O	O	O	O	O	O	Insecure
Motivate	O	O	O	O	O	O	O	Not motivating
Meet expectations	O	O	O	O	O	O	O	Not meeting expectations
Inefficient	O	O	O	O	O	O	O	Efficient
Clear	O	O	O	O	O	O	O	Fluster
Impractical	O	O	O	O	O	O	O	Practical
Organized	O	O	O	O	O	O	O	Messy
Attractive	O	O	O	O	O	O	O	Not attractive
User Friendly	O	O	O	O	O	O	O	Not user-friendly
Conservative	O	O	O	O	O	O	O	Innovative

3.6 | Data Processing

After the completion of the collection of all data, the next stage is the process of data analysis. Not only producing qualitative data but recorded interview videos will also be observed. Based on the video, researchers will get quantitative data regarding the needs of users and companies. Meanwhile, the qualitative data obtained will be grouped based on negative and positive perceptions and will then be associated with 6 UEQ scales. Then the results of the UEQ questionnaire will be processed using the data analysis tools available at <https://www.ueq-online.org/>.

3.7 | Data Analysis

Based on the conclusions obtained during qualitative data processing, researchers can analyze which aspects of the UEQ produce negative and positive perceptions and have recommendations for improvement. Then for the results of quantitative data processing, performance metrics analysis will be obtained. After conducting data analysis using the data analysis tools contained

in <https://www.ueq-online.org/>, the results of the UEQ questionnaire will be displayed in the form of a benchmark UEQ diagram to interpret the results of the evaluation that has been carried out. The results of the UEQ benchmark, the scale obtained will be known from each aspect of UEQ, including Excellent, Good, Above Average, Before Average, or Bad.

3.8 | Conclusion

If all stages of the analysis are completed, a conclusion will be obtained that is used to find the answer to the problem formulation listed in CHAPTER 1. In addition, the researcher will provide the advantages and disadvantages of the evaluation method that the researcher will use, namely User Centered Design and User Experience Questionnaire. Then suggestions for recommendations from the initial design of the system to the design of solutions from the system that the author presents in the form of graphs or tables for improvement in terms of user interface and user experience.

4 | RESULT AND DISCUSSION

In this chapter of analysis and discussion, the author will explain what the appropriate steps to the User Centered Design (UCD) method are to improve system design and use User Experience Questionnaire (UEQ) to find out how the existing design is good or not good in terms of user experience.

4.1 | Initial Design Evaluation

The initial design evaluation will be carried out based on the results obtained by the author from the User Experience Questionnaire (UEQ) questionnaire, the results of the answers given to respondents will be divided into 2 levels, namely not good and good. Bad levels are those that will be used as a foundation in system design improvements. Meanwhile, good levels will be used as things that must be maintained in the design in the new system.

UEQ Scales (Mean and Variance)		
Attractiveness	↑ 1,108	2,49
Perspicuity	↑ 1,163	2,78
Efficiency	↑ 1,413	1,78
Dependability	↑ 1,313	1,43
Stimulation	→ -0,763	4,12
Novelty	↓ -0,963	4,07

FIGURE 1 Initial Design UEQ Scale in table.

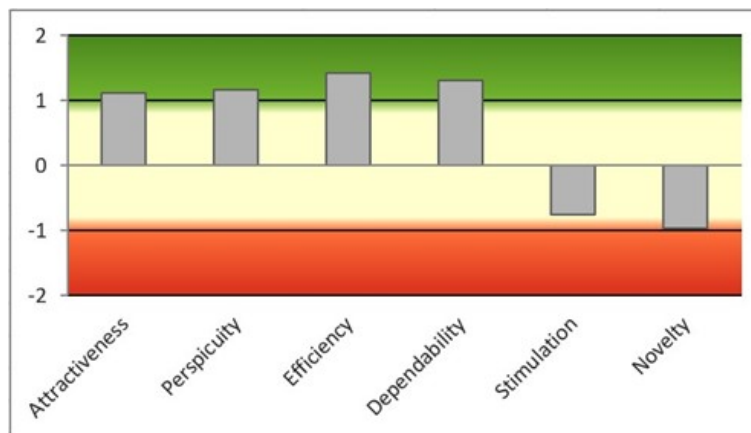


FIGURE 2 UEQ scale in graph.

Figure 1 presented a result of the calculation of the mean and variance of the entire existing UEQ scale with results where attractiveness with a mean result of 1.108, perspicuity with a mean result of 1.163, efficiency with a mean result of 1.413, dependability with mean results of 0.625, stimulation with mean results of -0.763 and novelty with mean results of -0.963. Then in Figure 2 which can be seen in the graphic format where if the graph of the direction of the mean arrow is pointing upwards means that the value of the evaluation is positive, and the sideways arrow means that the evaluation value is normal, and the down arrow which means that the evaluation value is negative. From the two images, it can be concluded that the attractiveness, perspicuity, and efficiency scales are positive, the dependability and stimulation scales are of normal value while the novelty values are negative.

The results of the evaluation value of the two images are not enough if they are used as a conclusion of User Experience from a website. A better and more appropriate step to increase the accuracy of a website's User Experience achievement is to look at benchmarks. Benchmark is a tool for benchmarking that can be used as a reference for the website is good or vice versa. The following are the results of the benchmarks at the evaluation stage of the initial design contained in Figure 3 .

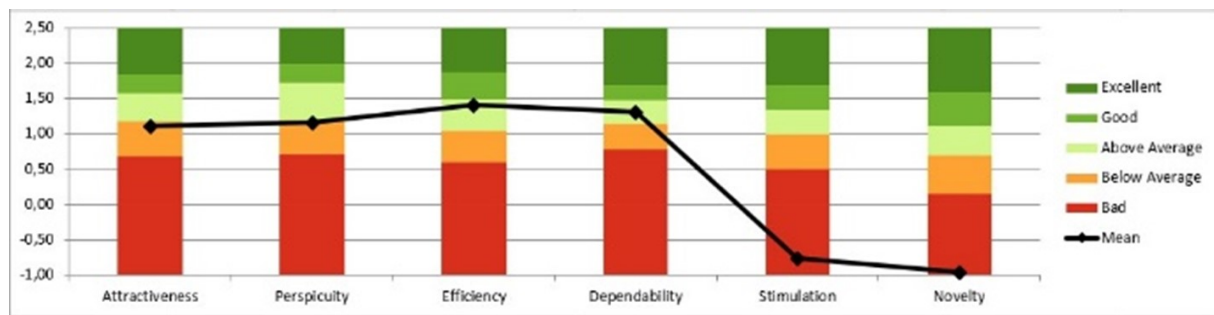


FIGURE 3 Preliminary Design Benchmark Results.

From Figure 3 above is the benchmark result of the entire UEQ scale that exists from attractiveness to novelty. The figure explains that each scale of the UEQ occupies a result where, whether excellent, good, above average, below average, bad or mean. The results of the test seem to be varied, including getting a below average score, good and even some getting a bad score which means it is still very lacking. To find out more details about the benchmark results of the evaluation, it can be seen in Table 2 .

TABLE 2 Interperformance of Benchmarks in Early Villages

Scale	Mean	Comparison to Benchmark	Interpretation
Attractiveness	1.11	Below Average	50% of the results better, 25% of results worse
Perspicuity	1.16	Below Average	50% of the results better, 25% of results worse
Efficiency	1.41	Above Average	25% of results better, 50% of results worse
Dependability	1.31	Above Average	25% of results better, 50% of results worse
Stimulation	-0.76	Bad	In the range of the 25% worst results
Novelty	-0.96	Bad	In the range of the 25% worst results

From Table 3 . very clearly can be seen data from the calculation of the average value (mean), comparison to benchmark (comparison to benchmark), and underperformance (interpretation). The Excellent value of the benchmark can be obtained if the mean value is above 1.75, the good value is above (1.52), the above average value is above (1.17) and the below average value is above (0.7). Then for a bad value is obtained if the mean value is below 0.7. If based on the table, then the conclusion of the initial design of the website has a benchmark level between below average to bad. Based on this, the system design of the Geek Studio website needs to be improved to improve benchmark results from previous results.

4.2 | Implementation of User Centered Design (UCD)

At the stage of user centered design implementation includes the following aspects:

4.2.1 | Understanding and Determining User Context

The author's first step to obtain this data was from interviewing several sources and distributing questionnaires to respondents who were in the company. The following is a summary of the interviews conducted by the authors presented in Table 3.

TABLE 3 User Context and Interview Results

No.	Sources	Place	Status
1	Sekti Indra Pratama	Geek Studio	Owner
2	Dini Oktaviani	Geek Studio	Employee
3	Nur Rohmah Sepputri	Geek Studio	Employee
4	Diajeng Saraswati P	Geek Studio	Employee
5	Anggi Ayu Lestari	Geek Studio	Photographer

Table 3 contains 5 speakers, due to limited resources and also time. The table can be concluded that some of the sources already represent the three roles in the photo studio. The first speaker, Sekti Indra Pratama, the owner of a geek studio, said that he strongly agreed to hold an analysis of the old geek studio website according to him the old website was still too boring and monotonous in terms of its user interface, he hoped that on the new website for the layout of menus, icons and display photos displayed on the main screen as highlights from geek studios to make it look more attractive to visitors to the website. he also wanted that Users other than employees can use the website to book and register studio photos online. Then, resource person Dini Oktaviani an employee of the geek studio said that he strongly agreed to the further development of the website because the website seems ordinary more like a cashier website in general even though the photo studio should be made aesthetic and attractive to show the characteristics of entertainment a photo studio. it would be nice in terms of coloring to be made more attractive as well. Furthermore, the speaker nurrohmah sepputri as an employee of the geek studio said that he agreed with the further development of the website because the previous website was not comfortable and seemed ordinary. He also feels bored and considers such a website in 2022 as it is now less relevant. The speaker, Saraswati Purnumatadika, a photographer from geek studio, said she agreed to further develop the website because she as a photographer felt that the website was undersold. After all, it looked ordinary and people who accessed it felt that they were not interested in accessing the website and lacked information about the ins and outs of the photo studio. Then the resource person anggi ayu lestari as an employee of geek studio said that he strongly agreed to further development on the website because he was often confused in using the geek studio menu because it was only a random panel and not grouped according to their respective roles, he also wanted the wider community to be more familiar with the geek studio website, therefore he wanted the website to be more eye-catching and could also be accessed online by the wider community. From the 5 speakers who have been interviewed by the author, it was concluded that it is agreed to develop a geek studio website that can be accessed by employees and potential customers from the studio, besides that the appearance of the geek studio is expected to make it easier to use if presented attractively and freshly.

4.2.2 | Making Improvements to the Interface Design

At the stage of making improvements to the interface design based on the initial design evaluation as well as the new design of the geek studio website using the UEQ questionnaire. The first step in making this improvement is that the author designs the repair design in the form of low fidelity design. The low fidelity design is divided into several pages. Below is a mockup of the new design of the geek studio website.

Based on the improvement of the interface design between the initial and new designs, there are some differences that can be seen from the differences between each other. You can see a comparison of the beginnings and novelties of the interface design in Figure 4 , Figure 5 , Figure 6 , Figure 7 and Figure 8 .

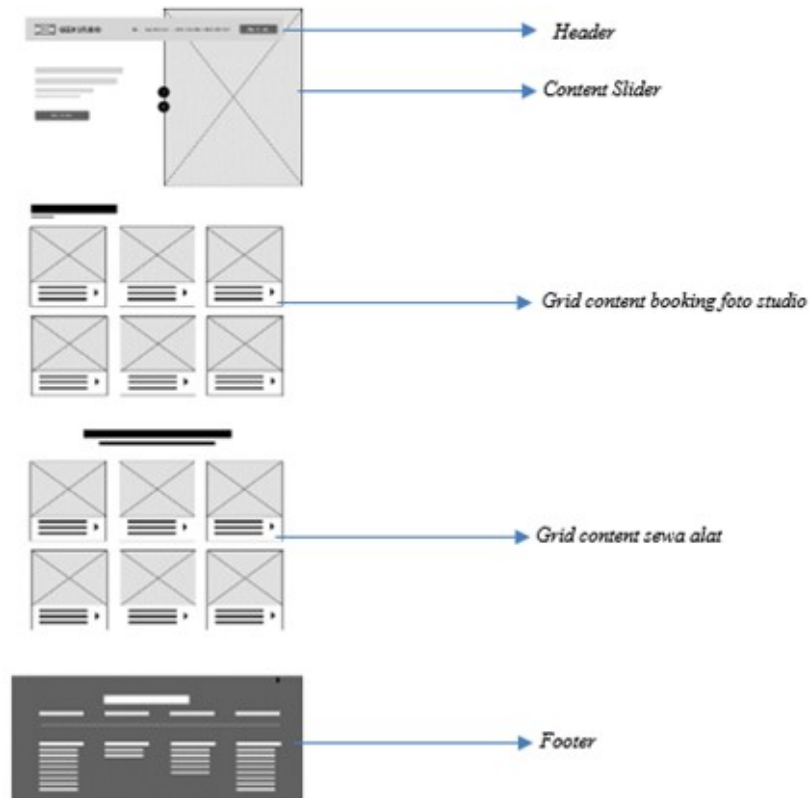


FIGURE 4 A New Design Mockup.

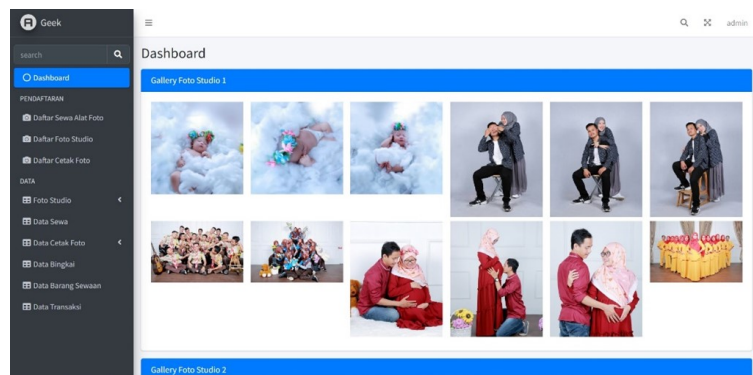


FIGURE 5 Old Design Dashboard Page.

In figure 5 , you can see the appearance of the dashboard menu in the old design, while in Figure 6 it is the appearance of a new design home menu. The difference is that if users want to see information about the studio's photo gallery, users will only see the photos, this makes potential customers less interested in the results of studio photos and seems less neat. While the new design for the photo gallery display is displayed on a slide on the right so that it is very highlighted and interesting for users who want to see and choose to use, then if you scroll down, you will see various studio packages and rental tools along with price information. Therefore, users will get more information than they want to know.

In figure 7 , you can see the appearance of the photography equipment rental menu on the old design where the user will only be shown a form to fill in, while in Figure 8 you can see the appearance of the new design equipment rental menu, the difference



FIGURE 6 of the New Design Dashboard Page.

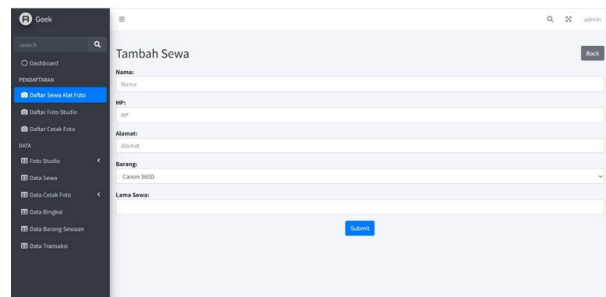


FIGURE 7 Old Design Equipment Rental Menu Page.

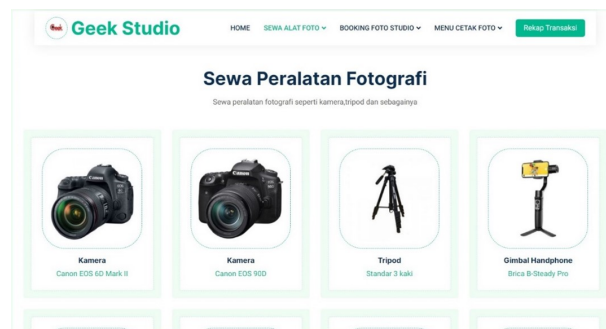


FIGURE 8 New Design Equipment Rental Menu Page.

with the old design is that there is information about the type of goods and photos of the goods, besides that the user only needs to click on the desired item, it will be directed to the rental page so that the user avoid input errors.

In figure 9 , you can see the display of the photo studio booking menu on the old design where the page only displays a blank form without displaying the results of the studio photo which makes the user feel confused in choosing so it had to be shown manually using the books available in the studio. Meanwhile, in Figure 10 , you can see the appearance of a new design menu that is fresher and more informative where each package will look complete with examples of photos and prices and benefits of the package said.

In Figure 11 , you can see the appearance of the old design photo print menu which looks less attractive and seems like a very rigid website. While in Figure 12 is a new design of a new photo print menu which is more interesting and interactive and easy to use.

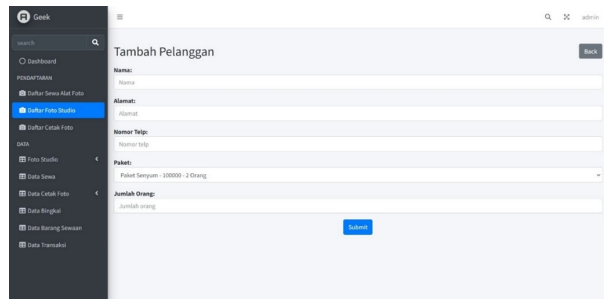


FIGURE 9 Old Design Studio Photo Booking Menu Page.

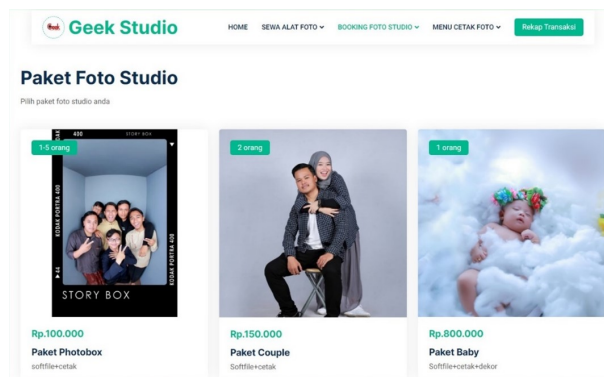


FIGURE 10 New Design Studio Photo Booking Menu Page.

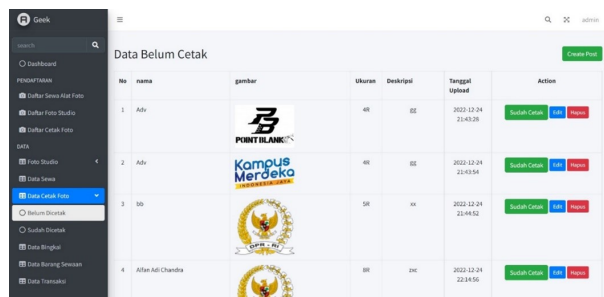


FIGURE 11 Old Design Photo Print Menu Page.

Based on the results of the UEQ questionnaire from the initial design, the main thing in improving the appearance of the system design is the "boring or exciting" parameter with the highest percentage being very boring at 45% of the UEQ results of all respondents who have filled in. In the interface design of the old website and the new website, there is a very noticeable difference. Based on the boring or exciting context, it can be seen from the entire menu and appearance on the old website can be used as a reference for evaluation that will be implemented in the new design improvements by rearranging the appearance to make it fresher and more attractive. Related to the mockup of the overall appearance of the website.

4.2.3 | Evaluating the Results of Interface Design Improvements

In the evaluation stage of the results of the interface improvement design, an evaluation of the new design was then carried out based on the User Experience Questionnaire (UEQ) questionnaire for the second time.

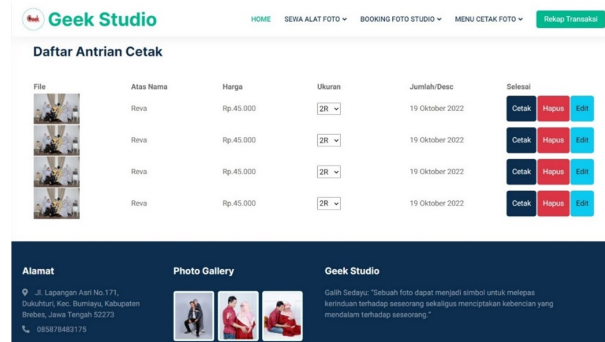


FIGURE 12 New Design Photo Print Menu Page.

UEQ Scales (Mean and Variance)		
Attractiveness	↑ 2,492	0,26
Perspicuity	↑ 2,200	0,96
Efficiency	↑ 2,263	0,33
Dependability	↑ 2,000	0,52
Stimulation	↑ 2,050	1,71
Novelty	↑ 2,175	0,76

FIGURE 13 UEQ Scale Results Using Mean and Variance Calculations of Table Shapes.

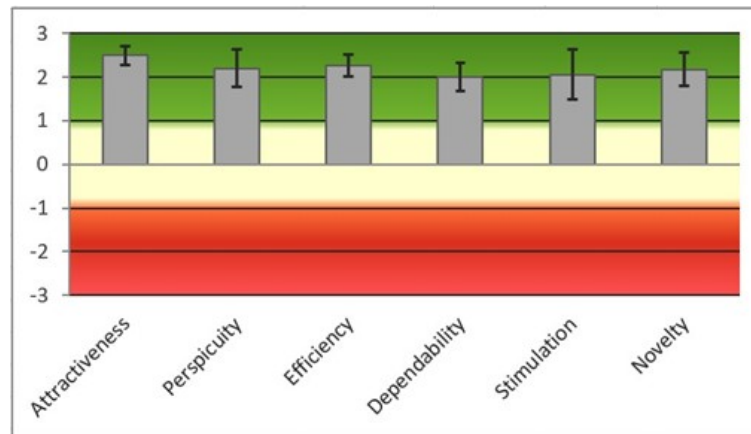


FIGURE 14 UEQ Scale Results Using Mean and Variance Calculations of Table Shapes.

Figure 13 is presented a result of the calculation of the mean and variance of the entire existing UEQ scale with a result where attractiveness with a mean result of 2.492, perspicuity with a mean result of 2.200, efficiency with a mean result of 2.263, dependability with a mean result of 2.000, stimulation with a mean result of 2.050 and novelty with a mean result of 2.175. Then in Figure 14 which can be seen in the chart format where if the graph of the direction of the mean arrow is pointing upwards means that the value of the evaluation is positive, the sideways arrow means that the value is normal, and the downward arrow means that the evaluation value is negative. From the two images, it can be concluded that the five existing scales are already positive, which means that the evaluation of the new website is good. The results of the evaluation values of the two images are positive but still not enough to be used as a conclusion of the User Experience of the website. A further step to increase the accuracy of a website's User Experience performance is to look at benchmarks. Benchmark is a tool used to benchmark a website whether it is good or vice versa. The following are the benchmark results at the evaluation stage of the new design found in Figure 15 .

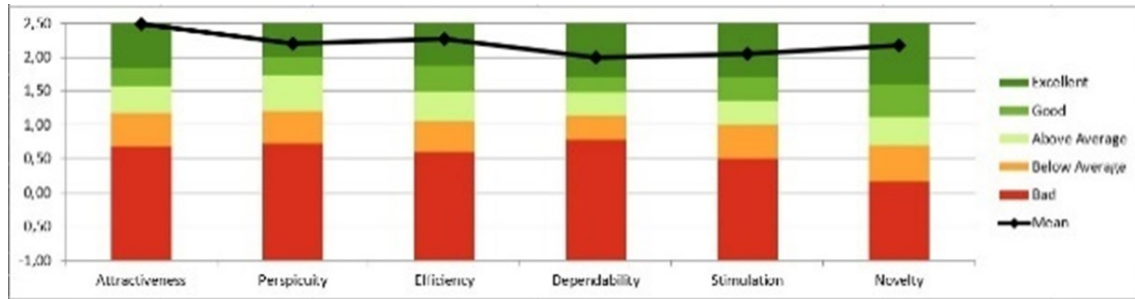


FIGURE 15 New Design Evaluation Phase Benchmark Results.

From Figure 3 above is the benchmark result of the entire existing UEQ scale ranging from attractiveness to novelty. The figure explains that each scale of the UEQ occupies a result where, whether excellent, good, above average, below average, bad, or mean. The results of the test look like the whole score got an excellent score. To find out more details about the results of the evaluation benchmark, it can be seen from the Table 4 .

TABLE 4 Interperformance of Benchmarks in Early Villages.

Scale	Mean	Comparison to Benchmark	Interpretation
Attractiveness	2.49	Excellent	In the range of the 10% best results
Perspicuity	2.20	Excellent	In the range of the 10% best results
Efficiency	2.26	Excellent	In the range of the 10% best results
Dependability	2.00	Excellent	In the range of the 10% best results
Stimulation	2.05	Excellent	In the range of the 10% best results
Novelty	2.14	Excellent	In the range of the 10% best results

From Table 4, it is very clear that the average value (mean), comparison to benchmark, and interpretation (interpretation). The Excellent value of the benchmark can be obtained if the mean value is above 1.75, the good value is above (1.52), the above-average value is above (1.17) and the below-average value is above (0.7). Then a bad value is obtained if the mean value is below 0.7. If seen from the table above, you can conclude that the new design is already above the good value and there are even 6 scales that touch the excellent value. Therefore, the conclusion from these results can already answer that the new design is better than the old design of the geek studio website.

5 | CONCLUSION

Based on the results of the research that has been carried out by the author, it can be concluded that the study has produced previous design benchmark values, namely attractiveness 1.11, perspicuity 1.16, efficiency 1.41, dependability 1.31, stimulation -0.76 and novelty -0.96 While in the design afterwards, namely attractiveness 2.49, perspicuity 2.20 , efficiency 2.26, dependability 2.00, stimulation 2.05 and novelty 2.18, based on this, it can be seen an increase in the graph From the benchmark that was originally from bad to above average to excellent overall.

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