



User Centered Design Method Approach for User Experience Analysis of Food Delivery Application

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Abstract. Online food delivery applications, especially the Pizza Hut application, are very helpful for people to order online delivery throughout Indonesia branches with various features and services in the application. Based on initial interviews with application users, users want and update the Pizza Hut application interface, the application screen is not well organized and somewhat confusing. In this study, the aim of this research is to conduct a user experience analysis and recommend a new Pizza Hut application interface design by applying the User Centered Design (UCD) method. 338 respondents provided answers from the same questionnaire for two evaluations, the first to inform the system requirements analysis and the second to evaluate the prototype. Evaluation of the new UI/UX prototype with UEQ resulted in an overall increase in scores categorized as Above Average. Thus, this new design is good enough to be used as a design recommendation to Pizza Hut.

Keywords: User Centered Design, Pizza Hut application, User Interface, User Experience and User Experience Questionnaire.

1 Introduction

1.1 Research Background

Digitalization allows businesses to complete transactions with consumers without having to face them directly. Digital transactions can make every service in business faster because every transaction will be processed faster. Digitalization also makes the market wider. Integrated information technology is expected to facilitate and support the role of the business world in availability and accessibility to improve workflow [1]. The faster development of technology encourages more open opportunities for innovation. The business world is also increasingly dynamic in facing competition and improving the products and services offered to consumers. Food delivery is one form of technological innovation that can fulfill human needs. Indonesians' interest in online food delivery is also high: the growth in the use of online food delivery services globally increased by 67% between 2019 and 2020[2]. Information technology plays a role in network optimization and a stronger strategy that can have a positive impact on the economy to support business growth [3].

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In this study, the object used is an online food delivery application, especially the Pizza Hut application. This application helps people to order online delivery in all branches of Indonesia with various features and services in the application. This application really helps pizza lovers to order easily and quickly. Based on a survey conducted by researchers, the lifestyle of people who often consume fast food is a phenomenon that often occurs, especially people who live in cities. And the biggest choice is that people prefer Pizza Hut because it is more practical and easier to get, guaranteed product quality, because of the influence of the social environment such as family, friends and the social environment [4]. But based on initial interviews with application users, users want to change or update the Pizza Hut application interface because according to some users, the application screen is not well organized and somewhat confusing. This empowers researchers to evaluate the appearance of the application used by Pizza Hut customers, and then the results of the evaluation can provide recommendations to the application development team.

Every website or mobile app must have a good user interface (UI) and user experience (UX). User interface is the interface of a system, meaning that it can be seen, heard, touched, or interacted with in the process of understanding. Efficient and effective user interface design is important because the user interface is described as the bridge between the user and the programming language. Proper user interface design will help users fulfill their needs while using the application most effectively [5] [6]. UX according to ISO 9241-210: 2019 is described as a person's perception of the response to a product, system or service. Good or bad UX can affect whether users feel satisfied, comfortable, or get the best experience when using the application [7] [6].

1.2 Literature Review

To reach Pizza Hut's wide and diverse customer base, this research analyzes the app's UX using a user-centered design (UCD) approach based on the user experience evaluation (UEQ) method. The UCD method is a user needs-oriented method. Overall, the UX analysis made using this method is based on users' expectations, goals, recommendations, experiences, and judgments to make users more satisfied with future use [8] [9]. On the other hand, UEQ is a tool that measures the overall user experience while using a product. UEQ in this study helps evaluate the UI/UX compatibility of applications that have been evaluated using UCD [10]. Compared to other methods, the combination of UCD and UEQ improves the service delivery process for users during product use with a focus on stimulating user innovation [11]. In previous research, the User Centered Design method has been carried out by Hasim and friends in the journal Redesign of E-Participation using User-Centered Design Approach for Improving User Experience [12]. In his research aims to redesign the Rembugan Jateng system in accordance with the user experience in e-government using the User Centered Design (UCD) method which then after being redesigned will be evaluated using the User Experience Questionnaire (UEQ). The results of this study have redesigned the appearance of Rembugan Jateng only based on assumptions from researchers and the evaluation results of many respondents who have participated prove the increase in scores on user experience. attractiveness, comfort, efficiency or speed of the product, dependability,

stimulation, and aspects have a good score. Other research was also conducted by Des-tiara Kirama Safitri and Andriansyah Andrianingsih in the journal "UI/UX Analysis for Smart-SITA Web Front-End Redesign Using UCD and UEQ Methods" [13].

In their research, Safitri and Andrianingsih created a design to further increase the usability value of the website. In Safitri's research, the method applied in the process to achieve the expected value is still too complicated. According to the research paper, the designer will only iterate the design based on the UEQ value obtained from the user. As a result, the process becomes less efficient and creates a missing gap because the research takes time to achieve the desired design. This is because previous research did not involve direct user evaluation, so other effectiveness issues may arise during the design process. This research aims to fill this gap and create the perfect UI/UX design by involving users to evaluate the design descriptively and providing UEQ so that they can evaluate the design. Applying this method helps designers have a robust process in emulating the expected UI/UX design without overdoing the design process. With this new design process, the website can produce more effective output because it is based on user needs and requests that have been through UEQ testing.

As a reference and complement to the previous review, this study collected descriptive research information from users after viewing the given prototype as a reference for further design. In addition, UCD also plays a role in the evaluation of this research. User Experience Questionnaire (UEQ) was then used to evaluate the UX by comparing the design with the benchmark to get the most compatible design as the final result. This research includes descriptive questionnaire and UEQ. We hope this research can be useful for future research and can be developed for other UX design journals.

2 Research Methods

2.1 Respondents

In this study, data was obtained from 338 respondents aged between 17 and 35 years. Respondents assessed the Pizza Hut application used for transactions and then assessed the UEQ. The evaluation results lead to an interpretation of the development of the application design and further design realization using Figma software resulting in an application prototype. Respondents then conducted a second evaluation step, answering a questionnaire similar to the previous one.

2.2 User Centered Design Method

User-centered design (UCD) is based on several principles, where designs are made based on evaluation results, previous experience, and suggestions from users. There are several UCD processes that can be used as a reference in developing UI/UX designs. (see Fig. 1).

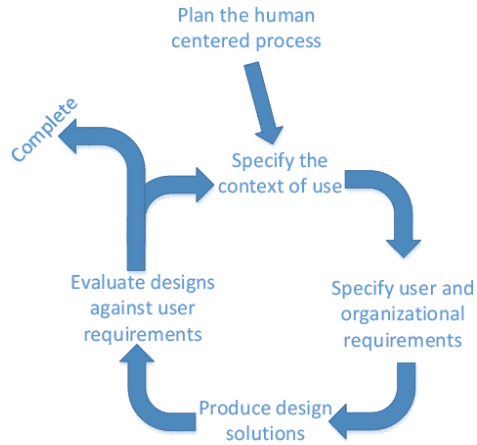


Fig. 1. UCD diagram

The People Centered Process phase of the Plan is a discussion process with stakeholders after collecting data from distributing questionnaires to designated users and continuing to evaluate the questionnaires submitted using the UEQ model. The next step is to define the context of use, specifically the step of redefining problems, users and needs. The next step is to complete the Determine user and organizational needs step, which is the process of analyzing the relationship between user needs and the users themselves to find what the application can meet. Then proceed to the Production Design Solutions stage, which is to create an interface design proposal using the Figma application. The final stage after design creation, entering the design evaluation stage according to user needs, a design evaluation of the new interface design is carried out using UEQ evaluation to be able to obtain a comparison value and show that the UCD method can provide good results [13] [14].

2.3 User Experience Questionnaire

The UEQ consists of 26 questions with 6 assessment aspects related to their prototype operating experience assessed in the form of questions (Figure 3) [15]. The 6 research aspects in the 26 UEQ questions are Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation, and Novelty. Attractiveness represents the user's overall impression of a product, whether the user likes it or finds it attractive. Perspicuity indicates how easy the user understands the product, whether the product is easy to understand overall, while Efficiency indicates how comfortable the user experience is when using the product, how well the product works, acting better or worse than it should. Dependability represents the level of control the user has when interacting with the product, whether the usage habits of the product are predictable or whether the user feels comfortable using the product. Stimulation involves showing how the product attracts users and motivates them to use the product again. Novelty is an expression of the level of innovation and creativity of a product to attract users' attention [16] [17].

	1	2	3	4	5	6	7		
annoying	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	enjoyable	1
not understandable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	understandable	2
creative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	dull	3
easy to learn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	difficult to learn	4
valuable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	inferior	5
boring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	exciting	6
not interesting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	interesting	7
unpredictable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	predictable	8
fast	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	slow	9
inventive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	conventional	10
obstructive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	supportive	11
good	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	bad	12
complicated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	easy	13
unlikable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	pleasing	14
usual	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	leading edge	15
unpleasant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	pleasant	16
secure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	not secure	17
motivating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	demotivating	18
meets expectations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	does not meet expectations	19
inefficient	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	efficient	20
clear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	confusing	21
impractical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	practical	22
organized	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	cluttered	23
attractive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	unattractive	24
friendly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	unfriendly	25
conservative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	innovative	26

Fig. 2. UEQ questions

UEQ calculations are carried out using the Analysis Tool provided on the official website [https:// www.ueq-online.org](https://www.ueq-online.org). UEQ is used to test user experience and provide product reviews so that future product improvements can be made [18]. Regarding relevance, the UEQ assessment was carried out twice in this study so that the results could show a comparison of values. UEQ uses benchmarks as indicators to determine the best UI/UX design results in the Pizza Hut application. There are values embedded in each aspect of the UEQ approach (see **Table 1**) [15].

Table 1. Table UEQ Benchmark

	Attractiveness	Efficiency	Perspiciuity	Dependability	Stimulation	Novelty
Excellent	≥ 1.75	≥ 1.78	≥ 1.9	≥ 1.65	≥ 1.55	≥ 1.4
Good	≥ 1.52 <1.75	≥ 1.47 <1.78	≥ 1.56 <1.9	≥ 1.48 <1.65	≥ 1.31 <1.55	≥ 1.05 <1.4
Above Average	≥ 1.17 <1.52	≥ 0.98 <1.47	≥ 1.08 <1.56	≥ 1.14 <1.48	≥ 0.99 <1.31	≥ 0.71 <1.05
Below Average	≥ 0.7 <1.17	≥ 0.54 <0.98	≥ 0.64 <1.08	≥ 0.78 <1.14	≥ 0.5 <0.99	≥ 0.3 <0.71
Bad	<0.7	<0.54	<0.64	<0.78	<0.5	<0.3

3 Results and Discussion

3.1 Results of the first UX Evaluation

The main target market for Pizza Hut is the social middle class, teenagers and families. Pizza Hut's advertising style is also modern and simple. Generally, Pizza Hut is only available to eat in and take away. Along with the many interests of buyers in various regions with the support of sophisticated technology, Pizza Hut also serves delivery via telephone and application. The Pizza Hut application can be downloaded via appstore and playstore. The first evaluation was conducted by 338 respondents. From the results of the questionnaire data collection, an assessment was carried out using UEQ with the results as shown in Fig. 3.

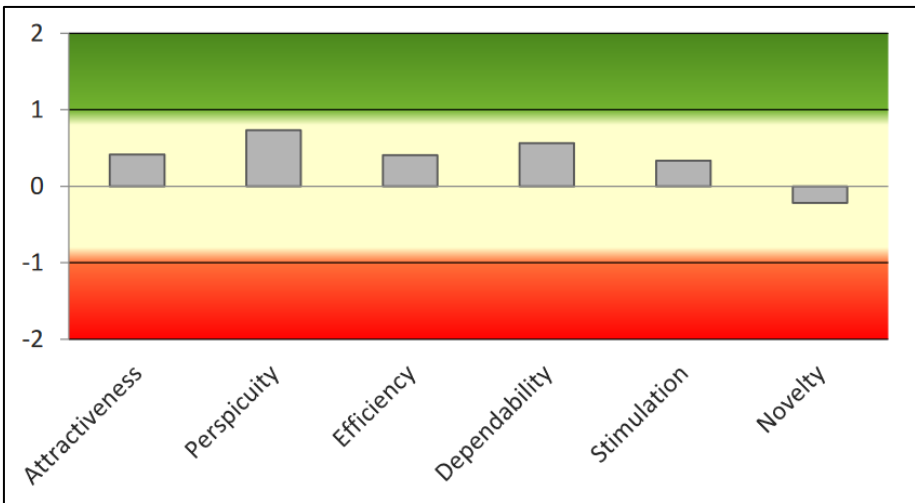


Fig. 3. Diagram of the first UEQ assessment results

The UEQ assessment obtained an average value of -0.8 to 0.8. Which means, users are not satisfied with the overall appearance of the Pizza Hut application, in the Novelty aspect the value obtained is -0.21, which means that updates to the Pizza Hut application interface are needed. Furthermore, the data is processed and produces a benchmark

diagram. The following Pizza Hut application benchmark diagram can be seen in Fig. 4.

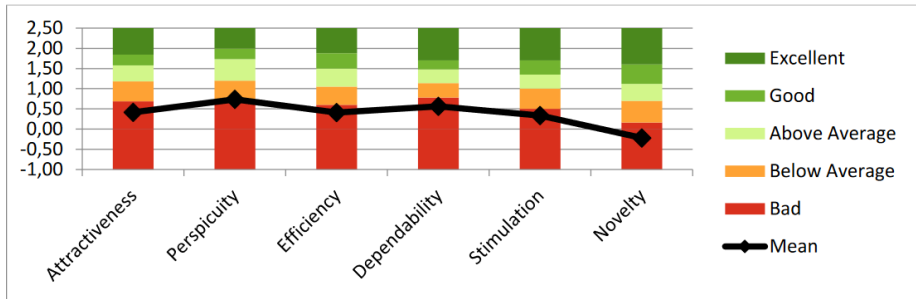


Fig. 4. Benchmark diagram of the first UEQ assessment results

3.2 Wireframe

Based on the results of the UEQ assessment and the identification of problems and interpretation of the weaknesses owned by the Pizza Hut application, continued After knowing the needs of users as outlined in the needs analysis, a wireframe will be made as a form of description or design framework for new design recommendations. Wireframe is shown in Fig. 5.

3.3 Design Results

In accordance with the instructions of the manager, in this proposed design does not eliminate the characteristic colors of Pizza Hut, namely red and white. Then, this new design is also based on the results of questionnaires that have been described through user needs analysis. In Fig. 6 below are the results of the new proposed interface design for the Pizza Hut application that has been made and a comparison between the old design and the new design. The old design is in the left position, while the new design is in the right position.

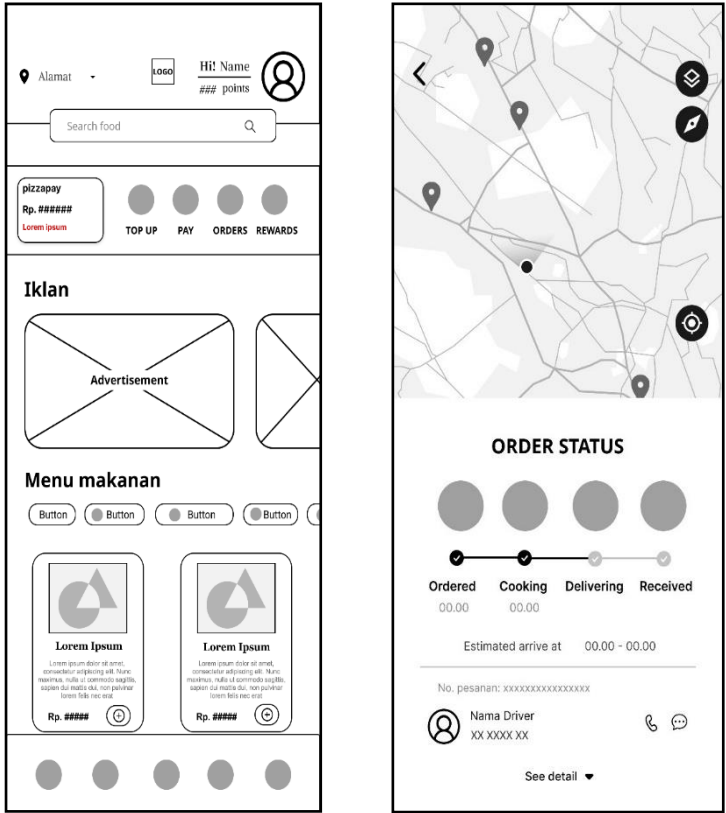


Fig. 5. Wireframe of Pizza Hut Application New Design Recommendation

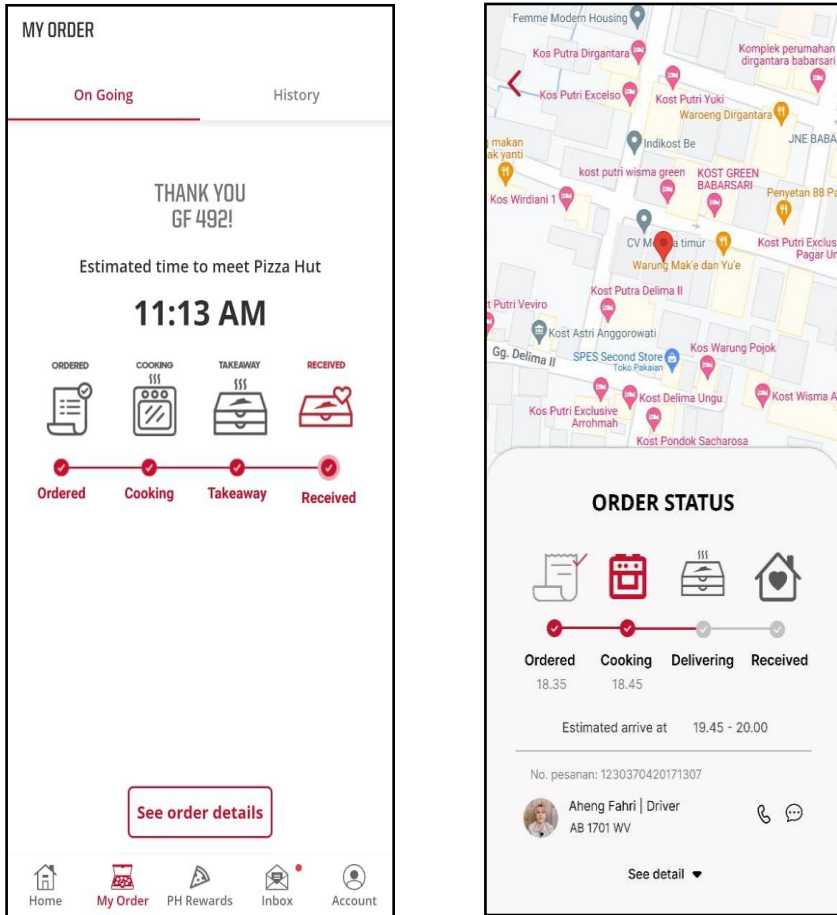


Fig. 6. Old design (A) and new design (B) of Pizza Hut tracking order application

Fig. 6 is the old design and new design of the tracking order page. The difference between the two displays is also quite significant because it can be seen in the new design that in addition to being able to see the order status, you can also see maps.

3.4 Design Evaluation

This assessment was carried out to the same respondents when conducting the survey at the beginning of the research.

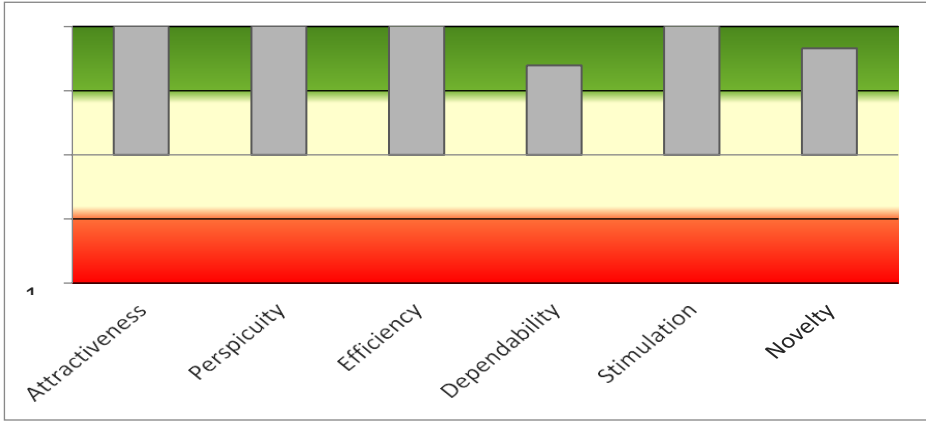


Fig. 7. UEQ Result Diagram of New Design Evaluation

Based on the evaluation results for the new design using the UEQ assessment, it can be seen that all aspects have experienced a significant increase in value from the previous value. The new design is considered quite good, the layout of features and buttons is more organized, has been updated and copyrighted according to users and is in accordance with user needs. Benchmark of the new design can be seen in Fig. 8.

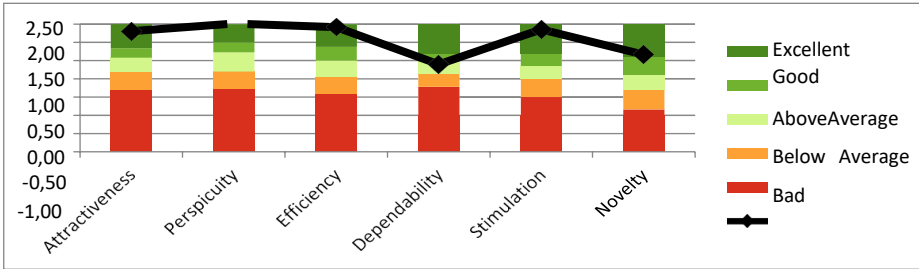


Fig. 8. New Design Benchmark

Based on the benchmark, it can be seen that all aspects, namely Attractiveness, Efficiency, Stimulation, have improved, namely in the Excellent or above average position. The Clarity aspect increased from Below Average to Excellent and the Novelty aspect increased from Bad to Good.

3.5 Comparison of UEQ Value of Old Design and New Design

After evaluating the assessment of the new design, the following comparison of UEQ values between the new design and the old design can be seen in Fig. 10.

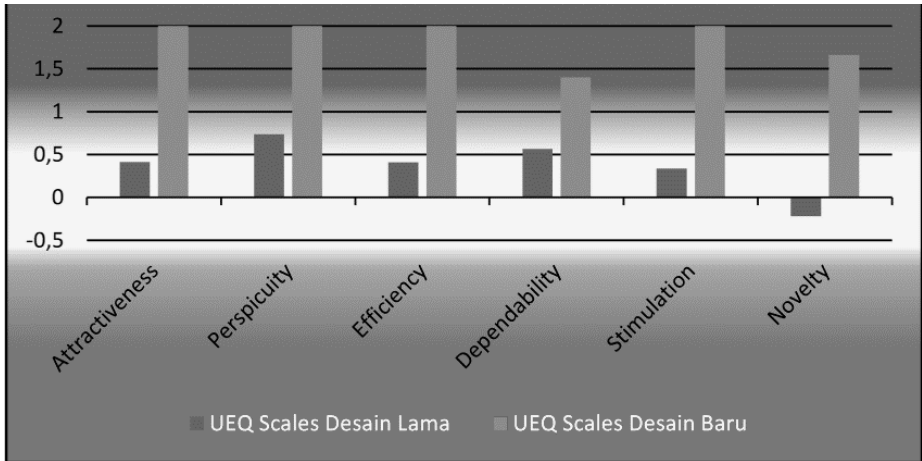


Fig. 9. Comparison of UEQ Scales New Design and Old Design

Based on the chart in Fig. 9, it can be seen that the UEQ value in the new design of each aspect has increased from the UEQ value in the old design. This comparison is intended to prove that the new interface design of the Pizza Hut application gets a good user experience for its users because it can increase the assessment of aspects in UEQ and it can be said that the new design succeeds in captivating a good user impression. With this, UCD succeeded in producing a better interface design using the UEQ assessment. The new display design of the Pizza Hut application is expected to be a reference or recommendation for future improvements.

4 Results and Discussion

This research shows that the process of designing a new UI/UX on the Pizza Hut application using the UCD method can support increasing the value of user experience quite well because the design is user-centered both in comfort and satisfaction and depends on the experience of the Pizza Hut application user. Evaluation of the new UI/UX prototype with UEQ results in an increase in the overall score categorized as Above Average. Thus, this new design is good enough to be used as a design recommendation to Pizza Hut.

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