Implementation of the User Centered Design (UCD) Method for MSME E-Commerce

[1]**Albertus Dwiyoga Widiantoro**, [2]**Bernardinus Harnadi**
Department Information system, Computer Science Faculty
Soegijapranata Catholic University Semarang
[1]yoga@unika.ac.id, [2]bharnadi@unika.ac.id

Abstract— Web and mobile-based application development for MSMEs is very necessary to help marketing and increase revenue. A user-centered design (UCD) approach that actively involves users at every stage of the design process for product development becomes more effective and efficient, resulting in E-commerce applications that are designed together with users to produce applications that suit the needs of local MSME users.

Keywords—User Center Design, UMKM, MSME, Integration.

I. INTRODUCTION

The user-centered design approach is a contemporary design approach that actively involves users at every stage of the design process for more effective, efficient and safe product development [1].

The term user-centered design was first used in the field of human-computer interaction. The first applications of the user-centered design approach in this field drew on the needs and interests of users and focused on the usability of computer design. These applications propose actions and systems that are easy to understand and can be used in computer design. This effort places the user at the center of the design process. Designers who act as facilitators and mediators in the design process facilitate tasks for users and enable use of the product with minimum effort to learn how to use it [1].

Micro, Small and Medium Enterprises (MSMEs) are a type of small business that plays a significant role in improving and growing the community's economy. Because the existence of MSMEs is able to survive when a crisis occurs. The existence of MSMEs is very important for the economy in Indonesia, because MSMEs are the largest contributor to gross domestic product. From 2017 to 2019, the number of MSMEs in Indonesia experienced growth every year, but in the 2020 period the number of MSMEs experienced a decrease in number due to the Covid-19 pandemic that hit Indonesia. Furthermore, in the 2021 period the number of MSMEs will increase again [2].

Business performance appears to improve when entrepreneurial organizations adopt information technology to facilitate greater market communications and increase exposure to online buyers. [3].

Trade transactions have experienced a very rapid transition from previously being manual, where sellers and buyers had to meet in one place to carry out transactions, now switching to using E-commerce technology, or electronic commerce. Sellers and buyers do not have to meet in person but use online platforms for trade or marketplace transactions. There has been a transformation of the trading system which started from a barter system, developed into traditional markets, modern markets, and is currently entering the era of digital markets or E-commerce [4].

It is important to develop E-commerce services that are integrated with Financial Technology services that can help buyers facilitate transactions.

This research will dig deeper into the needs of users who utilize E-commerce services for MSMEs, in this research MSMEs in Semarang are members of the CSE.

Research on User Centered Design (UCD) has been carried out by many groups. One of them is research by [5], who used the UCD method to develop touchscreen visual learning applications for the blind. The method used uses the interview method with

SISFORMA: Journal of Information Systems (e- Journal) Vol .10 | No. 2 |Th.2023
ISSN 2442-7888 (online) DOI 10.24167/ Sisforma

64

various stages. This application can help blind students to learn mathematics. The methods used for system specifications are interviews, surveys, workshops, and prototypes.

User Centered Design focuses on human centered design with deeper target user analysis. User Centered Design pays attention to details about the target user who is the object of the design, such as taking into account age, gender, potential educational level, professional background, product user environment, emotional characteristics and physical perceptions as well as level of technology awareness and other factors. This does not only concentrate on general human characteristics and perceptions but also the specific characteristics and features of the target user, this is also done by [6], the technique used in data collection with the UCD method is interview, asking questions directly to candidates. users regarding all the requirements needed for the system to be built, and the Observation method, directly observing prospective users regarding the habits of using online buying and selling websites.

Informally, usability can be interpreted as the level of convenience of a product to use. web usability criteria are as follows [7] [6]:

1. Learnability is a criterion that measures the ease of a site to learn and use, especially for users who are seeing and exploring the site for the first time.

2. Efficiency is a criterion that measures the level of user performance when using the site.

3. Memorability is a qualitative criterion that can be seen through the user's ease in using the product (site) again after not visiting the site for a while.

4. Errors is a quantitative criterion on web usability, errors assess the site through the number of errors made by the user when carrying out the given scenario task.

5. Satisfaction is a qualitative measurement that is felt or also shown by the user, when the system or site used is pleasant and easy to use, it will provide comfort to the user or also provide a sense of satisfaction when the user can complete the assigned task properly.

The process of each stage of UCD activity may differ in each company or agency. They can also make arrangements for additional stages in between the analysis and design phases. In general, the UCD process is [6] namely strategy, research, analysis, and design. Where Strategy, has a long-term vision of an organization. The underlying strategy will establish goals, what is expected, how to measure success and priorities. Research, conducting activities with users can be done by interviewing. Analysis, the purpose of this stage is to draw insight from the data collected during the research phase. In this activity, UX designers also communicate their understanding to end-users to help confirm whether or not any assumptions made are valid. Design at this stage the UX designer asks for input or feedback from users regarding ideas that are designed to be improved even better according to user needs, and Production, which is this stage is the final stage, namely making applications after going through the previous stages.

II. METHOD

The methodology for carrying out this research is to conduct a study to complete the materials for the system to be created, by collecting data from journal sources and interviews with MSME users related to system creation.

2.1 Literature Review

Reviewing papers used as references in application development and interviewing application users.

2.2. Application Design

The application is designed to be web-based and can be integrated with mobile applications.

2.3. Application Testing

Application testing is carried out by group discussions and filling out forms based on questions that have been designed in the following list starting from number 1.a to 6b. which consists of input and opinions about the mikrobisnis.id application

SISFORMA: Journal of Information Systems (e- Journal) Vol .10 | No. 2 |Th.2023
ISSN 2442-7888 (online) DOI 10.24167/ Sisforma

65

1a. Opinion about the appearance of the microbisnis.id application

1b. Input about the appearance of the mikrobisnis.id application

2a. Opinions about the responsive design of the mikrobisnis.id application

2b. Feedback about the responsive design of the mikrobisnis.id application

3a. Opinion about the functionality of the microbisnis.id application

3b. Input about the functionality of the mikrobisnis.id application

4a. Opinions about navigation in the mikrobisnis.id application

4b. Input about navigation in the mikrobisnis.id application

5a. Opinions about the microbisnis.id application content

5b. Input about the content of the mikrobisnis.id application

6a. Opinion about the microbusiness.id application fintech system

6b. Input about the microbusiness.id application fintech system

III. RESULTS AND DISCUSSION

Display of the MSME website, can be seen in figure 1. The display on the front page directly displays MSME products, which consist of the MSME name, address, telephone number and website address, so that this data can be used as evidence to convince buyers

Figure 1. Website mikrobisnis.id

After the complete address, the next display is the product can be seen in figure 2, so buyers can immediately choose the product they want to buy. Products are displayed in an attractive form and display original photos of the product, along with the price displayed below, this will make it easier for buyers to see the product in detail.
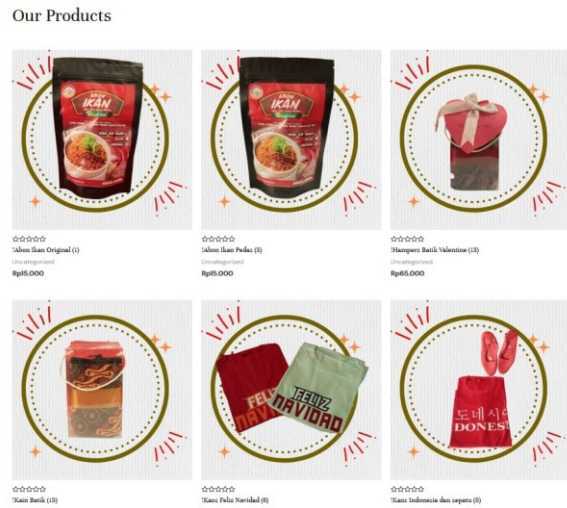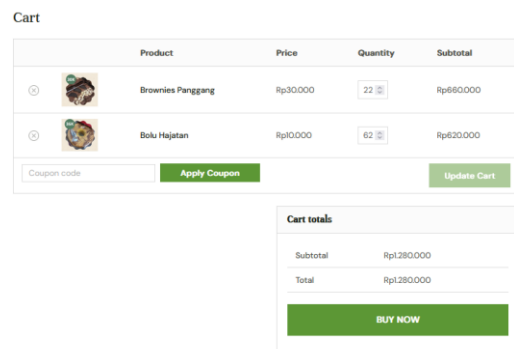

Figure 2. display items

Product purchases can be seen in figure 3. he selected product is entered into the purchase basket, once complete you can carry out the purchasing process, as shown in the image below:

Figure 3. Product purchases

Checkout process can be seen in figure 5. The product checkout process is an important stage in e-commerce or online sales where customers confirm and complete the purchase of products or services that they have added to their shopping cart. During the checkout process, several key actions are performed:

Shopping Cart Verification: Customers can double-check the contents of their shopping

SISFORMA: Journal of Information Systems (e- Journal) Vol .10 | No. 2 |Th.2023
ISSN 2442-7888 (online) DOI 10.24167/ Sisforma

66

cart, ensuring that all the items they want are there. They can also remove or change product quantities if necessary.

Shipping Information: Customers are usually asked to enter shipping information, such as shipping address and telephone number. They can also choose the shipping method they want, such as regular or express shipping.

Payment: Customers must select their desired payment method. This could be a credit card, PayPal, bank transfer, or other payment option depending on the website or online store used.

Order Double Check: Before completing a purchase, customers can double check to ensure that all the information they entered is correct and their order is complete.

Filling in a Discount or Coupon Code: If customers have a discount or coupon code, they can enter it during the checkout process to get a discount or other benefit.

Purchase Confirmation: Once all information has been checked and filled in correctly, customers are usually asked to confirm their purchase. This could be the final step where they have to click a "Purchase" or "Confirm Payment" button.

Order Acceptance: Once the payment has been successfully processed, the customer will receive a receipt or order confirmation. This could be a "Thank You" page or a confirmation email containing order details and shipping information.

This product checkout process is designed to make online purchasing easier and more convenient for customers, while ensuring that the information required for shipping and payment is captured correctly. Apart from that, it also allows sellers to process orders efficiently.
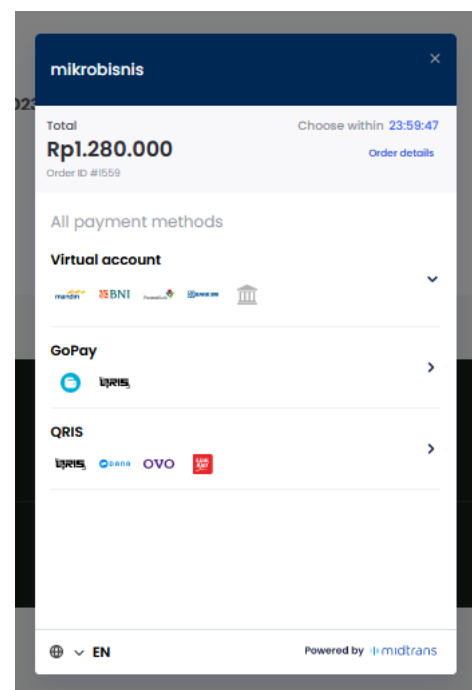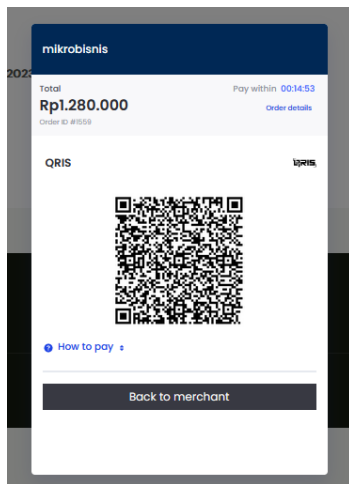

Figure 5. Checkout

Figure 6. Checkout

Digital payment process can be seen in figure 6. This process will appear when all transactions have been completed and entered the payment process. Payment options can be made by selecting the type, namely virtual account, ewallet and QRIS.
The process of generating qrcode

Interview material, namely opinions about the appearance of the application, input about the appearance, opinion about the responsive design of the application, input about the responsive design of the application, opinion about the application functionality, input about the application functionality, opinion about the navigation in the application, input about the navigation in the application, opinion about application content, input on application content, opinion on application fintech systems, input on application fintech systems.

FGD was carried out 2 times with the final results as follows:

1a. Opinion about the appearance of this microbusiness application displays a good and neat button design and placement, offers a neat and easy to understand appearance on a laptop, and overall this application is attractive with functionality that matches the general application. The information presented is quite informative and helps users interact with the application.

1b. feedback regarding the appearance of the website shows a neat and responsive appearance, with the potential for increased modernity through high-quality display photos and a well-organized layout. Innovative features such as color selection buttons and aesthetic animations can add visual diversity, while the addition of product categories will make it easier for consumers to find the products they are looking for more efficiently.

2a. opinions about the responsive design of the application are recognized as responsive and efficient, with an attractive design and able to adapt well across various devices. The use of unique colors and fonts gets special appreciation. Especially on a laptop or PC, the responsive design of this app looks clear and works very well.

2b. input regarding the responsive design of the application in general, this application is considered to have good and satisfying responsiveness and design, with fast loading speed and in accordance with network speed. Many users are satisfied and have no feedback or complaints. The app shows the potential for customization of more responsive design for use across devices, including mobile phones, as well as display compatibility between laptops and mobile phones which will improve the consistency of the user experience.

3a. Opinions about the functionality of this microbusiness application are generally considered to have good functionality and are able to operate smoothly, including the payment process. Users find this application makes purchasing easier, especially for items such as souvenirs, as well as practical and time efficient. The majority of users feel that the application functionality design meets their needs and runs well when used.

3b. input regarding application functionality for the website including creating separate pages for the showcase/catalog of goods per category, which will make it easier for users to find the desired product, as well as adding buyer identity for efficient recording and delivery. Some users feel that the existing features are adequate, with recommendations to update the 'about' and 'contact' menus to make them more functional.

4a. Opinions about navigation on the website are considered quite good overall, with navigation that is easy to follow and responsive. Users enjoy clear instructions and a neat layout. The app navigation, while initially appearing complicated for some users, becomes easy to understand upon further consideration. In general, the

SISFORMA: Journal of Information Systems (e- Journal) Vol .10 | No. 2 |Th.2023
ISSN 2442-7888 (online) DOI 10.24167/ Sisforma

68

responsiveness and functionality of the app is considered good and safe.

4b. Overall, input regarding navigation on this website has been neatly organized, with several suggestions for improvement such as optimizing navigation for easier user understanding and strategic placement of services or contacts at the bottom of the website. Many users are satisfied with using the website, indicating that this website is easy to use.

5a. opinion regarding the content of the microbisnis.id application that the promotion of MSMEs through this website is considered to be good with complete, informative and interesting content. Some users suggested improvements such as unifying image sizes and clarifying the types of products sold to improve product image representation. There are also suggestions to improve the appearance of the menu to make it more attractive. In general, many users feel that the application content is sufficient and complete.

5b. Feedback about the content of this application has the potential to improve the aesthetics of product photos, with suggestions for higher quality and consistent product images and uniform backgrounds that will increase attractiveness. Adding separate content and sections for various types of products, such as clothing and food, as well as more complete product descriptions will enrich information for users. Some users acknowledged the need for improved menu and product displays, while general recommendations included visual improvements that are more appealing to shoppers.

6a. opinions about the fintech system This application received praise for its modernity and ability to integrate many services, including collaboration with various fintech applications, which makes the payment system easy and complete. The available fintech system is considered to be good and in line with current developments, offering a variety of payment platform choices. In general, the payment system of this application is considered adequate and attractive.

6b. input about the microbisnis.id application fintech system can improve user experience, it is recommended to simplify the checkout (CO) process and add other payment methods, including options such as ShopeePay or OVO, as well as proof of purchase for buyers. Additional features such as adding items to cart in the product view will increase functionality. The existing payment system is considered good, with potential for improvement through a countdown feature, cancellation options, and automatic cancellation alerts for transactions that are not completed on time. The lack of feedback from some users indicates satisfaction with some existing aspects.

It can be concluded that this microbusiness application overall received a positive response for its appearance, design and functionality. Button design and good placement as well as a neat and easy to understand appearance on a laptop add to the appeal of this application, which is coupled with informative information and makes user interaction easier. The app's responsive design received praise for its efficiency and ability to adapt across devices, with its use of unique colors and fonts gaining appreciation. In terms of functionality, the application is considered good and makes purchasing easier, especially items such as souvenirs, as well as being practical and time efficient.

Navigation on the website is considered quite good overall, with navigation that is easy to follow and responsive, as well as a neat layout that initially seems complicated but becomes easier to understand after further consideration. The microbusiness app content was rated good, with suggestions for improvement such as unifying image sizes and clarifying product types. This application's fintech system has received praise for its modernity and ability to integrate many services, including collaboration with various fintech applications which make the payment system easy and complete. The available fintech systems are considered good, offering a wide choice of payment

SISFORMA: Journal of Information Systems (e- Journal) Vol .10 | No. 2 |Th.2023
ISSN 2442-7888 (online) DOI 10.24167/ Sisforma

69

platforms and are generally considered adequate and attractive.

IV. CONCLUSION

After carrying out implementation based on the design, and conducting FGDs, the following conclusions were obtained:

Based on the implementation of the microbusiness.id E-commerce application, the application has run well and smoothly with easy navigation and functionality.

Web-based and mobile application integration with third-party Fintech can be leveraged easily, even if transaction prices change

E-commerce designed together with users produces applications that suit the needs of local MSME users.

ACKNOWLEDGMENT

REFERENCES

[1] B. Harnadi, "An investigation of the adoption of online game technologies in Indonesia," International Journal of Gaming and Computer-Mediated Simulations, vol.9, issue 1, pp. 1–27, 2017.

[2] B. Harnadi, "Antecedents of the Adoption of Online Games Technologies: The Study of Adolescent Behavior in Playing Online Games," 2nd International Conference on Science in Information Technology (ICSITech), pp. 79 – 84, 2016.

[3] G. D. Israel, Determining Sample Size. IFAS Extension, University of Florida, 2015. [Online]. Available: https://edis.ifas.ufl.edu/pd006.[Accessed: 22- August- 2015].

[4] R. B. Kline, Principles and Practice of Structural Equation Modeling (3nd ed). London: Guilford Press, 2011.

[5] Z. E. H. Kahraman, "Using user-centered design approach in course design," Procedia - Soc. Behav. Sci., vol. 2, no. 2, pp. 2071–2076, 2010, doi: 10.1016/j.sbspro.2010.03.283.

[6] E. F. Zakiyah, A. B. P. Kasmo, and L. Nugroho, "Peran Dan Fungsi Usaha Mikro Kecil Dan Menengah (Umkm) Dalam Memitigasi Resesi Ekonomi Global 2023," J. Cakrawala Ilm., vol. 2, no. 4, pp. 1–12, 2022.

[7] G. Saridakis, Y. Lai, A. M. Mohammed, and J. M. Hansen, "Industry characteristics, stages of E-commerce communications, and entrepreneurs and SMEs revenue growth," Technol. Forecast. Soc. Change, vol. 128, no. March, pp. 56–66, 2018, doi: 10.1016/j.techfore.2017.10.017.

[8] S. C. Ho, R. J. Kauffman, and T. P. Liang, "A growth theory perspective on B2C e-commerce growth in Europe: An exploratory study," Electron. Commer. Res. Appl., vol. 6, no. 3, pp. 237–259, 2007, doi: 10.1016/j.elerap.2006.06.003.

[9] A. Bateman et al., "A user-centered design and analysis of an electrostatic haptic touchscreen system for students with visual impairments," Int. J. Hum. Comput. Stud., vol. 109, no. May 2016, pp. 102–111, 2018, doi: 10.1016/j.ijhcs.2017.09.004.

[10] B. A. Pratama, U. Proboyekti, and K. Wijana, "Penerapan Metode User Centered Design (UCD) Dalam Pembangunan Layanan Online Jual Beli Barang Bekas," J. Terap. Teknol. Inf., vol. 4, no. 1, pp. 33–43, 2021, doi: 10.21460/jutei.2020.41.192.

[11] Jakob Nielsen, "Usability Engineering," Angew. Chemie Int. Ed. 6(11), 951–952., no. Mi, pp. 5–24, 1967.

SISFORMA: Journal of Information Systems (e- Journal) Vol .10 | No. 2 |Th.2023
ISSN 2442-7888 (online) DOI 10.24167/ Sisforma

70