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UI/UX design of UMKM entrepreneurship e-catalog website in Karangrejo tourism village using the design thinking method

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Abstract

Entrepreneurship is things related to entrepreneurship. Meanwhile, wira means courage, and business means commercial or non-commercial business activities. Magelang Regency has many tourist villages that produce various types of entrepreneurships. In other words, tourist villages have succeeded in building MSMEs to advance the personal economy and advance the village. Karangrejo Village is one of the villages in Borobudur District, Magelang Regency. This village produces many MSME works and is also a suitable tourist destination. However, Karangrejo Village needs a website-based catalog to introduce its products to visitors. This research aims to design the appearance of an entrepreneurial website that displays the work of MSMEs in Karangrejo village. In creating a good website appearance that prospective users can use easily, a good user interface and user experience design are needed. A method is required to complete the design process. Design Thinking is one of the methods that will be used in this research. This research used the Design Thinking stages: empathy, definition, idea, prototype, and test. The results of the UI/UX design research for the Karangrejo Village MSME Entrepreneurship E-Catalog website show good usability and meet user needs. This design thinking method can improve the quality of the user experience when designing this website. This design is expected to become the basis for development carried out by the Karangrejo Village government to advance MSMEs in the village.

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Keywords

UI/UX design, e-catalog, Design thinking method

Introduction

Entrepreneurship involves creating ventures that add value to the economy. Entrepreneurs establish their own businesses, shoulder the majority of risks, and reap the rewards of their endeavors. Thus, entrepreneurship reflects an individual's boldness in engaging in business activities, often involving new ventures. Starting a business entails preparing for both risks and opportunities in the field [1]. In Magelang City,

Central Java, the micro, small, and medium enterprises (UMKM) sector contribute significantly to the local economy, accounting for 53.3% of the total GDP. The city is home to around 5,000 UMKM units spread across three sub-districts [2]. Effectively managed, these microbusinesses play a crucial role in bolstering the regional economy.

UMKM play a crucial role in Indonesia's economy, contributing to its sustainable growth and development. Karangrejo village stands out as a successful example in tourism enterprise development, garnering recognition from national-level ministries and earning the title of a sustainable tourism village [3]. Among the many UMKM in the village, there is a desire to establish a website-based catalog showcasing their products. To create an appealing catalog website, an attractive user interface (UI) and user experience (UX) are essential, employing UI/UX methods to streamline the design process. Previous studies have delved into UI and UX considerations [4].

Design Thinking, an iterative process, guides the creation of user-centered solutions by understanding user needs, challenging assumptions, and redefining problems to explore alternative strategies and solutions [5]. This method involves five stages: Empathize, Define, Ideate, Prototype, and Test [6]. Usability testing, including field testing, has been employed in prior research to evaluate the UI/UX of applications [7].

The System Usability Scale (SUS) emerges as a widely used standardized questionnaire for evaluating perceived usability. Originally coined as a "quick and dirty usability scale" in the 1980s, SUS has proven to be quick and effective in assessing perceived usability, garnering substantial attention in usability research [8].

Methods

Design thinking

Design thinking is one of the most well-known and widely used UI/UX methods in the design process. Several paths must be carried out in design thinking, including [9].

1. Empathize: Understanding the problem you're trying to solve.
2. Define: Define is the stage of defining and analyzing the problems found.
3. Ideate: This stage focuses on various solutions that can help solve the problem.
4. Prototype: The process of designing the website's appearance that will be developed.
5. Test: The process of testing the design results on potential users.

In Figure 1, the stages of design thinking are below. At this stage, the researcher will also carry out several processes by the flow of design thinking, starting from the empathy process to find a solution. The defined process analyzes the problem from the empathy process, and then the ideate process gets ideas as an initial basis for designing a prototype. The prototype stage aims to design the wireframe process user flow. The final stage is the test process, In this test process, the researcher uses the SUS method or System Usability Scale to measure the usability of a product that has been designed.

Figure 1. Design thinking process

Define (affinity diagram)

Before the design stage, the researcher creates an affinity diagram to facilitate the design process. This affinity diagram stage in the design thinking method is included in the define stage. Affinity diagrams are an approach used to analyze data that has been collected and a tool that can be used to categorize data [10]. The affinity diagram is used to organize multiple ideas that are conceptually similar [11]. In Figure 2, the researcher displays the affinity diagram that has been designed, containing the pain points aimed at problems or obstacles experienced by potential users when using the product. At the same time, "How Might We" is a method that allows us to change a problem found at the pain point.

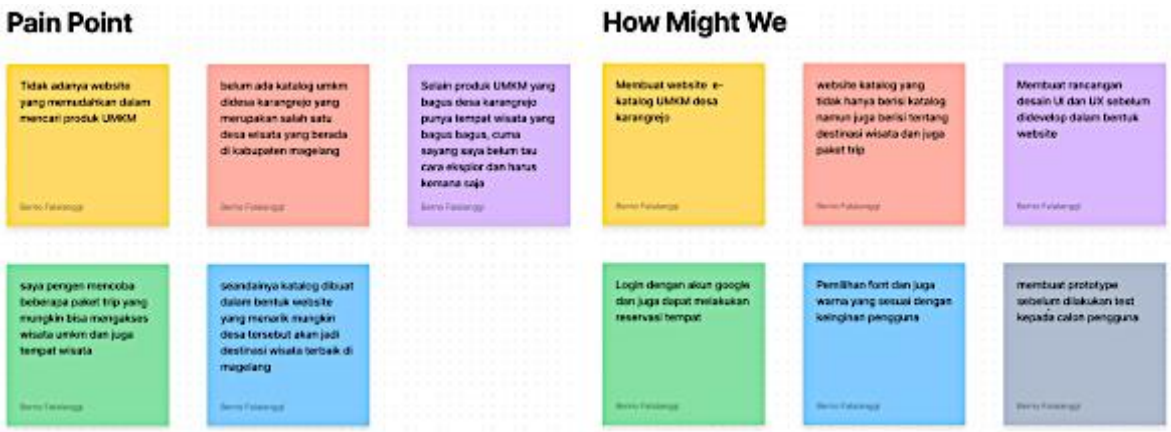

Figure 2. Affinity diagram

Prototype (user interface and user experience)

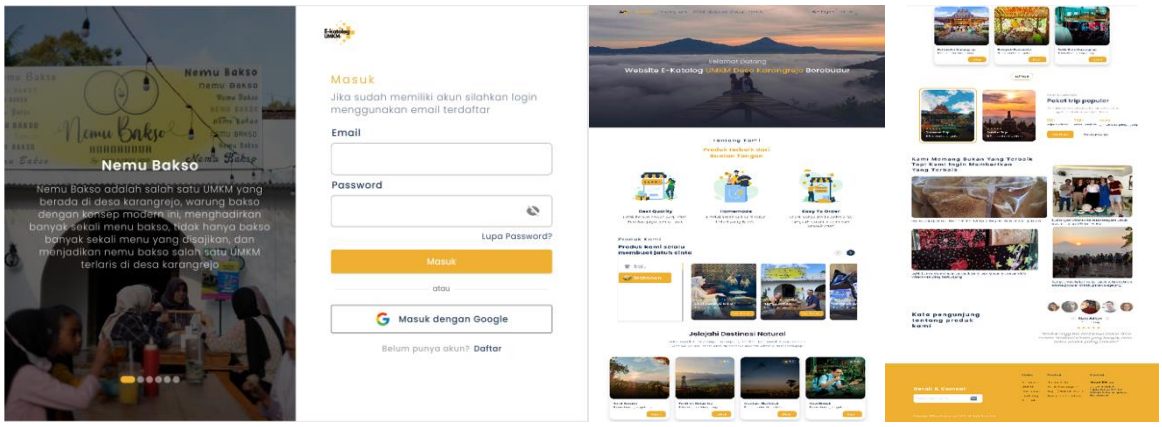

Figure 3. E-catalog website design mockup

User interface and user experience influence each other, so we often find the terms UI/UX. UI and UX are two important issues related to the usability of a product, especially mobile applications, where UI design is an important factor that affects whether users can easily use the application [12]. In Figure 3, the core sequence below is the appearance design process starting from the wireframe and mockup process.

After the prototype stage, the next stage will be carried out, namely testing the design created on potential users.

Test (system usability scale)

At this test stage, the researcher will create a questionnaire containing SUS questions for potential users, before the questionnaire is given, the researcher will ask potential users to try out the UI/UX prototype design of the E-catalog website, and after that, the potential user will fill out a satisfaction questionnaire with the design that has been researchers made. SUS is one of the most popular usability testing tools. SUS has 10 questions and 5 answer choices. There are several rules for calculating the SUS score and using the System Usability Scale (SUS). The following are the rules for calculating scores on the questionnaire:

1. For every odd-numbered question, the score for each question obtained from the user's score will be reduced by 1.
2. For every even-numbered question, the final score is obtained from 5 points minus the question score obtained from the user.
3. The SUS score is obtained from the sum of the scores for each question multiplied by 2.5.

Table 1 will explain what questions will be asked by participants [13]. Table 1 has a question for questioner SUS, and later, a user satisfaction score field [14] will be obtained for the design made. Next, a calculation process will be carried out, for the next calculation, look for the SUS score of each respondent to get an average score by adding up all the scores and dividing it by the number of respondents. The questionnaire uses the formula in formula 1, and in formula 2, the questionnaire process that has been carried out will be calculated.

$$\bar{x} = \frac{\sum x}{n} \quad (1)$$

Description: $\bar{x}$ = Average score; $\sum x$ = Total SUS score; and n = Number of respondents.

Table 1. Questionnaire SUS

Question	Answer Options				
	1	2	3	4	5
I think I will use this app again					
I find this app complicated to use					
I find this application difficult to use					
I need help from other people or technicians in using this application					
I feel the features of this application work properly					
I feel there are a lot of things that are inconsistent (incompatible with this app)					
I feel others will understand the way use this app quickly					
I find this app confusing					
I feel there are no obstacles in using this app					
I need to get used to it first before using this app					

Results and Discussion

Questionnaire SUS

At this phase, the SUS score is computed from the questionnaire devised by the researcher. The questionnaire, conducted during the empathize stage of the design thinking process, involves interviews with potential users. Users are tasked with completing a questionnaire based on the System Usability Scale (SUS), as outlined in Table 1, to assess user satisfaction. Subsequently, Table 2 illustrates the calculation of the final score for a single respondent according to the score calculation rules. To obtain the average SUS score, the scores of all respondents are tallied and divided by the total number of respondents, following the criteria outlined in Table 3 for further analysis.

Table 2. Result of questionnaire.

Calculated Score										Total	Value
Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10		(Total x 2.5)
2	4	4	4	4	4	4	4	4	4	38	95
3	3	3	3	4	2	3	3	2	2	28	70
4	2	4	4	4	1	2	3	4	0	28	70
3	4	4	4	4	4	4	4	4	3	38	95
2	3	3	1	4	3	4	3	2	0	25	63
3	4	3	4	3	4	4	3	3	4	35	88
4	0	2	2	1	4	0	0	0	0	13	33
4	4	4	4	4	4	4	4	4	2	38	95
4	3	4	4	4	3	4	4	0	4	34	85
3	4	3	4	3	3	3	1	3	3	30	75
2	2	2	1	1	2	2	2	2	2	18	45
4	4	4	4	4	4	4	4	4	4	40	100
3	3	3	4	3	3	3	3	3	2	30	75
3	3	3	3	3	3	3	3	3	2	29	73
4	4	4	4	4	4	4	4	4	3	39	98
Total											**1158**
Average (Final Result)											**77**

$$\text{Average score } \bar{x} = \frac{\text{Total SUS score}}{\text{Number of respondents}} = \frac{1158}{15} = 77 \quad (2)$$

Table 3. SUS Adjective rating

SUS Score	Grade	Adjective Rating
>80.3	A	Excellent
68-80.2	B	Good
67	C	Okay
51-66	D	Poor
<51	F	Awful

System usability scale score calculation

After the test process and a questionnaire using the usability scale system obtained a score of 77. In Figure 4 [15] and 5, a score of 77, which is a pretty good design and is liked by users. The grade obtained is B.

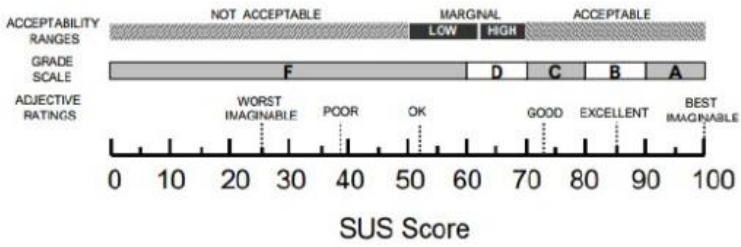

Figure 4. SUS score

Conclusion

This research concludes that potential users are very interested in using the designs researchers have created. UMKM will also feel happy if, in Karangrejo village, there is a digital platform via a website to accommodate a catalog of their work. Design using the design thinking method has proven effective in understanding user needs and designing solutions that can meet these needs. Apart from that, the research results and the results of this design can be used as recommendations for the Karangrejo Village government to develop their UMKM work in the form of a website that has a good level of usability and can also meet user needs.

References

[1] M. A. Tripathi, R. Tripathi, N. Sharma, S. Singhal, M. Jindal, and M. Aarif, "Brief Study on Entrepreneurship and Its Classification," *Int. J. Health Sci. (Qassim).*, no. May, 2022, doi: 10.53730/ijhs.v6ns2.6907.

[2] P. K. Prasetyanto, R. Destiningsih, and J. A. Prakoso, "MSMEs Innovation Strategies during the COVID-19 Pandemic by Tofu Producers in Trunan Village, Magelang City," *J. Pengabdi. Kpd. Masy. (Indonesian J. Community Engag.*, vol. 7, no. 2, p. 70, 2021, doi: 10.22146/jpkm.49881.

[3] C. L. Rembulan, A. Kusumowidagdo, and M. Rahadiyanti, "Exchanged actors behind the creation of sense of place value in indigenous tourism enterprise Karangrejo Borobudur Indonesia," *J. Enterprising Communities*, vol. 17, no. 6, pp. 1209–1251, 2023, doi: 10.1108/JEC-02-2022-0022.

[4] D. Dharmayanti, A. M. Bachtiar, and A. P. Wibawa, "Analysis of User Interface and User Experience on Comrades Application," *IOP Conf. Ser. Mater. Sci. Eng.*, vol. 407, no. 1, 2018, doi: 10.1088/1757-899X/407/1/012127.

[5] R. F. Dam and Y. S. Teo, "What is Design Thinking and Why Is It So Popular?," *Interact. Des. Found.*, pp. 1–6, 2018.

[6] C. Müller-roterberg, "Christian Mueller-Roterberg Handbook of," no. November 2018, 2019.

[7] T. Reitz, S. Schwenke, S. Hölzle, and A. Gauly, "Usability testing to evaluate user experience on cyclers for automated peritoneal dialysis," *Ren. Replace. Ther.*, vol. 7, no. 1, pp. 1–8, 2021, doi: 10.1186/s41100-021-00340-0.

[8] J. R. Lewis, "The System Usability Scale: Past, Present, and Future," *Int. J. Hum. Comput. Interact.*, vol. 34, no. 7, pp. 577–590, 2018, doi: 10.1080/10447318.2018.1455307.

[9] M. Juniantari, S. Ulfa, and H. Praherdhiono, "Design Thinking Approach in The Development of Cirgeo's World Media," *J. Nas. Pendidik. Tek. Inform.*, vol. 12, no. 1, pp. 42–55, 2023, doi: 10.23887/janapati.v12i1.55203.

[10] N. González-Cancelas, B. Molina Serrano, and F. Soler-Flores, "Study to Improve the Digitalization of the Spanish Port System Through an Affinity Diagram," *J. Marit. Transp. Logist.*, vol. 1, no. 2, 2020.

[11] ASQ(2022), "What is an affinity diagram? K-J Method," Available Online.

[12] A. Subiyakto, V. Adhiazni, E. Nurmiati, N. Hasanati, S. Sumarsono, and M. Irfan, "Redesigning User Interface Based on User Experience Using Goal-Directed Design Method," *2020 8th Int. Conf. Cyber IT Serv. Manag. CITSM 2020*, pp. 1–6, 2020, doi: 10.1109/CITSM50537.2020.9268822.

[13] Z. Sharfina and H. B. Santoso, "An Indonesian adaptation of the System Usability Scale (SUS)," *2016 Int. Conf. Adv. Comput. Sci. Inf. Syst. ICACSIS 2016*, pp. 145–148, 2017, doi: 10.1109/ICACSIS.2016.7872776.

[14] E. Kurniawan and A. K. Syahputra, "Usability Testing on The Asahan Covid-19 Web Portal using System Usability Scale (SUS)," *Int. Conf. Soc. Sci. Inf. Technol.*, vol. 4509, pp. 131–140, 2020.
[15] G. W. Sasmito, L. O. M. Zulfiqar, and M. Nishom, "Usability Testing based on System Usability Scale and Net Promoter Score," *2019 2nd Int. Semin. Res. Inf. Technol. Intell. Syst. ISRITI 2019*, pp. 540–545, 2019, doi: 10.1109/ISRITI48646.2019.9034666.