

KangSayur Application Interface Design Using Design Thinking Method and System Usability Scale

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Abstract. Problems that often occur in buying and selling vegetables include problems related to the quality of vegetables received by consumers, payment methods that still apply traditional models and the unavailability of vegetables among sellers causing inefficient use of time. The existence of the KangSayur application can facilitate ordering vegetables by keeping the quality of vegetables fresh when they arrive at consumers, various payment methods and the availability of vegetables that can be monitored via cellphones. This research aims to apply the design thinking method to the design of the KangSayur application user interface. The final result of this research is the UI/UX design of KangSayur application with user experience analysis using the system usability scale (SUS) testing method to determine the effectiveness of the application in its use. This research process consists of making UI/UX design using figma tools and design thinking method which has several stages including empathize, define, ideate, prototype and test.

Keywords: Design Thinking; System Usability Scale; User Interface; Vegetables

1. Introduction

Vegetables are a type of commodity that has high economic value and plays an important role in fulfilling community nutrition (Abraham et al., n.d.). The availability of vegetables in the community involves the role of farmers as producers, middlemen as distributors and consumers as users. Farmers play a role in producing vegetables, traders act as distributors whether through middlemen or not and consumers act as users of farmers' production to meet their needs.

However, in the process of vegetable transactions, there are still various kinds of problems experienced by consumers. These problems include the quality of vegetables received by consumers, the unavailability of vegetables among sellers causing inefficient use of time when shopping and payment methods that still use traditional concepts. These problems require solutions that are efficient and relevant to the times.

There is previous research conducted in Palembang city in 2022 where in this study found problems with suppliers, namely large quantities of vegetable transactions experiencing logistical constraints, operational costs, the quality of vegetables obtained and payment methods that still use traditional concepts. This research uses a solution by designing the user interface of the vegetable supplier application using the design thinking method. The results

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concluded that the design of the user interface of the vegetable supplier application has met the needs to facilitate ordering vegetables in large quantities (Kurniawan et al., n.d.).

In this study will specifically discuss how the design of this application will help solve the problem of the quality of vegetables received by consumers, the unavailability of vegetables among sellers causes inefficient use of time when shopping and payment methods that still use traditional concepts. The development of information technology today has helped drive progress in product technology and the process of forming an informative society (Miftah and Sari, 2020). In addition, it is supported by data on online shopping application users in 2021 amounting to 88.1% of users who surf the internet in Indonesia, namely 178.49 million people (Huda et al., 2023).

To help solve the problems previously described, the solution offered is KangSayur which is an android-based application user interface design. This application provides a variety of vegetable seller recommendations and detailed information regarding the types of vegetables provided by each seller. Features contained in this application include recommendations for vegetable sellers, detailed information regarding the types of vegetables provided by each seller, quality assurance, low shipping costs, information on the availability of vegetables at each seller, vegetable delivery monitoring maps, payment methods by e-money or cash on delivery (Rahardi et al., n.d.). The available features can also help increase consumer confidence in this application and increase the number of transactions due to public trust in this application.

In designing the user interface of the KangSayur application using the design thinking method. The stages carried out are empathize, define, ideate, prototype and test (Soedewi et al., n.d.). In addition, user experience analysis is also carried out using the System Usability Scale (SUS) method.

2. Methods

2.1. Design Thinking Method

The first method used is the design thinking method. The design thinking method is a method used to help solve a problem by thinking comprehensively to create an innovative solution based on user needs (Komalasari et al., 2023). The use of design thinking methods for software development can help reduce the occurrence of errors in software and facilitate implementation into a finished product after the prototype stage is complete (Kurnianto et al., n.d.). The following are the stages of the design thinking method presented in Figure 1 (Informatika and Polinema, n.d.).



Figure 1 Stages of the design thinking method

2.1.1. Empathize

At this stage the researcher focuses on finding information and observing the experience of the user. The purpose of this stage is so that researchers can empathise with users so that they can be in the same position and point of view as users.

2.1.2. Define

After completing the information search stage, then at this stage the researcher identifies the information that has been collected previously. From this identification, the core of the problem will be found which will be the main objective in making "KangSayur Application Interface Design Using Design Thinking Method and System Usability Scale".

2.1.3. Ideate

After going through the previous two stages, then proceed to the third stage, ideate. This stage is useful for searching and finding effective solutions to the problems that have been collected. At this stage, each group provides input or ideas according to their role. The ideas that have been submitted will then be selected as the most suitable and effective to be implemented.

2.1.4. Prototype

After getting a draft idea, it will then be continued in designing a prototype so that the abstract idea that has been described can be realised into a prototype design. This stage is an experimental stage to test the suitability of each solution idea obtained at the ideate stage.

2.1.5. Test

The finished prototype design will then be directly tested by potential users to see firsthand the user's reaction when using the vegetable e-commerce application. At this stage, the feedback that will be given by prospective users is very important to be used as a guide in making improvements. Although sometimes the needs and desires of users are very diverse or even contradictory. However, it is common and if it happens, it will return to the main purpose of making "KangSayur Application Interface Development Using Design Thinking Method and System Usability Scale" to consider feedback that supports the main purpose of making this idea (Chusnan Widodo and Gustri Wahyuni, n.d.).

2.2. System Usability Scale (SUS) Method

Besides using the design thinking method, researchers also use the System Usability Scale (SUS) method as a user interface testing method. System Usability Scale (SUS) is a method used to test a system using a usability scale. System Usability Scale (SUS) in its testing uses a questionnaire consisting of 10 questions with answers in the form of a linear scale of numbers 1-5. The number 1 means representing strongly disagree and the number 5 means representing strongly agree (Nufus et al., 2022). The list of questions used in the questionnaire is presented in Table 1.

Table 1 Questionnaire Question List

No	Question	Score
1	Looking at the interface design that has been presented I think I will use this system again	1-5
2	Looking at the interface design that has been presented I feel that this system is complicated to use	1-5
3	Looking at the interface design that has been presented I feel this system is easy to use	1-5
4	Looking at the interface design that has been presented, I need help from other people or technicians in using this system	1-5

No	Question	Score
5	Looking at the interface design that has been presented, I feel that the description of the available system features is working properly	1-5
6	Looking at the interface design that has been presented, I feel that there are many things that do not match in the description of this system	1-5
7	Looking at the interface design that has been presented I feel that others will understand how to use this application quickly	1-5
8	Looking at the interface design that has been presented I feel that the description of this application system is confusing	1-5
9	Looking at the interface design that has been presented, I feel that there are no obstacles that will occur when using this system	1-5
10	Looking at the interface design that has been presented, I feel the need to familiarise myself first before using this application system	1-5

3. Results and Discussion

3.1. Empathize

At the empathise stage to help formulate the problem to be solved, researchers conducted structured interviews with prospective users directly to four women. The data or information collected is information on the needs and desires of users on the price of vegetables in the market. Table 2 contains the criteria for prospective users who will be interviewed.

Table 2 List of Interview Criteria

No	Interview Criteria
1	Women aged 25 and above and housewives.
2	Domiciled in Sleman Yogyakarta and surrounding areas
3	Frequently shop for vegetables at the market
4	Experiencing problems related to the quality of vegetables received when shopping is not guaranteed
5	Having trouble choosing a payment method when shopping for vegetables
6	Experienced problems with the unavailability of complete vegetables at the seller

The information that has been obtained from the interviews with the targets whose criteria have been described in Table 2 will form the basis for developing the idea of this research. The information that has been obtained is then summarised as shown in Table 3 below.

Table 3 Problem Conclusion

No	Problem Conclusion
1	Users want a platform that easily connects users with vegetable traders
2	Users want an online vegetable selling application that is easy to operate and has features that can help select the location of the nearest seller and pocket-friendly sales prices
3	Users want features that can help ease the selection of sellers, types of vegetables to be purchased and payment methods
4	Users want secure, convenient and varied payment methods
5	Users want a safe, convenient and pocket-friendly delivery method

3.2. Define

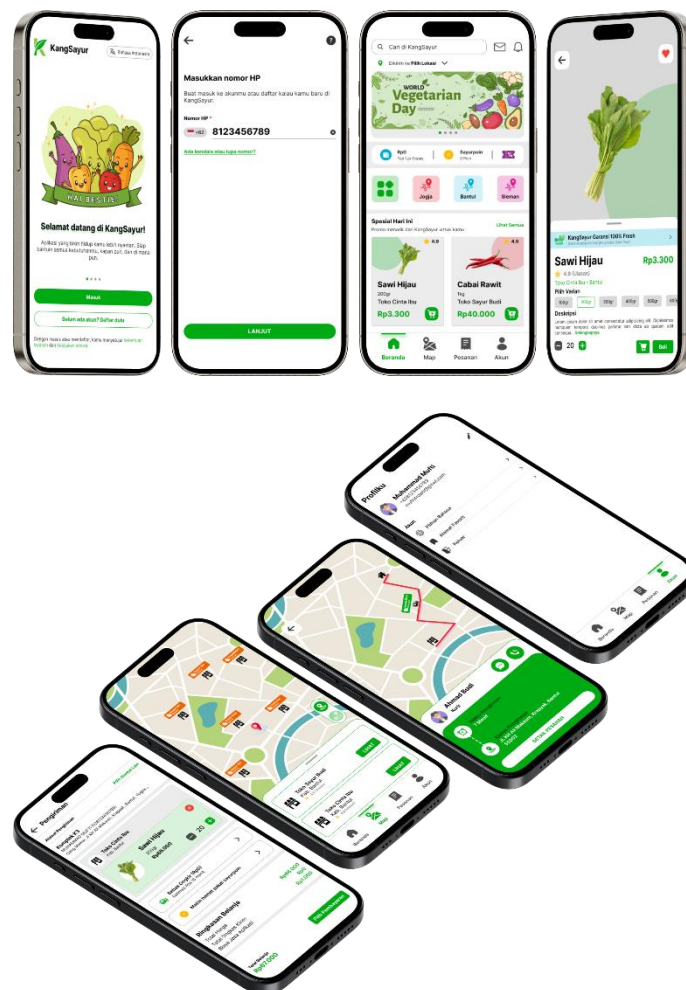
The result obtained from this stage is the categorisation of problems that are useful to facilitate researchers in finding effective solutions to these problems (Ilham Firman Ashari and Rahmat Rizky Muharram, 2022). The categorisation of problems is based on user needs, as presented in Table 4 below.

Table 4 Problem Categories

No	Problems	Problem Category
1	Existing online shopping applications have not been able to provide information on vegetable sellers and types of vegetables clearly	User friendly
2	Users have difficulty finding vegetable sellers with pocket-friendly prices	Recommendations for discounts and vendors with pocket-friendly prices
3	Users complain that the choice of payment methods provided is not up to date.	Payment system
4	Users complained about the choice of delivery method provided.	Delivery system

3.3. Ideate

In the ideate stage, the researcher created a solution to the needs expressed in the define stage. The solution is the KangSayur application. To illustrate the form of the solution, Figma UI/UX application design was used. By using the application design, UI/UX development will be faster and more efficient, and can improve the quality of UI/UX.

**Figure 2** KangSayuran Design View

3.4. Prototype

At the prototype stage, researchers utilised the present/prototype feature of the figma application to simulate the results of UI/UX without the need to create the actual application.

The interaction and flow of using the application has been implemented at this stage so that it can be tested before being realised in the application.

3.5. Test

At the test stage, researchers used the SUS (System Usability Scale) method by utilising google forms media to ask for opinions from a number of people. In this media, a picture of the design that has been made using figma is attached, so that respondents can assess and provide input for the prototype results. Respondents have been categorised in the empathise stage and several expert judgments who are experts in their fields as a reference in developing UI/UX design in the future.

The total respondents in this test were 42 people consisting of 38 people as respondents according to the criteria described in the empathize stage and 4 people as expert judgment. In the results of this test, the researcher groups the scores of each respondent which contains the value of each question to the respondent and the accumulated SUS score for each respondent. The value grouping of each respondent is described in Table 5 below.

Table 4 Questionnaire Results

Responden	1	2	3	4	5	6	7	8	9	10	Score Accumulation	SUS Accumulation
1	4	3	3	2	3	4	3	3	3	2	30	75
2	4	3	3	3	3	3	2	3	3	1	28	70
3	4	2	3	3	3	2	4	3	4	2	30	75
4	3	1	3	1	3	1	3	1	3	1	20	50
5	4	4	4	3	4	3	3	3	3	1	32	80
6	3	3	3	3	2	3	3	3	2	3	28	70
7	3	3	3	1	3	4	3	3	2	1	26	65
8	3	3	3	1	3	2	3	3	3	1	25	62,5
9	3	1	3	0	2	1	3	0	2	1	16	40
10	3	3	3	3	3	3	3	3	1	1	26	65
11	1	3	3	1	3	3	2	3	1	1	21	52,5
12	3	3	3	2	3	3	2	1	3	1	24	60
13	3	1	3	1	4	0	3	1	3	2	21	52,5
14	4	3	3	1	4	3	3	3	1	0	25	62,5
15	3	3	3	3	3	3	3	3	1	2	27	67,5
16	3	1	3	1	3	1	3	1	3	1	20	50
17	3	3	3	3	3	3	3	3	1	3	28	70
18	4	1	3	1	4	1	3	1	3	0	21	52,5
19	2	2	3	2	3	2	4	3	1	4	26	65
20	4	2	3	1	1	2	3	4	0	2	22	55
21	3	3	3	1	3	4	3	2	2	2	26	65
22	3	1	3	2	3	1	3	1	3	1	21	52,5
23	3	1	3	2	3	1	3	1	3	1	21	52,5
24	4	4	4	3	3	3	4	3	1	3	32	80
25	3	1	3	3	3	1	3	1	3	1	22	55
26	3	3	3	4	3	2	3	3	1	3	28	70
27	3	3	3	1	3	3	3	3	1	3	26	65
28	4	4	3	4	4	4	4	4	0	0	31	77,5
29	3	1	4	3	3	1	4	3	1	0	23	57,5
30	4	4	4	3	4	3	3	3	1	3	32	80
31	4	4	3	2	4	3	3	3	1	1	28	70
32	4	4	3	1	3	3	3	3	1	3	28	70
33	4	4	3	1	3	2	3	3	1	3	27	67,5
34	4	4	3	3	3	3	3	3	1	1	28	70
35	4	1	3	3	3	1	3	1	1	1	21	52,5
36	4	3	2	1	4	3	3	4	3	2	29	72,5
37	4	4	4	4	3	3	3	3	0	3	31	77,5

Responden	1	2	3	4	5	6	7	8	9	10	Score Accumulation	SUS Accumulation
38	4	1	4	2	3	1	3	1	1	1	21	52,5
39	4	3	4	4	3	3	3	3	3	4	34	85
40	3	3	4	3	3	2	4	2	1	2	27	67,5
41	4	0	4	0	4	0	4	0	2	0	18	45
42	3	0	4	0	4	0	4	0	4	0	19	47,5
TOTAL											1074	2675

From Table 5 of the Questionnaire Results above, the average score or final SUS result is 63.69. From these final results, continued by determining the grade of the assessment results by looking at the SUS (System Usability Scale) value range which consists of acceptable, adjective and grade. For more details can be seen in Figure 3 below:

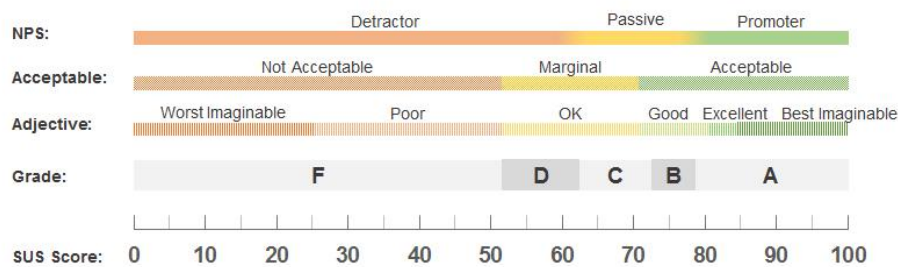


Figure 3 SUS (System Usability Scale) Score Range

Based on Figure 3 above, the test result grade using SUS (System Usability Scale) is obtained in the acceptable range of users towards the KangSayur application design is classified as marginal. In the adjective range of users towards the design of the KangSayur application is classified as ok. Finally, in the range of user grades for the KangSayur application design is classified as category C.

4. Conclusions

Based on the research activities that have been carried out, it can be concluded that:

1. KangSayur application design is a mobile-based application design designed to meet the needs of respondents who experience problems when shopping for vegetables.
2. The interface of the KangSayur application was designed using the design thinking method with an emphasis on user convenience and comfort when using the application.
3. Based on the test results using SUS (System Usability Scale), the user interface design of the KangSayur application gets a C grade in the grade method, an ok grade in the adjective range and a marginal grade in the acceptable range based on the SUS assessment linear scale.

References

- Abraham, A., Informatika, M., Teknologi, F., Wildannil, M., Informatika, H., Aditya, A., Informatika, W., Zukhri Informatika, Z., Rifqi, F., Informatika, A., Budi, A., Informatika, C., n.d. E-Sayur: Platform Jual Beli Sayur.
- Chusnan Widodo, A., Gustri Wahyuni, E., n.d. Penerapan Metode Pendekatan Design Thinking dalam Rancangan Ide Bisnis Kalografi.
- Huda, N., Habrizons, F., Satriawan, A., Iranda, M., Pramuda, T., 2023. Analisis Usability Testing Menggunakan Metode SUS (System Usability Scale) Terhadap Kepuasan Pengguna Aplikasi Shopee. SIMKOM 8, 208–220. <https://doi.org/10.51717/simkom.v8i2.158>
- Ilham Firman Ashari, Rahmat Rizky Muharram, 2022. PENGEMBANGAN ANTARMUKA PENGGUNA KOLEPA MOBILE APP MENGGUNAKAN METODE DESIGN THINKING DAN SYSTEM USABILITY SCALE. JSiI (Jurnal Sistem Informasi) 9, 168–176. <https://doi.org/10.30656/jsii.v9i2.4993>
- Informatika, S., Polinema, A., n.d. PENERAPAN METODE DESIGN THINKING PADA PERANCANGAN USER INTERFACE APLIKASI KOTAKKU. SIAP) 2020.
- Komalasari, R., Tsalitsa, R.H., Munawar, Z., Putri, N.I., 2023. Metode Design Thinking UI/UX Aplikasi UMKM Sanfresh. Jurnal ICT : Information Communication & Technology 23, 23–30.
- Kurnianto, F., Informatika, J., Industri, F.T., Gustri, E., Jurusan Informatika, W., n.d. Penerapan Metode Design Thinking Dalam Perancangan UI/UX Pada Aplikasi Basis Data Sekar Kawung Untuk Pegawai Lapangan Perusahaan Sosial Sekar Kawung.
- Kurniawan, F., Firmansyah, M., Rijaya, R., Yesua Sutanto, S., Rizky Pribadi, M., Ilmu Komputer dan Rekayasa, F., Multi Data Palembang, U., n.d. MDP STUDENT CONFERENCE (MSC) 2022 Penerapan Design Thinking Pada Perancangan User Interface Aplikasi Supplier Sayur.
- Miftah, Z., Sari, I.P., 2020. ANALISIS SISTEM PEMBELAJARAN DARING MENGGUNAKAN METODE SUS. Research and Development Journal of Education 1, 40. <https://doi.org/10.30998/rdje.v1i1.7076>
- Nufus, R., Aqilla Putri Tamimi, R., Jl Jenderal Ahmad Yani No, D., Seberang Ulu, K.I., Palembang, K., Selatan, S., 2022. Analisis Website Pedulilindungi Menggunakan Pengujian SUS (System Usability Scale). Jurnal Ilmu Teknik dan Komputer 6.
- Rahardi, A., Fauzan Azima, M., Susilo, Y., n.d. Implementasi Sistem Penjualan Sayur Online Berbasis E-Commerce Di Bandar Lampung.
- Soedewi, S., Mustikawan, A., Swasty, W., n.d. Penerapan Metode Design Thinking Pada Perancangan Website UMKM Kirihiuci.