DESIGNING USER INTERFACE OF TRAVEL MOBILE APPLICATION BASED ON ARTIFICIAL INTELLIGENCE

Nielson Teo Indrawan[1], Evelyne Henny Lukitasari[2], Ahmad Khoirul Anwar[3]
[1,2,3] Universitas Sahid Surakarta, Indonesia
Email: nelsenawan@gmail.com, evelynehenny@gmail.com, ahmadkhoirulanwar83@gmail.com

ABSTRACT

Indonesia is a country with many potential places that can be used as tourist destinations. The Central Statistics Agency (BPS) states that as of 2021 Indonesia has a total of 2,552 destinations in the tourism industry. The development of the tourism industry in Indonesia was hampered by the pandemic that had hit the country for approximately 2 years, which caused a narrow space for tourists to move. On the other hand, the use of digital technology has increased during the pandemic era. Artificial intelligence is one of the technologies that also developed during the pandemic. This technology allows for a program to think like a human and help facilitate daily activities and work. This design has the aim of creating an application display design that can implement artificial intelligence in a mobile application for the needs of the tourism industry. The method used in this design is the Design Thinking method popularized by Kelley and Brown from IDEO, consisting of the Emphatize, Define, Ideate, Prototype, and Testing stages. The result of this design is a design of a mobile application interface for the tourism industry, with the implementation of artificial intelligence and various features, and contains information about various tourist destinations, as well as designing its trials easily by users.

KEYWORDS	*Tourism Industry, Artificial Intelligence, Travel Destinations, Mobile Apps*

INTRODUCTION

As an archipelagic nation with many potential tourist destinations, Indonesia's tourism industry has become one of the main sectors. The Central Statistics Agency (BPS) stated that by the year 2021, Indonesia had a total of 2,552 tourism destinations. The abundance of tourist attractions undoubtedly makes Indonesia's tourism industry promising and attractive as a national asset.

Figure 1. Table of the Number of Tourist Attractions in Indonesia Based on BPS
(Source: https://dataindonesia.id/pariwisata, 2023)

The tourism sector takes a large part contributing in the economic growth in Indonesia. In order to boost the national economic growth, Indonesian tourism is expected to change strategy and follow changes that requires tourism to transform digitally. (Yasmine & Atmojo, 2022)

The Government of Indonesia has targeted the tourism sector to be the number one foreign exchange contributor. Over the past five years, the tourism industry in Indonesia has significantly contributed to foreign exchange, rising from 12.2 billion US dollars in 2015 to 15 billion US dollars in 2017 (Priyanto et al., 2021). However, this progress was hindered by the COVID-19 pandemic and the implementation of PSBB, leading to a decrease in the number of local and international tourists visiting Indonesia, significantly affecting the development of the tourism industry in Indonesia.

The implementation of PSBB in several regions and the cessation of tourism activities in Indonesia due to the spread of COVID-19 have resulted in a decrease in the number of foreign tourists visiting Indonesia. Recently, the World Tourism Organization (UNWTO) released a report stating that the situation and impact of the coronavirus would lead to a decline in international tourism revenue by an estimated 20 to 30 percent. According to UNWTO data, this means a loss of growth value for the next five to seven years due to the COVID-19 outbreak (Adam & Info, 2022, hlm.504).

Adam also explained in his journal that to address this situation, the government has taken various measures. Adam elaborated as follows: Tourism, which was initially experiencing rapid growth, is now weakening and experiencing a drastic decline. The decline caused by the COVID-19 pandemic in the tourism sector has not yet found a bright spot. In light of this, the Indonesian government is offering special rates for tourists to boost the tourism sector. This initiative is supported by Sandiaga Salahuddin Uno, the Minister of Tourism and Creative Economy, who has prepared discount promotion programs to stimulate tourism activities in

Indonesia. He emphasized that this program must be well-prepared by hotels, restaurants, and airlines, while strictly implementing health protocols (Adam & Info, 2022, hlm.505).

The pandemic has also brought about rapid developments in the use of digital communication technologies such as smartphones and laptops. The pandemic has also increased internet usage in Indonesia. Therefore, to support the development of the tourism industry in line with digital technology advancements, design that can keep up with both developments is required. One of the technologies currently being widely used is artificial intelligence (AI). This technology is designed to assist humans in any field.

Abdul Rozaq in his book "Artificial Intelligence for Beginners" (Rozaq, 2019) reveals that artificial intelligence is not only limited to human intelligence but also to tools and systems. Thus, artificial intelligence can be interpreted as the ability of a tool or system to adapt in the process of achieving a goal in an environment that can influence a system (Rozaq, 2019, hlm.2). Artificial intelligence in the tourism industry can be integrated into a digital communication technology such as smartphones as a mobile application that can be accessed anytime and anywhere to access information, make reservations, and transact within the application. Designing an application requires a user interface (UI) design, which is a visual element that will be directly seen by the public or users. The process of designing and creating application or website designs is known as UI (User Interface) and UX (User Experience). User Interface is the design of the interface of an application or final product that will be seen by the user. User Interface includes visual elements, visual elements, colors, shapes, buttons, and everything that will be used in the user interaction process in using the application (Agus Muhyidin dkk., 2020, hlm. 29). Artificial intelligence will also be able to create various innovations in tourism industry applications, thereby introducing features that have never been used by applications in similar fields before. This will facilitate the tourism industry's goal of further development and keeping up with the development of digital technology industries.

Based on the above description, the design of a user interface is needed as a bridge for artificial intelligence to play a role in the development of the tourism industry in Indonesia. Thus, the tourism industry can keep up with the current development and use of digital technology.

RESEARCH METHOD

Methods are needed to ensure and maintain that the design process remains on track with its goals. Methods also serve as references used in the research and design process. The Design Thinking method is considered appropriate for this design because it has phases that are necessary for conducting the design.

Design thinking is an approach method used as a strategic innovation in the design process and involves approaching users through empathy. Design thinking is used as an analytical method through understanding user needs and focusing on the form, relationships, behaviors, interactions, and human emotions to produce an optimal solution. There are five stages in the design thinking method: empathize, define, ideation, prototype, and test. By understanding these five stages in the

design process, complex problems faced by users can be solved (Soedewi dkk., 2022, hlm. 82).
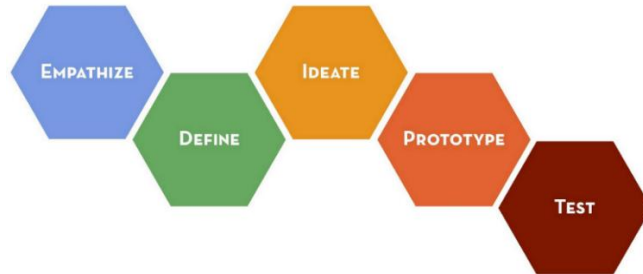

Figure 2. *Design Thingking*
(Source : *Stanford Design University*, 2017)

EMPHATIZE

The empathize stage is an activity about data collection that prioritizes empathy for those around, especially users. (Darmawan et al., 2022)

Empathize is the stage aimed at gaining empathetic understanding of the issues at hand and what is desired. This stage involves activities such as research, surveys, and journal literacy, which can also be conducted through observation and interviews. In this stage, research is conducted on two aspects: tourist visits in Indonesia during the pandemic and the level of internet usage in Indonesia in 2022.(Universitas BINUS, 2019)
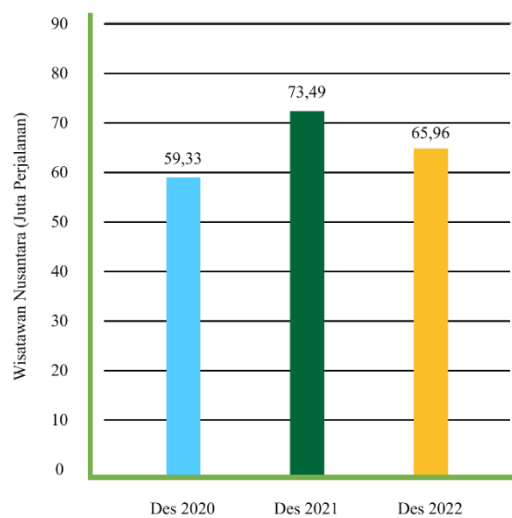

Figure 1. Graph of the Number of Local Tourists in Indonesia December 2020 – 2022
(Source: BPS, 2023)

Based on the graph above, tourist visits in Indonesia experienced an increase in December 2021, reaching 73.49 journeys, but decreased again to 65.95 journeys in December 2022. This is in comparison to the increasing internet usage in Indonesia.(Indriani dkk., 2022,hlm.12)
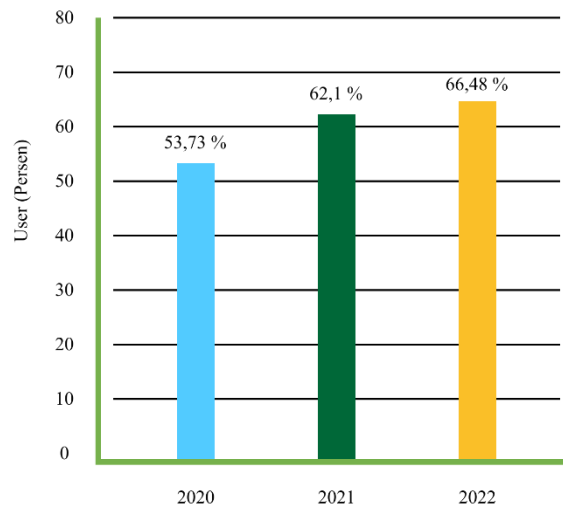
Figure 4. Graph of Internet Users in Indonesia (Percentage of Population)
(Source: BPS, 2023)

Internet usage in Indonesia has been increasing from year to year, reaching 66.48% of the population being classified as active internet users in 2022.

DEFINE

This stage involves data collection and determining pain points. Pain Points are the main issues that need to be addressed and solutions sought in this design process. The define stage includes collecting pain point data obtained from the empathize process and then moving on to the determination of How Might We, an initial idea for solutions to be applied in this design. Pain Points are determined from the empathize process. Some identified Pain Points are:

- Fluctuating or unstable tourist visits in the tourism industry.
- Increasing growth in internet usage from year to year.
- Limited participation of the tourism industry in keeping up with digital technology and internet usage.
- The lack of design solutions that could address the issues in the tourism sector.

Pain Points are also obtained through observation of applications operating in the tourism industry sector. The issues taken are complaints from users or the public as reviews of these applications. From several widely circulated applications, several Pain Points are identified as follows:
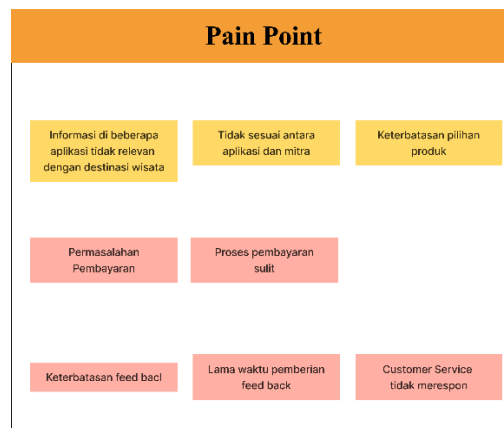
Figure 5. Pain Points Obtained Based on Reviews through the Google Play Store
(Source: Personal Documentation, 2023)

How Might We, or initial ideas, are:
- Creating a User Interface design as a solution to address the instability of the tourism industry and the increasing internet usage in Indonesia.
- Developing an attractive concept for mobile application features that capture the public's attention, thus encouraging people to use travel applications. This will also stimulate interest in exploring the application and, at the same time, exploring the tourism industry through mobile applications.
- Creating a User Interface design that can integrate these features to be easily understood by users and intuitive.

IDEATE

Ideate, or Ideation, is the stage where designers find and combine ideas from the How Might We statements that have been obtained. Ideation is rooted in the word "Ide," which according to the KBBI is a design that is arranged in the mind or a feeling that envelops the mind. The Ideate stage focuses on creating and gathering ideas that will become solutions to the identified Pain Points and the ideas outlined in the How Might We statements. There are 2 main ideas obtained in this phase:
- Creating a User Interface design that integrates a "Chat bot" as one of the features and the role of Artificial Intelligence in this travel mobile application.
- A trip planning and payment feature that seamlessly integrates the ease and flexibility in the process of determining travel plans and payments in this travel mobile application.

a. Userflow

The next step is to create a user flow, which is a depiction of the flow that users will go through within an application. Soedewi in her journal explains, "User flow is a diagrammatic representation to determine the scenario of user flow when accessing the Kirihuci website. The function of user flow is to facilitate designers

in determining the flow before designing the website interface and to avoid overly complex navigation to make it easier for users" (Soedewi dkk., 2022, hlm.86).
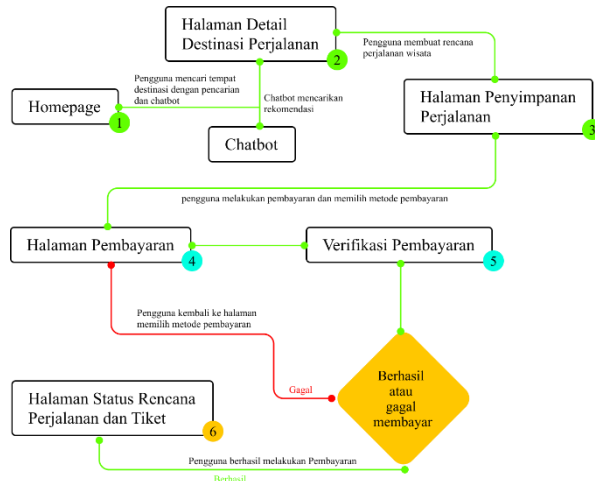

Figure 6. Userflow
(Source : Dokumentasi Pribadi, 2023)

RESULT AND DISCUSSION

PROTOTYPING

Prototyping is the fourth phase of the design thinking method. In this phase, the design process begins from sketches to refined designs that are ready for testing. The purpose of prototyping is to test specific aspects of a design solution generated in the ideation stage (Soedewi dkk., 2022, hlm.88).

The prototyping stage starts by determining basic aspects such as colors, typography, and icons. These aspects are integrated into a unified system called a design system.
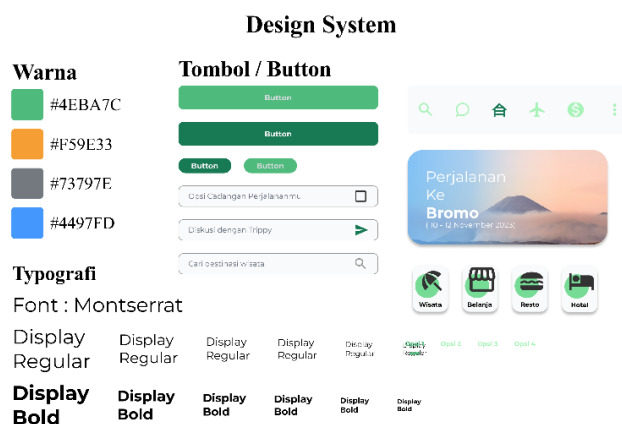

Figure 7. Design System
(Source: Personal Documentation, 2023)

Designing User Interface Of Travel Mobile Application Based On Artificial Intelligence

The components created within the design system will then be used in the process of creating the user interface design. The next step is creating wireframes or rough sketches in black and white, which provide an outline layout for the design.
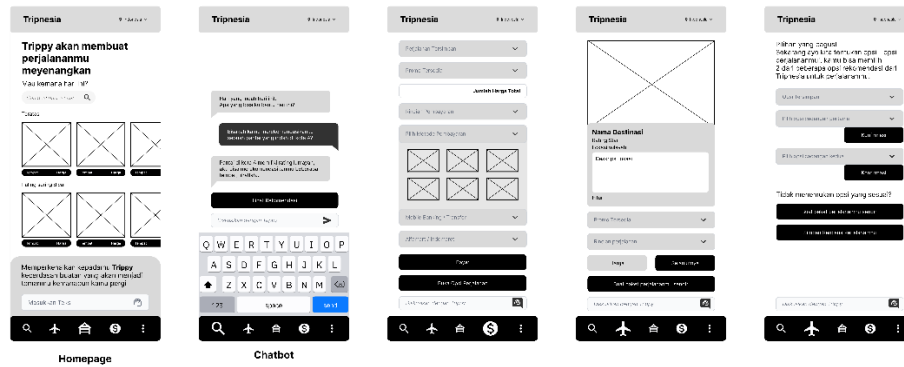

Figure 8. Wireframe/Sketch of Homepage, Chatbot, Search, and Payment
(Source: Personal Documentation, 2023)

The subsequent stage involves creating the user interface design. "User Interface (UI) is one part of the program that touches and interacts directly" (Suratno & Shafira, 2022). With users This stage is the final step in the prototyping process before testing. It includes producing finalized designs that meet all requirements before testing. In other words, the user interface design is the prospective final design product that will be disseminated.
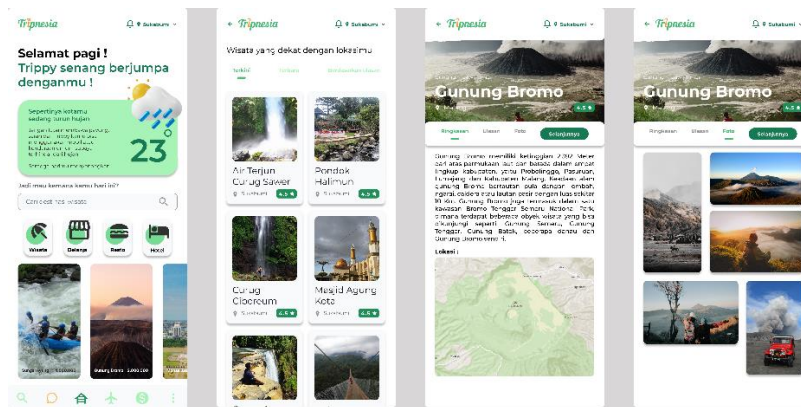

Figure 9. User Interface Design for Homepage and Search
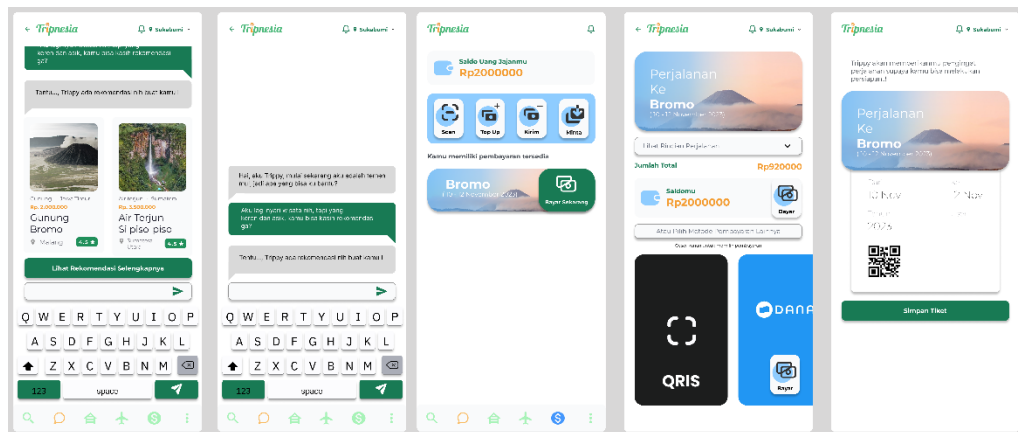(Source: Personal Documentation, 2023)

Figure 10. User Interface Design for Chatbot & Payment
(Source: Personal Documentation, 2023)

TESTING

In the final stage of this design thinking process, designers conduct testing to obtain feedback and improve existing solutions, making the product even better. User feedback is valuable for identifying strengths and weaknesses of the product, enabling improvements. (Soedewi dkk., 2022, hlm.92)

Usability Testing originates from the English word "usable," which means can be used effectively. Something is considered usable if it can minimize errors in the usage process and provide benefits to users. Usability Testing is conducted in various ways, one of which can be through meetings and surveys. Usability testing is also assessed using the Single Ease Question (SEQ) matrix. The purpose of SEQ is to assess the ease of a task within a prototype.

Testing is conducted online using a video conferencing application with the following conditions:

- Users/testers will navigate the prototype without guidance. The purpose of this procedure is to determine the difficulty level of the prototype.
- This procedure is observed through user/tester testing and assessed using the Single Ease Question (SEQ) method, where measurements range from 1 (easiest) to 7 (most difficult).
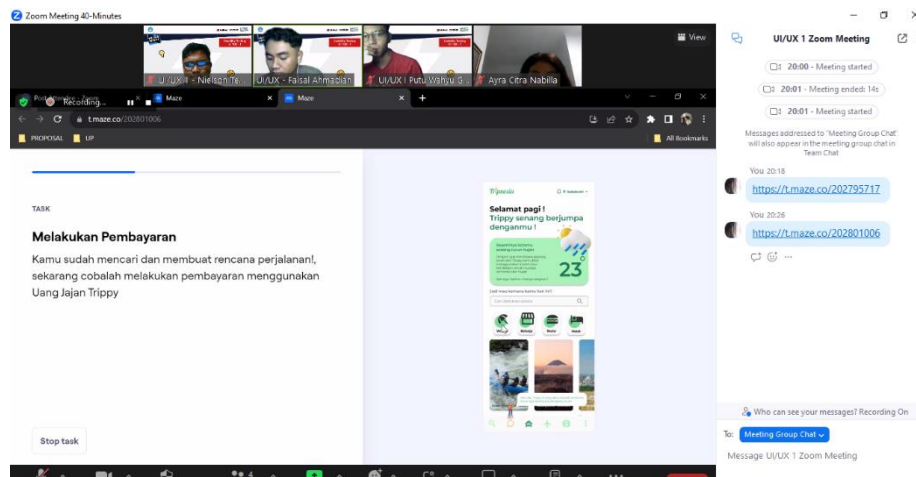
Figure 11. Testing Process of Zoom and Maze Applications
(Source: Personal Documentation, 2023)

Testing is done using two scenarios:
- The first scenario involves the task of finding and selecting a tourist destination.
- The second scenario involves the task of making a payment.

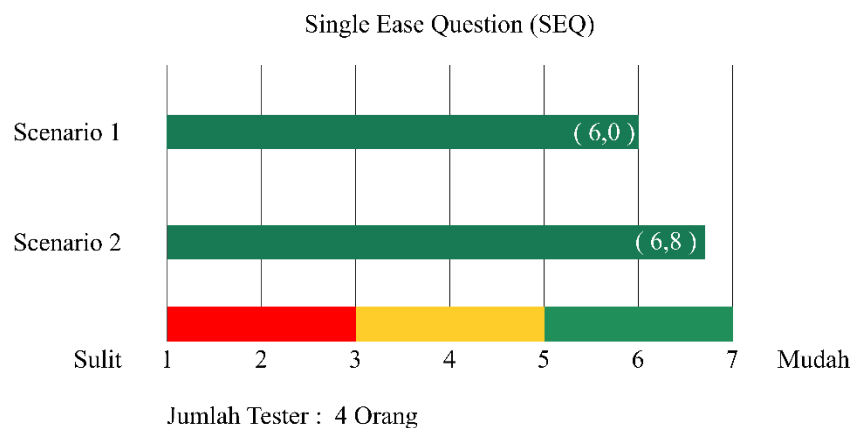Observations of users/testers who tested both scenarios yielded the following test results:

Figure 12. Single Ease Question Evaluation Results
(Source: Personal Documentation, 2023)

With the following explanation:
1) In scenario 1 the tester is required to make a destination travel plan, from the whole tester can understand and complete the task well and smoothly, but has a little obstacle in the recommendation display section so it is a bit constrained. However, testers reveal that the first scenario is quite easy to understand and do.
2) In scenario 2 the tester had almost no difficulty and revealed that the payment system is very easy to do

CONCLUSION

This design cannot be separated from research and data collection and problems regarding the situation of the Indonesian tourism industry during the pandemic. This design also requires observation of similar applications that are already circulating. This includes data collection and issues raised by the community regarding applications that are already circulating. This design uses a suitable method to execute and reference the process, and each stage can support the success of this design. The purpose of this design is to create a user interface design for an application that supports the process of industrial development in the tourism sector using artificial intelligence. With the design, the use of artificial intelligence in travel applications is known to facilitate various types of tasks and duties. The design takes into account technical novelty, innovation, and

convenience that users will later receive. The design method in this design helps develop the concept of design so that various kinds of conveniences can be obtained through the use of artificial intelligence in an application.

REFERENCES

Adam, R., & Info, A. (2022). Dampak Pandemi Covid 19 Terhadap Sektor Pariwisata Di Kota Batu. In Jurnal Ilmu Ekonomi (Jie) (Vol. 6, Issue 3).

Agus Muhyidin, M., Sulhan, M. A., & Sevtiana, A. (2020). Perancangan Ui/Ux Aplikasi My Cic Layanan Informasi Akademik Mahasiswa Menggunakan Aplikasi Figma (Vol. 10, Issue 2). Https://My.Cic.Ac.Id/.

Darmawan, I., Saiful Anwar, M., Rahmatulloh, A., & Sulastri, H. (2022). Design Thinking Approach For User Interface Design And User Experience On Campus Academic Information Systems. International Journal On Informatics Visualization. Www.Joiv.Org/Index.Php/Joiv

Indriani, R., Pravitasari, C., & Muin, F. M. (2022). Statistik-Kunjungan-Wisatawan-Mancanegara-2021 (Vol. 1). Https://Www.Bps.Go.Id/Id/Publication/2022/04/28/D79faad2c263388e94e160ee/Statistik-Kunjungan-Wisatawan-Mancanegara-2021.Html

Priyanto, R., Fariz Qinthara, R., & Ghani, Y. A. (2021). Analisis Dampak Pandemi Covid-19 Terhadap Penjualan Layanan Wisata. Jurnal Manajemen Jasa, 3(2). Http://Ejurnal.Ars.Ac.Id/Index.Php/Jsj

Rozaq, A. (2019). Artificial Intelligence Untuk Pemula (Vol. 1).

Soedewi, S., Mustikawan, A., & Swasty, W. (2022). Penerapan Metode Design Thinking Pada Perancangan Website Umkm Kirihuci. 10(2), 82–84.

Suratno, B., & Shafira, J. (2022). Development Of User Interface/User Experience Using Design Thinking Approach For Gms Service Company. Journal Of Information Systems And Informatics, 4(2). Http://Journal-Isi.Org/Index.Php/Isi

Universitas Binus. (2019, December). Teori Design Thinking Oleh Tim Brown From Ideo. Binus.Ac.Id.

Yasmine, H. T., & Atmojo, W. T. (2022). Ui/Ux Design For Tourism Village Website Using The User Centered Design Method. Tiers Information Technology Journal, 3(2), 100–114. Https://Doi.Org/10.38043/Tiers.V3i2.3871