AUCTION APPLICATION FOR BERINGKIT ANIMAL TRADITIONAL MARKET BASED ON ANDROID

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Abstract. Beringkit Animal Market is one of the large traditional animal markets in Bali which is famous for selling superior cows. In addition to selling superior cows, Beringkit Animal Market also sells dogs and various types of poultry such as chickens, ducks and roosters. However, in the midst of the COVID-19 outbreak, traditional markets are considered as the main cluster for the spread of COVID-19 due to the large number of interactions between buyers and traders. The implementation of Community Activity Restrictions (PPKM) has resulted in a lack of income for traders at the Beringkit Animal Market. This study aims to design an Android-based online animal auction application as a medium for buying and selling animals to minimize physical interaction between buyers and traders, the online auction transaction process is chosen because the auction transaction process can bring together traders and buyers in the same online media and make offers up to reach the highest agreed price. The research method applied is the DSRM method or Design Security Research Method, application development uses Android Studio to develop mobile applications, and uses Visual Studio Code to develop web-based systems. Data storage and web server management in this study using MySQL and Laravel. The results of this study are in the form of an Android-based animal auction application that can be used as a medium for transactions between buyers and traders who have gone through the blackbox testing process with the test results as expected.

Keywords : android, auction application, traditional market, animal market, covid-19

1. INTRODUCTION

Traditional markets are an important place for the survival of most people, the atmosphere of traditional markets which are often simple makes traditional markets feel more friendly to various groups of people. Both the lower middle class and the upper middle class do not feel reluctant to visit traditional markets which always survive to help meet the needs of people's lives when supermarkets and other modern markets go bankrupt. Beringkit Animal Market is one of the big traditional animal markets in Bali which is famous for selling superior cows. In addition to selling superior cows, at the Beringkit Animal Market there are also sellers of dogs and various types of poultry such as chickens, ducks and roosters [1].

Since March 2, 2020, President Joko Widodo announced that Indonesia had been tested positive for the Covid-19 outbreak [2]. As a step to suppress the positive number of Covid-19, the government, especially the Ministry of Health, issued a regulation, namely Large-Scale Social Restrictions (PSBB). Restrictions on community activities include schools and offices being closed, restrictions on activities in crowded places or public facilities. Regarding the PSBB policy, the governor of Bali issued Bali Governor Instruction number 8551 of 2020 regarding the strengthening and prevention of Covid-19 by holding Community Activity Restrictions or commonly called PPKM, namely the Enforcement of Restrictions on Community Activities [3].

In response to the Bali Governor's instructions regarding PPKM, the Head of Binmas Badung Police and the President Director of Beringkit Market imposed PPKM activities within the Beringkit Animal Market which is considered the main cluster for the spread of Covid-19 [4], the implementation of PPKM with a system of limiting the number of visitors resulted in a decrease in the income of traders [5].

Technological advances in this era of globalization allow physical buying and selling activities in the market to be minimized, by relying on the internet and applications that are connected online, the transaction process can be carried out without the need to meet face to face [6]. Utilizing technological advances, researchers designed an Android-based online animal auction application to minimize physical buying and selling activities at the Beringkit Animal Market. The reason for choosing to use online applications during the Covid-19 pandemic is because online buying and selling activities have increased during the pandemic. Based on research, the convenience factor is the main factor in increasing online buying and selling activities [7]. The selection of the auction system as a transaction method is also based on the fact that the auction system has advantages such as enthusiastic bidding activities, a fast and effective process, and high prices obtained from enthusiastic bidding activities [8].

2. METHODS

2.1 Research Method

The research method applied in this study is the DSRM (Design Science Research Method) research method which consists of the stages of problem identification, goal setting, design, case studies, evaluation and communication. [9].
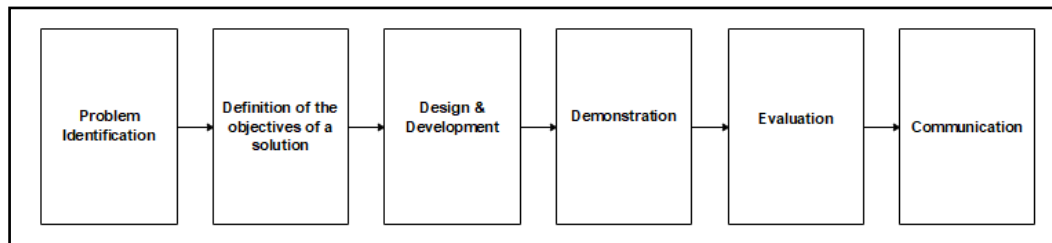

Figure 1. Design Science Research Methodology (DSRM)

a. **Identify problem and motivate**
   The first stage is the identification of the problem, at this stage observations are made to the location to identify the problems that occur in the Beringkit Animal Market and conduct a literature study.
b. **Define Objectives of a solution**
   The next stage is to group the problems and provide solutions to the market head and supervisor of Beringkit Animal Market.
c. **Design and development**
   The design phase carried out is to design an overview of the system, design a system tiered chart, design a system database and web service using Laravel and MySQL, design a mobile application using Android Studio, and design a web-based system using Visual Studio Code.
d. **Demonstration**
   The demonstration stage is carried out before carrying out the implementation, namely by conducting socialization and testing of the developed application to find out the errors contained in the application module during development. Besides, the demonstration also aims to get input from application users.
e. **Evaluation**
   The next stage is the evaluation stage which is carried out to find out system weaknesses or system deficiencies. Is the application developed in accordance with the needs or still needs to be improved.
f. **Communication**
   The communication stage of application development is by documenting the knowledge that is collected widely and can be discussed in the academic community in the form of seminars and scientific articles.

2.2 System Overview

An overview of the system regarding Android-Based Animal Auction Application Design for Beringkit Animal Market can be seen in Fig. 2 following.
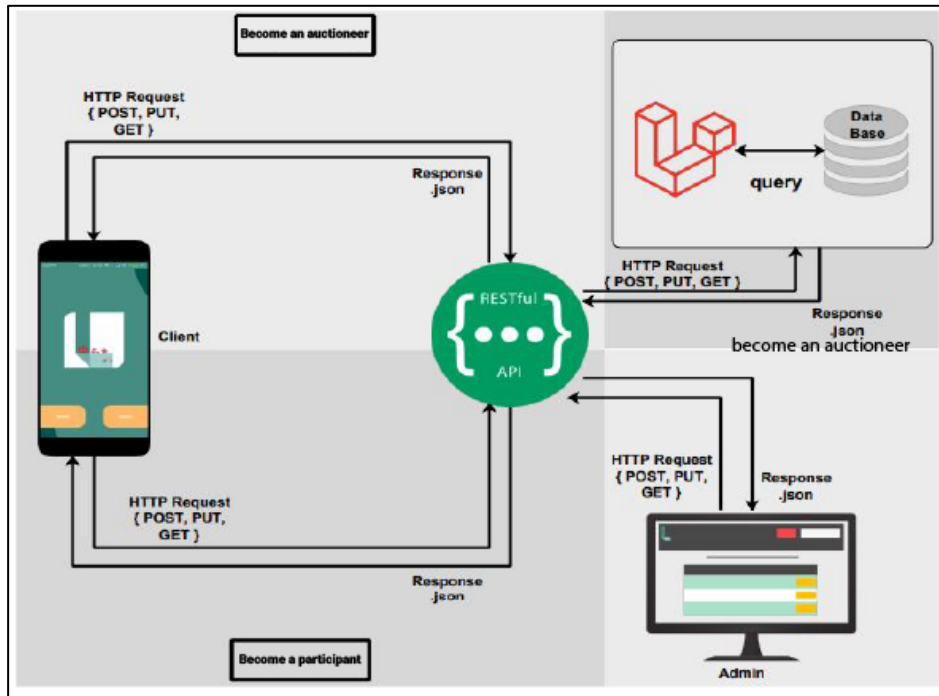
Figure 2. Animal Auction System Overview

The Beringkit Animal Market Animal Auction System has two types of users, namely clients and admins, clients can also be auctioneers or auction participants. The request sent through the client or admin is in the form of an HTTP Request, the request can be in the form of a POST, PUT, or GET method request sent to a web service. The web service on this system is built using the Laravel framework which is connected by implementing the REST architecture. The result of the HTTP Request that is query to the database will get a response in the form of JSON which will be forwarded to the client or admin.

2.3 System Tiered Chart

A tiered chart is a chart that illustrating the division function of the whole system, starting from the system into a sub-system that smaller [10]. Tiered chart of Android-Based Animal Auction Application Design for Beringkit Animal Market can be seen in Fig. 3 following.
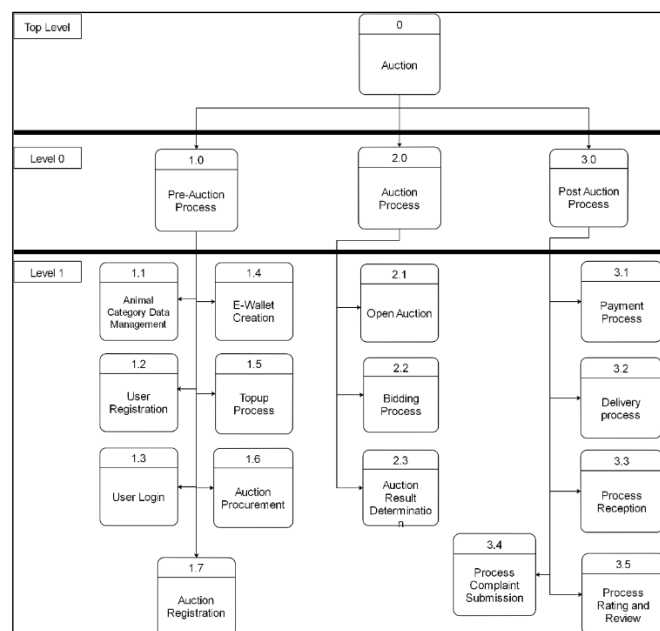

Figure 3. Animal Auction System Tiered Chart

The Beringkit Animal Market Animal Auction System is described in the form of a tiered chart and will be explained as follows.

1). Top Level consisting of the Auction Process.
2). Level 0 which consists of Pre-Auction Process, Auction Process, and Post-Auction Process.
3). Level 1 which consists of sub-processes from the three processes at level 0, namely Animal Category Data Management sub-process, User Registration sub-process, User Login sub-process, E-Wallet Creation sub-process, Topup Process sub-process, Auction Procurement sub-process, and sub-process Auction Registration process which is a sub-process of the Pre-Tender Process. Auction Opening sub-process, Bidding Process sub-process, and Auction Result Determination sub-process which are sub-processes of the Auction Process. Sub-process Payment Process, Sub-Process Delivery Process, Sub-Process Acceptance, Sub-Process Complaints Sub-process which is a sub-process of the Post-Auction Process.

3. RESULTS AND DISCUSSION

The Beringkit Animal Market Animal Auction application is an application that was built with the aim of minimizing physical buying and selling activities at the Beringkit Animal Market in the midst of the Covid-19 outbreak, the use of the auction system as a transaction method that can increase the selling value of animals through enthusiastic bidding activities is expected to increase the income of the traders at the Beringkit Animal Market.

The auction process in the Beringkit Animal Market Animal Auction Application is made using the chat room feature so that bargaining activities can be seen directly by fellow users who are online. This chat room feature allows application users to get instant messaging [11], instant messaging is obtained by users in the form of Bid Reports from every bargaining activity that occurs.

Research on mobile-based auction applications has previously been carried out by Andri and Suyanto (2020) [12], the difference in these two studies lies in the end time of the auction which in previous study the auction end time of the auction had been determined, while in this study the end time of the auction is when there is no more bidding activities.

This difference was also found in previous study conducted by Adam et al (2021) [13], in which the end time of the auction had been determined, not when there was no more bidding activity during the auction.

However, the two previous studies have similarity with this study, which is using the auction application as a medium to facilitate and streamline the transaction process between the traders and the buyers.

3.1 Implementation

The following is the result of the development of the Android-based Beringkit Animal Market Animal Auction System.
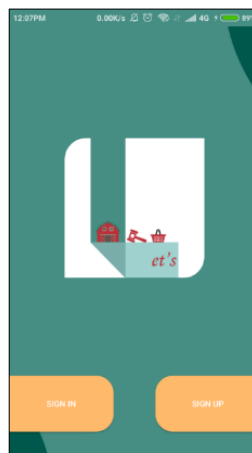

Figure 4. Application Home Menu Display

The initial menu display contains the application icon and two buttons for choice, namely the Signin button which will be directed to the Fig. 4 and the Signup button which will be directed to the Fig. 5.
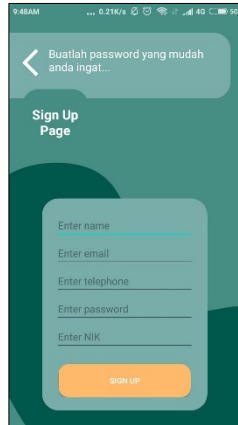
Figure 5. Application Sign Up Interface Display

The Signup interface is a display for new users to register, by sending their name, email, telephone number, password and also their NIK.
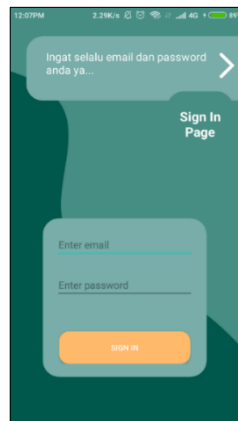

Figure 6. Application Sign In Interface Display

The Signin interface is a display for users to be able to sign in, by entering their e-mail and password as a condition for signing in. Users who have successfully signed in will be directed to the interface as shown in Fig. 7.
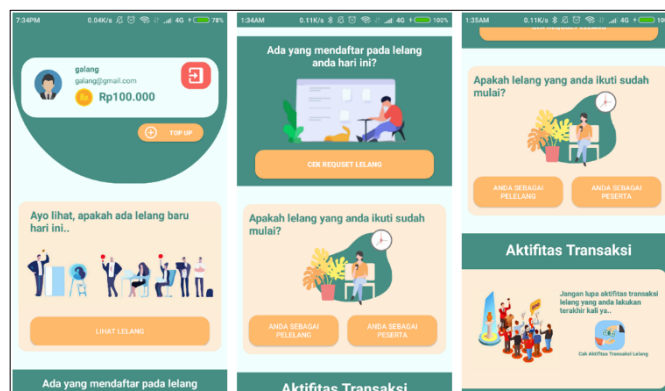

Figure 7. Application Main Menu Interface Display

The main menu interface display is an interface that displays the "Logout" button for users who want to log out, the "Topup" button to go to the Topup menu, the "View Auction" button to go to the Auction menu, the "Check Auction Request" button to go to the Auction Request menu, button "You are the Auctioneer" and "You

are the Participant" on the Auction menu, and the "Check Auction Transaction Activity" button goes to the Auction Transaction Activity menu and also displays the user's username, user e-mail, and the user's temporary balance.
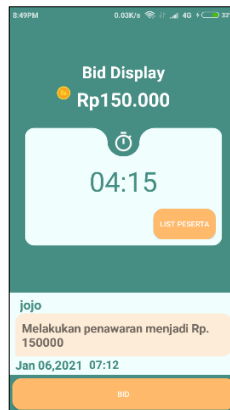

Figure 8. Auction Room Display

The Auction Room interface is a display for the auction process to occur, each participant can make a bid by selecting the BID button to secure a position as the winner of the auction and win the animal being auctioned. Each bid that occurs will be added to the value of the temporary auction price and the amount will appear on the Bid Display number display and new information will also appear about who conducted the auction, on what date and at what time the bidding was made on the Bid Report display. The user who bids and manages to survive until the time runs out will be the winner, an explanation of the auction process is also made in pseudocode as shown in Fig. 9. Pseudocode is a description of a programming algorithma computer that uses the simple structure of some programming languages but those languages only intended to be easily readable by humans [14].

```
BEGIN
Additional Time each Bid = 30 seconds
Value Up each Bid = Rp 25.000
Price Start From = Rp 50.000
        Timer CountDown Start at 05 minutes, 00 seconds (05.00)
        WHILE Timer CountDown at 04 minutes, 00 seconds (04.00)
                If ( User1 Bidding ) {
                Timer CountDown add Additional Time each Bid
                Price Start From add Value Up each Bid }
        Timer CountDown Start at 04 minutes, 30 seconds (04.30)
        Price Up to Rp 75.000
        WHILE Timer CountDown is finish (00.00)
                If (User1 = Last Bidder) {
                User1 = Winner }
END
```
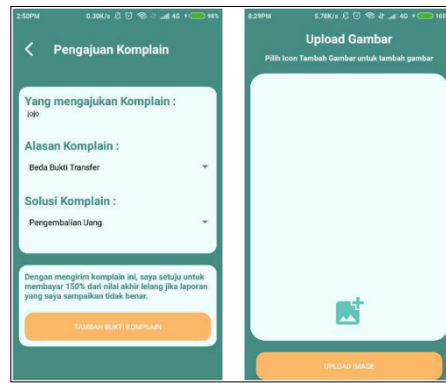
Figure 9. Auction Process Pseudocode

Figure 10. Complaint Submission Form Display

The interface for the Complaint Submission Form is an interface for participants who won the auction or the auctioneer can file a complaint for the incompatibility of the transaction evidence sent, participants who won the auction or the auctioneer can submit a complaint by choosing the reason for their complaint and the solution they want. The reasons that can be selected include "Different Proof of Transfer" and "Different Evidence of Animals" then for the solutions that can be selected including "Refunds" and "Replacement of Animals", the auctioneer or auction participant who has chosen the reason and solution for the complaint can select the Add Proof of Complaint button. The provisions that apply after selecting the Add Proof of Complaint button are that if the complaint submitted turns out to be incorrect or with the intention of bringing down one of the parties without clear evidence, they will be penalized by paying 150% of the transaction value.
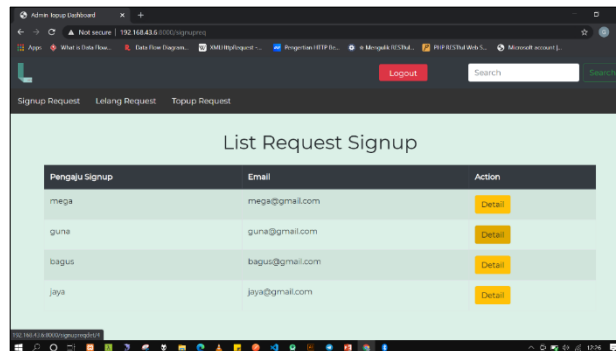

Figure 11. Display Request Signup on Admin

The interface display for the request or signup request details on the admin is a display for admins to see more complete data from prospective users who send requests for further validation of their requests The user has validated the request will be confirmed by the admin via the phone number or email that the user has provided.
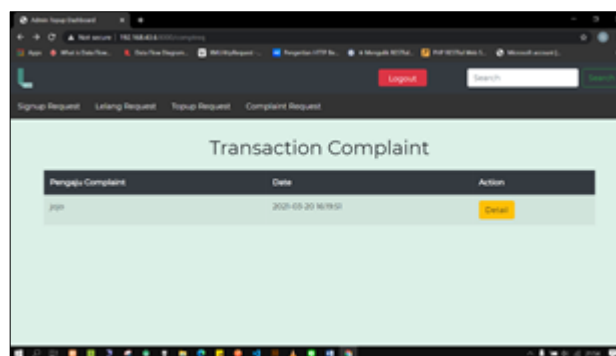

Figure 12. Display Complaint Request on Admin

The Complaint Request interface on the Admin is a display for the admin to see every complaint request from the user.

3.2 Black Box Testing

Blackbox testing is a test that is carried out by focusing on the functionality capabilities of a software, blackbox testing allows application developers to create several input conditions that will ensure the functionality and compatibility requirements of the application and make it possible to find error gaps that may exist in the application. The test aspects tested in blackbox testing are only on the input and output set using the user's point of view, blackbox testing is easy to use because the test uses a complete finished product and does not require knowledge of its construction [15].

Table 1. Black Box Testing Result

User	Test Scenario	Test Conditions	Expected results	Test result
Prospective User	Sign up with a phone number that is less than 10 characters	Name: galang Email: galang@gmail.com Telephone: 081123456 NIK:5112345640495960 Password: 12345	An error message appears "The number you entered is incorrect"	According to expectations
Prospective User	Do a re-signup with a telephone number of 10 characters or more	Name: galang Email: galang@gmail.com Telephone: 0811234569 NIK:5112345640495960 Password: 12345	Successfully signed up a new user	According to expectations
Admin	Check and submit signup data	Data that appears, Name: galang Email: galang@gmail.com Telephone: 0811234569 NIK:5112345640495960	The data that appears is in accordance with the signup input data by the prospective user and the new user data has been added	According to expectations
User	Login using email and password	Email: galang@gmail.com Password: 12345	*User has successfully logged into the application*	According to expectations
User	Newly logged in users will be taken to the create e-wallet view to create a new e-wallet as a transaction aid	New users login and don't have an e-wallet id yet	Users are taken directly to the create e-wallet screen after successfully logging in	According to expectations
User	Make a topup request to increase the e-wallet balance	Nominal: 100000	Successfully made a topup request	According to expectations
Admin	Check and submit topup request data	Data that appears, Name: galang Nominal: 100000	The data that appears is in accordance with the input data requested by the user and the user's balance has increased	According to expectations
User	Login data in accordance with the data that appears in the user information field field	Name: galang Email: galang@gmail.com Saldo: 100000	The data that appears is in accordance with the user data	According to expectations

User	Test Scenario	Test Conditions	Expected results	Test result
User	Placed a bid and successfully maintained the bid value until timeout	Last bid value: 2150000 User: jojo	Auction ends automatically when time runs out and is immediately taken to the auction results view	According to expectations
User	Make a complaint request	Name: jojo Reason for complaint: Different proof of transfer Complaint solution: Refund Application time: 2021-03-20 16:19:51	Successfully made a complaint request	According to expectations
Admin	Check the complaint request data	The data that appears Name: jojo Reason for complaint: Different proof of transfer Complaint solution: Refund Application time: 2021-03-20 16:19:51	The data that appears is in accordance with the input request data submitted by the user	According to expectations

4. CONCLUSION

After going through the field studies, field observations, design, implementation and testing of an android-based animal auction application at the Beringkit Animal Market, it can be concluded that an android-based animal auction application has been built. According to the results of the implementation, the Android-based animal auction application has succeeded in simplifying and shortening the auction of auctioneers to find buyers and minimizing the use of parking lots by cattle delivery cars to wait for the sold cows to find potential buyers.

To achieve the perfection of this application, the author conveys several suggestions if you want to do further development on this application, namely, the addition of the nearest buyer search feature.

5. REFERENCES

[1] Tours Club, Bali. "Pasar Hewan Beringkit," Balitoursclub.com. https://www.balitoursclub.com/berita_388_Pasar_Hewan_Beringkit.html [Accessed: 28-November-2021].
[2] N. Ghibran, L. Effendy, I. P. Lenap, "REAKSI PASAR ATAS PANDEMI VIRUS CORONA PADA PERUSAHAAN LQ45 DI BURSA EFEK INDONESIA," in Jurnal Bisnis Terapan, vol. 5, no. 1, 2021.
[3] N. N. Pujaningsih, I. G. A. A. G. D. S. Pinatih, "PENERAPAN KEBIJAKAN PEMBATASAN KEGIATAN MASYARAKAT (PKM) DALAM PENANGGULANGAN WABAH COVID-19 DI KOTA DENPASAR," in Jurnal MODERAT, vol. 6, no. 3, pp.459-460, 2020.
[4] Dewata, Suara. "AKP Luh Wirati Koordinasi dengan Direktur Utama PD Pasar Beringkit," Suaradewata.com. https://www.suaradewata. com/read/202007150017/akp-luh-wirati-koordinasi-dengan-direktur-utama-pd-pasar-beringkit.html [Accessed: 29-November-2021].
[5] Post, Bali. "PPKM Level 4, Perumda Pasar Mangu Giri Sedana Bebaskan Iuran," Balipost.com. https://www.balipost.com/news/2021/07/31/207395/PPKM-Level-4,Perumda-Pasar...html[Accessed:29-November-2021].
[6] Kasmi, A. N. Candra, "PENERAPAN E-COMMERCE BERBASIS BUSINESS TO CONSUMERS UNTUK MENINGKATAN PENJUALAN PRODUK MAKANAN RINGAN KHAS PRINGSEWU," in Jurnal Aktual STIE Trisna Negara, vol.15, no. 2, pp. 109-110, 2017.
[7] A. E. Permana, A. M. Reyhan, H. Rafli, N. A. Rakhmawati, "ANALISA TRANSAKSI BELANJA ONLINE PADA MASA PANDEMI COVID-19," in Jurnal Teknoinfo, vol.15 no.1, 2021.
[8] M. Rifaldi, R. T. Subagio, Kusnadi, "APLIKASI MARKETPLACE DENGAN SISTEM LELANG BERBASIS WEB MENGGUNAKAN METODE CONCURRENCY CONTROL (TIMESTAMP)," in Jurnal Digit, vol.9 No.2, p. 157, 2019.
[9] H. Hayati, M. R. Alifi, "ANALISIS SENTIMEN PADA TWEET TERKAIT VAKSIN COVID-19 MENGGUNAKAN METODE SUPPORT VECTOR MACHINE," in JTT (Jurnal Teknologi Terapan), vol. 7, no. 2, pp. 112–114, 2021.

[10] S. S. Romadlan, D. Sunarto, T. Soebijono, "Rancang Bangun Sistem Informasi Umat Gereja Katolik Gembala Yang Baik Surabaya Berbasis Web," in JSIKA, vol. 2, no. 2, p. 46, 2013.

[11] F. Kasih, M. Y. Simargolan, "PERANCANGAN CHATING ROOM BERBASIS NETWORK," in CESS (Journal of Computer Engineering, System And Science), vol. 1, no. 2, p. 39, 2016.

[12] Andri, Suyanto, "Pengembangan Aplikasi Lelang Karet Berbasis Mobile Sebagai Pendukung Akses Informasi Lelang," in Edumatic:Jurnal Pendidikan Informatika, vol. 4, no. 2, 2020.

[13] S. I. Adam, F. K. Celsia, N. T. Katuuk, "Aplikasi Pelelangan Ikan Online (E-Lelang) Berbasis Mobile," in Jurnal Sistem dan Teknologi Informasi, vol. 9, no. 2, 2021.

[14] R. Nuraini, "DESAIN ALGORITHMA OPERASI PERKALIAN MATRIKS MENGGUNAKAN METODE FLOWCHART," in Jurnal Teknik Komputer Amik BSI, vol. 1, no. 1, p. 145, 2015.

[15] M. W. P. Dananjaya, P. W. Buana, G. A. A. Putri, "E-Learning Pinandita Berbasis Website Studi Kasus Pasraman Brahma Vidya Samgraha Buleleng," in JURNAL ILMIAH MERPATI, vol. 8, no. 2, 2020.