DESIGNING AN ANDROID-BASED FUTSAL BOOKING APP USING FCFS AND MULTILEVEL FEEDBACK QUEUE ALGORITHMS

Rega Listya Ardani[1*]; Asrul Sani[2]

Study Program of Information System[1], Departement of Informatics[2]
Universitas Nasional, Jakarta, Indonesia[1, 2]
https://www.unas.ac.id[1, 2]
regaardani2020@student.unas.ac.id[1*]
(*) Corresponding Author

Abstract—*The improvement of data innovation has affected the advancement of human life, moving from ordinary strategies to present day computerized strategies. One application of data innovation in everyday life is online planning and booking. This investigate points to design an Android-based futsal field booking application utilizing the Primary Come To begin with Serve (FCFS) and Multilevel Input Line (MLFQ) calculations.This application is expected to energize clients in making futsal field reservations viably and effectively. The modify strategy utilized in this ask generally is Remarkable Programming (XP). The FCFS calculation was chosen for its straightforwardness in serving requests based on range arrange, though the MLFQ calculation endowments prioritization based on noteworthiness or specific criteria, engaging crucial bookings to be taken care of speedier. The comes approximately of this think approximately appear that the planned application capacities well concurring to client needs and gives ease inside the futsal field booking handle. By combining these two calculations, the application is expected to make a versatile and versatile reservation system, which isn't because it were compelling in directing booking lines but additionally sensible for all clients. The utilization of this application outlines exceptional potential in advancing the quality of futsal field booking organizations and can serve as a appear for making comparable applications in other ranges.*

Keywords: *android, extreme programming, FCFS, futsal field booking, MFQ.*

Abstrak— *Perkembangan teknologi informasi telah mempengaruhi evolusi kehidupan manusia, dengan pergeseran dari metode konvensional ke metode modern yang digital. Salah satu penerapan teknologi informasi dalam kehidupan sehari-hari adalah penjadwalan dan pemesanan secara online. Penelitian ini bertujuan untuk merancang aplikasi pemesanan lapangan futsal berbasis Android menggunakan algoritma First Come First Serve (FCFS) dan Multilevel Feedback Queue (MLFQ). Aplikasi ini diharapkan dapat mempermudah pengguna dalam melakukan reservasi lapangan futsal secara efisien dan efektif. Metode pengembangan yang digunakan dalam penelitian ini adalah Extreme Programming (XP). Algoritma FCFS dipilih karena kesederhanaannya dalam melayani permintaan berdasarkan surutan kedatangan, sementara algoritma MLFQ memungkinkan penetapan prioritas berdasarkan tingkat kepentingan atau kriteria tertentu, sehingga pemesanan mendesak dapat diproses lebih cepat. Hasil dari penelitian ini menunjukkan bahwa aplikasi yang dirancang dapat berfungsi dengan baik sesuai dengan kebutuhan pengguna dan memberikan kemudahan dalam proses pemesanan lapangan futsal.*

Kata Kunci: *android, extreme programming, FCFS, pemesanan lapangan futsal, MFQ.*

INTRODUCTION

The development of information technology affects the evolution of human life. The shift from conventional methods, which are mostly done manually, to modern methods, which are mostly digitized. Because the innovations of modern civilization offer speed, automation, and convenience in carrying out various daily activities, people choose to use modern systems, which means there needs to be technology and electronic devices that are easier to use(Manesia, Hasibuan, & Saputra, 2020). Information Technology is data Processing technology including Processing, retrieving, editing, storing, and manipulating data various ways to produce high quality information that is relevant, accurate, and timely (Supriatna, 2023). The world today has recognize a technology called the internet.

PILAR Nusa Mandiri: Journal of Computing and Information System
Vol. 20, No. 2 September 2024 | DOI: 10.33480/pilar.v20i2.5778

Through the internet, everyone can interact with People around the world. With a global Network the internet can be accessed 24 hours. How important internet media in life Can be imagined. Android applications offer easy access due to the increasingly widespread use of the internet for business purposes and as well as for finding information.

Android is an operating system for mobile phones based on Linux that allows developers to create their own applications for use on various mobile devices. Today, mobile phones have become an integral part of one's daily life. People today my interact with their cell phones, tablets, or other mobile devices with greater intensity compared to interacting with a laptop or desktop. Internet technology and the Android system can now be used as a tool for organizing time, one example is an online scheduling and ordering system that can be accessed anywhere and anytime (Syahputra, Siambaton, & Haramaini, 2022).

Smartphones are mobile devices that can be taken anywhere. With the development of the times, smartphones have provided many conveniences and facilities to people, including long distance communication, transportation, business, entertainment, and event access to all the information humans need The development of mobile devices such as Smartphones is growing very quickly (Azis & Pribadi, 2020). The technology is in great demand by the public because of its various features that are easy to use and its own appeal to its users(Abdulrohim, Vera Versanika, & Dirgantara, 2022). Around the world, the influence of smartphones has been felt, especially nowadays in the sports sector who want to apply technology to facilitate customer access and benefit there business ventures. Service quality, especially in the ordering queue sector, greatlty affects customer satisfaction so that customers will not be disappointed and look for other sports venues which have innovated online ordering.

Sports have grown to be a significant aspect of daily life. But as time has gone on and technology has advanced, sports have changed significantly and expanded in variety(Dwi Darmawan & amin angkasa mudiana putra, 2023). In addition to being a physical activity, sports are also thought to be a means of enhancing social interactions, raising quality of life, and even developing into a burgeoning economic industry. People can explore and expand their physical abilities through different types of sports. On the sports field or arena, differences of opinion and social differences are often forgotten, and more attention is paid to the spirit of cooperation, healthy competition, and a shared spirit.

Today, futsal is one of the most popular sports games in Indonesia and is favored by people of all ages(Putra & Chaerunida, 2023). The number of fans makes this business very promising. Currently, there are many futsal field rental places everywhere. However, people who want to book a field must come directly to the futsal field directly (onsite), this makes the field booking process very long. In addition, proof of payment still uses a lot of paper or books to make payment reports. This makes the manager's data recap difficult because a lot of paper must be collected and the booking data for using the Futsal field may not be well organized as a result it will be lost. Therefore, to help the management of futsal sports facilities providers in facilitating customers, especially field bookings, an application system is needed.

The utilize of android-based portable application innovation can be an viable arrangement to overcome these issues. The android-based futsal field reservation application can give comfort and consolation for clients in making field reservations rapidly and productively (I Made Dwima Gita Dirtama, Andeswari, & Fauzi, 2021), (Kristanto, Yosep, & Sijabat, 2021). In any case, in creating a futsal stadium reservation application, productive and reasonable reservation line administration is required to guarantee all clients have the same opportunity to form reservations. Hence, it is very vital to utilize the correct calculation for line administration. One of the only and most commonly utilized line administration calculations is the Primary Come, To begin with Serve (FCFS) calculation. The FCFS calculation works on a first-come, first-served premise. Within the setting of futsal stadium reservations, this calculation prioritizes reservations based on the user's entry time(Abdillah & Dedi Irawan, 2023). When different reservation demands are gotten, the FCFS calculation positions the demands based on the booking time.

Without considering other variables such as need or complexity of the ask. Although the FCFS algorithm is considered simple and easy to implement, in certain situations it may cause some problems, such as requests that require faster processing or varying levels of complexity not being prioritized. Therefore, the application of the FCFS algorithm in the context of futsal court reservation management may involve various factors and requirements, and may be combined with other algorithms or with specific modifications to ensure the efficiency and fairness of queue management.

In addition to the FCFS algorithm, this research also uses the Multilevel Feedback Queue algorithm in developing an android-based futsal

field reservation application. This algorithm is a scheduling algorithm that allows us to set priorities based on a certain level of importance or criteria. Higher priority queues are given to bookings with higher importance or urgent requests, while lower priority queues are given to bookings with lower importance.

The futsal field reservation application can prioritize certain circumstances with the MFQ calculation. in the event that there's an pressing booking ask due to a sudden plan alter, the ask will be prioritized and processed quickly. In case there's a ask from a enrollment part, it can moreover be prioritized by combining the FCFS calculation and the MFQ strategy, it is anticipated to be able to make a adaptable and versatile android-based futsal field reservation application that not as it were oversees the reservation line proficiently but too meets desires and characteristics of different client demands. Based on the clarification over, this research will plan an application that's built utilizing an android framework, so that individuals who don't have an android working framework cellphone can still get to information anytime and anyplace. This investigate is at that point titled "Planning an Android-Based Futsal Field Booking Application Utilizing the FCFS Calculation and Multilevel Feedback Queue".

The main contribution of this research is the development of an Android-based futsal field reservation application that efficiently manages booking queues by integrating the First-Come, First-Served (FCFS) algorithm with the MFQ strategy. This approach ensures that the application is not only flexible and adaptable to various user needs, including prioritization of urgent bookings and membership requests, but also accessible to users who may not have an Android device, allowing them to access reservation information anytime and anywhere

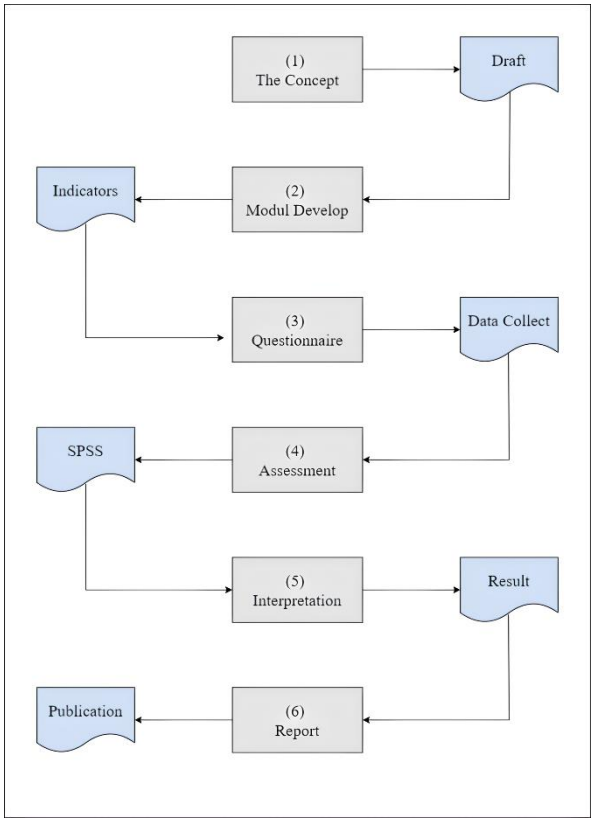
MATERIALS AND METHODS

Research Phase

At this stage,research design is needed so that research can be carried out systematically and according to procedures. This research design can be seen in this system on the Figure 1:

1) The concept

The focus of the research is to create an android-based application that allows booking of futsal courts using two main algorithm : First Come First Serve (FCFS) and Multilevel Feedback Queue (MFQ). The system combines the advantages of both algorithms to ensure fair and efficient order processing. While FCFS ensures that no booking is ignored, MFQ allows flexibility in handling bookings with varying levels of priority. In a real scenario, users who have urgent needs or special bookings can be handled faster, while other users are still processed in a fair order (Nurwansyah, Faizah, & Ginting, 2023).



Source: (Research Result,2024)

Figure 1. Research Stage

2) Model Develop

In this process will refer to the development of application elements including the design of the user interface design (UI), frontend development where the android-based application will be designed using java and android SDK technology, then backend development is to compile logic and data structures such as FCFS and MFQ algorithms, after all has been well designed later it will be integrated both the booking, schedule, and payment modules, and will be tested to ensure all functions work properly.

3) Questionnaire

It is a data collection tool that will be used to study user preferences and needs and to evaluate applications that have been developed. Some of the data needs that will be collected include user demographics, user experience, satisfaction with algorithms, and satisfaction with features.

4) Assessment

It is an evaluation of the application based on user data collected through questionnaires. The aspects to be assessed include the case with which users can interact with the application, the

PILAR Nusa Mandiri: Journal of Computing and Information System
Vol. 20, No. 2 September 2024 | DOI: 10.33480/pilar.v20i2.5778

performance of the application in terms of responsiveness and efficiency of order processing, and the reliability of the application to function smoothly.

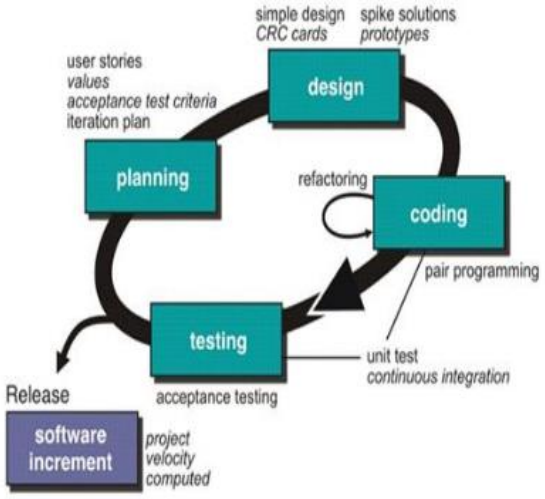
5) Interpretation

It is the process of analyzing the data obtained from the evaluation to gain significant understanding and conclusions. Some of the processes include seeing data patterns or trends that show the strengths and weaknesses of the application, as well as seeing user satisfaction variables and application features correlate with each other.

6) Report

Is a document that describes the entire process of development, evaluation, and research results. The main components of this report include background, objectives, literature review, methodology, results and discussion, conclusions suggestions, later after all the complete components of the report can be published.

Development Method



Source: (Halim, 2021)

Figure 2. Extreme Programming Method

Figure 2 illustrates the stages of the extreme programming method. Extreme programming (XP) is an Agile software development methodolgy that emphasize flexibility to adapt to changing requirements and uses an iteractive approach. XP development teams concentrate on software quality through pratices such as automated testing, pair programming and continous integration. During the development process, XP also encourages storng teamwork, active communication and active user and customer involvement. This approach minimizes development project risk and helps development teams create more responsive software (Sari & Cahyani, 2022).

Sampling and Population Determination

Based on this research an incidental sampling method will be used with the approach that every individual who interacts with the researcher is considered as a sample of relevant data sources. This study determines the amount of sampling using the slovin formula approach(Kurniawan & Wijayanti, 2021). The formula will be used in determining the sample size of a known population, around 100 visitors per day. Respondents consisted of amateur futsal players, and individuals who frequently booked courts online. They were selected based on their level of participation in futsal activities. with an applied precision level of around 10%.

$$n = \frac{N}{1+Ne^2} \quad (1)$$

Description:

n = Number of desired samples
N = Total Population of Objects
e^2 = Margin of error use

$$n = \frac{100}{1 + 100\ (0{,}1)^2}$$

$$n = \frac{100}{2} = 50 \text{ Respondents}$$

Questionaire Data Atributes

This research will use a questionnaire method to collect data. The questionaire is designed based on 4 variables in TAM (Technnology Acceptance Model) (Hindardjo, Sani, Rissa, & Dewi, 2021). Model among others, namely Perceived Usefulness, Perceived Ease of Use, Attitude Toward Using, Behavioral Intention Use (Wijaya & Zaid, 2024). Table 1 represents the variables used in this research. and Table 2 is 20 items that act as indicators for each variable to be measured using a Likert scale.

Table 1. TAM Variables

Variable	Description
Perceived Usefulness (PU)	The intention that in using a typical system will improve someones performance
Perceived Ease of Use (PEOU)	It can be defined as the ease in using a certain technology
Attitude Towards Using Technology (ATU)	Positive or negative attitude that someone's feel in using certain technology
Behavioral Intention Use (BIU)	It can be defined as intention to use a technology and behavioral tendency to use it sustainably.

Source: (Research Result,2024)

Table 2. Questionnaire Data Attributes

Codes	Questions
PU1	This app helps me find a futsal court that is suitable for me
PU2	Using this application can improve effciency in ordering futsal court
PU3	This application makes it easy for me to see prices related to bookings futsal court
PU4	Using this application increases my productivity in set a schedule to play futsal
PU5	Features that available on application already sufficient for making it easier to book a futsal court
PEU1	I did not encounter any significant difficulties in using the features of ths app
PEU2	I can easily palce an order for a futsal court through this app
PEU3	I find this app easy to understand and use
PEU4	The registration and login process in this application is very simple and easy to use
PEU5	Easy to upload proof of payment
ATU1	The features and appreance of the app are simple and attractive
ATU2	I think that using this app is a good idea
ATU3	I had the pleasure of using this app to book a pitch futsal
ATU4	I believe this app helps me in terms of booking
ATU5	I like using this app for my booking needs futsal court
BIU1	I will use this app over other apps
BIU2	I intend to use this app to my friends
BIU3	I will recommend this app to my friends
BIU4	I plan to use this app whenever i want to ordering a futsal court
BIU5	I am interested in trying the features offered in the app

Source: (Research Result,2024)

Validity Test

Is an evaluation of the range of instruments that have been determined in measuring the desired concept. It aims to place a value on the questionnaire question items to define certain variables. The validity test uses the product moment correlation technique with a certain formula (Vick, 2022).

$$r_{xy} = \frac{n\sum xy - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}} \quad (2)$$

Discription:
r_{xy} = The coefficient of validty of the items being sought
n = Number of respondents
$\sum xy$ = Sum of multiplication of x and y variables
$\sum x^2$ = Sum of squares of x weights
$\sum y^2$ = Sum of squares of y weights

Reliability Test

In this study,reliability will be tested using the Cronbach Alpha has a function, namely as a tool to measure the the assessment of the relationship or correlation that has been designed with all existing variables (Erida, 2021). The reliability of the instrument on the variables used is considered adequate if the Cronbach Alpha value exceeds 0.60 the formula thar will be used in testing reliability is as follows :

$$r_{11} = \left(\frac{k}{k-1}\right)\left(1 - \frac{\sum {\sigma_t}^2}{{\sigma_t}^2}\right) \quad (3)$$

Description:
r_{11} = Reliability coefficient alpha
k = Number of Question items
$\sum {\sigma_t}^2$ = Sum of variances of items
${\sigma_t}^2$ = total variance

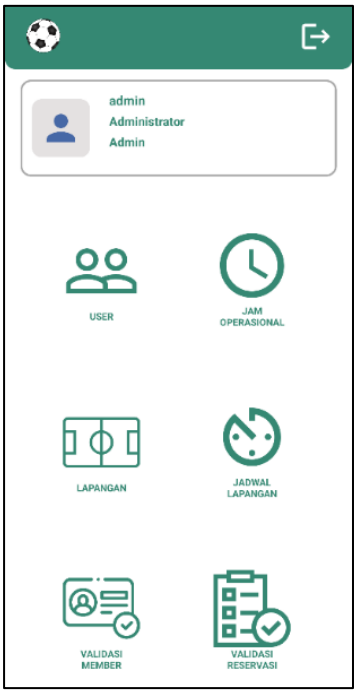
RESULTS AND DISCUSSION

a. System Interface Design

Source: (Research Results,2024)
Figure 3. Login Page

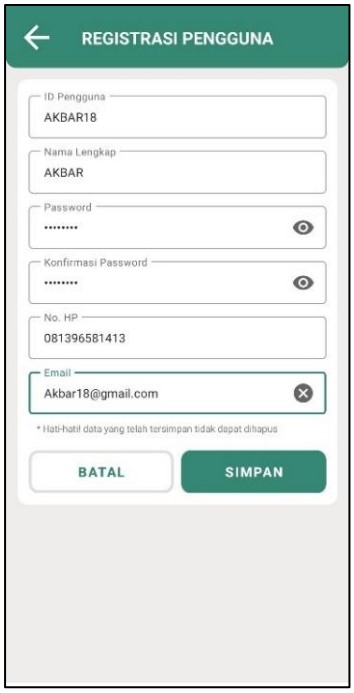
In the Figure 3, it displays a login form that contains an appeal for users to enter information related to the account they are using. Generally, the login information consists of two inputs including username and password. After the user has successfully entered information related to the account they are using, the system interface will display a login button that is used to start an authentication process. For further access, the administrator must first click the "Login" button. However, if the user name or password is entered incorrectly while logging in, an error message will be displayed indicating that the user ID or password is incorrect.

PILAR Nusa Mandiri: Journal of Computing and Information System
Vol. 20, No. 2 September 2024 | DOI: 10.33480/pilar.v20i2.5778



Source: (Research Results,2024)
Figure 4. Dashboard Page

The dashboard page in Figure 4 is made specifically for admins in the design of the Android-based futsal field booking application. The menu display provided provides easy access for administrators to manage various important elements related to futsal field booking management: User, field, field schedule, member validation, reservation validation.



Source: (Research Results,2024)
Figure 5. User Registration Page

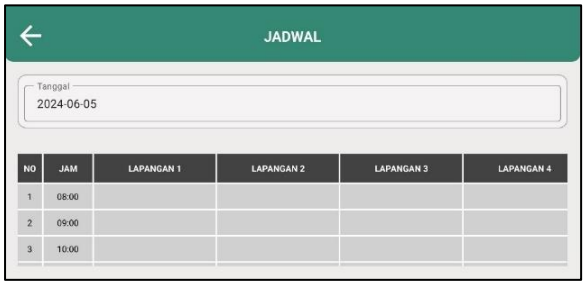
The display in Figure 5 is made for users who want to register an initial registration account. On this menu the user is encouraged to register by inputting user ID, full name, password, password confirmation, cellphone number, email. After ensuring that all the data entered is correct, the user can press the save button, so that later it can be used in accessing the login page.

Source: (Research Result,2024)
Figure 6. Admin User Page

In Figure 6, it is a page where the admin can monitor user accounts that have been added by users, which contains data details such as user ID, name, member status, cellphone number, and email. In this menu the admin can also deactivate the user account if the user commits an offense.

Source: (Research Result,2024)
Figure 7. Field Page

On the field page interface in Figure 7, user are presented with a page that displays a list of fields. On this page there is a search field and a drop down button labeled "sort". Which can function to sort the list of fields based on criteria such as the name of the number or based on the condition of the field, the interface system is designed intuitively so that it makes it easier for users to manage field ideas according to their needs, in addition, the presence of a search feature allows users to easily find and organize fields based on their respective frequencies.



Source: (Research Result,2024)

Figure 8. Field Schedule Page

In the Figure 8 above, displays the application interface for managing field schedules. Contains data details such as No, HOUR, field column 1, field 2, field 3, and field 4. This page serves to present a display of field usage schedules for several fields on a certain date. There is a column to select a date where the user can change the date as needed to view the schedule on another day.

Source: (Research Result,2024)

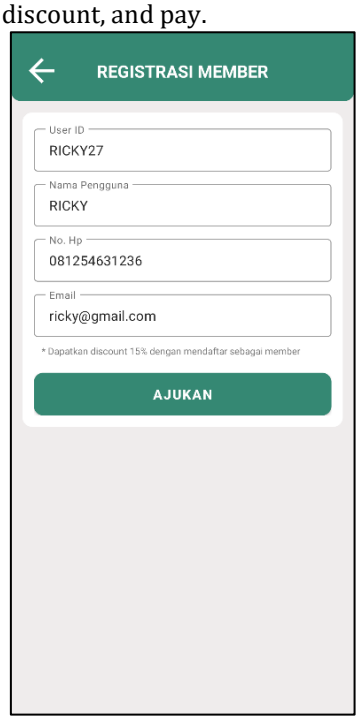
Figure 9. Member Validation Page

In the Figure 9 above, is a page that contains data details such as User ID, name. and date. This page gives member status to users who have applied for theur rights as members.

Source: (Research Result,2024)

Figure 10. Reservation Validation Page

On the interface page in Figure 10 above, displays the payment validation page which contains detailed data including name, day, date, field, fare discount, and pay.

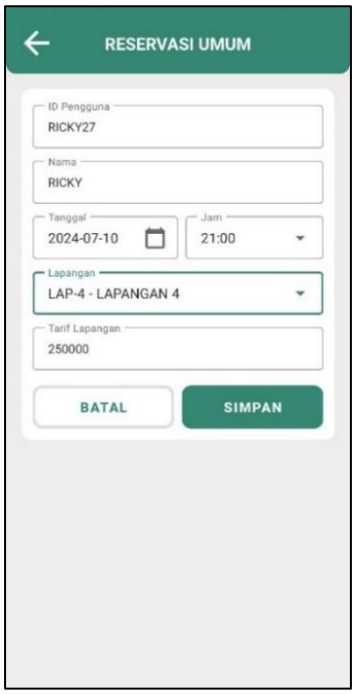


Source: (Research Result,2024)

Figure 11. Member User Registration Page

PILAR Nusa Mandiri: Journal of Computing and Information System
Vol. 20, No. 2 September 2024 | DOI: 10.33480/pilar.v20i2.5778

On the Figure 11, it displays a member registration page that contains data details including User ID, username, phone number, and email. This page was created to provide easy access to users to be able to apply for membership in a futsal field. After all the data details are confirmed to be vald, the user can press the submit button and then it will be reviewed directly by the admin.



Source: (Research Result,2024)

Figure 12. Field Reservation Page

In the system interface above, displays a general reservation page that contains data details including user ID, name, date, time, field, and field rates. This page was created to provide convenience to users to make field reservations based on certain dates and hours and the field they want to book. If all data details have been confirmed valid then the user can save it for later validation by the admin.

a. Validity Test

The validity test will measure a question attribute by comparing the calculated r value with the r table(Muslim Rasmanna & Utami, 2023). The search for places to collect questionnaires took place in 22 places spread across East, South, and Central Jakarta. and the time required to collect questionnaire data is 3 weeks. The validity test was carried out using 50 respondents from the questionnaire to find the value of r table (n) = 50. we will look for the value of df = (N- 2), resulting in a value of df = 50 - 2. 248. Then the r table coefficient that will be applied for comparison is amounted to 0, 284. In measuring the validity test, the significance level value will also be used, which is 5% or 0.05, so a significance value of <0.05 is considered valid. In calculating the validity test, all attributes must provide results with a calculated r value that exceeds the r table of 0, 284. The following below are the results of the validity test of all these attributes.

Table 3. Validity Test Result

Attribute	r Count	r table	Description
PU1	0,680	0,284	Valid
PU2	0,310	0,284	Valid
PU3	0,458	0,284	Valid
PU4	0,488	0,284	Valid
PU5	0,391	0,284	Valid
PEU1	0,512	0,284	Valid
PEU2	0,466	0,284	Valid
PEU3	0,476	0,284	Valid
PEU4	0,494	0,284	Valid
PEU5	0,438	0,284	Valid
ATU1	0,585	0,284	Valid
ATU2	0,534	0,284	Valid
ATU3	0,633	0,284	Valid
ATU4	0,592	0,284	Valid
ATU5	0,460	0,284	Valid
BIU1	0,541	0,284	Valid
BIU2	0,665	0,284	Valid
BIU3	0,583	0,284	Valid
BIU4	0,629	0,284	Valid
BIU5	0,623	0,284	Valid

Source: (Research Result,2024)

b. Reliability Test

The attributes of a questionnaire are said to be reliable if it has gone through a reliability test. Namely to measure the consistency of an instrument or variable indicated in the reliability test. In this study, the cronbach alpha method was applied where the correlation value exceeds 0,6 so attribute is declared reliable.

Table 4. Reliability Test Result

Cronbach Alpha	R critical	N of items	Description
0,856	0,600	50	Reliable

Source: (Research Result,2024)

Discussion

Previous research focusing on ordering systems has generally relied on only one type of algorithm, such as FCFS, which although simple and easy to implement, often lacks flexibility in handling variations in user needs and fluctuations in demand. By utilizing the MFQ algorithm, the system is able to give higher priority to users with urgent needs or specific criteria, without sacrificing the basic fairness offered by FCFS (Saktiadji, Faizah, & Koryanto, 2023).

One important aspect that differentiates this research from previous studies is the choice of platform. While many previous studies focused on web-based systems, this study chose the Android

platform. Because Android-based applications allow users to place orders anytime and anywhere, without having to rely on a computer or a stable internet connection, In addition, Android-based applications are generally more responsive and fast compared to web-based applications, as they can run directly on the user's device without the need to load web pages or communicate continuously with external servers (Lisafri Yolanda & Stephane, 2024).

CONCLUSION

Based on the research conducted on the design of an android-based futsal field booking application using the FCFS and MFQ algorithms, the following conclusions can be drawn:

The futsal field booking android application can execute the booking queue procedure, so the admin does not need to record the field booking schedulemanually. the implementation of the fefs and mfq algorithms is able to provide effective results in order queue management. So that the system can give priority to members who have been verified and provide convenience for non-member users. The use of android applications for booking futsal courts is able to increase user satisfaction due to the ease of access and efficiency in the ordering process offered by the application. The results of system testing show that all attributes tested in this study show good validity with the calculated r value exceeding the r table of 0.284. And the reliability test shows that these attributes are said to be reliable with a crown value of 0.856 which has exceeded the critical value of 0.600. Future research could explore the integration of more advanced algorithms or hybrid approaches that further enhance the flexibility and accuracy of booking prioritization. Moreover, expanding the application's compatibility across different operating systems or developing a web-based version could broaden its accessibility and user base. Additionally, ongoing user experience testing and feedback collection should be conducted to continuously improve the application's functionality and user satisfaction.

REFERENCE

Abdillah, M. I., & Dedi Irawan, M. (2023). Implementation of the First Come First Served Algorithm in the Futsal Field Booking Application using Extreme Programming. *Zero : Jurnal Sains, Matematika, Dan Terapan*, *7*(2), 182–191. http://dx.doi.org/10.30829/zero.v7i2.19163

Abdulrohim, U., Vera Versanika, D., & Dirgantara, C. (2022). IMPLEMENTASI METODE FIRST COME FIRST SERVED PADA PLATFORM RESERVASI LAPANGAN BADMINTON BERBASIS MOBILE. In *Jurnal Teknologi Informasi dan Komunikasi* (Vol. 11). Bandung.

Azis, N., & Pribadi, G. (2020). Analisa dan Perancangan Aplikasi Pembelajaran Bahasa Inggris Dasar Berbasis Android. *Jurnal Komputer Dan Informatika*, *4*(3), 1–5.

Dwi Darmawan, A., & amin angkasa mudiana putra, J. (2023). *MEMPROMOSIKAN OLAHRAGA UNTUK PENINGKATAN KESEHATAN MASYARAKAT* (Vol. 4). Madiun.

Erida, M. (2021). UJI VALIDITAS DAN UJI RELIABILITAS INSRUMEN MOTIVASI PENGIDAP HIV/AIDS. *Jurnal Ilmiah Bina Edukasi*, *1*(1), 10–21.

Halim, Z. (2021). PENERAPAN SISTEM INFORMASI AKADEMIK DENGAN METODE EXTREME PROGRAMMING. *Jurnal Sistem Informasi*, *8*(1), 66–74.

Hindardjo, A., Sani, A., Rissa, H., & Dewi, L. (2021). Preliminary Assessment of E-Business Adoption Models in Technology and Environmental Contexts based on the TAM Models. *IEEE*, *9*(2), 1–5.

I Made Dwima Gita Dirtama, Andeswari, R., & Fauzi, R. (2021). *PERANCANGAN SISTEM PENGELOLAAN MITRA DAN LAPANGAN PADA APLIKASI FUTSAL KUY MENGGUNAKAN PLATFORM ANDROID (STUDI KASUS: LINGKUNGAN UNIVERSITAS TELKOM) DESIGN OF PARTNER AND FIELD MANAGEMENT SYSTEMS IN FUTSAL KUY APPLICATIONS USING ANDROID PLATFORM (CASE STUDY: TELKOM UNIVERSITY ENVIRONMENT)*.

Kristanto, B. K., Yosep, E. P., & Sijabat, D. R. (2021). Aplikasi Gofutsal Untuk Pemesanan Lapangan Futsal Berbasis Android. *J-INTECH : Journal Of Information and Technology*, *9*(2), 63–69. https://doi.org/10.32664/j-intech.v9i02.584

Kurniawan, I., & Wijayanti, M. (2021). Meningkatkan Kinerja Karyawan: Peran Komunikasi,Motivasi kerja,dan Lingkungan Kerja pada Rumah Makan Candisari Kebumen. *Jurnal Pendidikan Tambusai*, *5*(3), 10348–10357.

Lisafri Yolanda, V., & Stephane, I. (2024). APLIKASI MOBILE BOOKING LAPANGAN FUTSAL BERBASIS ANDROID. *Journal Of Information Systems And Informatics Engineering*, *8*(1), 163–175. https://doi.org/10.35145/joisie.v8i1.4293

Manesia, P., Hasibuan, N. A., & Saputra, I. (2020). Perancangan Aplikasi Daftar Menu Restoran Berbasis Android Menggunakan Metode Multilevel Queue. *Jurnal Pelita Informatika*, *8*(4), 402–407.

Muslim Rasmanna, P., & Utami, Y. (2023). Uji Validitas dan Uji Reliabilitas Instrument

Penilaian Kinerja Dosen. *Jurnal Sains Dan Teknologi*, *4*(2), 20–24.

Nurwansyah, A., Faizah, N., & Ginting, W. (2023). Aplikasi Pemesanan E-Ticket di Kolam Renang Primer Koperasi Angkatan Laut (Primkopal) Lanmar Jakarta Berbasis Android dengan Metode First Come First Serve Menggunakan Android Studio dan Firebase. *Computer Journal*, *1*(1), 42–52. https://doi.org/10.58477/cj.v1i1.63

Putra, D., & Chaerunida, G. (2023). Survey Minat Siswa Terhadap Olahraga Futsal Di Smk Bina Karya Mandiri 1. *Journal Of Social Science Research*, *3*(3), 1–6.

Saktiadji, B. N., Faizah, N., & Koryanto, L. (2023). Aplikasi Pemesanan Lapangan Olahraga Usman Harun Sport Center Berbasis Android dengan Metode First Come First Serve Menggunakan Android Studio dan Firebase. *Computer Journal*, *1*(1), 53–63. https://doi.org/10.58477/cj.v1i1.64

Sari, N., & Cahyani, D. (2022). Perancangan Sistem Informasi Monitoring Sertifikat Menggunakan Extreme Programming. *Jurnal Ilmiah Computer Science*, *1*(1), 1–6. https://doi.org/10.58602/jics.v1i1.1

Supriatna, H. (2023). Reservasi Lapangan Futsal Berbasis Android . *Jurnal Informatika MULTI*, *1*(4), 320–327.

Syahputra, E., Siambaton, M., & Haramaini, T. (2022). APLIKASI PEMESANAN LAPANGAN FUTSAL PADA KARISMA FUTSAL DENGAN METODE FIRST COME FIRST SERVED INSTRUCTIONS FOR WRITING AND PUBLISHING ARTICLES FROM JOURNAL DSI 2021. In *Jurnal Deli Sains Informatika* (Vol. 1).

Vick, A. (2022). MENGUJI VALIDITAS DAN RELIABILITAS PADA MATA PELAJARAN AL QUR'AN HADITS MENGGUNAKAN KORELASI PRODUK MOMENSPEARMAN BROWN. *An-Nawa : Jurnal Studi Islam*, *4*(1), 12–24. https://doi.org/10.37758/annawa.v4i1.419

Wijaya, A., & Zaid. (2024). Penerapan Technology Acceptance Model (TAM) pada penggunaan Building Information Modeling (BIM) oleh para Arsitek Indonesia. *Journal of Multidisciplinary Science*, *1*(1), 42–50. https://doi.org/10.59631/multidiscience.v1i1.190