



Application Model As Online Ticketing And Funding Platform For Mobile-Based Cultural Events

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ABSTRACT

The Covid-19 pandemic has had an impact on cultural tourism actors in Indonesia having difficulty holding their cultural events again due to financial constraints. And ticket sales are still conventional. The research technique used is descriptive analysis method with literature study. The data collection technique used is literature study. And the software development technique used is the Software Development Life Cycle method with a prototype development model. The results of this research are in the form of a mobile application model that combines two functions, namely as an online ticketing platform and a funding platform, into one complete system that is interconnected with each other. Design design using Adobe Xd tools. Applications can CRUD data from and to the cloud server using the REST API. The cloud server used is Firestore, while the REST API uses Firebase Functions developed with the Javascript programming language (NodeJs) through the Firebase CLI. And also the application runs tests with unit testing, instrumentation testing, and performance testing with good results. Based on the results of this study, it can be concluded that the model or application design resulting from this research is a mobile application that has met the Minimum Viable Product (MVP) with an APK format that runs on the Android operating system, namely the native app. Along with other features and specifications described in this paper.

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1. Introduction

Cultural tourism is a type of tourism activity where the main motivation of visitors is to learn, discover, experience, and consume tangible and intangible cultural attractions/products in a tourist destination. These attractions/products relate to a set of material, intellectual, spiritual and emotional characteristics of a society which include art and architecture, historical and cultural heritage, culinary heritage, literature, music, creative industries and living culture with lifestyle, value systems, beliefs, and traditions [1]. Cultural tourism is a topic that is always interesting to talk about, but there are still contradictions in it which are homework for Indonesia to improve in this sector. The tourism sector in Indonesia is currently experiencing a significant decline. This can be seen in the data from the Central Statistics Agency 2021 [2], which shows that the total foreign tourist arrivals to Indonesia in 2020 amounted to 4.02 million visits. Compared to 2019, the number

1340

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of foreign tourists decreased by 75.03%. Based on nationality, there are 5 countries that visited Indonesia the most in 2020, namely Timor Leste, Malaysia, Singapore, Australia, and China, most of which are neighboring countries, except for China. That same year, the total number of domestic tourist visits decreased by 61 percent to only around 120 to 140 million from the initial projection of 310 million [3]. This significant decrease in the number of tourists had a very significant impact on economic conditions because tourism plays an important role in increasing state income, foreign exchange, and employment. It is hoped that this decline will not continue to occur in this sector, which in reality is the country's largest foreign exchange earner with a projected foreign exchange earning of USD 20 billion or IDR 280 trillion in 2019 from foreign tourist visits which are estimated at 16.3 million with foreign tourists spending around USD1,220 per visit [4]. Overall, Indonesia is ranked 40th out of 140 countries with a travel and tourism competitiveness index score of 4.3 in 2019 [5][6].

The Covid-19 pandemic that occurred in 2020 completely paralyzed all aspects of life in Indonesia, including the tourism sector. There were no tourist trips, domestically as well as to and from abroad due to strict restrictions on community mobilization. The government, of course, was not standing still. Policies were issued to deal with all of the impacts of the pandemic, including imposing restrictions on community activities, promoting health protocols, and accelerating national vaccinations. Towards the end of 2021, the benefits of these policies were starting to be felt. Community activities began to run normally despite strict health protocols, the economy gradually recovered, and tourist destinations began to reopen. But there were still problems that befell various tourist attractions, namely funding to re-run operations and hold events. In addition, marketing and especially ticket sales, which were still done conventionally, remained a classic problem of tourism management in Indonesia. On the other hand, most of the cultural tourism places which are MSMEs had difficulty obtaining funding through banks or crowdfunding. This is where peer-to-peer lending is considered suitable to be used. Peer-to-peer lending (P2P) is the way people lend money to individuals or businesses. Users as lenders receive interest and get their money back when the loan is repaid. P2P works like a marketplace, bringing together people or businesses that want to lend money and those who want to borrow. It is a way for borrowers to get funds without going to traditional financial sources such as banks and development agencies. On some websites, any money lent is automatically divided among many borrowers, but on other sites, lenders can choose who they want to lend the money to [7][8]. Regarding ticket sales, tourist attractions can sell them through an online ticketing platform, which allows them to market their cultural tourism more broadly, effectively, and quickly.

These two programs can be implemented using mobile technology which has become one of the main needs in the life of the world community including Indonesia in the 21st century. With the internet, various aspects of life cannot be separated from the touch of digitization and can be accessed anytime and anywhere. Mobile phones with their compact form are items that their owners will always carry with them wherever they go. In 2020, smartphone users in the world have touched the figure of 3.6 billion, and that number is projected to increase to 4.3 billion in 2023. Of the number of smartphone users in the world, Indonesia is on the fourth position with 160.23 million users, meaning that domestic smartphone users have reached 58.6% of the total population[9]. Worldwide there were 2.8 billion active Android users in 2020 with a market share of more than 85% in Brazil, India, Indonesia, Turkey, and Vietnam [10]. It illustrates that anyone can easily access existing mobile technology and applications.

Therefore, this study aims to develop a mobile application model that combines two functions, namely as an online ticketing platform and a funding platform into one complete system that is interconnected with each other.



2. Research Method

The software development method used was the Software Development Life Cycle (SDLC) method with a prototype development model. Development began with a requirements analysis where the software and all system requirements to be made were identified. The next step was to design a prototype that focused on the flow of the program to the user. Evaluation of the prototype was carried out to determine whether the prototype model had met expectations. If approved, the prototype would be translated into the appropriate programming language. The author translated the prototype application design using Android Studio with the Kotlin programming language and the MVVM (Model-View-ViewModel) architectural pattern along with several additional libraries and features to support application development such as clean architecture, Retrofit, Coroutine Flow, Coins, modularization, dynamic features, Firebase Crashlytics, Lotie, Shimmer, and maps. Once ready, the software must pass testing. The author wanted to guarantee the quality of the developed application by testing it through several tests, namely unit testing (black box testing), instrumentation testing (white box testing), and performance testing including GPU Overdrawn, GPU Rendering Tool, CPU Profiling, LeakCanary, and Battery Historian [11][12][13].

The application will develop in the form of a native app. The cloud servers used are Firestore and CRUD (Create Read Update Delete). The data uses the REST API of the Firebase Function which will program with the Javascript programming language (NodeJs) [14][15].

2.1. System Design

This section contains an overview of the working concept of the application named *Mixin App* which acts as a third party (third party) between users and partners, as illustrated in the diagram below.

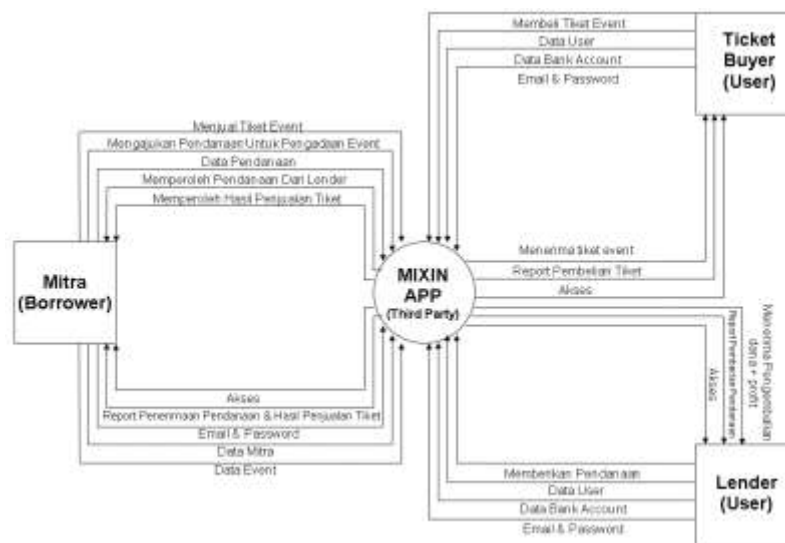


Figure 1. The Concept Diagram *Mixin App*



2.2. Database Model

The database system model that supports the system application is presented in the figure below.

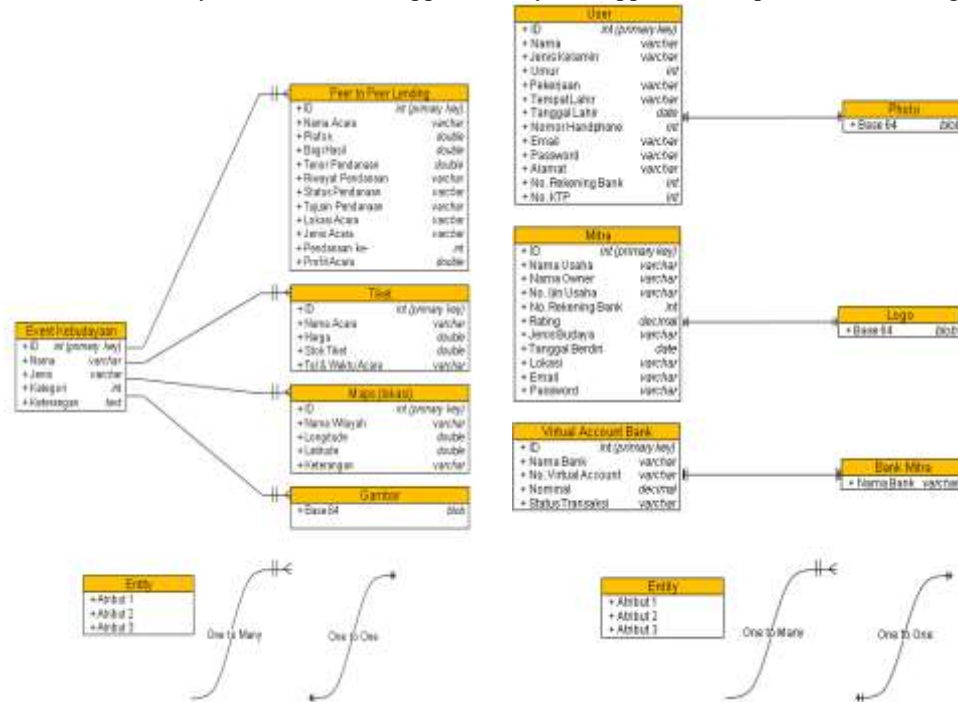


Figure 2. Data Modelling Diagram

The data modeling diagram in Figure 2 above shows the database relation schema in the system application, where the cultural event database consists of 4 interconnected entities, namely peer to peer lending, ticket, map (location), and photo. User has one interconnected entity, namely a photo with a 64-bit base. Meanwhile, Partner has one interconnected entity, namely the business logo of the Partner with a 64-bit base. And finally, the virtual bank account has one interconnected entity, namely the bank of the Partner.

3. Result and Discussion

The results of this study are a prototype mobile app that is shown in the figure below.

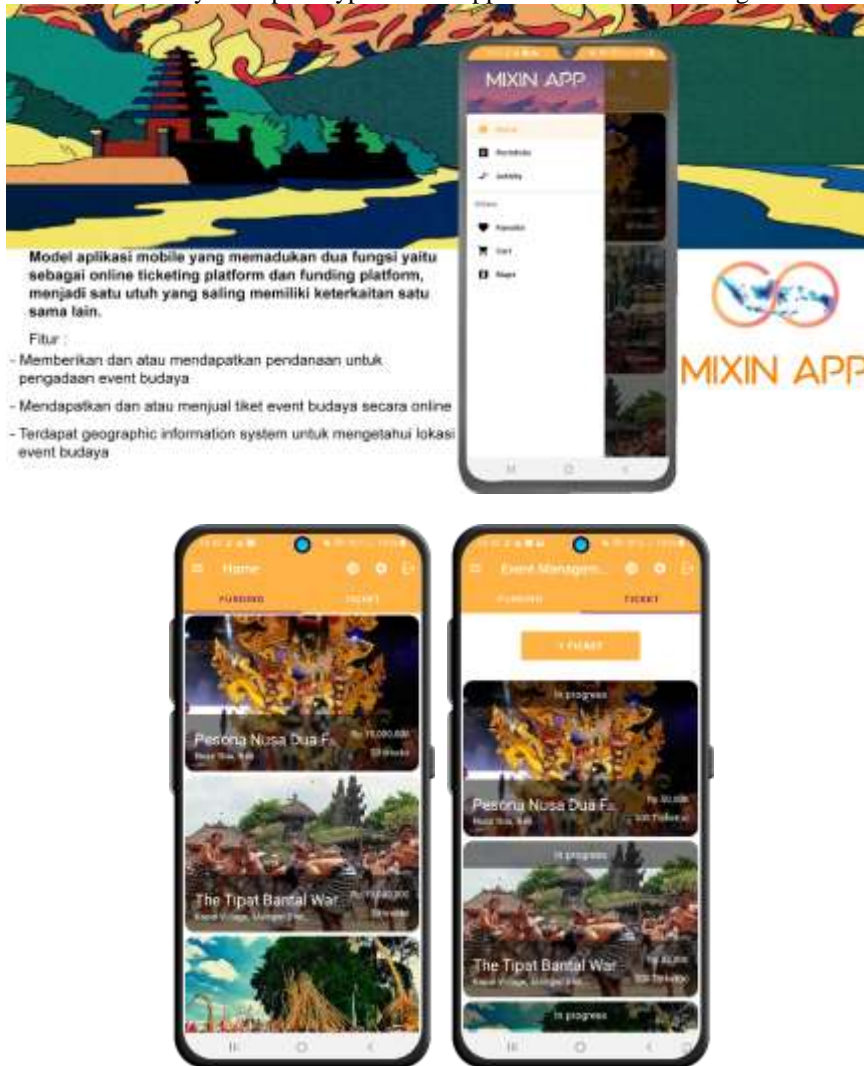


Figure 3. UI Display and Features of *Mixin App*

The Application Model as an Online Ticketing and Funding Platform for Mobile-based Cultural Events is a solution for partners in obtaining funding to hold cultural events and sell tickets online, and for users or tourists to find and buy online tickets online for cultural events in Indonesia in a way that is effortless, complete, and thorough. This application has 2 functions in one integrated application which is realized through a system that works to integrate the two functions. This mechanism is seen when partners want to sell their event tickets online from a previously installed funding application for the same event which has the



same name. The system will then recommend the price or minimum number of tickets to be able to fulfill the refund. If all the revenue from ticket sales exceeds the funding, the system will still process it. However, if the entire revenue from ticket sales is less than the funding, the ticket will not be installed until the recommendation from the system is met. When a partner tries to change the ticket price or number of tickets so that all revenue from the ticket is below the amount of funding that must be returned, the system will not process the change until the minimum recommendation on the ticket price or number of tickets is met. If the partner makes an event ticket sale first and then applies for funding, the system will continue to process the additional funding and generate a notification as a warning if the proposed funding is greater than event ticket sales at the same event. However, if the funding request is equal to or less than ticket sales for the same event, the notification will not appear. When the notification is clicked, the partner will go to the event ticket edit page that the system intends to change, or the notification can be ignored if this is not a problem. This mechanism also occurs when changes are made to the funding application that has been installed. The integration system only applies if the partner makes a funding application and ticket sales for the same event which has the same name regardless of which one is added to the system first. However, the system will not work if the partner only adds funding or ticket sales for the event.

This mobile application was developed in the form of a native app using the Kotlin programming language and Android Studio tools for coding. This application uses 2 data sources, namely a cloud server as a place to store initial data, and a local database in the application itself to store data that has been taken from the cloud, so that the application can save more internet data. The cloud servers used are Firestore and CRUD (Create Read Update Delete). The data uses the REST API of the Firebase Function which was programmed with the Javascript programming language (NodeJs). This application development used the Software Development Life Cycle (SDLC) method with a prototype development model that involved 7 stages of development, namely requirements analysis, prototype design, prototype evaluation, system coding, system testing, system evaluation, and system use.

The requirements analysis phase focused on identifying the software and all system requirements to be made. The prototype design phase focused on making a temporary design that focused on the program flow to the user. Evaluation of the prototype was carried out to find out whether the prototype model was in line with expectations. The system coding stage focused on translating the prototype design into a programming language. The system testing stage focused on software testing. The system evaluation stage focused on identifying whether the software met expectations or not. At the stage of system use, the software that had been tested and approved was declared ready for use.

The results of the latest application system testing based on unit testing (black box testing), instrumentation testing (white box testing), and performance testing are presented in the table below:



TABLE 1.
APPLICATION TEST RESULTS

No.	Aspect	Results	Category
1	Unit Testing (Black Box Testing)	Repository test and Retrofit service test were successful.	Good
2	Instrumentation Testing (White Box Testing)	The splash screen activity test, main activity test, login activity test, and sign up activity test were successful.	Good
3	GPU Overdrawn	With the following indicators: <ul style="list-style-type: none"> • True color: No overdraw • Blue: Overdrawn 1 time • Green: Overdrawn 2 times • Pink: Overdrawn 3 times • Red: Overdrawn 4 times or more times At least only one overdrawn process was carried out (blue). In the application out a total of 27 pages, 6 were red. The rest was a mixture of pink, green, blue, and true colors.	Satisfactory
Performance Testing	GPU Profiling	The explanation of the color indicators on the vertical histogram is on Android OS Marshmallow and above. The rendering process always displayed a very high vertical bar, even almost to the top of the screen, especially on the green Misc Time/Vsync Delay indicator. This green color indicated that there were redundant processes in the Thread user interface. Other indicators used were 3 horizontal lines of green, yellow, and red. The horizontal line visualizes the rendering process at each frame against the optimal benchmark reference of 16ms. This benchmark is visualized with a green line. In the application nothing crossed the green horizontal line, which means that the rendering process for each frame was optimal. Likewise in the Thread user interface; in the vertical histogram there was no green Misc Time/Vsync Delay indicator.	Good
	CPU Profiling	The test results on the application showed the CPU with a range of 0% - 20%, memory with a range of 145 MB - 274 MB, and energy with a light - medium range. The highest numbers on CPU, memory, and energy were generated when the map in the application was opened.	Good
	LeakCanary	The section that shows <i>Leaking: YES</i> is the location that caused the leak, and the section that starts showing <i>Leaking: UNKNOWN</i> is the cause. Therefore it can be concluded that in the application there is 1 leak in <i>LeakActivity</i> and the cause was <i>mPresenter</i> .	Satisfactory
	Battery Historian	Of the total 12 parts detected in this test, none of the parts showed a rapid decrease in battery level. This means that the application does not drain the battery and is energy friendly.	Good

4. Conclusion

This research has produced a mobile application model that combines two functions, namely as an online ticketing platform and a funding platform, into one complete system that is interconnected with each other. This research was developed with the latest technology in mobile application programming, namely Kotlin. Based on the results of the research, discussion, and conclusions above, the author suggests that further researchers are able to develop this application or similar applications into an application that enables funding transactions and ticket purchases and can be downloaded on the Google Play Store. It is also hoped



that further researchers can develop this application or similar applications without any leaks or other shortcomings that reduce the application performance.

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