Design and Build a Video Streaming Application using a Minimum Viable Product (MVP)

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Abstract

Covid-19 makes people's mobility very limited. Because the mobility and capacity of an event is very limited, it makes many events forced to be postponed or even canceled because to prevent the spread of the Covid-19 virus from increasing. Some media eventually became a solution to the problem. One of them is video streaming media. Video streaming media is very helpful for organizers to provide information and impressions of the event via the internet. So that the audience does not need to come to the venue directly. This also makes it easier for viewers who are outside the city or even abroad to follow the event directly. STIKI Basketball League (SBL) has used this solution to limit these problems. The absence of spectators makes the venue even more lonely and boring due to building capacity restrictions which make supporters unable to support their team directly on the spot, but they can still support through video streaming media provided by the organizer. The video streaming media is also sold on a website that functions so that viewers who want to access their team's matches must subscribe first. The website product is packaged by the organizer using the Minimum Viable Product (MVP) concept which aims to make it easier for the audience to understand what features are sold by the committee. Thus, the presence of MVP in the product can increase the income from the event.

1. Introduction

The COVID-19 pandemic has changed many aspects of people's lives today, especially in people's mobility. Until now, the origins of this pandemic are still the most common among many experts. Over the past few months, this virus has experienced a very significant reduction due to recommendations from the government related to health protocols, suggestions for maintaining a healthy immune system, and so on.

Over time, the development of information technology in the world is also growing rapidly, especially in the field of broadcasting, especially in streaming services. Streaming is a method for making audio, video, and other multimedia available in real-time on different types of networks. The data in the streaming file is divided into several small packets which are sent in a continuous stream to the end-user device. During the pandemic, people's mobility was very limited in order to prevent the spread of the Covid-19 virus.
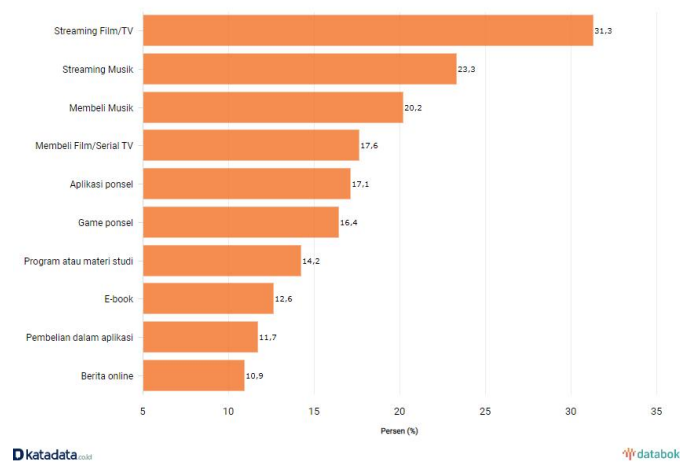

Fig. 1 Percentage of favorite paid content during Covid-19 pandemic

In 2021, film and television streaming services such as Netflix are internet users' favorite paid content. According to data from We Are Social, 31.3% of internet users aged 16-64 years have paid for this service. Another favorite paid content service is music streaming like Spotify. The percentage of respondents who said they were willing to pay for this service was 23.3%. Then, downloading music becomes the third favorite paid content.

In developing a product, there are various strategies, one of which is the Minimum Viable Product (MVP). MVP is a product development technique in which a new product or website is developed with certain features or characteristics to be tried by early adopters first. The final product is only made when there is input and suggestions from early users. There are several characteristics in MVP, namely having a certain value so that people still want to use/buy the product even though it is still not perfect, can provide future benefits for early users, there is a mechanism for criticizing suggestions for future development.

Basketball is a sport played by 2 teams, each team consisting of 5 people who aim to score points by putting the ball into the opponent's basket. Basketball fans also consist of all ages. Starting from children to adults, there are still many who are active and enjoy this game. Even today in Indonesia, there are many tournaments held from elementary to university level and some are even for the general public. STIKI Basketball League (SBL) is a tournament held by STIKI Malang for high school/equivalent level students throughout East Java. This tournament is held at the beginning of each year and is held for approximately 1 month. In SBL, students can experience competing against many teams from outside the city of Malang with a spirit of sportsmanship.

Even though the Covid-19 pandemic is almost over, many people still fear this "figure" because of the high risk of death. The community still has to follow the health protocol recommended by the government in order to reduce the risk of spreading the virus. This also happened at the implementation of the STIKI Basketball League 2022, where on the implementation date, the number of Covid-19 patients increased quite sharply so that Large-Scale Social Restrictions (PSBB) had to be imposed. As a result, the SBL has made a procedure that every player and spectator who enters the venue must take a swab and show a negative result. However, after 7 days of running, the event had to be stopped due to

the increasing spread of Covid-19. After a month had passed, the event was resumed due to a decrease in the numbers on the map of the spread of Covid-19 in Malang City.

The purpose of this research is as a solution so that basketball fans who want to watch basketball matches in real time can be realized even though they are hindered by Large-Scale Social Restrictions (PSBB) and the committee does not experience significant losses due to restrictions on the absence of spectators by using a video streaming application using the Minimum Viable Product (MVP) web-based.

1.1 Literature Review
1.1.1 Programming Languages
Programming language is the language used to translate every command on a website when accessed In this application, the language used is PHP and uses a relational database, namely MySQL.

PHP or short for Hypertext Pre-processor is an open-source programming language that is very suitable or devoted to web development and can be embedded in an HTML thesis.

This programming language is very widely used on commercial websites, companies, blogs, and so on because PHP is very easy to learn, material that is already abundant on the internet, is open source which means it is free to use without paying anything, many options to connect to databases such as MySQL and MariaDB can be used for multi-platform which means it can be used on various operating systems such as Windows, Linux and MacOS.

The database is a very important thing that must be considered. The database or database itself is used to store information or data later will be used. The database used in this application is a Relational Database, namely MySQL.

This database has several advantages such as being open-source, supporting integration with various programming languages, being able to be used by several people at the same time, and also a table structure that is easily understood by ordinary people, as well as guaranteed security.

1.1.2 Streaming Video
Video is an electronic media that is able to combine audio and visual technology together to produce a dynamic and interesting show. It can be concluded that video is a technology whose purpose is to capture, record, process, and transmit and rearrange moving images so that they can be packaged more dynamically and attractively. In this modern era, digital video is in great demand by the public because there are applications that can help them to easily access watching such as YouTube, Netflix, Vidio, etc. Apart from facilitating access to viewing, there are also other functions, namely giving the audience the opportunity to see a different world without having to go directly to the location and imagine when they come to the place, it is easier to attract someone's emotional feelings than just audio, it can also be a scientific asset as it can be stored and played back as many times as desired.
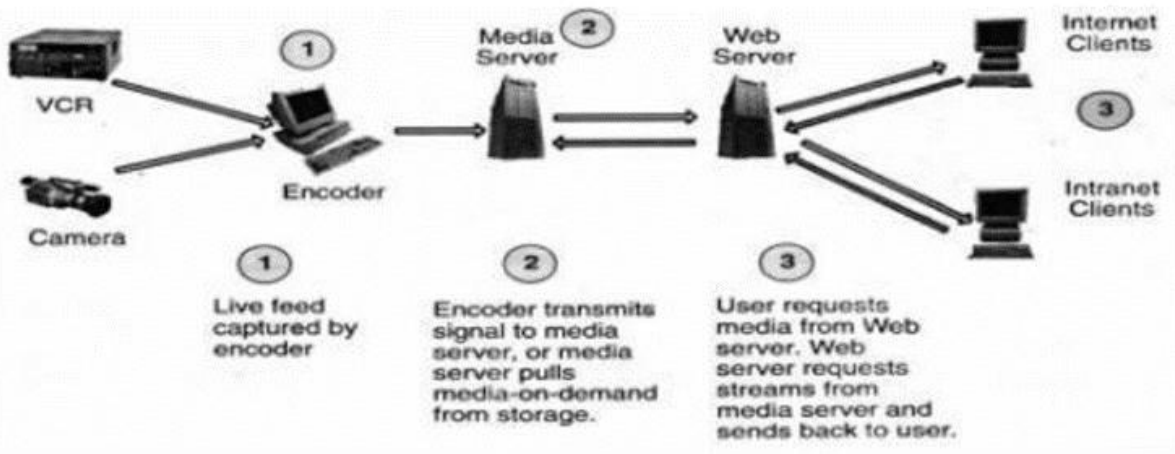
Fig. 2 Streaming Multimedia Flow

1.1.3 Minimum Viable Product (MVP)

Minimum Viable Product (MVP) is a series of products developed with sufficient features to satisfy the user at the start and receive input or feedback at the start. MVP is done so that the final feature can be designed after the initial development process so that it does not waste a lot of money and is also more acceptable to consumers. By using the MVP strategy, sellers can find out positive and negative feedback from users. This feedback can be used as a reference to improve a product and even produce the final product.

Table 1. Table of Main purpose of MVP

Minimum	Main purpose of MVP
Minimum Functionalities/Feature	To allow the product to be deployed To target market opportunities To create a viable product for the customer To test the fundamental business hypothesis To allow to test the product in the market To gather customer feedback To identify the most viable features by iteratively experimenting the market
Minimum Requirements	To meet the needs of early adopters
Smallest possible implementation	To motivate customers to provide feedbacks and recommend it to other customers To bring added value to customers
Minimum Effort	To collect the maximum amount of validated learning about customers To test the fundamental business hypothesis To develop a product that includes just enough features to allow early adopters feedbacks

	To gather customer feedback
Minimum Value Organization	To accelerate sales to first customers

2. Research Methods

The research method applied in this study is the development of the waterfall method. the advantages of the Waterfall Method. The following are some of the advantages possessed by the waterfall method, including:

1. Clear workflow
   By using this type of SDLC model, it has a series of clear and measurable system workflows. Each team has duties and responsibilities according to their area of   expertise. As well as being able to complete the work in accordance with the predetermined time allocation.
2. Results of good documentation
   Waterfall is a very methodical approach, where every information will be properly recorded and distributed to each team member quickly and accurately. With documents, the work of each team will be easier, and follow every direction from the document.
3. Can save costs
   The next advantage is of course in terms of resources and costs incurred by a company using this model. So, in this case the client cannot interfere with the affairs of the application development team. So that the expenses will be less.
   In contrast to the Agile method, in which clients can provide input and feedback to the development team regarding changes or additions to several features. So the company will incur greater costs than Waterfall.

4. Used for large-scale software development
   This method is considered very suitable for making large-scale applications that involve a lot of human resources and complex work procedures. However, this Model can also be used for small and medium scale projects. Of course adjusted to the conditions and needs of the project taken.
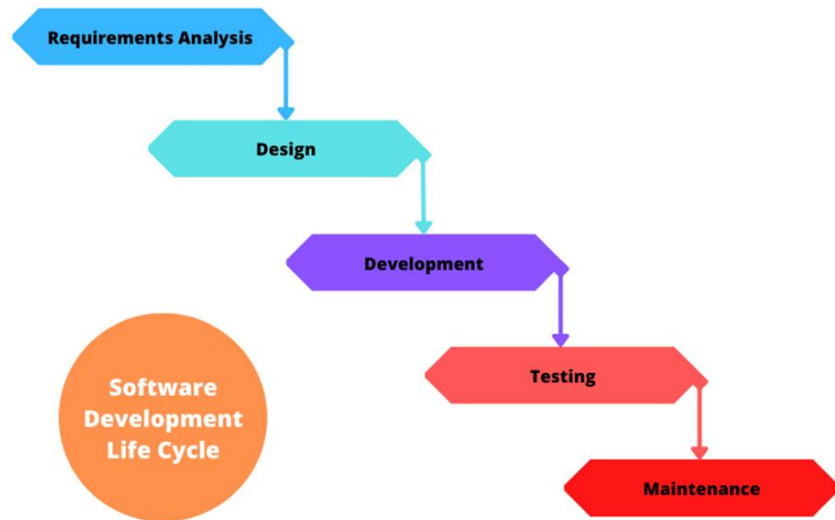
Fig. 3 Flow of Software Development Life Cycle

2.1. Requirement Analysis

System services, constraints, and goals are determined by the results of consultation with users which are then defined in detail and function as system specifications. The purpose of making this application is due to the constraints experienced during the Covid-19 pandemic which limited the mobility of the community. Events that are normally held with spectators at the venue must be held without spectators so that there is absolutely no revenue from ticket sales for spectators. In various ways, an alternative that can be used is to allow spectators to watch matches online through the official website.

2.2. Design

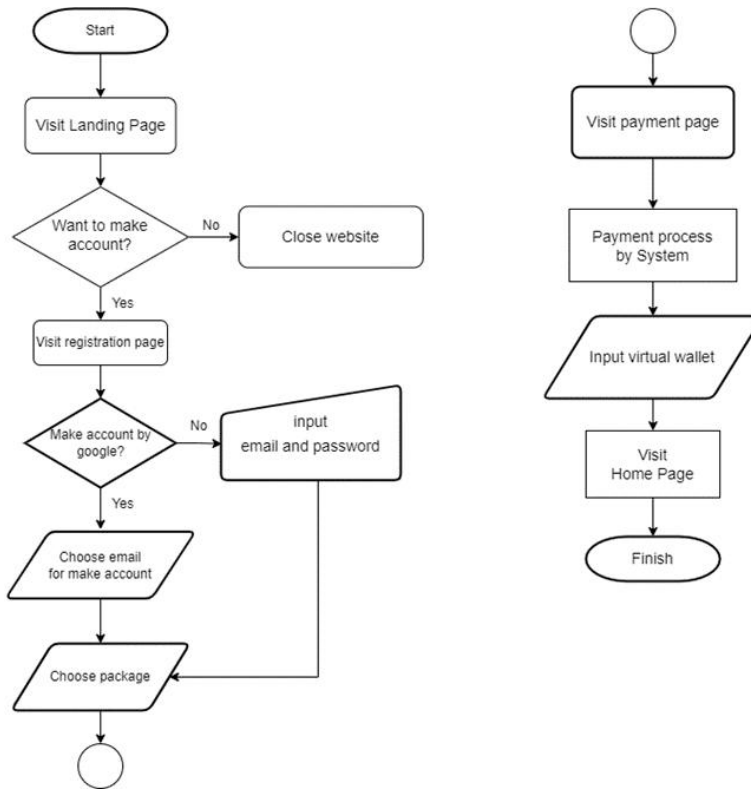There is the design of flowchart diagram, usecase diagram, and some prototype at this project
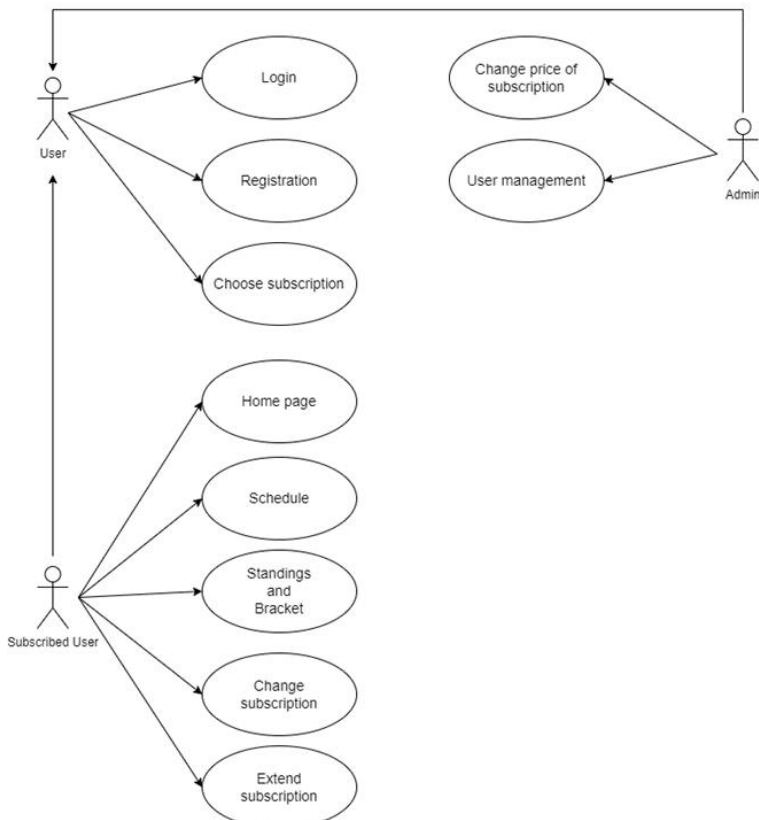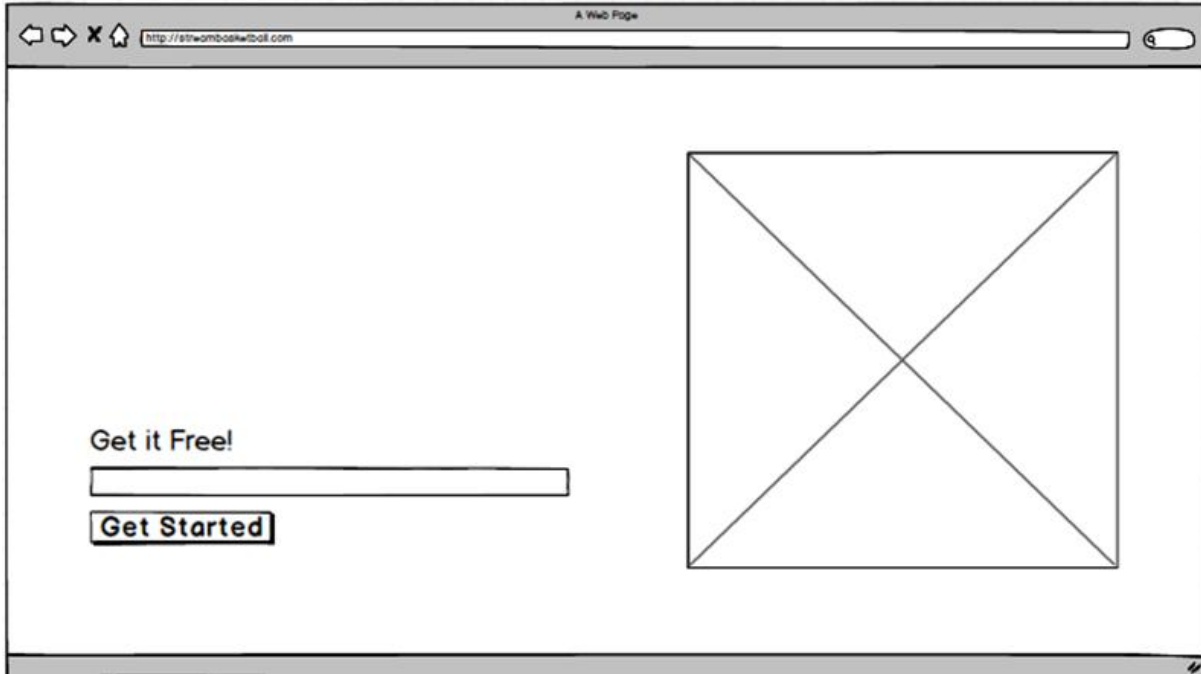
Fig. 4 Flowchart diagram

Fig. 5 Usecase diagram

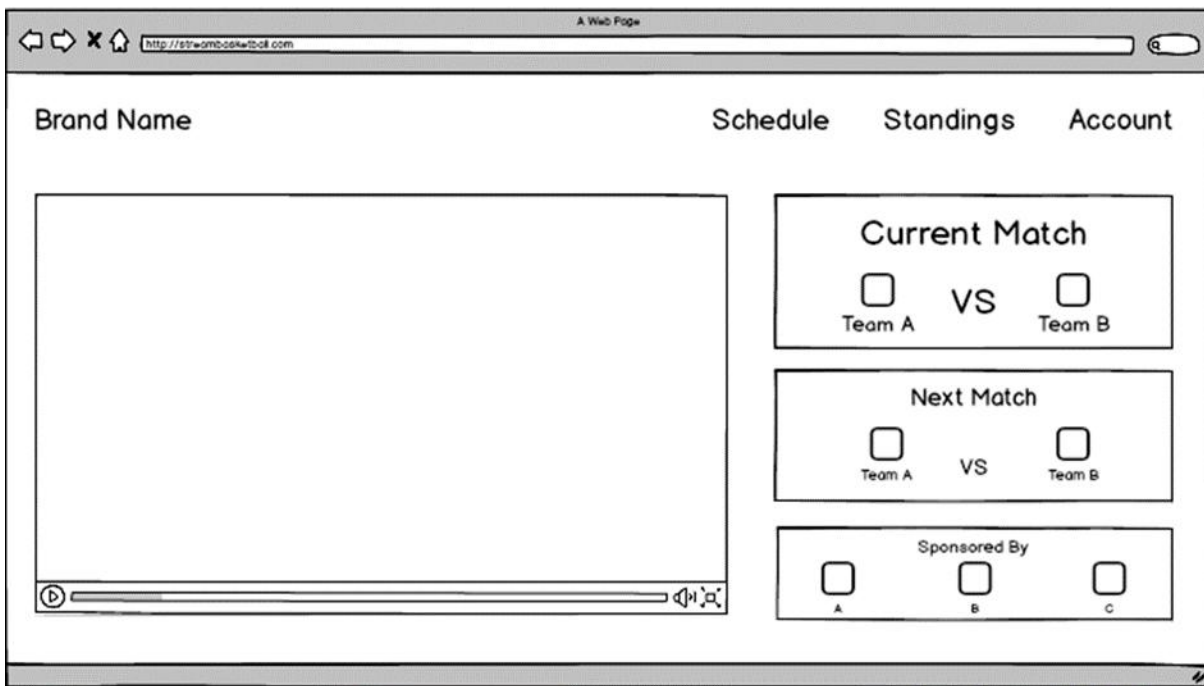*Fig. 6 Prototype of Landing Page*

Fig. 7 Prototype of Dashboard User

2.3. Development

At this stage, software design is realized as a series of programs or program units. Testing involves verifying that each unit meets its specifications. (It will be explained at Result and Discussion)

2.4. Testing

The individual units of a program or programs are combined and tested as a complete system to ensure whether they conform to the requirements of the software or not. After testing, the software can be delivered to the customer.

2.5. Maintenance

Usually (though not always), this stage is the longest. The system is installed and used for real. Maintenance involves correcting errors that were not found in the previous stages, improving the implementation of the system unit, and improving system services as new requirements.
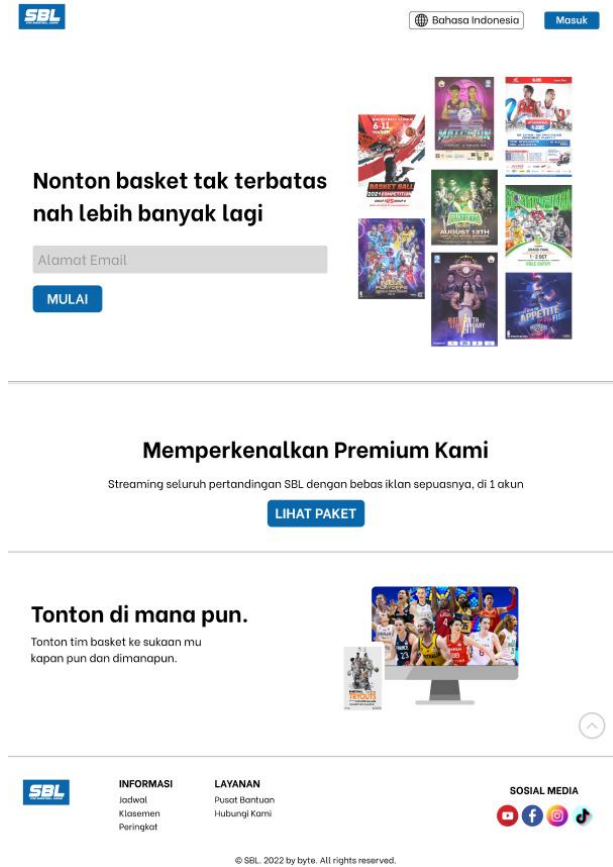
3. Result and Discussion

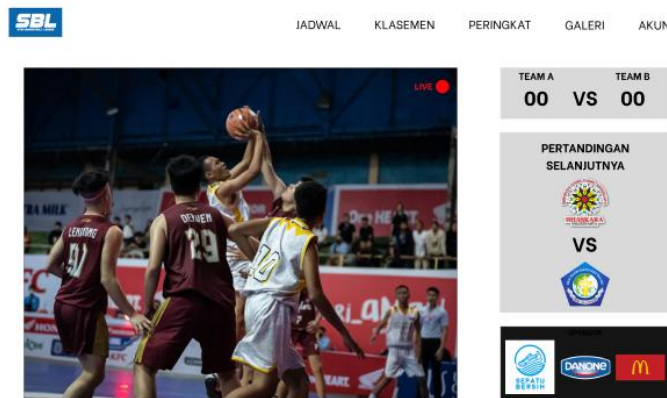
Fig.8 Result of Landing Page

Fig.7 Result of dashboard user

4. Conclusions

The conclusions obtained from this study can be concluded as follows. The Covid-19 pandemic has severely limited the mobility of people. Before the pandemic they could go out freely and interact with other people without distance or health protocols such as masks and hand sanitizers. A sports match will not be lively without an audience. Even though the pandemic limited participants from coming directly to the venue and also the committee could not interact directly with the audience, technology can help both parties by broadcasting matches to the audience via live streaming. By creating a separate platform, the event can increase branding and also get distinct benefits from viewers who subscribe to the platform and viewers also don't need to look for other platforms because the organizers have also created their own platform

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