International Journal Software Engineering and Computer Science (IJSECS)
5 (1), 2025, 204-214
Published Online April 2025 in IJSECS (http://www.journal.lembagakita.org/index.php/ijsecs)
P-ISSN: 2776-4869, E-ISSN: 2776-3242. DOI: https://doi.org/10.35870/ijsecs.v5i1.3647.

RESEARCH ARTICLE Open Access

Developing an Android-Based Online Football News Application Using News API for CV Cipta Rasendriya

Bagas Tri Prakoso *
Informatics Engineering Study Program, Faculty of Information Technology and Industry, Universitas Stikubank Semarang, Semarang City, Central Java Province, Indonesia.
Corresponding Email: bagastriprakoso@mhs.unisbank.ac.id.

R Soelistijadi
Informatics Engineering Study Program, Faculty of Information Technology and Industry, Universitas Stikubank Semarang, Semarang City, Central Java Province, Indonesia.
Email: r.soelistijadi@edu.unisbank.ac.id.

Taufiq Dwi Cahyono
Electrical Engineering Study Program, Faculty of Engineering, Universitas Semarang, Semarang City, Central Java Province, Indonesia.
Email: taufik_dc@usm.ac.id.

Received: January 14, 2025; Accepted: February 1, 2025; Published: April 1, 2025.

Abstract: Football is the most popular sport in the world with 4 billion fans, including in Indonesia which has the largest fan base. In the digital era, the majority of soccer fans access news via mobile devices because it is more practical than print media. However, limited access that requires users to open several websites to obtain the latest information is an obstacle. CV Cipta Rasendriya, as a football media that focuses on YouTube channels, took the initiative to develop an Android-based football news application. This application aims to make it easier for fans to access the latest news through the integration of the News API which displays real-time news from various trusted sources. Application development is carried out using the System Development Life Cycle (SDLC) Prototyping model, which was chosen because of its advantages in understanding user needs, flexibility to change, and cost efficiency. The results of application testing using the black box method showed a 100% success rate in the main test scenarios, such as news search, current news display, and navigation between pages, all of which functioned as expected. In addition, the UEQ test results showed that the application scored very well on the dimensions of Clarity (2.06), Efficiency (2.03), Attractiveness (1.92), Stimulation (1.81), and Novelty (1.69), as well as a good score on the dimension of Accuracy (1.59). The app provides more benefits than conventional methods by integrating various news into one platform, with a search feature to make it easier for users to find their favorite club news. In addition, this application has the potential to improve the user's experience in accessing football news in a practical, fast, and relevant manner.

Keywords: Football; Android; News API; SDLC Prototyping; News App.

1. Introduction

Football — without a doubt the most popular sport around the world. Statista reports that there are over 4 billion football fans (as published on WorldAtlas) way more than volleyball and basketball both standing at only 0.9 billion, and also with zero.083b fans respectively This unassailable lead makes sports thus, today the largest sport globally. The fan base of football in Indonesia is the most populated one internationally [1][2]. A survey conducted by Ipsos found 69% of Indonesians to have a strong passion for the game, ranking claims that Indonesia is home to the highest percentage of football fans in the world as of 2022. Often times these followers back certain clubs and they try to get the latest scores on their favorite team in their country.

Newspapers and sports magazines were the main sources of info before in time lengths. Nevertheless, the tech advancement hit this choice by now on fastest moving internet worlds. Number: most of the internet access in Indonesia is via mobile devices [3]. According to the "State of Mobile 2024", Data. ai reported that average daily mobile device usage in Indonesia went down to on weeks ending with April-2023 activity at 6.05 hours. This makes Indonesia the world leader in mobile time spent on hand, much higher than the global average that clocks around 5 hours daily. Many such Android sports news apps are available in the Market now days. Unfortunately, the vast majority of these applications fall flat on multiple fronts like poor content personalization and are just not attracting enough with users or a clunky application interface constituting their UI. A Statista report (2023) indicated that in Indonesia, the adoption of sports apps has increased by 25 Percentage points over last two years The footprint that such growth is indicative of greater demand on football (and other sports) information delivery, faster and faster.. Another side is a trend that comes in the form of developing solutions obeying Indonesian expectations better but fulfillment defects of existing apps.

The shift from print to digital media platforms have dramatically influenced how reading habits of a society is obtained. Today, everyone prefers the mobile device as their mainstay to seek out their information. With that being said one of the most common issues by far is being glued to multiple sites to keep up on all your clubs. After all, it takes more time and is also not a pleasurable experience for the user. The purpose of this study is to design an Android application that enables you to obtain news related football all from various sources without going to respective webBrowser. It will also have a search function specifically designed to simplify the use of selecting certain information user-friendly at first preference, like news a concern team. The most likely approach (method in developmental process) from the System Development Life Cycle (SDLC) that will be used in development is Prototyping method. This approach picked for its superior user requirement extraction ability, to engage users earlier and often during the development phases that can reduce errors and accommodate changing needs. As Kurniati (2021) stated, where the Prototyping method really shine is with user-centered application development that allows for continuous improvement using direct feedback. The same line of thought has Sulistyo *et al*. (2024) lowers the chances of development mistakes and guarantees a final product they could be more sympathetic to user desires. Add to that, the model aims time and cost effective activities by a set iterative path [4]. However with this method many depend the method on the quality of communication with users and ability to manage changing requirements processing. That is the reason this approach is considered best suited for the specification and implementation of an Android football news Mobile App with the Football News API needed to produce a system that actually is user needs-oriented. Yet, that said, it is important to manage the issues such as resource limitations and dissimilarities in understanding user requirements to keep the development from getting off course.

2. Related Work

The growing interest in football as a global phenomenon, coupled with the increasing reliance on mobile technology for information access, has spurred research into fan communities, digital platforms, and application development. In Indonesia, where football enjoys an immense following, studies on supporter dynamics and digital news solutions provide critical insights for creating tailored applications. The development of Android-based news applications has become a topic of interest in recent years, especially with the rising need for quick and easily accessible information. This section reviews prior works related to football fan culture, mobile application development, system design methodologies, and news delivery platforms, highlighting their relevance to the creation of an Android-based football news application. Several previous studies provide relevant insights to support this research.

Several studies have explored the social and cultural dimensions of football fandom in Indonesia, offering a foundation for understanding user needs. Wijayanti and Apriyadi (2023) examined the organizational dynamics within the Persik Mania supporter community, highlighting how collective identity and loyalty shape fan engagement [1]. Their findings suggest that supporters seek platforms to express allegiance and access real-time updates, underscoring the need for digital tools that cater to community-driven content. Similarly, Afrianto (2024) investigated the social identity and fanaticism of The Jakmania, supporters of Persija,

emphasizing how their dedication translates into a demand for constant club-related information [2]. These studies highlight the importance of designing applications that not only deliver news but also foster a sense of belonging among fans, a key factor for user retention in football news platforms. The shift toward digital media consumption, particularly via mobile devices, has been a focal point in recent research. A study by A *et al*. (2023) explored the intensity of social media usage among informatics students, revealing the pervasive role of mobile technology in daily information access [3]. Their analysis indicates that young users, a primary demographic for football news apps, spend significant time on mobile platforms, necessitating applications with intuitive interfaces and rapid content delivery. This aligns with the broader trend of mobile dependency in Indonesia, where smartphones are the primary tool for news and entertainment, emphasizing the need for Android-based solutions that prioritize speed and accessibility.

In terms of application development methodologies, prior works offer valuable guidance. Kurniati (2021) discussed the application of the Prototyping method in designing a document archiving system, emphasizing its effectiveness in capturing user requirements through iterative feedback [4]. This approach is directly applicable to football news apps, where user preferences for specific clubs or news types vary widely. Similarly, Nurlelah *et al*. (2023) implemented the Prototyping model in a raw material inventory system, demonstrating how iterative design reduces errors and enhances relevance [9]. Their work reinforces Prototyping's suitability for projects requiring continuous user input, as in personalized news applications. The integration of APIs and digital platforms for news delivery has also been extensively studied. Indira *et al*. (2021) conducted research on the development of a news generator website using REST API and an internal search engine [17]. This research focuses on comparing the accuracy of news searches between internal engines and Google, as well as evaluating the effectiveness of APIs in retrieving news data from various sources. Although their work successfully developed an efficient web-based system, it differs from the current research, which is Android-based with a specific focus on the sports news category in Indonesia. Additionally, the proposed application utilizes one specific news category to improve relevance and user experience. Sulistyo *et al*. (2024) conducted research on a simple news portal application by utilizing the News API, employing the Prototyping method for design and development iterations based on user feedback [19]. However, their use of the App Inventor platform, a visual block-based programming tool, contrasts with this research, which utilizes Android Studio with the Kotlin programming language to provide greater flexibility in implementing features and improving application performance.

Further exploring Android-based news applications, Rini Sovia *et al*. (2020) developed an Android and web-based e-news application for RRI Padang Station [18]. Their research uses the System Development Life Cycle (SDLC) Waterfall model, involving manual collection and storage of news data into a MySQL database. This application aims to present local news to the public quickly and efficiently. In contrast, the current research employs the News API as the primary data source to facilitate integration of news from various external sources, enabling automatic content updates without manual management, thus saving time and resources. Similarly, Surya Duha *et al*. (2018) developed an Android-based online news application for Labuhanbatu Regency using the Waterfall method, emphasizing local server storage with PHP and MySQL [20]. Meanwhile, this research adopts a more modern approach by leveraging the News API, allowing direct retrieval of news data from external sources, making data management more efficient and easier to implement. Additionally, Saptomi *et al*. (2016) researched an Android-based Lampung daily news portal application using the Waterfall method and the Volley library to connect to an external database [21]. While their application achieved compatibility across various Android devices, limitations in data management flexibility posed challenges. In contrast, this research uses the News API, which provides data in JSON format, facilitating easier integration and automatic updates.

User experience (UX) remains a cornerstone of successful application design. Schrepp *et al*. (2017) constructed a benchmark for the User Experience Questionnaire (UEQ), providing a standardized tool to evaluate user satisfaction across digital interfaces [16]. Their framework is instrumental in assessing the usability of a football news app, ensuring design elements like navigation meet user expectations. Complementing this, Voutama and Novalia (2021) designed an Android-based M-Magazine application for high school bulletins, focusing on accessibility and engagement [6]. Their emphasis on user-friendly design offers practical insights for creating an app that appeals to football fans seeking quick updates. By utilizing the results and findings from previous studies, this research is expected to contribute to the development of Android-based news applications, especially for the sports news category, while increasing the efficiency and convenience of users in accessing real-time information. Studies on fan culture emphasize the need for community engagement and personalized content, while research on mobile usage underscores accessibility and speed. Technical works on Prototyping, API integration, and UX design provide actionable methodologies for creating a user-centric, efficient platform. By synthesizing these insights, this research aims to address gaps in existing football news applications, particularly in content aggregation and user experience, to deliver a solution that resonates with Indonesian football fans' needs and expectations.

3. Research Method

This research primarily aims to develop a product in the form of an Android-based online football news application utilizing the News API. In line with the research objectives outlined in Chapter 1, the most suitable method for this study is the System Development Life Cycle (SDLC) with a Prototyping model. This approach allows the system to be designed and built in stages, incorporating repeated testing to ensure that it functions as expected [5]. The System Development Life Cycle (SDLC), often referred to as the Software Development Life Cycle, is a structured process for creating software using various models and methodologies to develop software systems. In its application, SDLC encompasses seven distinct models, namely the Waterfall model, Prototype model, Rapid Application Development (RAD) model, Incremental model, Spiral model, Build and Fix model, and V-shaped model [6]. Each model offers unique characteristics and advantages that can be tailored to the specific needs and goals of software development projects. The SDLC Prototyping method is an iterative approach to software development where prototypes of the system are created and evaluated by users to gather feedback and refine subsequent iterations [7]. A prototype serves as an early representation of the proposed system, which may be a partial working model or a simulation of certain system aspects. This method enables developers to better understand user requirements through direct interaction with the prototype, thereby reducing the risk of design errors in the later stages of development. The Prototyping model was specifically chosen for this research because it is more suitable for customizable systems or software, meaning the software is developed based on specific user requests and needs. Additionally, it is well-suited for final projects or theses that aim to implement a particular method or algorithm in a specific case [8]. In the context of this study, the Prototyping model provides flexibility in designing a football news application that focuses on user experience, ensuring that features such as News API integration and content personalization can be adjusted based on user feedback during the development process.

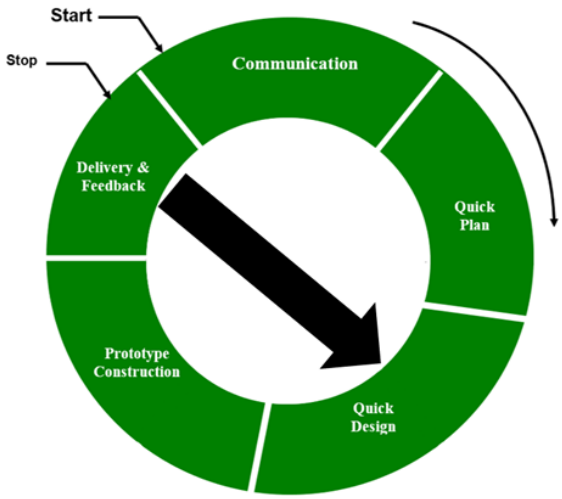

Figure 1. SDLC Stages of the Prototype Model

To model software effectively, several stages are required in the development process, and these stages significantly determine the success of the software. Within the Prototyping model, these stages include the initial identification of requirements, prototype creation, user evaluation, and iterative revisions until the system achieves the desired level of satisfaction. This process ensures that every aspect of the system, from interface design to functionality, is periodically tested and refined. For a clearer illustration of the stages involved in the SDLC Prototyping model, refer to Figure 1, which outlines the flow of the Prototyping process, encompassing requirement identification, prototype design, testing, and iteration. (Note: Figure 1, titled "SDLC Stages of the Prototype Model," will be elaborated upon in the complete document or depicted as a flowchart detailing the aforementioned stages.)

4. Result and Discussion

4.1 Results

This research successfully produced a prototype application that provides quick and easy access to the latest football news. This prototype is the result of applying the System Development Life Cycle (SDLC)

methodology of the Prototyping model, which includes several stages: Communication, Quick Plan, Quick Design, Prototype Construction, and Delivery & Feedback.

4.1.1 Communication

Communication is a question and answer conducted by programmers or writers to source information to obtain information from problems or obstacles experienced by the company. At this stage the author collects the needs of the system by conducting interviews with Rhama Sucipto as the owner of CV Cipta Rasendriya. The author finds out more about the needs and problems related to the application to be made. The author asks about the main features desired in the application, such as searching for football news based on favorite clubs, real-time news integration, and ease of navigation. The results of this discussion revealed that users need an application that is able to present news quickly, easily, and according to their preferences. In-depth discussions were conducted to understand the obstacles faced by soccer fans, such as having to open multiple websites to get relevant information. In addition, users often complain about the limited search features on current news platforms. The results of the interviews and discussions were then integrated into the design process. For example, the news search feature was designed to make it easier for users to quickly find their favorite club news, while the app interface was designed to be intuitive and easy to use even by new users.

4.1.2 Quick Plan

System Quick Plan or System Planning is a developer stage for identifying software and all system requirements to be made [9]. At this stage, the system design is made according to system requirements. This design starts from UML design which is used to create the flow of a system.

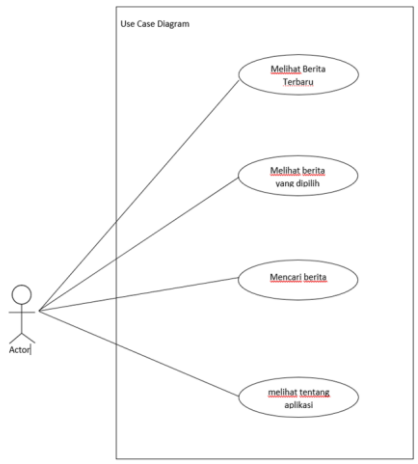

Figure 2. Use Case Diagram

Use Case Diagram contains interactions between actors (users) and the system. This diagram can also be seen as a description of the duties and responsibilities of each actor in the software system or use case can explain the flow of activities performed by the user [10]. In this study, the application to be made has a main actor, namely the user. The user can use all the features contained in the application such as viewing the latest news, viewing selected news, searching for news, and viewing the page about the application.

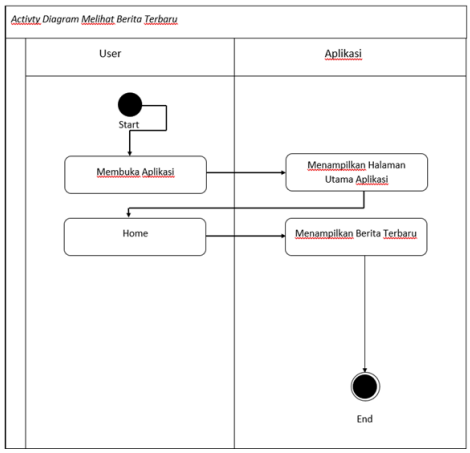

Figure 3. Activity Diagram of Viewing Latest News

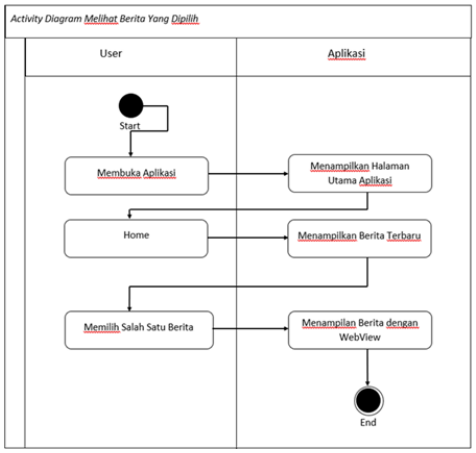

Figure 4. Activity Diagram of Viewing Selected News

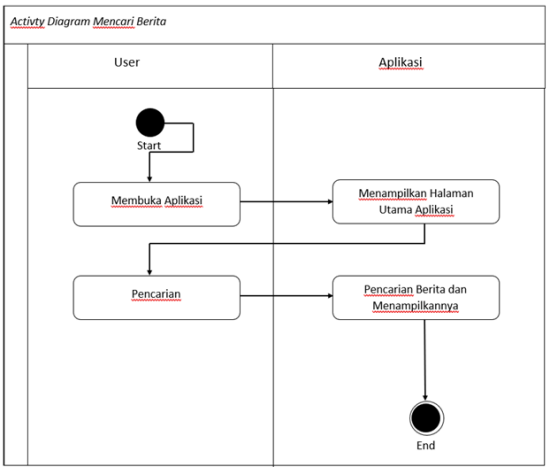

Figure 5. Activity Diagram of Searching for News

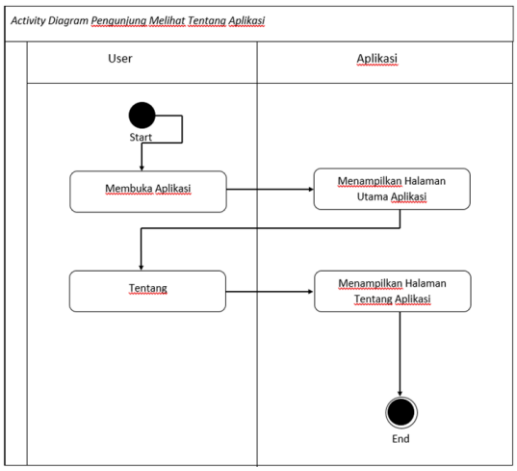

Figure 6. Activity Diagram of Viewing About the Application

Activity Diagram explains how the activity of an operation is generated. This stage will determine the activities of the actor, namely the user or application user with the application which is intended to determine the flow of activities in running the application [11].

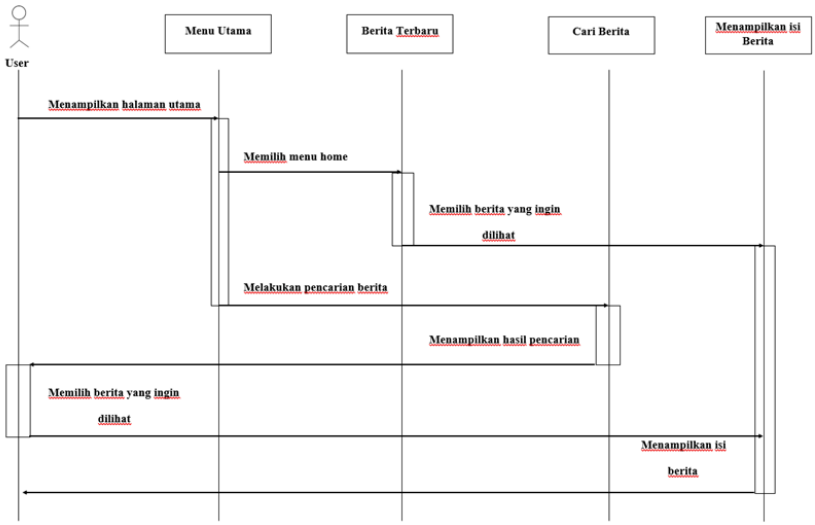

Figure 7. Sequence Diagram

At this stage the sequence diagram can be used to model and explain the use case because the sequence diagram can describe the interaction activities between the class objects contained therein [12].

4.1.3 Quick Design

Before building software, it is necessary to design the interface of the software to be created [13]. At this stage the developer makes an initial design of the android application system which contains the system user interface design.

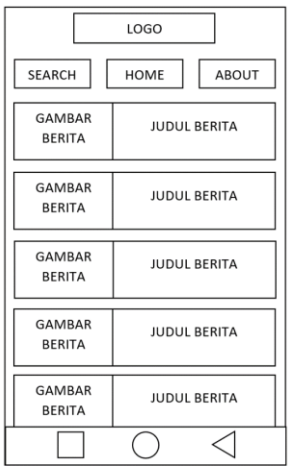

Figure 8. Home Page Design

Figure 9. Search for Page Design

Figure 10. News Detail Page Design

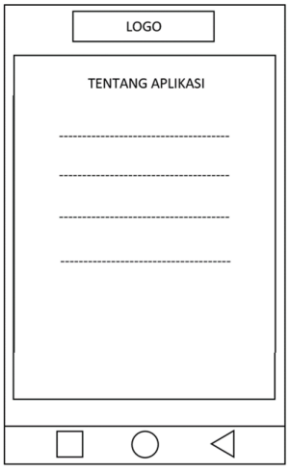

Figure 11. About Page Design

At this stage of the design, it will display the main page of the soccer news application. This main display displays the latest news, which is displayed in the form of images and news titles (Figure 8). At this stage of the design, it will display the search page of the soccer news application. This search display shows some news related to the keywords that have been typed in the search field (Figure 9). At this stage of the design, it will display the news detail page of the soccer news application. This display shows the content of the entire news which includes headlines, leads, body, and tail. The application will display the content of the news with a webview (Figure 10). While the last is the About menu which contains application information, when the user presses the "About" button, the page that will appear is as shown in the picture (Figure 11).

4.1.4 Prototype Construction

Prototype construction or building a prototype is the stage where all designs and plans that have been made are implemented into the programming language [14]. Coding on this system uses the Kotlin programming language and uses Android Studio software. For data sources using news api from the website https://newsdata.io. The selection of the News API from newsdata.io is based on the following technical reasons: News API from newsdata.io is able to provide real-time news from various trusted sources, ensuring that the information presented is always up-to-date. The JSON data format that the News API of newsdata.io provides is compatible with the needs of Android applications, allowing for seamless integration with the designed application components. Compared to other APIs, News API from newsdata.io offers a free option with a daily request limit that is sufficient for early stage development needs. In addition, data from the News API can also be filtered by language, country and category. A paid version option is also available to support larger scale in the future. Compared to other news APIs, such as Google News API or Bing News API, News API from newsdata.io has a simpler interface and more flexible authentication requirements, making it an optimal choice for early development. With the above considerations in mind, News API was chosen to ensure the development of the application runs efficiently and according to user needs.

Figure 12. Home view

Figure 13. Search view

Figure 14. News Content Display

Figure 15. About Display

4.1.5 Delivery & Feedback

Delivery & Feedback is the process of delivering the work or prototype that has been built to users, who will then be evaluated and receive input and suggestions from them [15]. At this stage, the system that has been built will be tested through the black box testing method and the User Experience Questionnaire (UEQ). This black box test aims to evaluate the system using test scenarios on input functions, to find out whether the system is developed as expected. And the following are the results of black box testing on this system.

Table 1. Black Box Testing Results

No	Test Scenario	Test Case	Expected Results	Testing Results	Status
1	When clicking the Home menu	Click the Home menu	Display the main page containing the latest soccer news news	As per	Valid
2	When clicking the search menu	Click on the search menu and input the keywords of the news you want to search.	Display a page containing news related to the keywords that have been inputted.	As per	Valid
3	When clicking on a headline	Click the headline	Display news details	As per	Valid
4	When clicking the About menu	Click the About menu	About Page Displayed	As per	Valid
5	When clicking on a YouTube channel on the About page	Click on the YouTube channel name	Redirected to the homepage of the clicked YouTube channel	As per	Valid

In addition to functional testing using the black box method, this research also uses the User Experience Questionnaire (UEQ) to evaluate the user experience of the developed soccer news application. User Experience Questionnaire (UEQ) is a tool designed to quantitatively measure user experience of an application or product [16]. This questionnaire allows developers to understand how users perceive the quality and convenience of the application. To measure user experience, the author involved eight respondents including the owner of CV Cipta Rasendriya, one voice actor, one script editor and five video editors.

Table 2. Average Scale Score per Respondent

Attractiveness	Clarity	Efficiency	Accuracy	Stimulation	Novelty
2.00	2.25	2.25	1.75	1.75	1.00
1.50	2.25	1.25	2.00	1.25	1.25
1.67	1.75	0.75	2.75	2.25	2.00
2.83	2.75	2.50	1.50	2.00	2.50
2.17	2.50	2.75	2.00	1.50	1.50
1.67	2.00	2.00	0.25	2.50	1.50
1.00	2.00	3.00	1.25	1.75	1.75
2.50	1.00	1.75	1.25	1.50	2.00

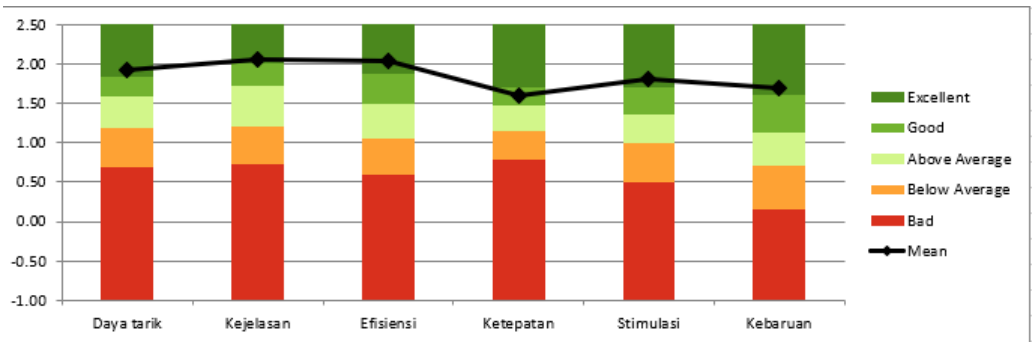

Figure 16. Score Diagram After Prototype Implementation

The UEQ test results in this chart show the average scores for the six dimensions of the app's user experience. The Clarity (2.06) and Efficiency (2.03) dimensions get the highest scores, which are in the Excellent category, indicating the app is very easy to use and supports users in completing tasks quickly. Attractiveness (1.92), Stimulation (1.81), and Novelty (1.69) also fall into the Excellent category, indicating that the app is visually

appealing, fun to use, and quite innovative, although the novelty aspect could still be improved. The Accuracy dimension (1.59) is in the good category, indicating that the app's reliability is quite good but still has room for improvement, particularly in stability and user confidence in the system. Overall, this graph shows the app has very good user experience performance, with potential for further development on the novelty and reliability dimensions.

4.2 Discussion

This research has proven to be valuable in facilitating user access to the latest football news by consolidating various news sources into a single, cohesive Android-based application. The adoption of the Prototyping method in the development process offers several notable advantages. Primarily, it enables developers to thoroughly identify and understand user needs prior to coding, ensuring that the resulting solution is both relevant and effective. Furthermore, the iterative nature of this approach supports continuous improvement through user feedback, leading to a more tailored and user-centric application that aligns closely with the specific demands of football enthusiasts. A key strength of this methodology is the active involvement of users at every stage of development, from requirements gathering to application testing. This user-centered approach significantly contributes to the creation of a system that is intuitive, user-friendly, and easy to adopt. Such engagement not only enhances user satisfaction but also boosts the overall acceptability and usability of the application, fostering greater trust and reliance among its target audience.

The integration of the News API into the application plays a pivotal role in enabling real-time access to news data from multiple credible sources. Features such as news search functionality and the dynamic display of content demonstrate the application's capability to deliver accurate and up-to-date information to users promptly. Additionally, the incorporation of a webview to present news directly from source websites adds flexibility in content presentation, allowing users to access full articles seamlessly without leaving the app, thereby enhancing the overall user experience. The effectiveness of the application's core functionalities was validated through black box testing. The results confirmed that essential features, including the display of the latest news, news search capabilities, and navigation between pages, performed as intended according to the designed test scenarios. This testing phase underscores the reliability and operational stability of the application, ensuring that it meets the expected standards of performance.

This research highlights the efficacy of the Prototyping method in developing applications that cater to user needs effectively. The utilization of the News API not only streamlines the development process by providing a robust data source but also reduces operational costs by eliminating the need for independent news server management. This cost-efficiency is a significant advantage for sustainable app maintenance and scalability. The developed application offers football fans convenient access to relevant information while simultaneously presenting monetization opportunities for CV. Cipta Rasendriya through avenues such as advertisements or premium paid features. Looking ahead, the potential for further development is substantial. Introducing additional functionalities, such as personalized news feeds based on user preferences or expanding the platform to support the iOS operating system, could significantly enhance the application's competitiveness in a broader market. These advancements would not only attract a wider user base but also position the application as a leading source of football news across multiple platforms.

5. Conclusion and Recommendations

This research has successfully designed and developed an Android-based football news application leveraging the News API. The primary goal of this application is to deliver the latest information to users swiftly and efficiently while ensuring easy access through mobile devices. By integrating the News API, the application provides real-time, continuously updated news without the need for independent news server management. This approach enhances efficiency in data handling, saving both time and operational costs, and ensures that users receive current and relevant content seamlessly. The adoption of the System Development Life Cycle (SDLC) with the Prototyping model has proven highly effective in creating an application that aligns with user needs. This methodology supports rapid iteration and continuous evaluation, resulting in a functional and user-relevant system [22]. Additionally, key features such as news search functionality and the use of webviews to display full articles significantly enhance the user experience. The intuitive interface design further caters to the information needs of football enthusiasts, offering immediate access to pertinent news without requiring users to navigate multiple sources.

For future development, several recommendations are proposed to elevate the application's quality and deliver greater value to users. Firstly, incorporating personalization features could be a crucial step in boosting user engagement. Options such as selecting favorite teams or leagues would enable the app to present news tailored to individual user interests. Moreover, adding a feature to save favorite articles would allow users to revisit important content effortlessly without needing to search for it again. Currently, the application utilizes

the free version of the News API, which restricts the number of daily news data requests to two hundred. To accommodate a larger user base and ensure scalability, upgrading to a paid version of the API service is advisable. This upgrade would provide a more reliable and unrestricted service, guaranteeing consistent access to news and improving the overall user experience. Expanding the application to other platforms, such as web and iOS devices, represents a strategic opportunity to reach a broader audience. A presence in the iOS ecosystem, alongside Android, would widen the app's user coverage and unlock additional market potential. Furthermore, conducting more comprehensive usability testing with diverse user groups is essential to refine the interface design and enhance the overall user experience. Such testing would yield valuable feedback for continuous improvement. From a sustainability perspective, the application holds significant potential for monetization through various channels. Implementing relevant advertising, offering premium content, or introducing paid subscription models could support long-term operations. Additionally, developers could explore partnerships with news platforms or football communities to extend the app's reach and add value for users. By acting on these recommendations, this football news application can evolve into a more innovative and functional platform, delivering an exceptional experience to its users and maintaining a competitive edge in the market.

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