

## IMPLEMENTATION OF PROGRESSIVE WEB APPS-BASED CLICK PROFILE ON SOCIAL MEDIA

Setiawan Jodi<sup>1</sup>; Ruhul Amin <sup>2\*)</sup>

Sistem Informasi, Ilmu Komputer Fakultas Teknologi Informasi<sup>1</sup>  
Universitas Nusa Mandiri  
www.nusamandiri.ac.id  
setiawandodi17@gmail.com, ruhul.ran@nusamandiri.ac.id

(\*) Corresponding Author

**Abstract**— Instagram as one of the social media that has active users with a high number of users is an example of the use of social media as promotional media. However, limitations on Instagram by not allowing placing a "Link" to a post cause limitations in promoting products or services. Instagram is a native app-based application found in app stores such as the Google Play Store and Apple's App Store that requires memory on a smartphone to be installed. Based on these problems the author has a desire to create an application that can be used as a medium of sharing and promotion for various types of content that can be channeled through images that are categorized into images and videos, each uploaded image can be embedded with certain "Links" using Progressive Web Apps Technology (PWA). The goal of implementing Progress Web Application is to design and build a system that can share content with other users. The result of the implementation of PWA is to increase the number of visitors (visitors) an average of two times on content published on the website when compared to conditions before using PWA technology.

**Keywords:** Application, App Native, Instagram, Progressive Web Apps, Social Media.

**Intisari**— Instagram sebagai salah satu sosial media yang memiliki pengguna aktif dengan jumlah pengguna yang tinggi merupakan salah satu contoh penggunaan media sosial sebagai media promosi. Akan tetapi keterbatasan pada Instagram dengan tidak diperbolehkannya menempatkan "Link" ke sebuah posting menyebabkan keterbatasan dalam melakukan promosi produk atau jasa. Instagram merupakan aplikasi berbasis app native yang terdapat pada app store seperti Google Play Store dan App Store milik Apple yang membutuhkan memori pada smartphone untuk dapat diinstal. Berdasarkan permasalahan tersebut penulis memiliki keinginan untuk membuat aplikasi yang dapat digunakan sebagai media berbagi dan promosi untuk berbagai jenis konten yang bisa disalurkan melalui image yang dikategorikan menjadi image dan video, setiap image yang diupload dapat disematkan "Link" tertentu dengan menggunakan Teknologi Progressive Web Apps (PWA). Tujuan dari implementasi Progress Web Applcation yaitu merancang dan membangun sistem yang dapat berbagi konten kepada pengguna lainnya. Hasil dari implementasi PWA yaitu meningkatkan jumlah pengunjung (visitor) rata-rata dua kali lipat pada sebuah konten yang dipublikasi di website, jika dibandingkan dengan kondisi sebelum menggunakan teknologi PWA.

**Kata Kunci:** Aplikasi, App Native, Instagram, Media Sosial, Progressive Web Apps.

### INTRODUCTION

In 2016 the Association of Indonesian Internet Service Providers (APJII) issued a survey of internet users in Indonesia reaching 132.7 million, this number has increased from 2014 which was at 88 million users [1]. Where the most accessed type of content is social media as much as 97.4%, in the second place is entertainment content as much as 96.8%, in third place is dominated by news content as much as 96.4%, in the four educational content as

much as 93.8%, in fifth position 93.1% commercial content and 91.6% public services at sixth position.

A large number of social media users in Indonesia, of course, creates an opportunity to optimize the presence of social media as a medium of communication, so that then raises the question, how to use social media to make communication effective in society, both in the field of marketing, politics and in the field of learning

Instagram as one of the social media that has active users with a high number of users is an example of the use of social media as promotional



media. However, the limitations on Instagram by not being allowed to place a "Link" to a post cause limitations in promoting products/services. And Instagram is a native app-based application found in app stores such as the Google Play Store and Apple's App Store that requires memory on a smartphone to be installed.

Indeed, even with the accessibility of a completely created versatile web application, it battles to give an eye-satisfying and palatable experience to the clients mostly on account of the absence of solid organization association across different regions. Hence, PWA (Progressive Web Apps) is another innovation planned and created by Google to beat the limit of versatile perusing and local applications [2].

PWA is not packaged and published through the App Store, PWA is just a Mobile Web that is given advantages that can make the Mobile Web top-level on the task switcher, home screen, and notification tray without having to install it beforehand [3]. In terms of implementation, PWA uses several approaches, ranging from optimizing applications, using new technologies, to standardizing the Mobile Web. This is claimed to be able to improve performance to improve the quality of the user experience.

A lot of research on implementation has been done. One method that can be used to make it easier for tourists to find public transportation is to create a guide transportation application based on Progressive Web Apps [4]. YSlow-related performance on PWA is superior compared to web-native. Although web-native has a faster fully loaded system than PWA, it turns out that this does not significantly affect YSlow's performance on web-native [5]. With the Progressive Web Application technology developed by Google and in collaboration with other browser and mobile developers, the challenge of making multi-platform applications becomes easier and faster [6]. Progressive web apps start as simple websites, but as users follow them, they gain more and more power. They went from a website to something much more like a native app [7]. Web app manifest that makes a website can be like a native application [8]. The API works as a liaison that unites various applications from various types of platforms, commonly known as the public API. Public APIs are widely distributed, while users, namely programmers who want to find public APIs, must search through various ways such as general search engines, repository documentation, or directly on web articles [9]. Lighthouse is an open-source application built by Google to test the PWA concept with its aspects, performance, accessibility, and best practices. Lighthouse can be run from the user's browser in the form of an extension on Google

Chrome [10]. Some of the features of Laravel are the development of a system of manageable modules, introducing different ways to access relational databases, utilities that help in application deployment, and easy maintenance [11].

## MATERIALS AND METHODS

### Progressive Web Apps (PWA)

Progressive web apps (PWA) start as simple websites, but as users use them, they experience a whole new experience, the app transforms from a website into something much nicer like a native app [12]. PWAs are useful for users because first open a web page with the PWA concept, and as users use more Web applications, applications will become more and more powerful [13].

With PWA Fast application loading speed, even if in poor network conditions, can send push notifications, there is an app icon on the home screen, and can run in full-screen mode [10]. Progressive web application (PWA) is a collection of concepts and keywords, such as progressive, responsive, independent of connectivity, similar to the original application, new, safe, easy to find, reconfigurable, installable design and can be linked [14].

Some of the technologies found in the progressive web app include :

#### a. Service worker

The service worker is already running when the web is first loaded automatically, in other words, the user doesn't need to take any action to fire up the service worker. Life cycle service worker in figure 1.

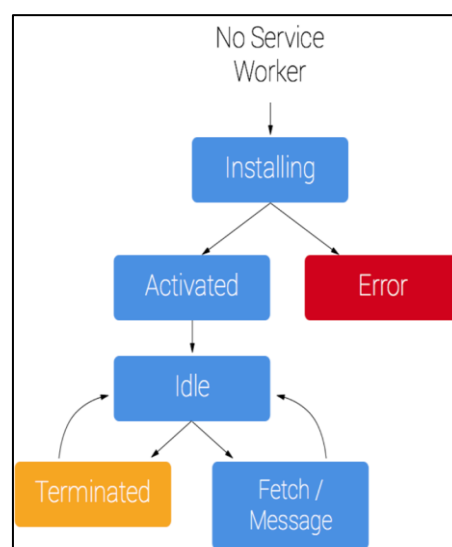


Figure 1. Life cycle Service worker [15]

b. Web Manifest

A web app manifest that makes a website look like a native app [8].

c. Application Programming Interface (API)

Public APIs are widely distributed, while users, namely programmers who want to find public APIs, must search through various means such as general search engines, repository documentation, or directly on web articles [9].

d. Lighthouse

Lighthouse can be run from the user's browser in the form of an extension on Google Chrome [10].

Some of the steps involved in developing and implementing PWA are illustrated in Figure 2.

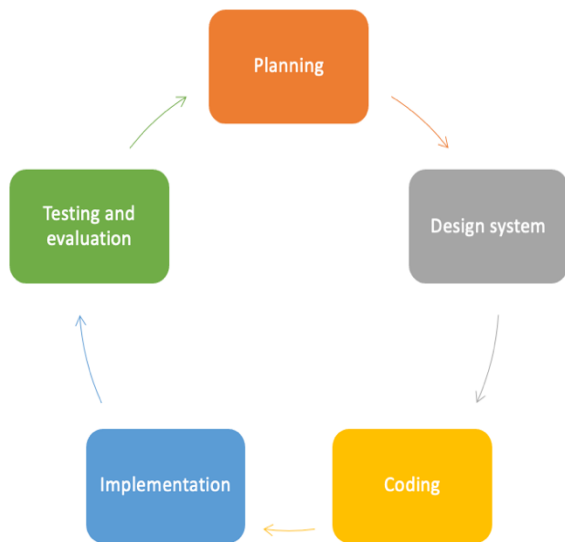


Figure 2. Stages of development and implementation

Several stages are carried out for implementation :

1. Planning  
This stage observes the problems and opportunities of many social media users in Indonesia.
2. Design & System Stage  
This stage is the application and system design that will be made. Using a mockup application, use case diagram, and mockup.
3. Implementation  
This stage describes the system architecture of the implementation of making applications using the PWA method.
4. Testing and Evaluation  
At this stage, the end-user conducts testing with the developer to identify forms of errors from the system. The method used for testing is the user acceptance test (UAT).

The results of this study are the implementation of a progressive web apps-based click profile on social media. Some of the sections :

**Design & System Stage**

At this stage, we describe the interaction between users and the system using use case diagrams.

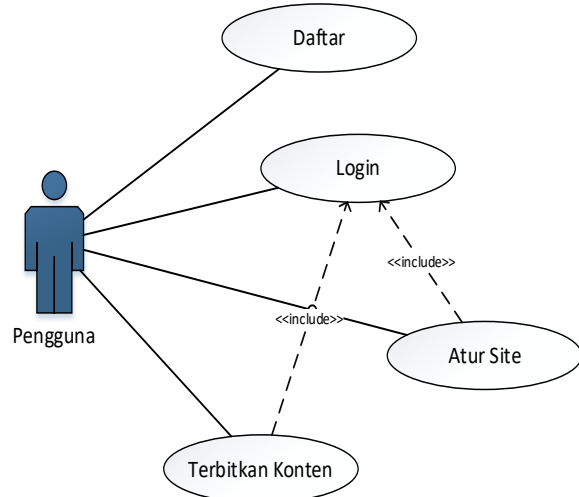


Figure 3. Use case diagram users

Figure 3 users can register before having an account and log in after going through an account. Facilities owned by users after registering are managing the site and publishing content. Figure 4 activity diagram when the user logs in to the system.

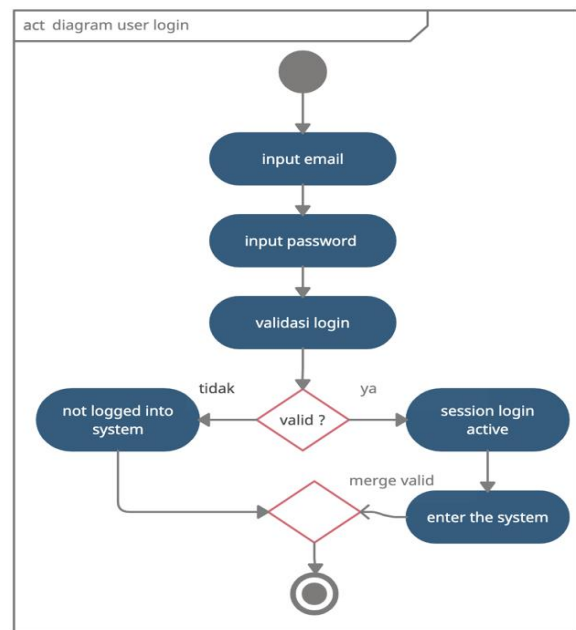


Figure 4. Activity diagram login

Figure 4 is an activity diagram of when the user uses the system. Users can use the system if the

**RESULTS AND DISCUSSION**



email and password used are correct. Figures 5(a) and 5(b) are mockups of a user setting up a site and publishing content.



Figure 5(a) mockup set up the site and 5(b) mockup publish content

### Implementation System

The system architecture of the implementation of progressive web apps is shown in Figure 6.

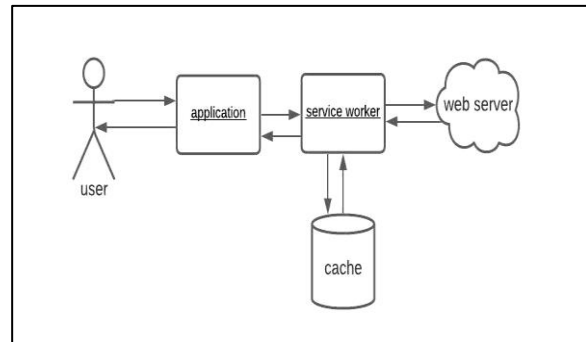


Figure 6. Application system architecture

Figure 6 describes the technology used by progressive web, namely service workers, with this technology applications that must be installed on mobile phones can be run through all browsers.

### Testing and Evaluation Stage

The testing stage is the final stage when all processes are passed to find out whether the application is by the expected results. This test uses the BlackBox Testing method, where this test focuses on the functional needs of the device to try to find errors, the errors in question are the error of functional, interface errors, data structure errors, or performance errors.

User acceptance testing (UAT) has been carried out on the system to find out it is suitable for the user. End users perform tests to identify and fix problems. The results of the tests that have been carried out are shown in Table 1.

Table 1. Test results with the UAT method

No	Use case	Succeed/fail	Tested By	Test Date
1	Test name: Registration	Succeed	Eko Setiawan	25 July 2020
	Test description: verification of entering registration data	Succeed	Feri Suryanata	25 July 2020
	Test description :			
	<ul style="list-style-type: none"> <li>• Fullname: Setiawan Jodi</li> <li>• Email: jodi12345@gmail.com</li> <li>• Password: rahasia12345</li> <li>• Confirm Password: rahasia 12345</li> </ul>			
	Expected results :			
	<ul style="list-style-type: none"> <li>• The system will redirect to a notification page for email verification</li> </ul>			
	The system will refuse to sign up and display the message "This field is required." in the column of each column that is empty			
2	Test name: login	Succeed	Eko Setiawan	25 July 2020
	Test description: Verification of access rights can only be accessed by registered users	Succeed	Feri Suryanata	25 July 2020
	Test description :			
	<ul style="list-style-type: none"> <li>• Username: jodi1988@gmail.com</li> <li>• Password: rahasia12345</li> </ul>			

No	Use case	Succeed/fail	Tested By	Test Date
	<p>Expected results :</p> <ul style="list-style-type: none"> <li>The system will receive login access and redirect to the main application page</li> </ul> <p>The system will deny login access and display the message "Incorrect username or password. Please try again."</p>			

### CONCLUSION

With the Progressive Web Apps-based Klikprofile application, application users can share content and information without having to install applications through the "Apps Store". The interest in using progressive web-based applications is quite high, so the application display is made as attractive as possible.

### REFERENCE

- [1] Tim APJII, "Laporan Survei Internet APJII 2019-Q2 2020: Ada Kenaikan 25,5 Juta Pengguna Internet Baru di RI," *APJII*, Jakarta, pp. 1-10, Nov-2020.
- [2] S. S. Tandel and A. Jamada, "Impact of Progressive Web Apps on Web App Development," *Int. J. Innov. Res. Sci. Eng. Technol.*, vol. 7, no. 9, pp. 9439-9444, 2018.
- [3] M. R. Ridho, A. Pinandito, and R. K. Dewi, "Perbandingan Performa Progressive Web Apps dan Mobile Web Terkait Waktu Respon, Penggunaan Memori dan Penggunaan Media Penyimpanan | Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer," *JPTIK*, vol. 2, no. 10, 2018.
- [4] M.- Patasik, N.- -, and A.- Akhhriana, "Perancangan Progressive WEB APPS Transportasi di Kota Makassar," *SISITI Semin. Ilm. Sist. Inf. dan Teknol. Inf.*, vol. 7, no. 1, pp. 193-202, 2018.
- [5] K. Syaifudin, E. Pranata, W. N. A, and A. R. Dian, "Analisis Usability pada Perbandingan Web-Native dengan Web Berbasis Progressive Web App," *Informatika*, 2019.
- [6] Soleha, E. Budirman, and M. Wati, "Pengembangan Progressive Web Application Portal Program Studi Teknik Informatika Berbasis Restful API," *Pros. Semin. Nas. Ilmu Komput. dan Teknol. Inf.*, vol. 4, no. 2, pp. 115-120, 2019.
- [7] T. Ater, "Building Progressive Web Apps," *Anim. Genet.*, vol. 39, no. 5, pp. 561-563, 2008.
- [8] A. Atikah and A. Huda, "PERANCANGAN APLIKASI HOME SERVICE MENGGUNAKAN PROGRESSIVE WEB APPLICATION," *Voteteknika (Vocational Tek. Elektron. dan Inform.*, vol. 7, no. 3, pp. 85-93, Jul. 2019.
- [9] M. F. A. Muri, H. S. Utomo, and R. Sayyidati, "Search Engine Get Application Programming Interface," *J. Sains dan Inform.*, vol. 5, no. 2, pp. 88-97, Dec. 2019.
- [10] L. Adi, R. J. Akbar, and W. N. Khotimah, "Platform e-Learning untuk Pembelajaran Pemrograman Web Menggunakan Konsep Progressive Web Apps," *J. Tek. ITS*, vol. 6, no. 2, pp. 2-6, 2018.
- [11] M. A. S. O. D. W. Firma Sahrul B, "Implementasi Sistem Informasi Akademik Berbasis Web Menggunakan Framework Laravel," *J. Transform.*, vol. 12, no. 1, pp. 1-4, 2017.
- [12] T. Ater, *Building Progressive Web Apps*, no. 5. O'Reilly Media, 2017.
- [13] N. T. S. Lampah and E. B. Setiawan, "Aplikasi Asesmen Anak Berkebutuhan Khusus di SLB Rafaha Arjasari Menggunakan Progressive Web App," *Ultim. Comput. J. Sist. Komput.*, vol. 10, no. 2, pp. 65-74, Mar. 2018.
- [14] A. Biørn-Hansen, T. A. Majchrzak, and T. M. Grønli, "Progressive web apps: The possibleweb-native unifier for mobile development," in *WEBIST 2017 - Proceedings of the 13th International Conference on Web Information Systems and Technologies*, 2017, pp. 344-351.
- [15] C. Enyinnaya, "Demystifying The Service Worker Lifecycle," *DigitalOcean*,





2019. [Online]. Available:  
[https://www.digitalocean.com/commu  
nity/tutorials/demystifying-the-](https://www.digitalocean.com/community/tutorials/demystifying-the-)

service-worker-lifecycle. [Accessed: 07-  
Sep-2021].