Design and Build a Web-Based Village Information System for Acceleration of Village Services in Gampong Jantho Makmur

Ichsan[a,1,*], Feri Susilawati[b,2], Muhammad Haykal[c,3]

[a,,b,c] *Politeknik Aceh, Banda Aceh*
[1] *ichsan@politeknikaceh.ac.id*;* [2] *feri@politeknikaceh.ac.id;* [3] *muhamadhaykal99@gmail.com*

ARTICLE INFO	ABSTRACT
	Today, information systems are very important in village governance. Jantho Makmur is one of the villages which currently still uses the conventional system in various ways, this method is not very effective considering that the times are developing and technology is getting more advanced. To provide efficient services to the public, we need an information system that can replace the conventional system. Based on this, a web-based village information system was developed. In its creation, this system uses the PHP programming language with Laravel as the Framework and MySQL as database management. This village information system provides an online feature for making certificates and public complaints. Submissions of letters and complaints that have been validated will be sent to the WhatsApp community in PDF format using the WhatsApp API Gateway. This application also implements Ajax and Data tables technology so it is very light and efficient to use. Besides that, this application also has features for filing incoming and outgoing letters, managing population data, writing articles and photo documentation of community activities.

I. Introduction

The ever-increasing realm of information technology has helped improve many areas of public and private human life including service and administration for the community. The use of information technology in the field of government includes the use of information systems in processing information about potential village resources in the form of village information system development [1]. This service is also known as e-government which is adapted to social conditions whose ultimate goal is to improve the quality of performance of village officials, especially in the scope of community services [2]. Gampong Jantho Makmur currently requires an information system to facilitate correspondence and public complaint services in order to provide excellent service to the community. So far, this service has been carried out using the conventional system, namely by coming directly to the location.

To overcome this problem to make it easier and more efficient, a web-based Gampong Information System (SIGAM) application is needed that can be accessed directly by the public without having to be in the keuchik office. We know that the WhatsApp application plays a role as an online messenger application that can be used for various things such as personal chats, communities, online seminars, and various other fields [3]. Besides that, WhatsApp is the most popular conversation application at the moment and the average user spends 300 minutes per day on Whatsapp both doing personal and group chats [4]. Therefore, to accelerate the communication of SIGAM application services with the community, WhatsApp API Gateway is implemented. One of the applications of whatsapp gateway is a notification system where this system can send something notification to someone [5]. Thus, the SIGAM application can notify in real time the process of service development requested by the community.

The designed system will be able to handle public complaints in terms of obtaining information, complaints, managing population data, correspondence services, hamlet data information and

administration of incoming and outgoing mail data. Processing population data and presenting it in real time will run slowly. This is because large data causes the process of presenting data to be very long because all data must be displayed in one process [6]. jQuery Datatable is a plugin that can be used to solve this problem.

II. Method

In designing a web-based SIGAM application, the first step taken is the analysis stage which involves the "User requirements" process. The user requirements are the foundation for system where it define what the customer wants and define what the software system is required to do [7]. In designing a web-based SIGAM application, the first step taken is the analysis stage which involves the "User requirements" process. The user requirements are the foundation for system where it define what the customer wants and define what the software system is required to do. Thus, the analysis stage is the basis of the system design [8]. The next step is to transform the requirements specifications into the design stage. The design is specified in graphical notation include: Use Case Diagram, Activity Diagram and Entity Relation Diagram.

A. Use Case Diagram

Use case diagrams are used to show functionality that the system will provide and to show which users will communicate with the system in some way to use that functionality [9]. The actors involved are the society and village operators as admins as shown in the Use Case Diagram below:
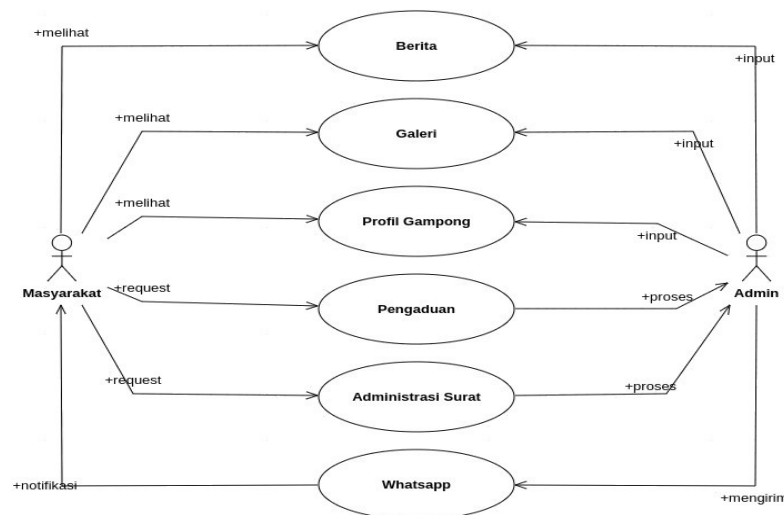

Fig 1. Use Case Diagram SIGAM

According to the diagram above, actor "masyarakat" can access the news menu, galleries, village profiles and request complaints and administration letters. The management process and system input are carried out by the admin. Complaints and letter administration will later be sent to the public via WhatsApp.

B. Activity Diagram

The next design stage is an activity diagram that describes the work flow of a system. This activity diagram aims to describe the flow of activities starting from how the process starts, the decisions that appear until the system ends [10]. The following figure shows activity diagram that modeling the flow from activity in swim lane "Admin" until to swim lane "Masyarakat".
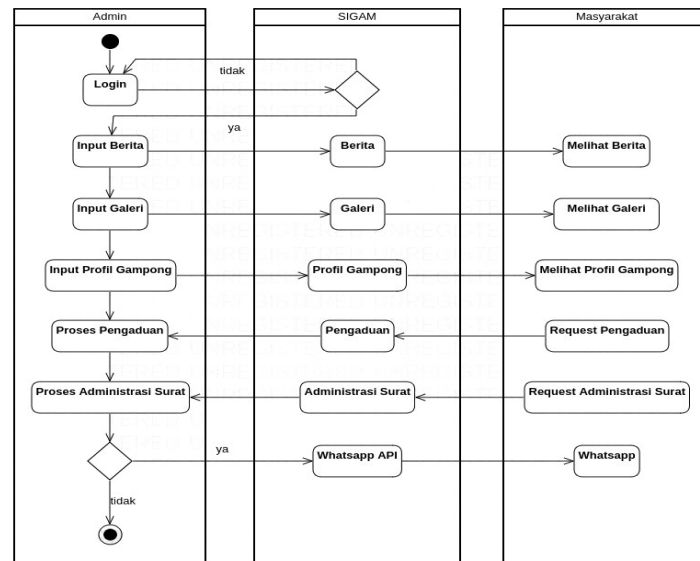
Fig 2. Activity Diagram SIGAM

After administrator successfully logged in, he can input input news, galleries village profiles, so that later they can be seen by the public. We see other activity based on diagram above, the citizen requests a certificate and other mailing services. Each requested services by citizen will be notified by using WhatsApp.

C. Logical Record Structured (LRS)

Logical Record Structured (LRS) describes the records from the tables formed from the results of the entity sets created in the Entity Relation Diagram [11]. The diagram below is the logical record structured of system proposed.
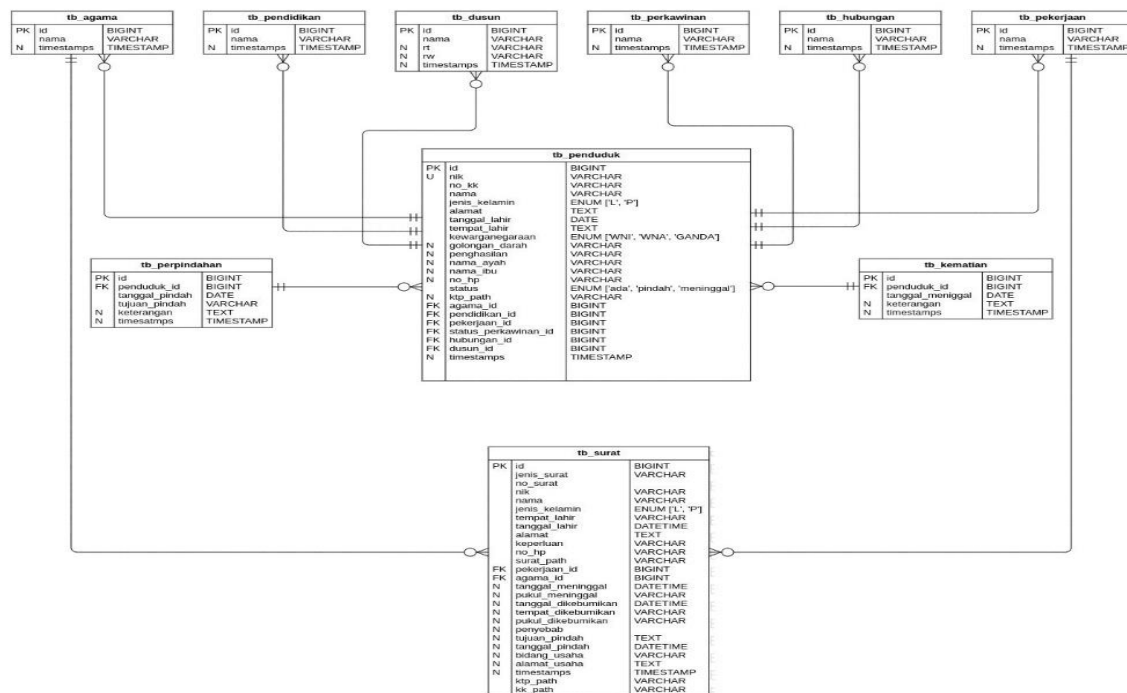

Fig 3. Logical Record Structured   SIGAM

III. Results and Discussion

The result of system divides into frontend and backend. The front-end part of a website describes how the user interacts it. The front-end part of a website describes how the user interacts it. Meanwhile back-end is cannot be accessed by end user, it only be accessed administrator or user created with privilege access. Both the frontend and backend are implemented frameworks to speed up system development. This is possible because the Framework is a framework that contains a set of functions and classes that are ready to be used for system development purposes so that the framework can facilitate the programmer's work without the need to make everything from scratch [12]. Bootstrap is the framework that used in front-end side and for backend is used Laravel where in fact it contains PHP language.

A. Front-end Displays

Here is the display result for front-end side. It contains menu: home menu, news, photo gallery, gampong (village) profile, complaints, letter administration .
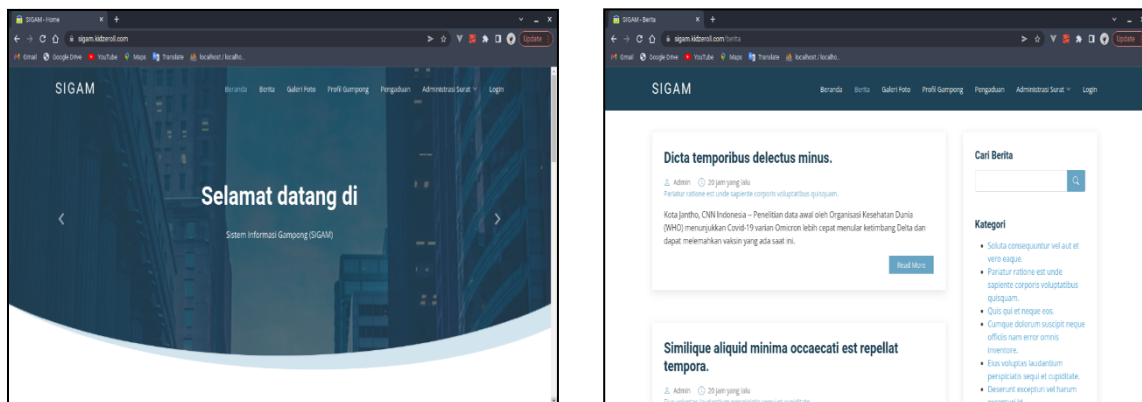

Fig 4. Home page and News page

The home page is the page that will be displayed first when the application is opened. This page also has a navigation menu to access other pages. On the news page, all the news that is input by administrator it will be displayed so that the public can see the latest information from the Gampong. On the right side, there is also a feature for searching and also displays a filter feature by category. The user (citizen) could be read information about gampong profile or see the photo gallery in the website as shown in figure.5 below.
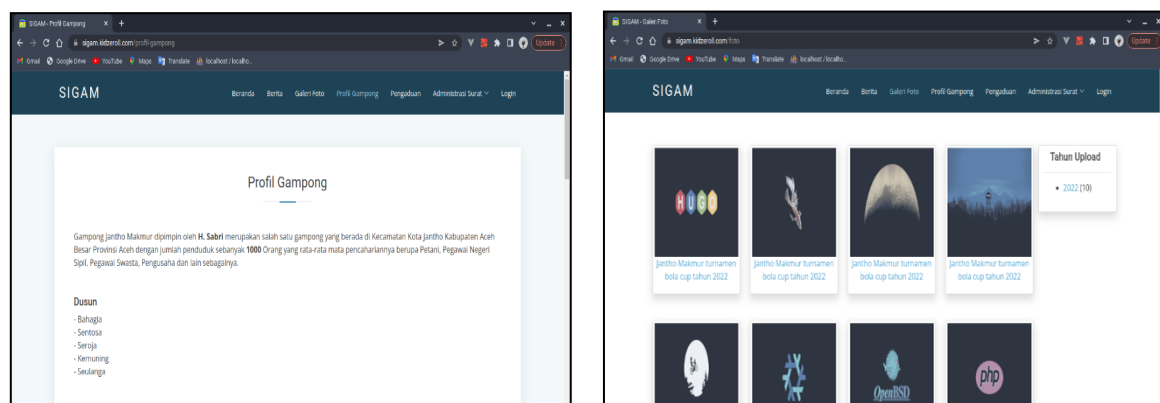

Fig 5. Gallery page and Gampong profile page

The complaints menu aims to make it easier for local people to make complaints. For every complaint made, it must include a WhatsApp number, so that it will be notified of the progress of the complaint made. There is also a photo attachment feature to complete the complaint. Meanwhile, the letter administration functions for people who want to make a certificate.
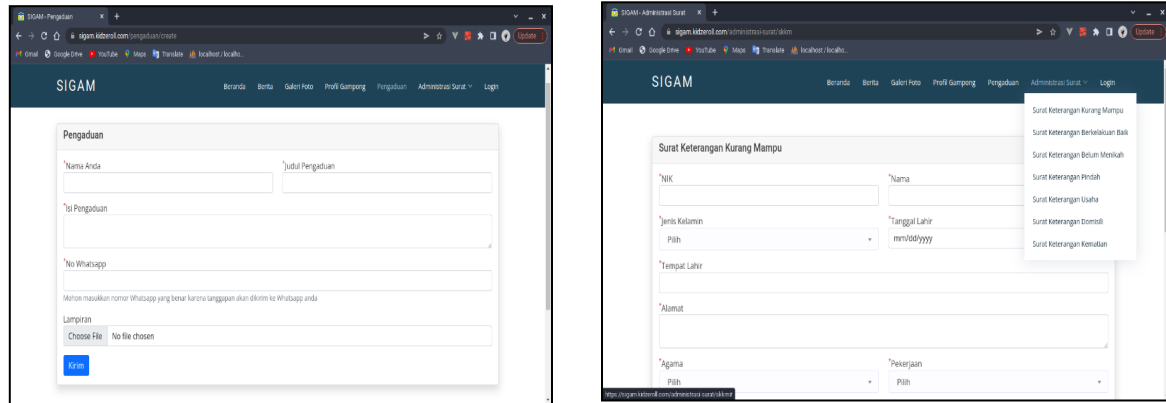

Fig 6. Complaints page and letter administration page

The certificates that can be submitted online by the public are: certificate of poverty, statement of good conduct, nonmarriage certificate, domicile change certificate, certificate of business, certificate of residence, death certificate as shown figure above.

B. Back-end Displays

The menus on the backend side are for admins or officers. The menu includes: user profile, dashboard, mail archive, photo gallery management, manage articles, manage categories, view incoming complaints, management of mail administration, resident mutation, village apparatus, resident attributes and manage users.
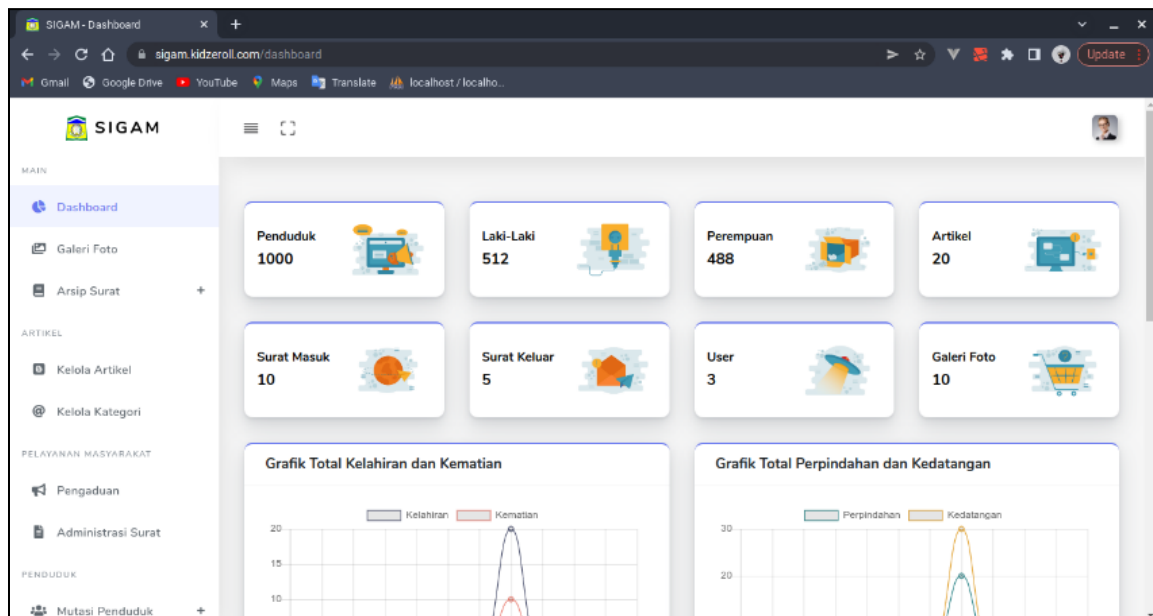

Fig 7. Dashboard page

The dashboard page displays information on the total population, total men and women, total articles, total incoming and outgoing mail, total users and total complaints. There is also a graph that displays birth and death rates per year, migration and immigrant rates per year and total administrative requests for letters per year. For people who make complaints online, it will be seen on the side of the officer as shown below:
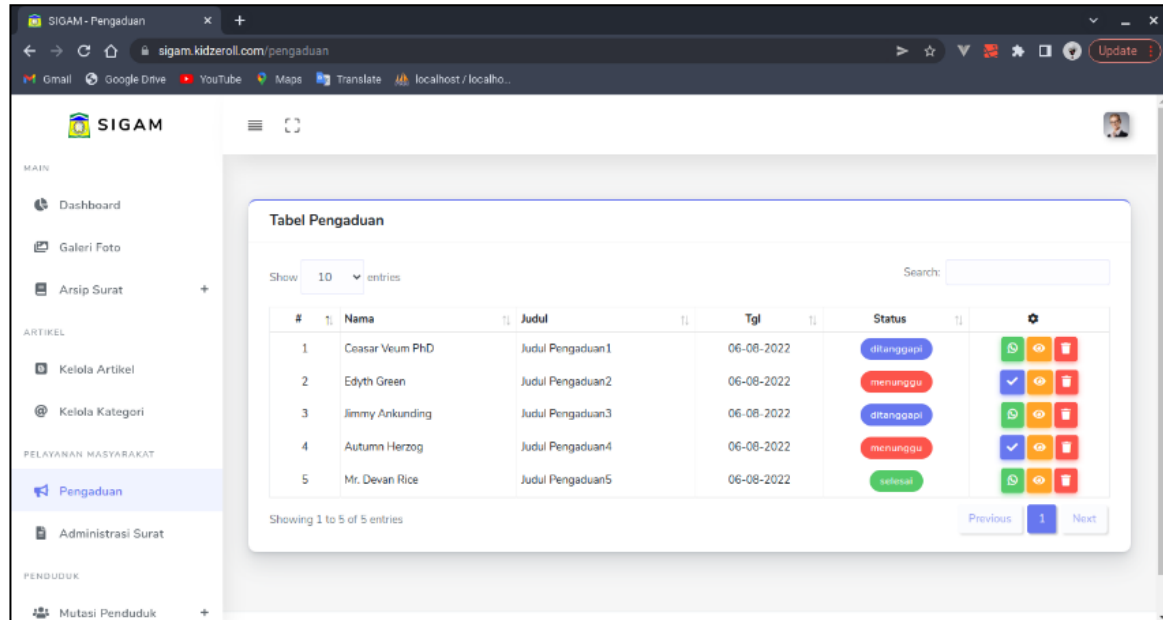

Fig 8. Complaints management page

On the side of the officer who manages the complaint, there will be three statuses: responded to, waiting and completed. Notification of complaints will be made via WhatsApp number.

IV. Conclusion

Based on the application that has been made, the following conclusions can be drawn.

1. This application can make it easier for the public to get information, complaints and the administrative process of correspondence.

2. This application can help the Gampong Government in managing population data, sharing information, correspondence services, hamlet data and incoming and outgoing mail data.

3. This application can support the Gampong Jantho Makmur government in disseminating information and administering correspondence.

4. Applications are built web-based very responsively so that they can be opened using devices such as computers, laptops and smartphones

References

[1] M. Arief Sutisna and D. Bernadisman, "Sistem Informasi Desa Berbasis Web Pada Desa Pandansari Kecamatan Paguyangan Kabupaten Brebes," vol. 5, no. 1, pp. 45–54, 2019.

Jurnal Inovasi Teknologi dan Rekayasa
Vol. 8, No. 1, January-June 2023, pp. 161-161

[2] S. Romzah Isnini, N. Hikmah, and T. Asrori, "Sistem Informasi Desa Berbasis Web Di Desa Sumbersuko," Informatika dan Teknik Elektro, vol. 1, no. 1, 2022, doi: 10.11591/eei.v9i3.xxxx..

[3] T. Siti, M. Lestari, and S. M. Jaya, "Perancangan Sistem Informasi Berbasis Web Melalui Whatsapp Gateway Studi Kasus Sekolah Luar Biasa-Bc Nurani," 2021. [Online]. Available: http://jurnal.unnur.ac.id/index.php/jurnalfiki.

[4] Ichsan, M. Fattah and D. Taufan Lessy, "Perancangan Aplikasi Analisis Data Group Whatsapp", J-Innovation, vol. 9 no. 1, 2020.

[5] S. v. Yulianto, L. D. Setia, and A. P. Atmaja, "The Use of Whatsapp Gateway for Automatic Notification System," in *Journal of Physics: Conference Series*, Mar. 2021, vol. 1845, no. 1. doi: 10.1088/1742-6596/1845/1/012014.

[6] A. Dwi Praba, M. Safitri, Faridi, "Implementasi Datatables Server-Side Untuk Mempercepat Load Halaman Pada Aplikasi E-Commerce, " JIKA(Jurnal Informatika) Universitas Muhammadiya Tangerang, pp 139-144, vol. 5, no. 2, 2021.

[7] G. O'regan, Concise Guide to Software Engineering - From Fundamentals to Application Method. Undergraduate Topics in Computer Science, Springer, 2017.

[8] Z. H. Muhamad, D. A. Abdulmonim, and B. Alathari, "An integration of uml use case diagram and activity diagram with Z language for formalization of library management system," International Journal of Electrical and Computer Engineering, vol. 9, no. 4, pp. 3069–3076, Aug. 2019, doi: 10.11591/ijece.v9i4.pp3069-3076.

[9] S. Bennett, S. McRobb and R. Farmer, Object-oriented Systems Analysis and Design Using UML. McGraw-Hill,2006.

[10] S. Sandfreni, M. B. Ulum, and A. H. Azizah, "Analisis Perancangan Sistem Informasi Pusat Studi Pada Fakultas Ilmu Komputer Universitas Esa Unggul" Sebatik, vol. 25, no. 2, pp. 345–356, Dec. 2021, doi: 10.46984/sebatik.v25i2.1587.

[11] A. Nafiudin and L. Suryadi, "Pemodelan Sistem Informasi Pengadaan Barang Pada Pt Kayreach System Dengan Berorientasi Obyek", Jurnal IDEALIS, vol.2 no.1 , pp. 9-15, Jan, 2019.

[12] W. Mualim and G. U. Putra, "Implementasi Framework MVC pada Sistem Informasi Akademik di STMIK Yadika Bangil," Jurnal SPIRIT, vol. 9, 2017.