

## Development Of Village Office Service Models To Community Based On Mobile Computing

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### Abstract

*The village as a centre for government services to the community at the grassroots level is the government's principal development priority. This research resulted in the development of an online public service administration system based on open source and utilising a cloud computing method for population administration, moving, business permits, building permits, and letter issuance with ease and efficiency. A literature review of cloud computing technology was conducted, followed by surveys and data collection of information technology infrastructure design that can be applied to online community services, analysis of survey data on real conditions in several community service centres, particularly villages in Kampar Regency, and finally the creation of online community service models from the village, such as f. Using cloud computing technologies and a modular and dynamic development design, the outcome is a web-based village community service administration application system. This application paradigm also incorporates the benefits of open-source patterned apps with flexible system designs for implementation and development, as well as mobile device support to increase community service quality. The web-based network structure allows for online communication not just between villages and communities, but also between villages and sub-districts, and can be accessed using mobile devices at any time and from any location. The application model's development is also based on functionalities of business processes and village administration processes found in Indonesian government legislation. Each model has been tried to be fitted to the community service system and is intended to be integrated to maximise efficiency.*

**Keywords** : Cloud Computing, Village, Model Development, Mobile Computing, Open Source

### 1. Introduction

Data management, information, facts, dissemination, and knowledge are all examples of how information and communication technology can help support business processes. One of the community support services provided by government agencies in districts, sub-districts, villages, hamlets, and neighbourhoods is the provision of direct public service administration applications. As mentioned in I Putu Agus Eka Pratama [06], cloud computing technology is the right solution for utilising computer technology with internet-based development, as it

allows customers to rent and use information and communication technology services with infrastructure, platform, and application management carried out by the provider, without any investment on the customer's part, resulting in I Putu Agus Eka Pratama [06]. Cloud computing is a future change that will improve the productivity of systems and user entities. Cloud computing is the next big thing in the era of virtual communication and the Internet. The transition to cloud computing technology will affect all parts of society, including businesses, governments, and individuals. From the central level to the village level, government services, in this case the adoption of mobile computing-based e-government, require proper technological support, including cloud computing-based information technology. Similarly to the development of e-desa, specifically remote administration services. As explained by Ni Ketut Bagiastuti [02], this means community service that incorporates all types of administration that use the media, where the community and village officials can communicate remotely, utilising cell phones, landlines, the internet, and other ways. The transfer of electronic administrative data from one site to another via the internet is also known as e-desa. e-desa is a tool that can assist many people with a variety of administrative issues.

To obtain village-level administrative services, the community simply relies on information technology, such as email or even video conferencing. Other advantages include the ability to avoid the accumulation of application files, timeliness, and increased efficiency because residents who require administrative services do not always have to go to the Village Office, but can simply fill out electronic forms using their mobile devices provided when requesting administrative services. In principle, with electronic-based administration, the general public can acquire administrative services, ask inquiries, and confer with the apparatus on duty remotely, which is thought to be able to help with the problem. The numerous problems and obstacles that people in Indonesia have when it comes to village administration services can actually present exciting chances to establish an e-village system that can help alleviate these issues. Uneven quantity and quality of aid offered in the form of rice or other forms of social support are instances of difficulties.

Since its inception in 2000, the Cloud Computing Research Group has focused on research in the application of information technology systems. The progressive and continual implementation of an e-village system based on communication and information technology in administrative services to the community is projected to boost community productivity and satisfaction with village authorities' administrative services. Remote administration is the use of electronic, computer, and telecommunications technology in administrative application techniques to provide administrative services between the community and the RT, the community and the RW, or the community and the Village Apparatus, with the goal of assisting the implementation of government administration and improving the quality of life. As a result, in an electronic-based administrative system, information processing, sending and receiving of current-situation information from the public is always carried out, and the results must support the implementation of government procedures. In recent years, there has been a quick development in administration and e-village to go along with the rapid improvement in supporting technology. The rapid growth of wireless mobile and satellite telecommunication systems, as well as the availability of infrastructure offered by various telecommunications network providers, has enabled the creation of a variety of village mobile services and village level administration. The creation of numerous administrative and e-village systems for many types of applications has been inspired by advancements in supporting technology, including computer hardware and software. Informatics engineering is a multidisciplinary field that uses various engineering and scientific methods in the field of e-government to process various types of government information in order to aid the implementation of administrative procedures and improve service quality by improving administrative services to the community. Electronics and microelectronics, computers, telecommunications, informatics, government science, ethnography, networking, and even economics, law, ethics, and religion all require synergistic cooperation in this multidisciplinary sector. Alphanumeric text, signals, voice

(narrator), static or dynamic visuals, and various combinations of these are examples of administrative information. With almost 74,000 villages across Indonesia, village dwellers account for 46 % of the population, or 110,000,000 persons [09]. This research is critical, and it must be applied. The following objectives (competitive advantages) guided the development of this study:

1. Developing an open source-based administrative service administration system infrastructure with an effective and efficient cloud computing strategy;
2. Developing applications that support the administrative service system that can be used in the village, such as community data recording and reporting, administrative service databases, remote business permit consultation, and learning for the community and village officials in the form of knowledge management and open source program-based repositories;
3. Obtain remote administration service models based on cloud computing, such as administrative consultation, online reporting, mobile administration, and online real-time monitoring of community circumstances.
4. Make effective and efficient village administration service recommendations based on open source online, particularly those that can be implemented to villages or citizens who are far from the Village Office.

The following are some of the advantages that can be gained from this research: gaining an overview of the village's community administration services and the possibility of developing online administrative services using a cloud computing approach; the availability of an online village administration application system that can be used in the village to improve services to the residents; and the availability of an online village administration application system that can be used in the village to improve services to the residents; The availability of standard references for government or commercial entities to use when establishing administrative service applications involving online services, electronic forms, online notifications, and trustworthy online personnel.

## **2. Literature Review**

Several research, including those conducted through mobile computing, have been conducted on cloud computing-based electronic village administration management. Information Technology services will be possible to enhance, according to Siti Maimunah and Rudianto [08], who examined Information and Communication Technology Services for Village Development. Aside from that, the community is becoming more active and contributing by sharing the information they have with the rest of the world. The further impact that can be obtained is that in addition to developing the village, it also becomes known to the world. In general, research based on village administration concludes:

1. At a global level, increasing the competitiveness of rural areas. According to this survey, the community has less understanding (39%), but this can substantially improve following the training.
2. According to S. Bayu Wahyono, implementing electronic-based village administration requires commitment from village administrators, residents, and leaders (ulama, youth, religious leaders) [08]

According to Eko Didik Widiyanto's [01] cloud computing research, cloud computing can break the chain of obstacles in accelerating the penetration of ICT infrastructure and

services for rural areas by presenting an ICT system framework that uses cloud technology to optimally utilise infrastructure and computing resources. The Community Reversed Base Station network, with its multi-hop multi-radio routing strategy, load balancing, and QoS, can be used as a reference algorithm to ensure high service availability in a wireless mesh network. The service provider interoperability framework can be utilised in a larger cloud-based system.

No one has done research on e-Village, research in the field of village administration still employs local applications, and cloud computing-based research is still normative and theoretical, and has not been tested in actual terms, according to the papers listed above. This is evident by the lack of data supplied by village officials and the community on system efficiency and efficacy, as well as acceptable levels. As a result, the Analysis and Implementation Model of the e-Village cloud system for Village Administration Management will be examined in this study. The provision of ICT services in rural communities allows them to develop and compete in the larger world, according to research conducted in Siti Maimunah and Rudianto [03]. People are becoming more involved and participating by sharing their knowledge with the rest of the globe. A further benefit is that, in addition to growing the town, it will become known around the world. There is still no standardised framework for adopting information technology in rural areas. Strong efforts are needed to promote cloud computing technology as the foundation for information technology development, as Eko Didik Widiyanto [01] explains, because cloud computing breaks the chain of hurdles in accelerating infrastructure and service penetration. ICT for rural areas by proposing a cloud-based ICT system framework that maximises the use of infrastructure and computer resources. The Community Reversed Base Station network, with its multi-hop multi-radio routing strategy, load balancing, and QoS, can be used as a reference algorithm to ensure high service availability in a wireless mesh network. The architecture for inter-provider interoperability can be used in a variety of cloud-based systems.

Agus Pramusinto and M. Syahbudin Latief [05] stated that efforts to enhance information technology in rural regions are not exclusively centred on the availability of technology, but more on the political will of community and government leaders. The bureaucracy of the village government is still extremely modest. Wedomartani Village lacks political parties capable of acting as intermediary agents in enabling the articulation of public interests, as well as controlling and supervising the operation of village administration. Religious figures, as well as members of the community, are more prominent. Political changes at the macro level might have a ripple effect in the hamlet.

The government must make significant efforts to ensure that the introduction of information technology in rural regions goes smoothly. According to S. Bayu Wahyono's research [08], the notion of managing and establishing an Information Village must take into account the assumption of bottom-up social determinism and then be executed consistently. A commitment must be made by the designated village to become an information village. Efforts to expand the capacity of the village apparatus must be made in a big way and on a regular basis. Although there is a significant increase, as stated by Hariyanto and Nuryani Tri Rahayu [04], the average result of participants' initial knowledge and ability in operating computer programmes is 13.78 (39.37 %) of the target material, while the final knowledge and ability after training is 26.44 (75.54 %) of the target material. The average participant gained 12.67 points in knowledge and ability (36.2 %).

All stakeholders should recognise that the use of information technology will increase village officials' ability to provide the best services to the community. According to Eko Didik Widiyanto [03], the cloud computing system for e-government is unique since it performs similarly to a community cloud. Community members, cloud users, and application users are the three most crucial actors. The goal of community cloud is to decentralise cloud vendor control. This study must be completed in order to supply e-Government services and applications with community-based use cases on open source cloud computing systems.

Observations of the global development of e-government show that applications for public services are more influential in developing countries, but the failure rate in terms of acceptability and sustainability is quite consistent as a result of government organisations' unwillingness to accept change and other factors that initially did not support the continuity of services. The development of a concept for an ICT-based community e-government system that emphasises the effectiveness, acceptability, and long-term viability of the system's actual implementation still requires a simple application. Conducted a few activities E-village has a wide range of applications and has grown significantly. This is evidenced by the high number of scholarly publications in cloud computing, e-village, and related topics that were presented at numerous scientific events and/or published in various magazines or proceedings.

The following are some of the activities that are presently being carried out or will be carried out: tele-administration system for business licence services; tele-administration system for certificate services; use of fingerprint biometrics in recording and identifying community data (for villages with more than 100 people per day); development of an electronic office system for villages; mobile e-village system with multiple comms; An ICT-based tele-administration system for managing unusual occurrences (outbreaks); An ICT-based tele-administration system for managing community administrative service issues.

### **3. Research Methods**

In this project, an online administration service administration system based on open source with a cloud computing approach will be built, with the goal of collecting community data, business permits, recommendations, and administrative handling linked to the village at a low cost. The following are the results of this investigation: Literature review on cloud computing technology, survey and data collection of information technology infrastructure design that can be applied to online public administration services, data analysis of survey results on real conditions in several community service centres, particularly in Tarai Bangun Village's neighbourhood and hamlet, and creation of an online community administration service The village's online community was then given an application system for administrative functions. Furthermore, at this point, a system will be designed as a module to ease the development of other applications and their implementation in various locations. The steps taken in this research are:

1. Literature review and internet searches are carried out to obtain the most up-to-date information on the development of online administrative service methods and models in villages and sub-districts;
2. Data collection and field surveys – this activity is carried out in two ways: a direct survey of villages in the Kampar Regency area and the distribution of questionnaires to the community in order to obtain data on the method of service conditions and the level of service quality of an administrative service in order to get an overview of conditions in the field;
3. Data analysis and system modelling – performed to analyse data obtained using statistical methods in order to get system modelling parameters, both structured and object-oriented;
4. Model formulation and system design are carried out in order to get functional and non-functional user needs and system requirements, as well as system design, in this case the relationship between literature studies and field circumstances will be obtained, resulting in a pretty valid model;
5. System implementation, with the goal of creating a prototype of the system model that has been created in order to construct online administrative service applications in a modular manner;

6. System testing and assessment - to validate the model, testing is done on application systems and models produced with real data.

#### **First Phase: Development of an Online Village Service Model**

An online village service model will be built at this stage, which will include the creation of a reporting database as well as the coordination of community data, population data, resource data, and village operating data in a web-based database using an open source approach. programming. This method can be used to generate periodic reports of village services, allowing village administrators or the sub-district to keep track of every village service in a hamlet or neighbourhood. The suitable information technology infrastructure approach will be designed at this stage in order to provide administrative services to the village's community online. A cloud computing technique based on open source is being used to construct the information technology strategy. It is intended that this approach may be utilised to pinpoint the existence of community unhappiness with the service since the process can be identified early, allowing any administrative service demands by the community to be handled more efficiently.

#### **Second Stage: Development of Online Financial Reporting Model**

At this stage, a model for an online financial reporting system will be built using the concepts of electronic recording and mobile computing in order to perform financial learning at all levels of society with the same amount of information at both the central and regional levels. Because the availability of management people can be represented by a system that can provide financial recording solutions for village officials, this approach can also bring convenience to villages with limited financial management capabilities. A government accounting system standard will be developed to focus the research at this level. Starting with the planning and budgeting process in finance.

#### **Third Stage: Development of an Online Administrative Consultation Model**

At this point, a system will be developed that can conduct problem consultations online or remotely, as well as one that can continuously analyse community data in real time to better understand the state of community development. Humanist concepts were applied in the development of the administrative consulting model, so that people feel at ease and can openly discuss their issues. At this point, the expected outcome is the creation of a system that uses cloud computing technologies to monitor the community online. It can also provide a welcoming environment for the community when conducting village administration.

#### **4. Results and Discussion**

The use of SaaS (Software as a Service) in the development of an open source-based village public service administration application model was chosen because this technology has service characteristics that benefit, among other things, operational cost efficiency, particularly in village apparatus services. Because everything is done online by the service provider, including the up-to-date procedure, village officials don't have to develop, purchase, manage, or protect software, hardware, or operating systems. Cost savings, because this technology requires a low budget for resources from the village, and also assists in decreasing running costs incurred by the village in order to boost the reliability and criticism of the system being developed, are some of the benefits received. Increased storage capacity; communities that use this technology can store more data than a home computer. Because it's easy to automate, a developer won't have to worry about keeping software or village administration

service applications up to date. Flexible, this technology gives greater flexibility than prior computing methods, for example in terms of virtualization, and may easily be profit-oriented and fast-changing changes. Greater mobility; villages with employees/users can get information from any location. Because the community or village is connected in one cloud, it can be readily monitored and managed, and the cloud can make management and operations easier. By shifting the focal point, villages can focus on other things rather than worrying about servers that need to be upgraded or other technological concerns. The development of service administration application models in neighbourhood and hamlet with cloud computing based on open source.

In this study, the application model is an information system application for village administration services, particularly in a broad and comprehensive scope. Web-based development using cloud computing technology and a flexible and dynamic development framework. This application architecture also combines the benefits of open-source patterned apps with a flexible system design for deployment and development needs, as well as support for mobile devices to increase public service quality. The web-based network structure enables for online communication not only within departments but also between agencies, and it can be accessed at any time, from any location, and on any device. The available communication protocols have been created with a high level of security in mind to ensure that data is kept private. Every community wants the greatest and most professional service from an expert, at an affordable price for people of all socioeconomic levels. The application model is being developed in accordance with the functionalities of business operations and village administration processes in Indonesia. This can streamline the work process and prevent overheating from features that aren't required. Each model has been tried to be fitted to the village administration service system and is intended to be integrated to maximise efficiency.

## **5. Conclusion**

When a community receives administrative services from a section in the village, such as obtaining a business licence, a certificate of domicile, or a cover letter to the Subdistrict Head Office; or based on the results of administrative activities, such as obtaining Bidikmisi scholarship assistance, data is compiled for this study. In general, the community and village authorities deal with data through applications that are available for each sector independently in the existing village administration service system. If necessary, data is still exchanged between departments via paper notes delivered from one division to another; it is intended that this will not be the case with this study. This system can handle the public service administration system's organised architecture and allow data to be transferred inside the system. Administrative components, Village Consultative Body components, Village Secretary components, Hamlet Chair components, and Technical Implementers are the primary components of this system.

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