**Analysis of the Utilization of Information and Communication Technology in the Communication and Information Services of Batu City in Supporting the Realization of Batu City as a “Smart City”**

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| **Executive Sumarry** With the use of information and communication technology brings ease of information for the community. Through an application system, various information about the city can be accessed quickly by the community and the local government through a program called Smart City. Smart City has been implemented in various cities in the world and has been proven to be able to solve various problems quickly as well. This information can also be used by local governments to create comfort, security and order and a better life. The purpose of writing this article is to obtain an overview of the use of information and communication technology at the Department of Communication and Information Technology of Batu City to realize Batu City as a Smart City. For that, it is necessary to do several things that support the use of information and communication technology so that it can realize Batu City as a smart city. However, of course there are several things that must be implemented so that the smart city program can run smoothly in Batu City. |

*Key Words: Smart City, communication technology, Batu City, Information*

## Introduction

The development of the use of information and communication technology makes smart cities a way out for various problems that must be solved by local governments, starting from clean water, garbage, education, transportation, socio-economics, disasters, health, and public service information. which is very interesting in Indonesia. Now people are increasingly understanding and realizing their rights to obtain information which is a major need, while on the other hand society has become more modern along with the times and has become modern so that people have started to use information technology to meet their needs. Currently, the new civilization of information technology has entered the era of digitalization (Patalo et al., 2021). The latest products are starting to emerge, causing the term modern society to shift and the meaning being expanded to become a digital society (Riandi et al., 2021)(Hidayatullah et al., 2018). In the past, the service used paper and other physical documents, now the service is in the form of paperless and soft-files. Not to mention when the service has to go through various procedures that are long and tend to be convoluted and take a very long time. However, currently, with the digitalization era, bureaucratic and administrative services are increasingly effective and efficient. Registration can be via the internet, just fill out the form created in an online information system or some kind of website (page) (Shodiq et al., 2018)(Stephanie et al., 2019). Data filling can be done through various information devices such as computers, mobile phones, smartphones, tablets and other cutting-edge technology products. Over time, the government began to look at the use of information technology to provide maximum and even optimal public services. The implementation of information systems and communication technology is growing very rapidly in the world of bureaucracy and companies. This finally gave rise to a big idea in the form of creating community governance, including urban communities, which tend to be more prepared than rural communities(Rakhmadani et al., n.d.) (Aristanto et al., 2020). Big ideas and creative steps also emerged with the presence of the term smart city (known as a smart city) or similar terms. Various big cities in the world and even in Indonesia have started to implement it with all its advantages and disadvantages.

In accordance with Law Number 25 of 2009 concerning Public Services, public services are activities or a series of activities in the context of fulfilling service needs for every citizen and resident of goods, services, and/or administrative services provided by public service providers. local government and community resources, infrastructure, education, health, social and economic.

The demand for the formation of a government that is clean, transparent, and able to respond to the demands of change effectively means that public services are expected to be able to meet the interests of the wider community, be reliable and trustworthy, and easily accessible interactively, which is a must. This needs to be supported by regional apparatus organizations tasked with managing e-government within the district/city Regional Government. The rapid advancement of communication and information technology and the potential for its utilization opens up opportunities for accessing, managing and utilizing large volumes of information. Utilization of communication and information technology in the process of government (e-government) will increase efficiency, effectiveness, transparency and accountability of government administration (Nugraha et al., 2017)(Hayat, 2016). Policies and regulations on e-government are growing from year to year. The central government nationally for the development of e-government, issued Presidential Regulation Number 95 of 2018 concerning the Electronic-Based Government System (SPBE). This regulation contains about how to realize clean, effective, transparent, and accountable governance as well as quality and reliable public services that require an electronic-based government system. Electronic-Based Government System abbreviated as SPBE is a government administration that utilizes information and communication technology to provide services to SPBE users. In order for the SPBE implementation to run to achieve its objectives, it is necessary to conduct periodic evaluations to find out the progress of the SPBE implementation in each Central Agency and Local Government.

**Authorization of the Batu City Communication and Information Office**

Batu Mayor Regulation Number: 111 of 2020 concerning Position, Organizational Structure, Duties and Functions and Work Procedures of the Batu City Communication and Information Technology Office, is the basis for the implementation of one of the duties and functions of the government apparatus as a public servant, in the sense of being able to provide optimal services. at the same time it can motivate and empower the community to be actively involved in development and can create new innovations in the community service process. The implementation of the authority for communication and informatics in the application of technology and communication-based public services has made digitalization necessary and increasing. In this case, the Department of communication and informatics Batu City always strives to maintain the quality of service either directly or indirectly. The Department of Communication and Information Technology as one of the regional apparatus organizations that acts as the manager of the information system of communication technology, statistics and coding, of course, must be balanced with the quality of service that is accurate, precise, efficient, effective, innovative and accountable. For the realization of the Batu City government's vision and mission, the Communications and Information Office as the supporting service in the implementation of information technology in the Batu City government through the Batu Mayor Regulation Number: 48 of 2017 concerning the Smart City Master Plan in Batu City, the Batu City Communication and Information Office coordinates approximately 100 employees from 37 regional work units within the Batu City Government who work and are tasked with implementing the use of electronic-based Government System information technology in accordance with the Batu Mayor's Decree number: 188.45/254/KEP/422.012/2021 concerning the formation of a coordination team for optimization and evaluation implementation of the Electronic-Based Government system in the Batu City Government Environment,

**Problem Statement**

The development of the concept of information communication technology through Smart City seems to be the answer to the problems faced by the city government in providing services to the community in various fields. Improving community services is one of the Smart City concepts in Batu City to serve the community, but in the application to realize Batu City as a Smart city through the use of information and communication technology there are several things that need to be prepared in advance, these things are indeed necessary to further examined and researched, the challenges and problems in realizing Batu City as a Smart city through the use of information and communication technology are part of the purpose of writing this scientific paper. The implementation of the application of the use of Information and Communication Technology in realizing the city as a Smart city between one region and another has many differences because it is adjusted to the potential and conditions in the region. This study analyzes the use of information and communication technology at the Batu City Communication and Information Office in supporting the realization of Batu City as a "Smart City".

**Objectives of the Study**

This research uses a population of employees within the Batu City Government as managers and or those responsible for managing the utilization of Information and Communication Technology in each regional work unit (SKPD) in the Batu City Government as many as 100 people, in accordance with the Batu Mayor Regulation. Number 42 of 2021 concerning the implementation of an Electronic-Based Government System (SPBE) within the Batu City Government. And the Decree of the Mayor of Batu Number: 188.45/254/KEP/422.012/2021 concerning the formation of a coordination team for the optimization and evaluation of the implementation of the Electronic-Based Government system within the Batu City Government. In this study using independent variables whose existence is not influenced by other variables, namely: 1. Superstructure, 2. Human Resources, 3. ICT Infrastructure. with the number of respondents from the results of the questionnaire that was distributed as many as 84 employees.

**Research Methodology**

Data collection techniques to obtain the data needed in the study are as follows. Questionnaire/question: is a data collection technique that is carried out by giving a set of questions or written statements to respondents to answer. Questionnaires will be given directly to respondents, via online with google form facilities, it is hoped that respondents can answer all questions on the questionnaire freely without any personal connection so that the results of the answers to the questionnaire are valid and independent.

The quantitative analysis technique in this study is basically a process of changing research data in tabulated form, so that it is easy to understand and interpret and implement. This study uses quantitative research. The location of the research was carried out at the Department of Communication and Information of Batu City. The population in this study is the State Civil Apparatus who manages the management information system and or the application of government internal services or ICT-based public services with a total of 100 people using a non-probability sampling method with accidental sampling, so as to obtain a sample of 84 samples. The data collection method used is a questionnaire with a Likert scale of 1 to 5. The data analysis method used in this study uses multiple regression analysis with path testing which is used to analyze the indirect effect on research variables.

**Literature Review**

According to (Hayat, 2016) argues that regulations and cooperation are needed that are directly related to Smart cities as a form of public service for the community, the need for regulations is a superstructure, with regulations that support the use of information and communication technology in realizing Smart City will have a positive impact on support According to (Sah & Suhartono, 2018) explained that previous research has explained some of the readiness of the local government and also the community to be strong on public services. in building a Smart City, starting from the readiness of policies that are contained in the Regional Medium Term Program Plan (RPJMD) so that planning becomes focused.

According to (Hayat, 2016) in Smart City defined by some experts as a concept of city processing using information and communication technology and human resources that are able to improve the community's economy, the need for improvement and development of human resources in the era of digitalization, especially in the implementation of public services in Batu City Government requires State Civil Apparatus (ASN) which is capable and has management information system competence in supporting the use of information and communication technology, management information system is a system consisting of the collection, processing and storage, maintenance and acquisition of interrelated data in the context of providing and utilizing communication information technology.

Nam and Pardo define Smart City in (Damanik & Purwaningsih, 2018) explaining the implementation of Smart City consists of several elements, namely information and communication technology in the form of infrastructure, in Presidential Regulation Number 95 of 2018 concerning Electronic-Based Government Systems (SPBE), article 1 paragraph 15. Regional Government Electronic-Based Government System Infrastructure (SPBE) consists of Intra Local Government Networks, and Local Government Service Liaison Systems. Intra Regional Government Agencies Network in question is an intra network organized by the Regional Government to connect between network nodes within the Regional Government. Meanwhile, the Regional Government Service Liaison System in question is a Service Liaison System organized by the Regional Government to exchange SPBE Services within the Regional Government. The use of Regional Government Electronic-Based Government System Infrastructure (SPBE) aims to improve efficiency, security, and ease of integration in order to meet the needs of Electronic-Based Government System Infrastructure (SPBE) for internal Regional Governments, Electronic-Based Government System Infrastructure (SPBE) is all hardware , software, and facilities that are the main support for running systems, applications, data communication, data processing and storage, integration/connection devices, and other electronic devices.

Utilization of appropriate information technology and supported by the expertise of individuals who operate it can improve the performance of the company as well as the performance of the individual concerned. Based on the description above, each government in particular the Batu city government continuously organizes and improves the performance of agencies by improving a service system based on transparency and accountability in order to achieve the goals and ideals of good governance (Good Governance).

**Conceptual Framework**

As referred to in Figure 1 below, the conceptual framework of this research refers to 3 mediating variables that influence the realization of Batu City as a Smart City by using the use of information and communication technology.

Superstructure

- Regulation

- Decree

Smart City

- Service procedure

- Service clarity

- Service speed

Use of ICT

- Governance

- Innovative Service

Human Resources

- Have IT skills

- HR Capability Improvement

Infrastruktur

* Jaringan Internet
* Data Center

## Figure 1 Conceptual Framework

## Results and Discussion

Public service is a form of service activity carried out by central and regional government agencies in an effort to meet the needs of the community in accordance with applicable laws and regulations. In accordance with the mandate of Law no. 9 of 2015 concerning the Second Amendment to Law No. 23 of 2014 concerning Regional Government, the level of service in the local area must really be felt by the community and continue to improve the quality of service. This has the consequence that Human Resources / Apparatus which is an inseparable part of a very broad and complex public service system which must also be improved and strive to increase competence.

Based on the validity test, as many as 30 statement items get a positive correlation coefficient value greater than r table, so it can be concluded that the statement items are valid and can be used as instruments in measuring research variables. Reliability testing in this study was carried out using the SPSS 23 application, the results obtained, it was concluded that each variable in this study had a reliability coefficient value greater than 0.60, so it can be seen that all instruments of each variable are reliable or appropriate for research data collection.

Overall, the average superstructure variable (X1) is 4.74. This shows that respondents Strongly Agree on the superstructure formed by regulations and decrees. The main thing that drives the superstructure is the use of smart city communication information technology systems that require planning and study.

In the Human Resources variable (X2) the average is 4.49. This shows that respondents agree about Human Resources which is formed by having IT capabilities and increasing HR capabilities. The main thing that encourages human resources is the development of smart city communication information technology systems that require reliable human resources.

Then the average infrastructure variable (X3) is 4.67. This shows that the respondents strongly agree about the infrastructure formed by the internet network and data center. The main thing that drives Human Resources is in the development of Information Technology System Utilization, smart city communication requires a stable internet network.

While the average variable Information Technology and Communication System (Z) is 4.34. This shows that respondents agree about the Information Technology and Communication System formed by Governance and Innovative Services. The main thing that encourages Human Resources is the use of smart city communication information technology systems to help speed up the completion of employee tasks and help complete work in accordance with work targets.

For the Smart City variable average (Y) is 4.36. This shows that respondents agree about the Smart City which is formed by service procedures, service clarity and service speed. The main thing that drives Smart City is the Smart City Program which includes Smart Government, Smart Society, Smart Branding, Smart Economy, Smart Environment and Smart Living.

**The influence of the independent variable and the dependent variable**

**Table 1**

Sub-Structural Regression Analysis Test Results 1

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable**  | **Standardized Coefficients** | **t value** | **Sig.** |
| Superstructure | -0,068 | -0,555 | 0,581 |
| HR | -0,406 | -3,065 | 0,71 |
| Infrastructure | 0,357 | 2,682 | 0,009 |
| Dependent variable = Use of ICTR = 0,408R square (R2) = 0,167 |

 Source: Primary data processed, 2021

Table 1 shows the results of sub-structural regression testing 1 which examines the effect of the independent variables Suprastruktutr (X1), Human Resources (X2), and Infrastructure (X3) on the dependent variable of ICT Utilization (Z). The magnitude of the coefficient of determination is shown by the summary model, where the R² value is 0.167 or 16.7% which shows the large contribution of the influence of the Suprastruktutr (X1), Human Resources (X2), and Infrastructure (X3) variables on the ICT utilization variable, while the rest is 83.3% is the magnitude of the influence of other variables not examined in this study.

**Tabel 2**

Sub-Structural Regression Analysis Test Results 2

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable**  | **Standardized Coefficients** | **t value** | **Sig.** |
| Superstructure | 0,128 | 1,164 | 0,249 |
| HR | 0,257 | 2,019 | 0,048 |
| Infrastructure | 0,413 | 3,277 | 0,002 |
| Use of ICT | 0,16 | 2,373 | 0,20 |
| Dependent variable = Smart CityR = 0,589R square (R2) = 0,347 |

 Sumber: Data primer diolah, 2021

Furthermore, sub-structural regression test 2, examines the effect of the independent variables Suprastruktutr (X1), Human Resources (X2), and Infrastructure (X3) on the dependent variable Smart City (Y) through the intervening variable ICT Utilization (Y). The test results can be seen in table 2. Based on the results of the sub-structural regression test 2, the magnitude of the coefficient of determination is shown by the summary model, where the R² value of 0.347 or 34.7% indicates the large contribution of the influence of the Supratruktutr variable (X1), Human Resources ( X2), and Infrastructure (X3) on Smart City, while the remaining 65.3% represents the magnitude of the influence of other variables not examined in this study.

## Conclusions

Based on the discussion of the results of data analysis, in this study the following conclusions can be drawn:

1. The implementation of the use of information and communication technology requires the existence of a planned superstructure and local government policies.
2. Reliable and professional human resources are needed to support the implementation of the use of information and communication technology.
3. In the implementation of the use of information and communication technology, it is necessary to support the facilities and infrastructure of Information and communication technology infrastructure
4. The existence of a superstructure policy supports the implementation of the Smart city program in urban areas.
5. Human resources who are reliable and have IT will strongly support the smart city program
6. Information and communication technology infrastructure supports the implementation of Smart City
7. Utilization of information and communication technology supports the realization of Smart City
8. The superstructure supports the implementation of the smart city program by implementing the use of information and communication technology
9. Competent human resources in the use of information and communication technology to support the implementation of Smart City.
10. By using information technology infrastructure to support the realization of a Smart city by implementing optimal and integrated use of information and communication technology.

**Recommendation**

P The government of Batu City needs to have a Road Map or plan map in the development of information and communication technology through regulatory policies that accommodate the use of information technology systems in accordance with the direction of the long and medium term development plan as a Smart City so that development goals in providing community services can be better good for the welfare of the community, especially the people of Batu City. Education and Human Resource Development in managing and developing information and communication technology within the Batu City Government is carried out in stages, professionally and planned in accordance with the main tasks and functions of each person in charge of IT management in each regional work unit. This needs to be done because at this time and in the future, data, progress and challenges in the use of information and communication technology are increasingly modern, sophisticated and developing, especially in facing the Metaverse (digital world/virtual world) and the challenges of the 5G network going forward. as well as the quality of the information provided on the website or the existing information system (Rachmawati et al., 2020)(Hidayatullah, 2020)(Hardianti et al., 2021), Furthermore, the development of existing systems and networks is also considered in making investments (Hardianti et al., 2021)(Windhyastiti et al., 2020)(Windhyastiti, Hidayatullah, & Khouroh, 2019)(Windhyastiti, Hidayatullah, Khouroh, et al., 2019). The development of a city into a smart city also needs to be considered as a whole city planning including the existing network system and transport system (Windhyastiti, Hidayatullah, & Khouroh, 2019) (Syarif Hidayatullah, Setiyorini, Irany Windhyastiti, 2020). And last but not least, it is necessary to pay attention to the ease of use and ease of use of the smart city system created (Rachmawati, 2020) (Pratama, 2021) by paying attention to Batu City as a Tourist Destination City (Ningtiyas et al., 2021)(Priambudi et al., 2021) (Pratama, 2021).

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