

# Realization of Information and Communication Technology (Ict) Innovation in Several Aceh Districts (Study Lhokseumawe City)

Muhammad Fazil, Zulham and Subhani

**Abstract:** This study (2018) attempts to analyse the Realization of Information and Communication Technology (ICT) innovation in several Aceh districts. The study was conducted in Lhokseumawe City. In order to maintain the government's commitment as well as the support of implementation of information and communication technology innovations, this must be followed by a good facilities and infrastructure in the field of technology. The use of technology systems has facilitated decision making and supervision of development in every government program activity. Information and communication technology (ICT) innovation can play a large role in supporting good governance through transparency and community participation. Therefore, to address the problem of village development acceleration in Lhokseumawe City, thus this research is aimed to describe and analyze the realization and innovation of information and communication technology in the government in penetrating access to the internet. This research was employed descriptive qualitative approach using purposive sampling technique in selecting the participants. Data was collected through observation, interview and relevant documents review. Data analysis was undergone through three steps using interactive methods as follow: 1). Data reduction, 2). Display, and 3). Conclusion.

**Index terms:** Innovation, Information and communication technology, Development, Aceh

## I. INTRODUCTION

The evolution of technology always occurs as a goal as the results of efforts applied to obtain benefits from its technology. People who can master technology will become a technology beneficiary, otherwise, they will stand beyond of the technology beneficiaries. In its development, a person who is capable of producing technological innovations and at the same time utilizing technology has a greater opportunity to manage resources for progress. Technology was introduced to facilitate human activities, which later developed as component of life. This convenience and purpose of technology are the core of the empowerment movement in the acceleration of development by government organizations.[1] The current global communication era has made information technology devices such as the internet no longer known as odd object. The ability to utilize information technology and

communicate with various applications can be used to facilitate and simplify all human activities, such as the use of e-mail, social networking and even teleconferences and so on. In fact, government institutions have implemented several programs such as: e-government, e-learning, e-commerce, but the content is very dependent on the penetration access to the internet and new innovations in software and content.

The technology of information and communication can play as a major role in supporting good governance through transparency and public participation. The enactment of constitution 2008, number 14 concerning on Public Information Openness has provided firmness on this issue. It depends on the government manager and the active role of the community so that good governance can be realized and this is not just a myth. Furthermore, access to better information and the delivery of information to hiterogene citizens with various backgrounds and characteristics requires innovation that is in tandem with community development. For the government, information and communication technology is to open up vast possibilities in increasing dialogue between the government and the government with the communities it serves and forming a more transparent government. And ultimately information and communication technology offer the potential for broader community participation[2].

Innovation is often defined as everything new or renewal .[3] Some others argue that innovation is an idea, practice, or object that is considered new by humans or other adoption units. In the concept of diffusion theory, an innovation diffuses throughout society in predictable patterns. Some groups of people will soon adopt an innovation after they hear the innovation. While some other community groups need more time to adopt these innovations[4].

To see obviously the reality on using information and communication technology at villages in Lhokseumawe, this paper tries to investigate on how new realization and innovation in the use of information technology and communication in accelerating the development of villages in Lhokseumawe city. This study certainly aims to find out the

factors of innovation in the use of information and communication technology within the Aceh government.

Revised Manuscript Received on December 22, 2018.

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Published By:  
Blue Eyes Intelligence Engineering  
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Specifically describe and analyze the realization of new innovations in the use of information and communication

technology in the acceleration of the development of villages in the Lhokseumawe city.

## II. INFORMATION AND COMMUNICATION TECHNOLOGY IN LHOKSEUMAWE GOVERNMENT.

The autonomy of Aceh which is realized by ratifying Constitution 18/2001 concerning Regional Government and the Birth of Constitution Number 11 of 2006 concerning Aceh Governance Constitution (UUPA), is a step taken by the government in order to realize responsive and aspirational governance to meet the needs of the community. Special Autonomy is seen as part of democratization which emphasizes the principles of democracy, community participation, equity and justice, and considers the potential and diversity of the region as a manifestation of the welfare of the Acehnese people[15].

Aceh with a dignified, prosperous, justice and independent vision based on Aceh UUPA as a form of the Helsinki MoU has 23 districts / cities with their respective characteristics. One of them is the government of Lhokseumawe which is on the eastern path of Sumatra, the edge of the Malacca Strait. The city of Lhokseumawe which has coordinates: 5 ° 7'0 " LU 97 ° 2'0 " BT, total 181 km<sup>2</sup> (70 miles<sup>2</sup>), total population 179,807, density 950 / km<sup>2</sup> (2,400 / sq mi) and with 68 villages spread in four sub-districts, are city governments that participate in the application of information and communication technology in supporting organizational administration to be tidier and more cost-effective.

From the characteristics of information and communication technology application in Lhokseumawe government, it is still incompetence, few are open to accessing information, even though it starts to be integrated with its operators, but it is still of little value to the community. Some findings are that information systems are not yet integrated, commitments have not been accompanied by policies in the form of regional regulations (regulation) as part of an order to integrate information and communication data from all internal government work units, and the grand design has not been portrayed in the development of Information and Communication Technology in Lhokseumawe government[5].

From the characteristic description and commitment of the government, it can be seen that the ICT is a bit more starting to lead to the support of accelerated development in Lhokseumawe. Ideally, the development of an organization will be accompanied by technological developments in order to carry out its duties and realize its vision and mission. Of course, the application of information and communication technology as one of the medias in managing information and policies in achieving that vision. Organizations are made to handle routine tasks on a large scale through a rule about human relations. Structure is needed to accommodate the results of innovation; besides, it can be a link between one

innovation and another innovation so that it can be interrelated which at the end is integrated into a systemic[6],[7].

## III. LITERATURE REVIEW

Information and Communication Technology (ICT) as part of science and technology in general is all technological uses related to retrieval, acquisition (processing), storage, distribution, and presentation of information (State Ministry of Research and Technology. 2006: 6). Furthermore, in its development, information and communication technology has presented a flow of communication processes in organizational and management changes both in government and in business institutions. Naisbitt & Aburdene (1985) see various changes in the paradigm of communication flow as a result of changes in the global environment. Meijer (2008) sees the occurrence of various changes in the paradigm of communication flow that have implications for organizational and management paradigm changes both in structure, strategy and culture[13],[14].

Communication has a very important role in the innovation process. Hadiat (2002) revealed the communication function in a national innovation system, where a system cannot be separated from aspects related to patterns of interaction, relationship and linkage, where communication becomes the main process instrument. Brown and Eisenhardt (1995) also state that structured communication is a decisive prerequisite in internal and external communication for the success of an innovation process. Michael Gibbons, et.al (1997)[9] states that there are two important elements in communication systems in the innovation process, namely mobility and selectivity. Furthermore, Ulijn (2000) adds the third element, reflexivity, namely the need to pay attention to the competencies of the communication process actors in the innovation, from the context of its reflection to culture[19].

Innovation is an idea, practice, or object that is considered new by humans or other adoption units [1]. Thompson and Eveland in Plomp & Ely. (1996) [17], define innovation as technology, which is a design that is used for instrumental actions in order to reduce irregularities in a causal relationship in achieving a certain goal. So, innovation can be seen as an effort to achieve certain goals. Information and communication technology innovation in the internet itself is the role of communication widely in changing society through the dissemination of ideas and new things that constantly go beyond the boundaries of place, time and field. An innovation usually consists of two components, namely the components of ideas and components of objects. The diffusion process of innovation in the organization itself is slightly different from the diffusion process of innovation at the individual level. Innovation in an organization represents a change in the classical model that no longer focuses on individuals, but on the organization itself [8].



Diffusion Innovation consists of two equivalent words, "diffusion" and "innovation". Rogers (1995) states that diffusion is a process in which an innovation is communicated through certain channels within a certain period of time among members of a social system through certain channels overtime among the members of a social system. The nature of the diffusion of innovation reflects the characteristics of innovation itself, where diffusion characteristics are one that determines the speed of an innovation process. Rogers (1983) suggests there are 5 characteristics of innovation, namely: relative advantages, relative compatibility, complexity or complexity (complexity), triability or triability (observable) and observability. Based on the 5 characteristics of the innovation category proposed by Rogers (1983), in this study we will look at the 3 initial characteristics that have been implemented so far by the Lhokseumawe City government. The application of information and communication technology needs to be studied more deeply so that information and communication technology innovations that are carried out have an impact on all substructure below it and the community[6],[7].

#### **IV. RESEARCH DESIGN**

Qualitative descriptive design was applied in this study. Creswel (1994) states that qualitative is descriptive in nature, it describes the symptoms or the symptoms relationships found in observation in the field. The method / type of this research was intended to obtain an overview of information and communication technology realization in Lhokseumawe city. Primary data obtained based on the results of observations and structured interviews, where the researchers determine their own informants taken based on purposive sampling technique which includes informants in the government of Lhokseumawe, elements of society and villagers in the Lhokseumawe.

21 people were considered as informants in using information and communication technology, 5 informants from Lhokseumawe government, 8 informants from vilages and 8 from community. Secondary data taken from books, papers, research journals, and other written materials related to 3 characteristics of 5 characteristics in the diffusion of innovations provided by Rogers (1983). Furthermore, interactive model technique was used in analyzing the data. This model consists of three main things, namely data reduction, data presentation, and conclusion (Miles and Huberman in Idrus. 2009).

#### **V. REALIZATION AND NEW INNOVATIONS IN THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN THE ACCELERATION OF VILLAGE DEVELOPMENT IN THE LHOKSEUMAWE CITY AREA**

The realization and the development of information and communication technology in Lhokseumawe city government, from data obtained through observation and interviews, the government has presented several means of improving information technology (IT). This is certainly in an

effort to narrow the digital divide between regions and improve infrastructure management and strengthening institutions and human resources in all elements of governance in Lhokseumawe city.

In Lhokseumawe city, information and communication is the responsibility of the Regional Information and Communication Service (DISKOMINFO), in accordance with Lhokseumawe City *Qanun* (Law) number 9 of 2016 concerning the Formation and Composition of Regional Devices in Lhokseumawe City. Until the beginning

of 2017, there was no good grand design for the development of information and communication technology in the city of Lhokseumawe. Nevertheless, budgeting and planning for the improvement of information systems and information and communication technology are commitments that must be carried out. This is because DISKOMINFO itself is only present in the organizational structure of regional government work units in 2016 and has only just begun to develop work programs for 2017.

In 2017, several facilities continue to be strived to improve the city's information system, both with the realization of equipment and improving applications that are considered good and accelerating the process of information and communication systems within the government. The realization presented by the city government of Lhokseumawe in 2017, is like a representative data center under DISKOMINFO management that can reach all systems of government and service later. This realization began to integrate all information and communication networks in the city of Lhokseumawe.

The next realization is the application and server inventory that has been carried out by each City Government Work Unit (SKPK) in Lhokseumawe City. There are 14 SKPKs that report the realization of 17 applications from 33 SKPK in Lhokseumawe City government. Furthermore, from the application data reported by 14 SKPK in Lhokseumawe city to DISKOMINFO, it was found that 14 applications could be automatically integrated while 3 applications had to be manual. Of the 17 applications reported by 14 SKPK in the city of Lhokseumawe, it was found that 11 applications were closed and not accessible to the public, only internal applications and 6 applications were open to the public. Furthermore, some information and communication technology equipment found such as computers, laptops, printers, wifi and smartphones are used to support administration such as in community services, correspondence between agencies.

Information and communication technology encourage changes in overall organizational management and changes the organization's approach in dealing with the community or citizens. (Abidin, 2016; 149) As a consequence, these changes require the presence of innovation in managing the public services provided. In fact, information and communication technology-based services make it easier for people to access various types of services, both





with computers, cellular networks and mobile telephones

(Rust and Kannan, 2002; 121). Some changes in administrative management, finance and public services and the development planning system in Lhokseumawe city government, presented several innovations in the form of integrated and fast services, namely through:

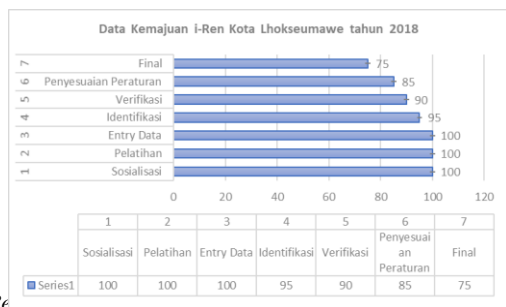
#### A. e-Planning Application

The realization in innovations of information and communication technology for the acceleration of development in Lhokseumawe in 2018 has undergone several improvements. Like the online system integration implemented by the Regional Planning Agency (Bappeda) in Lhokseumawe from the adoption of Banda Aceh city administration, e-Planning. This concept has been planned from the 2017 budget, where information system funds are allocated which includes the provision of servers, experts and operator training.

This application program is used to integrate the development process into a synergy between the vision and mission of the government, work unit agencies and villages in Lhokseumawe city. The process in this program starts from development planning, namely the proposed development plan from the village-gampong, the City Government Work Unit (SKPK) and other agency agencies entered online and arranged in one document, e-Musrenbang. E-Musrenbang is a website-based planning information system built to harmonize the aspirations and ideas between the community, community, village / village, sub-district, SKPK, DPRK with the government in the preparation of effective and efficient regional Government development plans.

The application of i-Ren certainly must go through several processes for success in its application. From some progressing processes, the percentage can be seen until 2018, that is, the 100% socialization process, meaning that the socialization phase will start using i-Ren in the formulation of the 2019 budget has been known by all the elements involved. After socialization, of course training must be done on how to input or fill in the correct data so that it can run well. From the progress data, the current training has also reached 100%. The meaning of the government through the Regional Planning Agency has trained operators of inputting data from i-Ren users or stakeholders in the government area of Lhokseumawe city consisting of 68 villages, 4 sub-districts, 33 Municipal Government Work Units, 3 Coordination Fields and 5 Supervisors. Here is a graph of i-Ren's progress in 2018.

Graph 1: Progress of i-Ren in Lhokseumawe City 2018



Source: website of the Bappeda Lhokseumawe City 2018

#### B. Application of the Village Financial Governance System

In Indonesia, Law No. 6 of 2014 became the main legal protection in the framework of the new era village development. This law also mandates several factors of Information and Communication Technology (ICT) in village development. This is most obvious is Article 86 concerning the Village Information System, and several articles related to the application of Appropriate Technology. Village development programs need to be initiated by sharing components within the government. Especially in the application of ICT in all areas of village governance properly and correctly. This is a counter-active response to the flow of globalization and technology in various fields of government, because inevitably, the village government will soon be exposed to technology.

In the Lhokseumawe city currently in technology empowerment at the villages in its territory, the legal protection is also contained in Lhokseumawe City Qanun number 1 of 2015 about village, which is contained in article 29 paragraph 2 in the obligation of the village government and in article 30 paragraph 2 in the duties and authority of the Keuchik in the village. The implementation of information and communication technology at the village level can be seen from several procurement of information technology supporting facilities such as running the Gampong administration and financial management information system, which implements administrative and financial data and village archives through SIMAKDES applications which have been online and servers during 2016 and 2017 and the data server at the Community Empowerment Service of Lhokseumawe City.

However, at the suggestion of the central government, in 2018 the Lhokseumawe Village Community Empowerment Agency made the latest application change, SisKeuDes, namely the Village Financial Management System which was implemented in June 2015. Furthermore, village financial applications that have passed the Quality Assurance (QA) stage has been carried out by the Deputy for Supervision of Regional Financial Management to be applied throughout Indonesia. This village financial application uses the Microsoft Access database so that it is more portable and easier to apply by even ordinary application users. Technically, village financial transactions are included in small scale groups, so that they are more easily handled with this database access.

The application of the Village Financial System application in village at the Lhokseumawe city area which is conducted by the Village



Community Empowerment Service starting in 2018 is certainly very helpful in monitoring financial and development systems, where the application of

the village financial system accommodates all village financial regulations and designed in an integrated manner from planning to reporting. In general, the output of the application of the village financial system is planning documents, budgeting documents, administration documents and village and district / city level reports. Although in the initial stages of implementation there were several obstacles in running this application, this was more due to the fact that this application was not online. So charging is still manual and requires time. The filling process like this, then has an obstacle in monitoring the process of inputting data by the village at the same time.

Application changes that implemented by the government through the ministries and government agencies are so that village government officials get convenience when conducting financial management processes, and accountability can be accounted for. Furthermore, it is expected to be able to realize Village Finance management that is transparent, accountable and participatory. Other values also for village government apparatus can increase scientific capacity as a technical implementing element of village financial management, which helps the Keuchik as the holder of the village financial management power.

C. Website

Website is an information system site page that can be accessed quickly. This website is based on the development of information and communication technology. From the development of information technology, created an interconnected network between computers.

Networks known as the internet are constantly becoming electronic messages, including e-mail, file transmission, and two-way communication between individuals or computers.

Government organizations based on Information Technology have become very important in the twenty-first century in this third milineum era. Information Technology is a technology used to process data, including processing, obtaining, compiling, storing, manipulating data in various ways to produce quality information, that is relevant, accurate and timely information (Setiyadi, nn). The strength of a government organization will depend on the information or knowledge it has, information will become the adhesive of the elements in an organization.

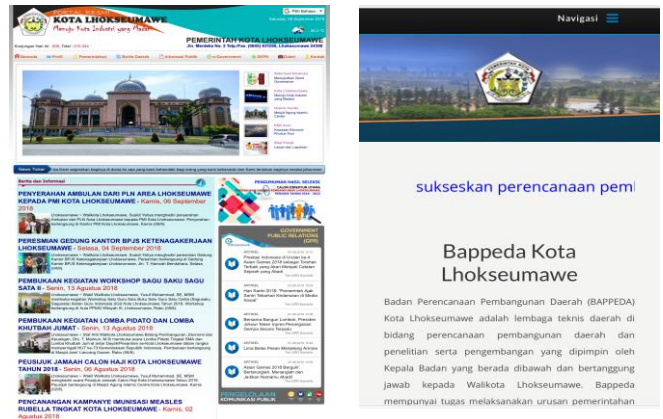
The development of information technology is so rapid that requires all parties, individuals, organizations, private sector and government to be able to present the latest information through digital media, including the city government of Lhokseumawe as the leading government institution that provides services to the public. The city government is required to be able to provide information and services based online, especially through media websites. There are several websites that address the development process in the city government of Lhokseumawe City including

the Lhokseumawekota.go.id website, the Bappedalhokseumawe.go.id website and the Teumpok Teungoh Gampong website.

The Lhokseumawekota.go.id website is a web that is presented by the City Government under the Government's Public Relations section with the tagged Official Portal of the Lhokseumawe City, Towards a Civilized Industrial City. In addition to displaying hyperlinked images, this website also reports news and information about city development, vision, government mission, up to date government regulations and activity agenda in Lhokseumawe city government. This website also presents e-government that contains applications that are available in several regional work unit in the Lhokseumawe City. This is in order to lead a clean and accountable government in the development process.

Furthermore, in order to support good development planning, the Regional Development Planning Agency (BAPPEDA) of Lhokseumawe City also presents its own website. This is done to inform the news and the development process as well as regional programs that are considered to support economic growth and support public services and rapid and equitable development. This website also presents information systems and applications in e-Planning that are being applied to the city development planning process. Services that use information and communication technology are increasingly developing, not only including the use of electronic networks, the internet, or information and communication technology infrastructure, but also include the types and forms of public services and the environment and the service process it self. (Abidin, 2016; 149). Some websites of the Lhokseumawe City government in supporting regional development information.

Figure 1: Website of the Lhokseumawe City government



Source : Google search, accessed on August 20, 2018

Furthermore, in the internal information and communication technology of several offices in the government and village in the communication process, more use of social networking media

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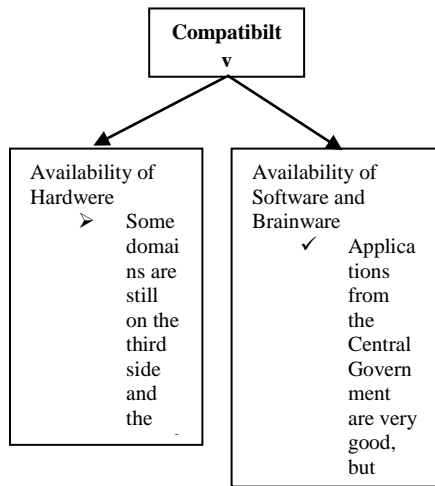
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that is WhatsApp (WA). Where this application has facilitated the delivery of information and communication in a non-formal manner in the internal and external of office management and the relationship between the city government and the village government.

Innovation is an idea, creation or object that is considered new by someone. In the process of adopting an innovation, the community has considerations whether the innovation will be adopted or not. This consideration is based on the character of an innovation. In the stage of compatibility and the stage of complexity settlement in the innovation the use of information and communication technology in the Lhokseumawe city government was obtained in 2018 the characteristics of internal government implementation (figure 2).

Figure 2: Stage of Compatibility



In the solving complexity, it is known that information and communication technology innovation that is felt difficult and complicated, is caused the understanding of the strengthening information and communication technology in less detailed information obtained by adopters (figure 3).

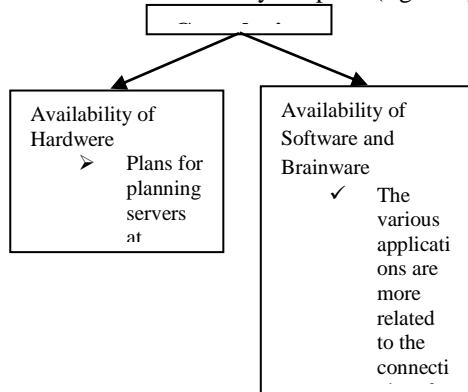
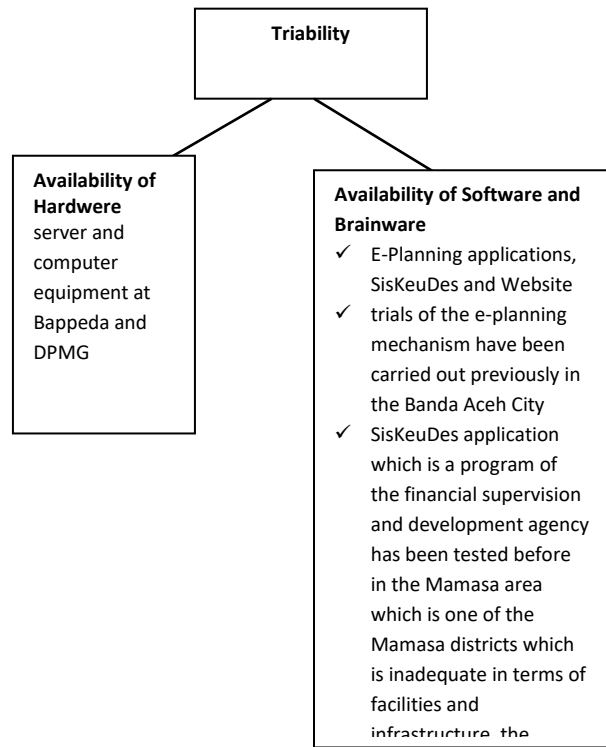


Figure 3: Stage of Complexity

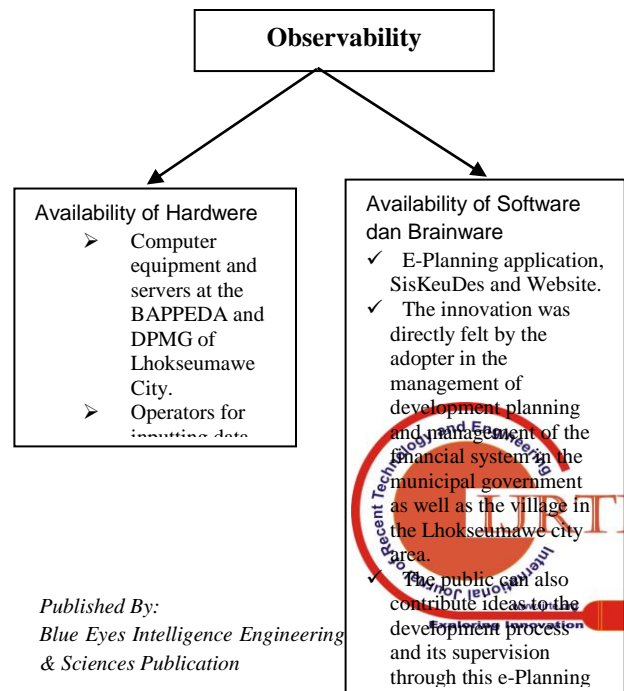
Furthermore, in the trial process (Triability), several applications that are currently implemented such as e-Planning, SisKeuDes applications and website creation are now being implemented, and have been tested on a limited scale to find out whether this application is appropriate or still needs improvement (figure 4).

Figure 4: Triability



The last condition that will be passed is when the application of information and communication technology innovation can be seen (Observability) that the innovation has been felt directly by the adopter (figure 5).

Figure 5: Observability



Other things can also be felt personally by the community how this application will be open to the public. The public will also be able to contribute ideas to the development process and its supervision through this e-Planning application. An innovation that results can be observed directly, then the possibility of the innovation being adopted will be greater. But if the innovation is unclear in results and difficult to observe, then the prospective adopter will think first to accept the innovations introduced to him.

## VI. CONCLUSION

The realization and innovation from the application of information and communication technology in the city administration has led to the accelerated process of development with online applications involving 68 villages, 33 City Government Work Units (SKPK), 5 Fields of Coordination and 3 Fields of Supervision. From the realization of information and communication technology, the city of Lhokseumawe has implemented the e-Planning application, which is an online application of development planning to the establishment of a development budget plan that passes through various elements of stake holders involved in the development process. The application is good and will soon be open to the public to be involved in the input process and also supervision of development. Furthermore in the field of village financial management there is an application of the Village Financial System which is implemented by the central BPKP. Although some other old applications are still used by several SKPK in Lhokseumawe City such as: some information systems have not been integrated with each other, that is the application of staffing and still part of the input data with hardcopy documents. Furthermore, there are several systems with the same functions as SIMBADA and SIMDA for asset data and SIMDA and SALID SIM. While the Lhokseumawekota.go.id website is currently starting to update.

## REFERENCES

1. Akhmad Sudrajat. 2008. *Difusi Inovasi. Let's Talk About Educational*. File : //F:IDifusi Inovasi.
2. Alam Setiadi, 2008. *Difusi Inovasi*. File ://F:1 Difusi Inovasi Alam Setiadi 08's Weblog. html.
3. Badan Pengawasan Keuangan dan Pembangunan. 2016. *Buku Kerja-Aplikasi sistem Keuangan Desa (SISKEUDES)*. Bogor; Pusat Pendidikan dan Pelatihan Pengawasan BPKP.
4. Brown, S.L., and Eisenhardt, K.M. 1995. Product Development: Past Research, Present Findings, and Future Directions. *Academy of Management Review*, 20, 343-3
5. Creswell, John W. 1994. *Research design: qualitative & quantitative approaches*. London: Sage Publications
6. Everett M Rogers, 1983. *Diffusi of Innovations, third edition*. New York: The Free Press.
7. Everett M Rogers. 1995. *Diffusion of Innovations.Fourth Edition*. New York: The Free Press.
8. Fazil, Muhammad. 2018. Characteristic of Information and Communication Technology (ICT) Innovation and Its Application. (A Descriptive Study in Lhokseumawe City), *Malaysian Journal of Communication*. Vol 34, No 3 (2018). 379-391.
9. Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P., & Trow, M. 1994. *The New Production of Knowledge*. London: Sage Publications.
10. Hadiat. 2002. *Komersialisasi Produk Litbang, Sebuah Proses Pembelajaran*. Jakarta: Lembaga Pengembangan Inovasi (LPI).
11. Hanafi, Abdillah. 1987. *Memasyarakatkan Ide-Ide Baru*. Surabaya: Penerbit Usaha Nasional
12. Idrus, Muhammad, 2009, *Metode Penelitian Ilmu Sosial Pendekatan Kualitatif dan kuantitatif*, Yogyakarta, Penerbit Erlangga.
13. John Naisbitt and Patricia Aburdene. 1983. *Re-Inventing the Corporation: Transforming Your Job and Your Company for the New Information Society*. New York: Warner Books.
14. Meijer, A. J. 2008. E-mail in government: Not post-bureaucratic but late-bureaucratic organizations. *Government Information Quarterly*, 25:429-447.
15. Muklir, Aiyub, dan Akmal. 2006. *Demokratisasi Pemerintahan Gampong dalam Mendukung Otonomi Khusus Provinsi Nanggroe Aceh Darussalam. (Studi Kelembagaan Birokrasi Pemerintah Gampong Di Kec. Baktya Timur . Kab. Aceh Utara)*. Lhokseumawe: UNIMAL
16. Pala, Rukman. 2009. Teknologi Informasi dan Komunikasi dan Perannya dalam Proses Perubahan Sosial. Dlm: *Majalah Publik Ilmiah Semi Populer.Ed.Desember 2009*. Makassar: Balai Besar Pengkajian dan Pengembangan Komunikasi dan informatika.
17. Plomp, Tjeerd & Donald P. Ely. (1996). *International Encyclopedia of Educational Technology*. Cambridge, UK: Elsevier Science Ltd.
18. R.T Rust and P.K. Kannan. 2002. *E-Service: New Directions in Theory an Practice*. New York: M.E Sharpe.
19. Ulijn, J. 2000. Innovation and International Business Communication: Can European Research Help to Increase the Validity and Reliability for Our Business and Teaching Practice. *Journal of Business Communication* 37(2), 173-187 (2000). <https://www.researchgate.net/publication>
20. Zainal Abidin. Yusuf. M.M, Dr. 2016. *Komunikasi Pemerintahan. Filosofi, konsep dan aplikasi*. Bandung: Pustaka setia. Web. <http://www.bappedalhhokseumawe.web.id/profil-kota-lhhokseumawe> (diakses 10 Maret 2015)