

## Utilizing Information Technology in Supporting Education Transformation in Indonesia

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### Abstract

Utilization of Information and Communication Technology (ICT) in the field of academic administration services in tertiary institutions is a necessity, not just for the dignity or the latest higher education management lifestyle but in its implementation, there are many obstacles that tertiary institutions encounter in implementing ICT in this institutional management process. both technical and non-technical factors. Strengthening governance, accountability and public image of higher education forums will lead to increased performance of higher education institutions and product quality. This policy will be meaningful if it is associated with efforts to provide quality educational institution management services, quality teaching programs, quality educational facilities, and quality education staff as well.

### INTRODUCTION

Utilization of Information and Communication Technology (ICT) in the field of academic administration services in tertiary institutions is a necessity, not just for the dignity or the latest higher education management lifestyle but in its implementation, there are many obstacles that tertiary institutions encounter in implementing ICT in this institutional management process. both technical and non-technical factors. Strengthening governance, accountability and public image of higher education forums will lead to increased performance of higher education institutions and product quality. This policy will be meaningful if it is associated with efforts to provide quality educational institution management services, quality teaching programs, quality educational facilities, and quality education staff as well.

Related to the current context, the use of ICT in the application of policies to strengthen governance, accountability, and the public image of higher education forums, the implementation of information systems in higher education management services can certainly be said to be very appropriate. The effectiveness of ICT implementation in the management of tertiary institutions needs to receive more attention considering its relatively central role in the process of making managerial decisions or other decisions to increase the effectiveness of this

implementation, which will obviously affect the effectiveness of achieving educational implementation carried out by the forum, then the factors which influence the effectiveness of ICT implementation in institutional management, particularly in terms of academic administration, need further investigation. This is intended so that the academic management process in tertiary institutions becomes more effective and efficient so that it can support the achievement of high performance from the forum.

In simple terms, information systems can be said to be the knowledge needed to manage information so that the information can be searched simply and thoroughly. The contents of this knowledge can be in the form of techniques and mechanisms for storing information efficiently and effectively. Information can be said to be data that has been processed in the news, which can be stored in the form of text, sound, images, dead images or live images so that the final information can be in the form of science and knowledge itself.

If the volume of the information is small, of course there is no need for complicated techniques or mechanisms to store it, but if the information is in large volume, certain techniques and procedures are needed to store it so that it is easy to find stored information. The computer has the capacity to store large volumes of information beforehand personal computers can only store simple text

and graphics, but nowadays computers can store information in various forms, for example in the form of audio, visual and audio visual.

Information Technology, which became popular in the late 70s, was sent to answer challenges in the past, the term computer technology or electronic data processing or EDP (Electronic Data Processing) from the Oxford dictionary (1995), information technology is the study or the use of electrical equipment, especially computers to store, analyze, and distribute any information, including words, numbers, and images according to Alter (1992), information technology includes hardware and software to carry out one or more data processing tasks such as capturing, transmitting, storing, parse, manipulate, or display data.

Meanwhile, according to Martin (1999), news technology is not only limited to personal computer technology used to process and store information, but also includes communication technology to send news. More generally, Lucas (2000) states that information technology is any form of technology applied to process and transmit information in electronic form, such as microcomputers, mainframe computers, barcode readers, transaction processing software applications for worksheets, communications equipment and networks.

Everett M Rogers in his book *Communication Technology* (1986), argues that information technology means hardware that is organizational and transmits social values using which individuals or audiences collect, process and exchange information with other individuals or audiences. Haag and Keen (1996) on Abdul Kadir and Terra Ch Triwahyuni (2003:2) that suggesting gossip technology means a set of senses that help you work with gossip and perform tasks related to gossip processing. William and Sawyer (2003) quoted by Abdul Kadir and Terra Ch Triwahyuni (2003:2) in their book *Introduction to Information Technology* argue that news technology means technology that combines computing (personal computers) using high-speed communication lines that carry data, sound, and video from The

definition above illustrates that information technology, both implicitly and explicitly, is not only in the form of computer technology, but also telecommunications technology, in other words, what is called information technology, is a combination of personal computer technology and telecommunications technology.

An explanation of the 2 technologies that underlie information technology is as follows. First, personal computer technology means technology related to computers, including tools that work with personal computers such as printers, fingerprint readers, and even computer CD-ROMs, which are multipurpose machines that can be program controlled, used for cooking. Data into program information is a collection of instructions used to control a personal computer so that it can perform actions according to what the manufacturer wants.

Data is raw material for computers which can be in the form of numbers or images, while information is a form of data that has been processed so that it can become useful material for making decisions. Second, telecommunications technology is technology that works with long distance communication. Included in this technology category are telephone, radio, and television, as long as the statement above can be concluded that gossip technology does not have to be specifically in the form of a personal computer connected to another computer via telecommunications equipment, but can also be in the form of other electronic devices that work together. with the presentation of issues (eg television). The most important thing is that the technology issues involve personal computers and telecommunications.

In the National Education System Law no. 20 of 2003, it has been realized that the acceptance of the recognition that it is not the time to rely on conventional approaches alone in organizing the national education system. Not only in closed spaces using books and educators who, whenever encountered, are asked to help indicate where gossip students can fulfill their desire to be smarter, smarter, better and more prosperous in their lives. However, the transformation of learning

messages by utilizing advances in educational technology will presumably motivate students more.

The gossip system revolution has changed the way humans work, starting from how to communicate, how to produce, how to coordinate, how to think, to how to learn and teach. In fact, advances in information systems have blurred the boundaries of organizations, markets and people, shortened the boundaries of space and time and simplified complexity.

The role of information systems in human activities at this time is indeed very large. The information system has become the primary facilitator for various activities, including in the field of education, including in the form of multimedia computing technology which is a new era in modern global issues that has developed rapidly in recent years. The target of information system development means the formation of an integrated information system supported by reliable SIM software to support all university functions both for information management services and transaction processing. In other words, the aim of the information system transformation activity is to improve USU's information system to support decision-making processes, teaching and learning processes, and provide public information to stakeholders in order to improve performance and productivity. The academic management system aims to reduce the complexity of academic process management and operations, increase the efficiency of human, financial and time resources, and to improve the quality of information products.

Digital transformation is a multifaceted transformation of a business or organization, starting from human resources, processes, strategy and structure, to adopting technology to improve performance (Royyana, 2018). Digital transformation is the profound transformation of business and organizational activities, processes, capabilities and models, maximizing change and opportunity in the technology mix, and making social impact a strategic and prioritized method to accelerate. With digital transformation comes the need for infrastructure and technology. It is clear that technology-enhanced learning methods

require the right IT infrastructure and platform for their implementation.

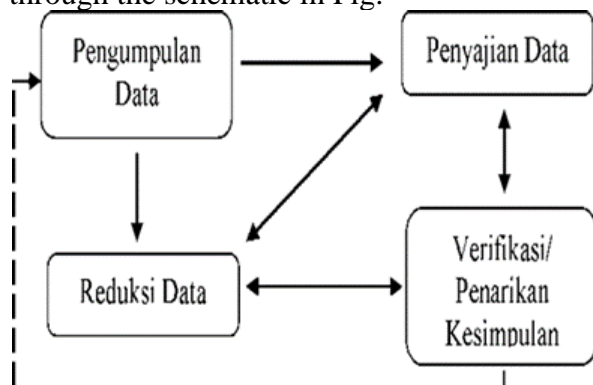
Digital transformation can be understood as the process of using digital technology that is already available. Such as Cloud integrated with virtualization technology, mobile computers, and other media (Loonam et al., 2018). Furthermore, digital transformation is "a process that aims to improve entities by bringing about significant changes in their characteristics through a combination of information, computing, communication and connectivity technologies" (Vial, 2021). Digital transformation is an area of opportunity as well as a challenge in the world of education. Rapidly developing technological advances have made digital transformation enter the realm of everyday human life. Like it or not, humans must continue to follow the flow of technological progress and continue to adapt. One of them is in the world of education. This digital transformation is gradually changing old processes and study habits into new ones that are more effective and efficient in the educational process. The presence of new technology that marks the start of this digital transformation will bring a breath of fresh air to human life. There is no denying progress in the increasingly sophisticated digital world, including the world of education.

This digital transformation will have a major impact on the world of education. Digital transformation makes learning activities easier and more flexible to implement. In addition, the demands of digital transformation demand that the world of education always adapt to technological developments to improve the quality of education, especially adjustments to the use of technology in education, especially in the learning process. This digital transformation will also help change human behavior as educators and students track, study, document, and continue on-demand class materials. Seeing the current reality, it cannot be denied that digital transformation presents opportunities and challenges for the world of education.

**RESEARCH METHODS**

The method used in this study is a qualitative method. The object of this research is the Management of Facilities and Infrastructure Inventory in SMK Competency. Informants in this study consisted of deputy principals for the Facilities and Infrastructure section and the Head of the Expertise Program. Observation can be interpreted as a data collection method that observes and records certain behaviors or situations without direct interaction with the subject. Observations can be made in various contexts, such as in the field, in the laboratory, or via video. Interview is a data collection method that involves direct interaction between the researcher and the subject. In the interview, the researcher asked questions and the subject gave answers orally. Interviews can be conducted face-to-face or via telephone or video (Ascarya, 2023).

The next stage after the data collection stage is the data reduction stage. At this stage, data that is considered irrelevant and has no correlation to the research will be reduced. Some of the data that is reduced at this stage is data on teacher status and rank and data on infrastructure that is not related to the research being conducted. The next stage after data reduction is data presentation. The data presented must be data that has the possibility of research analysis. In this study, the data presented is data in the form of a number of matrices regarding Utilizing Information Technology in Supporting Education Transformation in Indonesia. The last stage is the stage of drawing conclusions which are then used in the discussion in this study. The process of data analysis can be described through the schematic in Fig.



**Gambar. Skema Proses Analisis**

**a. Data Collection Techniques**

Interview and Observation

**b. Documentation**

Review documents supporting research sourced from archives.

**c. Data source**

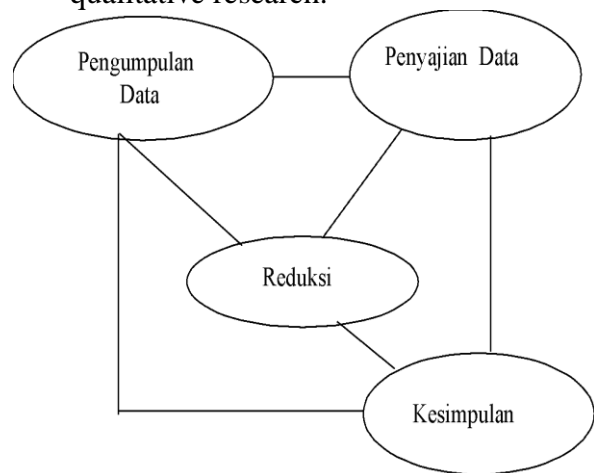
Deputy Head of Facilities & Infrastructure and Head of Expertise Program.

**d. Research sites**

The place or location of this research is archipelago data.

**e. The analytical procedure used**

The data analysis procedure used is according to Miles and Huberman (2014), which is most often used to present data in qualitative research.



**RESULTS AND DISCUSSION**

Information and Communication Technology has influenced and shaped people's lives both economically, socially and culturally. Information has become a major force in the joints of life and the current source of cultural power pivots on knowledge. Therefore, the development of a knowledge society as part of ICT development needs to be continued so that ICT can be able to encourage economic growth and increase the competitiveness of a nation. With the rapid development of technology in the midst of various development problems in the ICT sector such as access coverage, affordability, ability to adopt innovation, and also the impact of its use on the socio-cultural aspects of society and vice versa, it is important to know these changes which have implications for various things. that arise in society both from the positive and negative sides.

This needs to be anticipated with policies that support both from an

economic/business perspective if it relates to people's welfare. But also, anticipation of negative things that circulate quickly in society such as fake news (hoaxes), eroding sense of nationalism, erosion of ethics and manners as well as other religious and cultural aspects due to the use of this ICT. The development of technology towards all-digital is currently growing rapidly. In the digital era, humans generally have a new lifestyle that cannot be separated from all-electronic devices. Technology is a tool that can help almost all human needs. Technology has been used by humans to make it easier to do anything in terms of tasks and work. This important role of technology has brought human civilization into the digital 4.0 era. Technology and digitalization not only provide various conveniences but also bring changes in the order of our lives. Millions of people in the world are now very dependent on digital technology, including Indonesia. Of course, not only as a support, now technology has even become the main Platform in the Business, Economy, Infrastructure and Transportation sectors. Through the analysis of this report, it is hoped that the general public will be able to know and understand the use of ICT and its impact on socio-cultural aspects and the policies adopted. Thus, all levels of society, especially stakeholders, are expected to actively participate in the development of ICT in Indonesia and anticipate both positive and negative impacts. With the support and participation of various parties, we hope that the use of ICT can add value to our lives together.

The growth of ICT has changed the pattern of interaction and communication of society towards digital. One of the changes that have occurred as a result of the massive use of ICT is a change in the socio-cultural aspects of urban and rural communities. There are three things from the socio-cultural aspect that are strongly influenced by the use of ICT, namely social welfare, social bonding and social culture. The government in this case must look at the competitiveness potential of its people in related fields because this will encourage the independence of the Indonesian nation. These things become a challenge that has a positive

impact on Indonesia because the advancement of Information and Communication Technology does not only narrate about today or later but for tomorrow and forever. This analysis aims to get an overview of the use of ICT and its implications for the socio-cultural aspects of Indonesian society with quantitative research methods and data collection using questionnaires. In utilizing this ICT, the characteristics of the district/city area are divided into three criteria proportionally namely low, medium and high and are categorized based on the availability of electricity, signals and BTS. Individual ownership of computers is one of the biggest factors in the use of technology. The analytical survey shows that there is a high gap between respondents who have computers and those who do not have computers.

There are 92.03% who do not have a computer and 7.97% who have a computer. Based on an analysis of the use of ICT in 2017, the island of Java was in the top rank with 11.04%, followed by the island of Kalimantan 8.01%, the island of Sumatra 7.63%, the island of Sulawesi 5.98%, Bali and Nusa Tenggara 5.78%, Maluku and Papua 4.13%. The use of ICT and socio-cultural aspects of society can increase knowledge about education, healthy living, healthy settlements and cultural activities. However, ICT can also make it easier for the general public to access negative content. Public perception of the ease of accessing negative content based on the type of work, namely:

1. Private Employees 59.55%
2. Entrepreneur/Freelance 62.57%
3. Student 63.64%
4. Civil Servant/Army/Police 59.92%
5. Housewives 65.35%
6. Retirement 58.78%
7. Traders/Laborers/Workers 54.87%
8. Non-Civil Servant /Honorary Village Devices 62.13%
9. Not Working 66.67%
10. Farmers 57.89%
11. Fishermen 69.23%

In the socio-cultural aspects of society seen from the side of social welfare, social bonds, and values (social culture). As many as 60% of respondents stated that the use of ICT

encourages productivity at work, obtain business opportunities and obtain various information both in rural and urban areas, but 30% of respondents in the fishermen category oppose this statement. The majority of Civil Servant/Army/Police, private employees, non PNS/honorary employees spend more than IDR 100,000 per month in both rural and urban areas. The average respondent stated that it was easier for them to access various negative information such as gambling, pornography, radicalism and terrorism. Even though the education level of the respondents was low, the urban community's knowledge of negative content was quite adequate, reaching 62.5% with the majority having a tendency not to search for information about what they got.

## CONCLUSION

Digital transformation in the world of education in turbulent times also creates opportunities and challenges that are recognized by society, especially educators and students. There are many factors that influence the opportunities and challenges of digital transformation in education. One of them is geography which makes it difficult for some people in Indonesia to keep up with the ongoing digital transformation.

Optimizing the proportion of digital transformation opportunities in education, society and government need to work together to create a smart and qualified workforce as well as the right technology and facilities. Because if only one party participates, there will only be challenges that have an impact on limitations in their education.

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