

Technology of Telecommunication System in Management Information Systems

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Abstract— *The development of information and communication technology has been so fast that it affects every aspect of human life. It was realized that technology products had become a daily necessity. Television, telephone, fax, cellular phone (mobile) users and now the internet is not a strange and new thing, especially in big cities. Now it is necessary to look at how the use of the internet, whether it is going according to its original purpose, is utilized to facilitate human life, because in addition to contributing to the improvement of human welfare, progress and civilization, it is also an effective suggestion for committing crime. The progress of information and communication technology currently has the influence on the development of data transmission with the development of information technology allows the process of delivering information that is both fast and relevant.*

Index Terms—*Technology, Information Systems, Telecommunication System, Management Information Systems.*

I. INTRODUCTION

The development of technology from time to time is getting faster, even almost every year there are always emerging technological innovations that are increasingly sophisticated and efficient.

Advances in communication technology now have an influence on the development of data processing. Data from one place can be sent to another place by telecommunications equipment. Information systems now utilize telecommunications equipment to form a computer network. In telecommunications systems, the term network is used when at least two or more devices are connected to one another. An airline ticket booking system is an example of a computer network, with tens, hundreds or even thousands of terminals that can be connected to a computer center that stores all flight schedule and seating information for each flight number.

This computer network allows not only the same organization to be connected to one another for data transmission but also with other organizations and even directly with suppliers and consumers. In a strategic way, because companies can be closer to suppliers and customers. Many of these efforts have begun to be carried out, for example, the ATM network, which is pulling the bank's information system out toward customers using telecommunications technology. Another example is the virtual bookstore through the internet network. Therefore the use of telecommunications technology into computer system technology is important.

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Transmission of data by electronic transmission is usually called the term Data Communication (Data Communication). Data needs to be sent from one place to another for several reasons, including:

1. Transactions often occur at a place that is different from the place of processing of the data or the place where the data will be stored, so the data needs to be sent to the processing site and sent again to the place that requires information from the data.
 2. Sometimes it's more efficient or cheaper to send data via communication lines, more so if the data has been organized through a computer, compared to the usual delivery method.
 3. An organization that has several data processing sites, data from a busy processing place can divide its tasks by sending data to other processing sites that are less busy.
 4. Expensive tools, such as graphic printer tools for high-speed printers, are simply placed in one location and used together - thus saving costs.
- Components of a Telecommunications System

Telecommunication system is to communicate data or information from one location to another. To communicate data or information from one place to another, five components must be available, namely as follows.

1. Sending computer or terminal to send data or information.
2. Transmission media (transmission media) or a communication channel or channel that will carry data sent from the data source to the recipient.
3. Communication processor (communication processor) is a supporting device for data transmission such as modems, multiplexers, front and processor switching and others.
4. Communication software that controls the data communication process.
5. Computer or data receiver.

One of them is in the field of telecommunications, where every individual must need the name of communication so that triggers the discoveries. Unlike before, where communication with people abroad is still difficult, different from now, international communication is not a difficult problem even though not 100% of people use this technology.

II. LITERATURE REVIEW

2.1 Telecommunications System Technology

The following study studies related to telecommunications system technology:

- a. Rifki Hartikas N and Umami Azizah S (2014) in their journal entitled "Telecommunications Systems Using Microwaves" states that microwave communication systems aim to send information from one place to another without interference and the results can be received clearly. Wave Transmission Process, the use of microwaves consists of Telecommunications, radar, Microwave Radio besides the communication system in Indonesia, especially using the system to the end user in every cellular system still using microwaves. Where to communicate to end users GSM operators in Indonesia use frequencies around 800 MHz, 900MHz and 1800MHz.
- b. Muh Sulaiman et al (2014) wrote a journal entitled "Fiber Optic Data Communication System for Satellite Data" argues that fiber optic technology is a technology with data speeds that have greater capacity and longer distances at lower prices. In Satellite, fiber optic technology is very useful for various aspects of sending data information, ranging from the local scope to intercontinental telecommunications. This technology uses light to transmit data. Light that carries data information can be guided through optical fibers based on physical phenomena called total internal reflection. In terms of light as electromagnetic waves, information is carried as a collection of guided electromagnetic waves called

modes.

c. B. Destyningtias (2013) in his journal entitled "HANDOFF Technology in CDMA Telecommunications Systems" states that the development of cellular communication CDMA systems appears as an alternative that offers various advantages of the previous system, including a higher capacity to handle more simultaneous calls per channel compared to the existing system. The CDMA system provides soft hand-off from one base-station to another as a roaming mobile phone from cell to cell.

III. DISCUSSION

Telecommunication system technology development

Antonio Meucci invented the telephone. After that the development of telecommunications is very fast compared to other systems. And since the discovery of transistors, integrated circuits (IC), processor systems, and storage systems have become even more unpredictable.

Before the invention of the telephone. Humans use drums for long distance communication, for example, in the days of the war, someone hit the drums to signal attack. In the 5th century BC, humans used fire. Then again using smoke in the 2nd century BC and water in the 4th century BC by using Morse code to convey the message.

Telecommunications system technology is anything that is made to make it easier to send data or information from an individual to another individual or a place to another place.

based on the above understanding in order to be able to carry out the process. Then it takes the main components that are connected. The following components:

- a. Message or data to be sent.
- b. Sending device (sender) that functions to send data or as a Source (source).
- c. Transmission media (medium) or the path or channel that will distribute data.
- d. Receiver device (receiver).
- e. Protocol or rules/standards agreed in the process of sending, channeling, and receiving.

The following additional explanation regarding the transmission media:

- a. Form of transmission media

Some transmission media can be used as transmission canals, which can be in the form of cables, electromagnetic radiation and satellites. If the data source and receiver are not too far away and in a local area, cables can be used as the transmission media. The cable can be in the form of an ordinary copper cable, which is used on telephone or coaxial cable or fiber optical cable.

Examples of transmission media speeds can be seen in the table as follows:

Table 3.1: Speed / Transmission Media

Transmission Media	Speed
Twisted pair	14,4 Kb/s – 100 Mb/s
Coaxial Cable	10 Mb/s – 550 Mb/s
Radio Frequensi wireless	2 Mb/s – 8 Mb/s
LAN	4 Mb/s – 16 Mb/s
Infrared Light wireless	64 kb/s – 50 Mb/s

LAN	64 kb/s – 50 Mb/s
Microwave	100 Mb/s – 10 Gb/s
Satelit	
Fiber Optic Cable	

If the data source and receiver of the data are far enough away the communication channel can be in the form of electromagnetic radiation emitted through the open air, which can be in the form of micro bubbles or microwaves or satellite systems. Microwave is a high frequency radio wave that is emitted from one station to another station. The nature of transmitting from a microwave is a line of sight, that is, it should not be hindered because of tall buildings, hills or tall mountains. Usually microwaves are used for short distances only. For long distances, a relay station 30 - 50 km must be used. station relay is needed, because to strengthen the signal received from the relay station, before and forward it to the next relay station. Because the microwave must not be obstructed, long distances can be used by satellite. The satellite functions as a relay station located in outer space. A satellite that is placed in a fixed orbit as far as 30,320 km above the earth's surface can reach about 40% of the entire surface of the earth. 2 satellites can reach more than half of the earth's surface and 3 satellites can reach the entire surface of the earth.

In addition, there are also data transmission support devices such as modems, multi-plexers, front end processors, switches, and others.

b. Transmission channel capacity

Bandwidth (band width) Shows the amount of data that can be transmitted for 1 unit of time expressed in units of bits per second (bps) or characters per second (cps). Bandwidth with the unit bps / cps states the size of the transmission channel capacity, not the speed measure. Data transmission with a size of 1000 bps is not only said to be faster than data transmission of a size of 200 bps, but it can be said that more data can be sent in 1 particular time unit. As an illustration, in the same unit of time, the volume of water supplied by pipes with a larger cross-section diameter will be more than the distribution of water by pipes with smaller cross-section diameters, because pipes with larger diameters have larger capacities, instead of the speed at which water flows in pipes with a larger cross-section diameter.

Transmission channel type

A transmission canal can have a transmission type:

1) One-way (Simplex)

Is a transmission canal that can only carry data information in one direction only, not biased back and forth. Examples of radio or television broadcasts are the signals sent by the broadcasting station can only be captured by broadcast capture aircraft. But broadcasting aircraft cannot send information to the transmitting station. Sending data from one computer to another one way, can not go back and forth.

2) Semi-directional Semi (Half Duplex)

It is a transmission channel where data information can flow alternately (one direction at a time), that is, if one sends the other, as recipients and vice versa, it cannot be synchronized. With the type of two-way transmission which can alternately send and receive pictorial data. Examples of walkie talkies are examples that can be heard.

3) Bidirectional (Duplex)

Is a transmission channel where data information can flow in two directions simultaneously (can send and receive at

the same time). For example, the telephone can talk and listen to each other.

d. Transmission mode

Data transmission over the transmission canal can be in the form of parallel and serial transmission. In parallel transmission mode all bits of the character represented by a code are transmitted simultaneously at any time. For example, if ASCII code is used, 8 canals are needed to be transmitted into 1 bit of character.

Serial transmission, a transmission mode that is commonly used. In this mode each bit of a character is sent sequentially, that is, a bit, one bit is followed by the next bit. Receiver, then reassemble the flow of bits that come into character.

IV. CONCLUSIONS

From the discussion above, the following conclusions are obtained:

a. In ancient times, humans used drums, fire, smoke, then water with certain codes in order to communicate long distance. In contrast to know who have used components - components that are complex but efficient.

b. In general, telecommunications components consist of messages (data), sending devices, transmission media, receiving devices (receivers), and rules / standards (protocols).

c. The message is encoded into a signal and sent through the transmitter media then the receiver receives it and decodes it into a message again.

d. The type of network topology; star, ring, bus, mesh, tree, etc.

The ability to send data electronically has many benefits. The telecommunications systems that handle it are very diverse ranging from the off-line hollow card system to the on-line, timely and sophisticated distributed data processing system. The telecommunications channels used for these systems also vary greatly in terms of data volume, speed, and other characteristics. Judging from its use, channels can be switched or private. Private lines can be "rented" or owned by a company. Modems will convert data and digital form (used by computers) to analog form (used by most telecommunications channels) and then return to its original form.

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