

# STUDENT EMPOWERMENT FROM FAMILY WHO STAY IN RURAL TO USE ITC TO INCREASE E-LEARNING IN BOGOR REGENCY

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**Abstract** - Telecommunication and informatics access providers KPU / USO in the Universal Telecommunication Service Area (WPUT) is in the area between disadvantaged areas, remote areas, pioneering areas, rear areas, and areas where regional access is unfit and unreachable. This problem because the low level of equity development of communication and information access in the region. Besides that, the equal rights of all community groups to enjoy the ease of accessing and using information through the existence of information technology. The purpose of this study is to explain Universal Services Obligation policies in rural areas, to know students' interest in e-learning in rural areas, and to describe how ICT services are maintained in the village. The approach used is descriptive, and developmental. The samples of research are 250 respondents, while the data type are primary data and secondary data. Meanwhile, the data analysis used content analysis. The research results show that the procurement policy of Universal Services Obligation in rural areas has been done by the Ministry of Information and Communication of the Republic of Indonesia, students' interest in e-learning in rural areas is pretty high, and the way of maintenance and the introduction of computer equipment in rural areas has been done by the manager.

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**Key Words** - ITC USO, Student Interest on E-Learning, Introduction to Computer Devices

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## I. INTRODUCTION

### 1.1. Background

The Ministry of Communications and Informatics declared that [5] in 2006, the Ministry of Communication and Informatics established the Public Service Board, the Rural Telecommunication and Informatics Center (BTIP) as an operational working unit dealing exclusively for the provision of telecommunications and informatics in rural areas. However, in line with the demands of the development of information technology as well as the distribution of development in the information and communications technology sector, in 2009 BTIP changed into the Central Provider and Manager of Telecommunications and Informatics Financing (BP3TI) where the main tasks and functions become expanded not only in rural areas but including in urban areas that have not yet reached the accessibility of telecommunication and informatics services to the public. The provision of telecommunication and informatics services of the KPU / USO in the Universal Telecommunication Service Area (WPUT) is in the areas of disadvantaged areas, remote areas, pioneering areas, frontier areas, and economically unfeasible areas and areas not covered by access and telecommunication services. This is due to the low distribution of access to communications and information in the region. Besides the equal rights of all community groups to enjoy the ease of accessing and using information through the existence of information technology [5]

The Universal Service Obligation (USO) concept, translated into Indonesian as the Universal Service Obligation (KPU) of Telecommunications, basically

refers to the government's obligation to ensure the availability of public services for every citizen even if the state does not directly play the role of organizing public service activities.

Implementation of the provision of KPU / USO based on new regulations and policies is expected to produce benefits with efficient and effective productivity. The expected benefits are divided into 4 (four) phases that obtained gradually [5] they are:

1. Connectivity, the connectivity between villages and villages with municipalities with access to voice services, SMS, and internet service access which is the initial target of the provision of KPU / USO.
2. Transaction, the availability of facilities supporting daily community activities that can improve the living standard obtained by means of long-distance or virtual communication without considering the distance and time such as e-education, e-business, e-health, etc. through access available ICT services.
3. Collaboration, the creation of good communication between villages either incorporated in certain administrative areas or in different administrative areas so inter-village communities are established that can develop the potential of each village and can work together.
4. Transformation, which is the transformation of social conditions of people who are familiar with ICT so that all forms of daily activities can be more efficient and effective by using ICT

Based on the four phases mentioned above, the impact is the students in the rural areas of Bogor district can access ICT through information posts for the benefit of e-learning.

**1.2. Purposes**

The purposes of this research are as follows:

1. Explaining the policy of Universal Services Obligation in rural area;
2. Knowing students' interest in e-learning in rural areas;
3. Describing how to maintain ICT services in the village

**II. MATERIALS AND METHODS**

**2.1. Research Location**

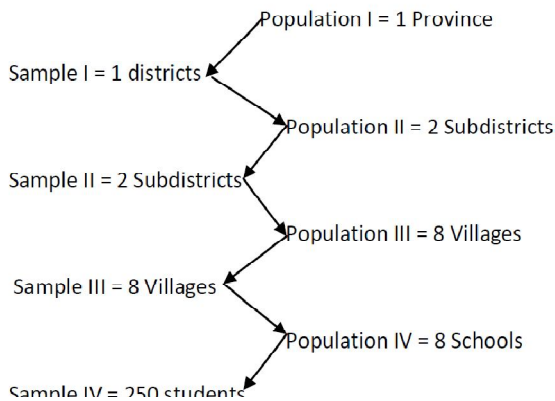
This research took place in Bogor District Ciampea Subdistrict and District Sukamakmur. the Research conducted for 8 (eight) months from March until October 2017.

**2.2. Research Approach**

The approaches used in this research were descriptive, correlational and developmental (development).

**2.3. Population and Sample**

The sampling technique is a gradual cluster. Sampling of two or more stepwise clusters can be separated according to random layers. So the sampling technique is Probability Sampling. It means the sampling techniques that provide equal opportunities for each regional level of a population to be selected into samples [6]. Sampling according to [3].



The technique used is Proportionate Stratified Random Sampling, which is selected based on the sample elements in Ciampea and Sukamakmur Subdistricts in Bogor District. Based on the theory of sampling that if all possible random samples of size n are taken without recovery from a finite population of size N with median and standard deviation values then the sample drawing for the mean of the sample would approximate the normal distribution by the mean and standard deviation [8].

This argument can be close to the truth if the measurement results indicated by independent variables close to normal. The importance of this proposition is primarily to make inferences about the

estimator of a central limit theorem following or nearing the normal function, if the sample is large enough that if n goes infinity. This premise is in practice if n > 30, because in such circumstances the value of Table t for a certain alpha will be close to the value of the normal table [7]. The number of respondents taken is arranged in the following table:

No	Subdistrict	School	Respondents
1	Ciampea	Elementary schoolCinangka 01	34
		Junior high school (MTs) DarutTafsir	28
		Vocational High SchoolPelita	32
		Senior High SchoolHanura	30
		Jumlah	124
2	Sukamakmur	Elementary school Suka makmur 01	30
		Junior high school (SMPN 02)	34
		Senior High School(SMAN 01)	31
		Vocational High School PGRI	31
		total	126
		total	250

Table 2.1 The number of respondents

**2.4. Data Types and Data Collection Methods**

The type of data in this study are primary data and secondary data. Primary data obtained through the respondent, while secondary data obtained through other parties related.

**2.5. Data analysis**

Data analysis were done through quantitative and qualitative analysis. To know the transformation of e-learning system through USO use content analysis [2], whereas if we want to know positif or negative influence, we used Product Moment Correlation with Exel and SPSS help.

**III. RESULTS**

**3.1. KPU / USO Policies**

In the implementation of the provision of KPU / USO as outlined in [5], there are several policies implemented under the new regulations and policies, they are:

- a. Funding Policies The original KPU funding source of the APBN contributed to the telecommunications operator of 1.25% (originally 0.75%) of the Gross Revenue. The Least Cost Subsidy / Lowest Subsidy based on Service Based Contract.
- b. The Central Government's Internet Asset Center Policy (PLIK)
- c. The government buys the internet service center access service so that asset ownership is fully available to the provider (Internet Service Provider / ISP). Policies in the Service Period PLIK the service period is 4 years (multiyear year). Policy in Operation and Maintenance
- d. Operation and Maintenance is part of the service to be purchased by the government as outlined in the contract. The risk of failure in management is entirely the responsibility of the provider.
- e. Policies in the Application of Service Cost. The cost to the public shall be determined by virtue of a Ministerial Regulation, or offerings in

- the Bidding Document; or if there is no both then according to the market mechanism with due regard to the purchasing power of the public;
- f. Policies in the Use of Technology (Neutral Technology) the technology used in the implementation of the KPU program is neutral technology It is intended that the government can increase internet customers and internet users and especially to the ease of access information. However the government decided that any technology to be used in the implementation of the KPU must meet certain criteria to be specified in the election document and discussed in the next section.
  - g. Policies in the Selection / Targeting of Universal Telecommunication Service Area (WPUT). WPUT is an area that has not been reached by telecommunication network and or service facilities such as disadvantaged areas, remote areas, pioneering areas or border areas and economically unfeasible areas.

Universal Service Obligations (KPU) are set in [4]. on the Provision of Universal Telecommunication Service Obligations and [5] about the Provision of Internet Access Services in Universal Telecommunications Internet Telecommunication Service Areas, in the form of: Facilities that have been and will continue to be built towards the realization of access and telephone services in 41 sub-districts and 434 villages located in Bogor Regency [1] Of the eight villages taken as samples turned out to be insufficient info kiosk even some villages do not have info kiosks.

The existence of internet facilities through the Internet Service Center Program District, Village Smart, Village Dring and Kios Info virtual, has been able to enter the people in the global information network. Communities have the facility to access and obtain unlimited information, data, knowledge and networks through telephone and internet communications. Operational Internet facilities are expected to meet the needs of the people, take place in a continuous manner and can evolve following technological advances [4] as described below.

Based on the above, it is very important that the program of guidance, development and empowerment of telecommunication access services KPU / USO is from all aspects by involving various elements, they are: government, society, university institutions and private parties. One form of activities in the framework of improving the operation and service of internet facilities in the rural area is the optimization and empowerment of telecommunication access services KPU / USO through the development of advisory concept. The development of the concept of assistance by universities has not been fully implemented either PLIK, Desa Pintar, Desa Dring, and others. PLIK, Dring Village and Smart village

which become the object of assistance may be limited in number in accordance with the capacity of universities in providing assistance and implementation costs. Therefore, it is still necessary to suggest the assistance program by the related universities and others for PLIK, Smart Village and Dring Village which have not been handled for implementation.

In the implementation of this mentoring program, consultant services are needed to provide assistance to universities with a view to better ensure the implementation of the mentoring program is running in accordance with the proposed. Consultant service is also needed to make selection process of proposal program proposal by university for implementation

In various development programs the facilities are often faced with how the concept of improvement and development of the development results. The current state of government through BP3TI has launched several programs in the framework of telecommunication and informatics access services, especially in remote / remote areas. Some of the programs that have been implemented include the Subdistrict Internet Service Center (PLIK), Dring village and smart village for the purpose of providing telecommunication and informatics access services to rural communities

In the operational of the service facility, assistance service is needed to improve and develop the implementation performance of PLIK, Smart Village and Dring Village as an effort to optimize various performance factors to support the function of the facility such as facility development, facility management improvement, intensive socialization, and others. Overall this requires a coaching system, models and mentoring programs, as well as the concept of facility empowerment.

Thus, it is expected that participation in operational and utilization in improving the performance of facilities that have been built is one of the efforts in creating synergy of government and society in optimizing telecommunication and informatics facilities in support of the purpose of program KPU / USO.

Implementation of the mentoring program needs to be accompanied to ensure the implementation of the mentoring program runs as expected. Mentoring program can not be implemented thoroughly in all PLIK, Smart Village and Dring Village due to the limited number of universities that provide assistance and implementation costs, therefore the selection of further mentoring program is still needed to be implemented in the future.

### 3.2. Student Interest on E-Learning In Rural Areas

#### a. Access of Students to Service

Services The results showed that internet service services accessed by students in the cafe is greater

when compared with PLIK, Dring village, Smart Village and others. In detail can be seen in the table below :

No	Services Accessible to Students	Respondents	Percentage
1	Smart village	10	4.0
2	PLIK	10	4.0
3	Internet Cafe	230	92.0
	Total	250	100.0

Table 3.1-Identification of Student Accessible Internet Services

### b. Student-Accessed Computer Programs

The results show that WINDOWS programs are more used by students than LINUX programs. In detail can be seen in the table below

No	Computer program	Respondents	Percentage
1	LINUX	9	3.6
2	WINDOWS	241	96.4
	Total	250	100.0

Table 3.2

Identification of Student Accessible Computer Programs

### c. Student Accessible Electronic Network

The results showed that the electronic network accessed by students is the Internet when compared with LAN and WAN. In detail can be seen in the table below

No	Electronic Network	Respondents	Percentage
1	Internet	233	93.2
2	LAN	13	5.2
3	WAN	4	1.6
	Total	250	100.0

Table 3.3

Identification of Student Accessed Computers

### d. Student Learning Through E-Learning

The results showed that learning by students through e-learning is a subject when compared with others as in the table below

No	Learning	Respondents	Percentage
1	Curriculum	103	41.2
2	Syllabus	8	3.2
3	Subjects	111	44.4
4	Personal E-mail	14	5.6
5	Personal Website	3	1.2
6	Has never been	11	4.4
	Total	250	100.0

Table 3.4

Identify Student's Learning

### e. E-Learning Purposes Held In Villages

The results of research show that the reason for e-learning done by students in school can Access various information in the world when compared to other reasons such as faster ICT access, faster access IPTEKS and others. In detail can be seen in the table below

No	E-Learning Needs in the Village	Respondents	Percentage
1	ICT access faster	74	29.6
2	Access IPTEKS faster	39	15.6
3	Lesson delivery faster	66	26.4
4	Access a variety of information in the world	71	28.4
	Total	250	100.0

Table 3.5

Reasons for E-Learning Performed by Students at School

### f. Factors Affecting Student Interest on E-Learning

#### Correlations

Variabel		Student Class	Services	Benefits of E-learning	Benefits of ICT	advantages of ICT
Student Class	Pearson Correlation	1	-.041	-.025	.212**	-.037
	Sig. (2-tailed)		.521	.697	.001	.557
	N	250	250	250	250	250
Services	Pearson Correlation	-.041	1	-.022	.107	.084
	Sig. (2-tailed)	.521		.727	.093	.185
	N	250	250	250	250	250
Benefits of E-learning	Pearson Correlation	-.025	-.022	1	.030	.076
	Sig. (2-tailed)	.697	.727		.636	.231
	N	250	250	250	250	250
Benefits of ICT	Pearson Correlation	.212**	.107	.030	1	.225**
	Sig. (2-tailed)	.001	.093	.636		.000
	N	250	250	250	250	250
advantages of ICT	Pearson Correlation	-.037	.084	.076	.225**	1
	Sig. (2-tailed)	.557	.185	.231	.000	
	N	250	250	250	250	250

\*\* Correlation is significant at the 0.01 level (2-tailed).

### Interpretation

The correlation coefficient number is 0.212, meaning the relationship between the student-occupied class and the ICT benefits is very close. The correlation coefficient marked positive (+), meaning the relationship between the class occupied by students with the benefits of ICT direction, so that if the occupied student class is higher then ICT also increasingly useful for students.

The correlation coefficient 0.225, meaning the relationship between the advantages of ICT with the benefits of ICT very closely. Coefficient correlation positive sign (+), meaning the relationship of ICT advantages with ICT benefits unidirectional, so if the ICT excess is increasingly known to many students then ICT is also increasingly used by students or users.

The \*\* sign indicates that the correlation coefficient is significant at the 99 percent confidence level.

## IV. DISCUSSION

### 4.1. How to Maintain Service in Village

The results of observations and interviews with a number of ICT service providers are as follows

#### A. Protection of Service

The results of observation and interviews show that to keep the available computer devices in the village is maintained then the service managers perform the following rules:

- To protect students from unintended internet impacts by teachers, communities and managers such as pornographic films and others;
- to Avoid students from wanting to access information unwanted by teachers, communities and managers;
- to Educate students how to face the development of information technology. Students should be protected from interest in the site and things unwanted by teachers, communities and managers. This is useful for maturing students

using the internet in order to prepare themselves to access the information that is needed.

Thus, the simple way that the provider of internet services in this case PLIK, Dring village, smart village, or internet cafe are:

- By cleaning the CPU every day, and the various webs that have been accessed are cleared, and the CPU cleared of various download files of the users or students of that day;
- By taking each computer to rest less than 1 hour in a day then this activity will be very useful to protect users or students and computer devices used and sustainability for PLIK, Dring village, Smart Village and internet cafe.

## **B. Tips Maintenance PLIK, Village Dring, Smart Village, or internet café**

### **1. Room Cleanliness and Support Facilities**

Room cleanliness and supporting facilities such as desks, benches, air conditioners and toilets are very important. Make sure everything is clean every day and also periodically cleaned completely. Customers will be more comfortable if the service in a clean and fresh.

### **2. Pay attention to Computer Vent**

Place the monitor and the CPU in such a way that the air vents from and to the monitor / CPU smoothly enough, with the aim that not to cause excessive heat, so that the components / electronic circuit in it can last longer. If you need to install the fan in the room. (Ac if possible)

### **3. Electric Main Problems That Make Hardware Damage**

Use UPS or stavolt. Use UPS to anticipate a sudden power failure which can result in damage to hard drives and other components / electronic circuits. If there is no UPS, you use Stavolt to anticipate the rise and fall of the utility voltage. UPS or uninterruptible power source has a way of working to save electricity for some time after the occurrence of electricity dies tersebut.dengan so computer users can still have time to turn off the computer normally. UPS itself we can buy bias in many electrical stores or computer.

### **4. Close Unnecessary Programs Every**

Program that runs requires memory (RAM), then close / close programs that are not useful so that the computer runs not slow.

### **5. Install and Update Antivirus Routinely**

Security systems owned the computer now must be strong from malicious virus attacks. Everyday harmful viruses are produced by thousands of malicious programmers for their lustful interests. Therefore antivirus that is installed on your computer must be the best and updated. The best antiviruses

may already be known eg AVG, Norton, Avast and others. You can also get free antivirus by using trial period for 30 days or more. If you want a free antivirus 100 percent then you can look for various computer articles in the virtual world Once the antivirus installed on your pc and laptop then the next important step is to update the antivirus. Antivirus that does not update the virus definitions then it will not be strong against the latest virus attacks. The way to get an antivirus update download is by visiting the official website of the antivirus company we use. You can update your antivirus online and offline. If online antivirus update then you need internet connection, but for offline antivirus update then you just need virus definitionsnya data only

### **6. Clean Recycle Bin, Cookies Routinely**

Recycle Bin, temporary internet, cookies are cleaned regularly. Because the Recycle Bin, cookies who have a lot of space will also take up harddisk which can lead to hard disk readings and browsing to be slow

### **7. Remove Unnecessary Programs**

Remove of useless programs with the aim of making the hard disk space much more so that the workload will be lighter and hard drive can last longer. You should be able to understand the character of the customer, what program they need

### **8. Computer Maintenance Regularly**

Computer needs to be cleaned regularly. Usually computers that are used continuously will cause the accumulation of dust or dirt. Dust that accumulates and when not cleaned can cause damage to parts of the computer such as Processor, VGA and other sensitive parts. Clean at least once a month using a vacuum or blower (preferably not using water compressor as blower) and cleaning brush. A clean computer can run more smoothly and less damage happens. It's a bit complicated, if you do not understand you can ask people who understand better. You clean the motherboard and other hardware from the dust gradually. at least 3 months. Do not forget the power cord in turn off before the clean.

### **9. Human Resource Training**

Human Resource Training is an important part. Training periodically for example includes areas such as customer care and computer maintenance. Customer service is important and applicable in PLIK. Good customer service can form a solid community. With the community in PLIK, of course this will increase the popularity of PLIK itself

## **C. Tips For Cleaning Computer**

Clean the area around the computer before you begin. Dust around easily attached to your computer device later. Do not spray liquid cleaner directly on the device komputer.Penetrasi directly with cleaning



fluid will damage the PC components and make it quickly rusty. Spray the liquid first onto the cloth, then clean the computer only on surfaces that are not sensitive to liquids and moisture.

Do not Use a Normal Vacuum Cleaner in cleaning the internal components of the computer. Vacuum cleaners generally have static electricity charges that can damage the device in case of contact. So, use a special vacuum (usually a battery-powered vacuum). If you do not have it, it's better not to use a vacuum cleaner

Do not Try Cleaning Inside the Monitor. Monitors have a large electrical charge even in a dead position. You better leave it to someone who is really professional to clean it. Close the monitor and let it cool before cleaning it because the monitor has an electrical charge even if it is not turned on. Do not ever let the computer still connect with the outlet when cleaning the computer, let alone the computer has the feature "wake" that can be active at any time. Do not touch your fingers to the LCD screen because you will physically confuse pixels and screens. Use a soft anti-static or lint-free cloth that is specifically used to clean dust from computer screens. Do not use ordinary cleaners to clean your LCD screen because general cleaning fluid can damage the anti-glare coating on your screen. So, you use a special liquid to clean it. Do not use a rough cloth to clean the LCD because a rough cloth can cause scratches and also damage to the LCD resulting in dead pixels.

**D. Introduction of Devices and Operations of Computers to Managers**

**1. Introduction to Computer Devices**

The word computer comes from the Latin word Computare which means counting. In English is called to compute. By definition computer is translated as a set of electronic tools that work together, can receive data (input), process data (process) and provide information (output) and coordinated under the control program stored in the memory. the computer system consists of three important parts:

1. CPU (Central Processing Unit) / Processor
2. Memory (RAM and ROM)
3. Input / Output.

Simply Block Diagram can be seen in the following picture

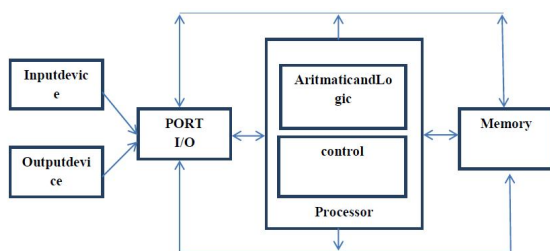


Figure 4.1. Computer System Micro Block Diagram

Where the CPU / Processor, Memory and Port I / O sections are located (installed) on the MotherBoard, the next section will detail the parts of the computer:

**1. Central Processing Unit / Processor**

Processor Is the main part of the computer because the processor serves to manage all the activities that exist on the computer. The unit speed of the processor is MHz (Mega Hertz) or GHz (1000 MegaHertz), where the greater the value the faster the execution process on the computer.



Figure 4.2. Central Proccessing Unit / Processor

**2. Memory**

Memory serves to store data and programs. Memory has various types from the fastest access until The slowest. Based on the access speed can be made hierarchy of memory as below.

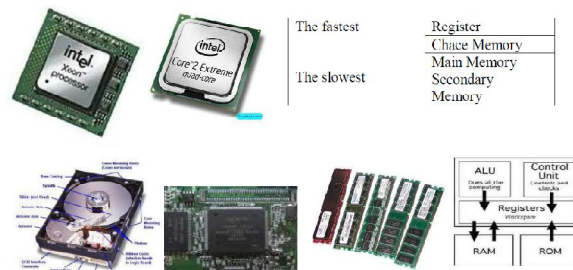


Figure 4.3. Memory Hierarchy

**2.1 Register Memory**

It is the type of memory where the fastest access speed, This memory is on the CPU / Processor. Example: Data Register, Register Address, Stack Pointer Register, Memory Addresss Register, I / O Address register, Instruction Register, and others

**2.2 Memory Cache**

Limited, high-speed memory that is more expensive than main memory. Cachememory is between the main memory and processing registers, so that the processor does not directly refer to the main memory for performance can be improved.

Cache Memory there are two kinds:

- a. Cache Memory contained in the internal processor, this type of memory chace access speed is very high, and the price is very expensive. This can be seen on the expensive Processor like Core ix, P4, P3, AMD-Athlon etc, the higher the capacity of L1, L2 Chace memory then the more expensive and the more ceppat Processor.

- b. Cache Memory contained outside the processor, which is located on the MotherBoard, this type of memory access speed is very high, although not as fast as the first type of memory cache (which is on the internal processor). The larger the capacity the more expensive and faster. This can be seen on the motherboard with a wide range of memory cache capacities of 256kb, 512kb, 1Mb, 2Mb and others.

**2.3. Main Memory**

Memory that serves to store data and programs. Main Memory Types:

**1. ROM (Read Only memory)**

ROM memory that can only be read only data or program. On the PC, ROM is in the BIOS (Basic Input Output System) contained in the Mother Board that serves to set the existing peripherals on the system.

Example: AMIBIOS, AWARD BIOS, etc.

ROM for BIOS there are various types of Flash EEPROM BIOS types that have the ability to be replaced with software programs provided by the manufacturer Mother Board, which is generally the replacement is to increase the performance of the peripherals in the Mother Board.

**2. RAM (Random Access Memory)**

It has the ability to change data or programs stored therein. There are bebrapa types of RAM that exist in the market today:

- SRAM • SDRAM
- EDORAM • DDRAM 1, 2, 3,
- Etc.

In memory type known as RAM BUS SPEED term, such as PC66, PC100, PC 133, PC200, PC 400 etc which means is the speed of data flow or program on the memory where the greater the BUS SPEED value, the faster access to the memory.

**2.4.Secondary Memory**

It Is an additional memory that serves to store data or programs. Examples: Hardisk, Floppy Disk and others

**3. Input / Output Unit**

Input / Output Unit is part of the computer to receive data and output / display data after being processed by Processor. To facilitate discussion about Input / Output unit, this book will be explained in two parts, namely • Port I / O • Peripheral I / O.

**3.1 Port I / O Port I / O is a Port or Gate or place of conector of I / O equipment. Where each I / O port is under control of the Processor.**

1. Parallel Port (LPT1 or LPT2) Is a port for equipment that works with data transmission in parallel. Examples of equipment that use this port are: Printer, Scanner and others.
2. Serial Port (Com1, Com2) Is a port for devices that work with serial data transmission. Examples of equipment that use this port are: Mouse, Modem, and others
3. Port AT / PS2 This port is generally used for input from Keyboard, Mouse.
4. USB Port USB Port (Universal Serial Bus) Port is a universal Serial Port for devices that work with serial data transmission. Examples of equipment that uses USB port: Digital Camera
5. VGA Port Is a port that is directly connected to the monitor. VGA port obtained from the installation of VGA Card.
6. Audio Port Is a port that is directly related to audio equipment such as Tape, Radio, Speaker, Microphone, and others.

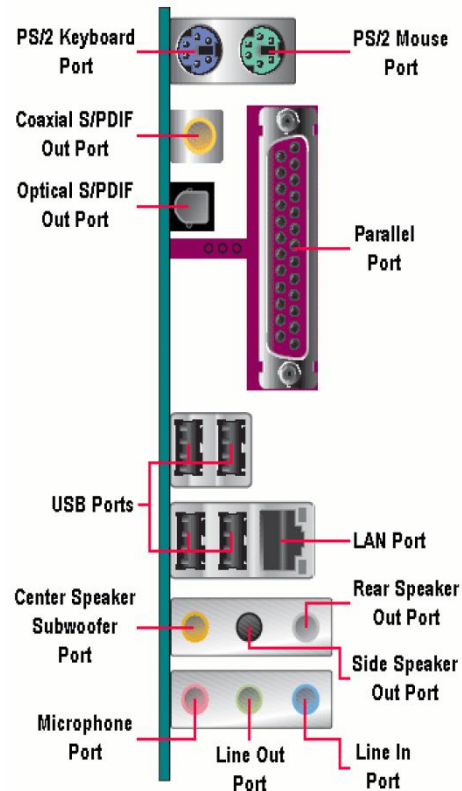


Figure 4.4. Port I / O

**3.2 Peripheral I / O**

Peripheral is something that refers to the external equipment connected to the computer. Computer peripherals can be divided into two categories based on function. The first category consists of equipment that performs input and output operations, this category includes keyboard, trackball, mouse, printer, and video display. The second category consists of the preferred equipment in the secondary data storage, which the main storage is provided by the computer's main memory. There are so many storage

devices, such as magnetic disks, optical disks, magnetic tapes, capable of storing large data. Equipment commonly used on Personal Computer (PC):

- Keyboard • Mouse • Scanner • CD ROM Drive
- Monitor • Printer • Disk Drive, Zip Drive

**4. Development of Computer Hardware**

The most rapid development of electronic technology and widely used in many fields in the job and to get information is computers. The development of this computer is caused by the development of microprocessor (processor) as the brain in dealing with the whole of the computer work.

**4.1. Development of Intel and Personal Computer (PC)**

Microprocessors In accordance with the evolutionary times new generations of processors emerge with more sophisticated performance, both in terms of quality and complexity. Development of processor type:

- XT 8086 - 8088
- AT 286, AT 386, AT 486
- Pentium I: AT 80586 with 50 Mhz, 70 Mhz, 90 Mhz, 100 Mhz, 133 Mhz
- Pentium II: 266 Mhz., 300 Mhz, 350 Mhz, 400 Mhz, 450 Mhz.
- Pentium III: 500 Mhz, 550 Mhz, 600 Mhz, 650 Mhz, 700 Mhz.
- Pentium IV Generation
- The latest generation is now Pentium V (core ix)

**4.2. Processors besides Intel and the development**

The market share for Computer technology in Indonesia causes the existing processor in the Market not only Intel Co. products. but other companies such as AMD (Advanced Micro Device) and Cyrix also issued several types of Processors that try to compensate for products from Intel.

AMD K-5, AMD K-6, AMD K6-2, AMD K6-3, AMD K-7, AMD Duron, AMD Athlon, Sempron, Athlon X2, etc., where these AMD products turn out some and lately succeed beyond the capabilities of Intel products.

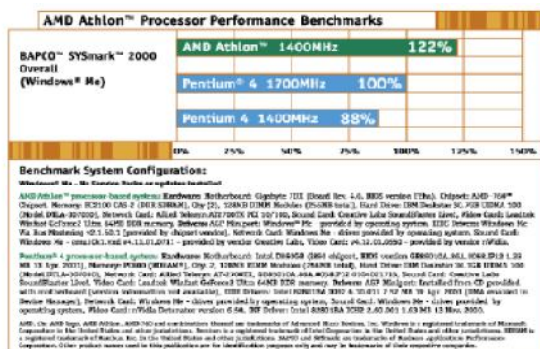


Figure 4.5. Processors besides Intel and the development

Here are the comparative data architecture of AMD and Intel products and Benchmark results (Test Reliability uProcessor). AMD processor is known for a cheaper price with reliability that is not inferior to Intel products.



Figure 4.6. Cyrix brand processor

Besides AMD, Processor other brands that circulate in the market of Indonesia is Cyrix. Cyrix processor that is Cyrix 6x86, M-II, and M-III, but unfortunately Cyrix processor is not as successful as AMD to create a counter processor for Intel.

**4.3 Mother Board**

Mother Board is a board / board where all devices are installed starting from processor, memory, slots for expansion, etc. and that must be considered in choosing or assembling Mother board is that every motherboard has different specifications for each brand or others type.

1. Each motherboard has a pair with a particular processor that is type socket or slot available for the processor.
2. Motherboard ability to be upgraded up to speed Processor. Generally the motherboard is able to be upgraded by replacing the processor. Information about this is very important for the purchase of motherboards with consideration to be upgraded.
3. RAM memory capacity that can be installed on the motherboard The greater the memory capacity disediakn more profitable.
4. Available slots for each type of RAM, eg how many slots are provided for EDO RAM, SDRAM and others.
5. Motherboard settings in BIOS (software) or jumper settings.
6. Number of slots for PCI and ISA. Slot slot is very useful for the addition of peripherals such as audio cards.
7. Whether the AGP support motherboard for VGA cards, AGP support will be more profitable for inventory if desired upgrade of graphics capabilities from computer by installing AGP card.
8. Speed Bus for memory up to speed (66,100,133,200,400 Mhz).
9. Is the VGA card and audio Card is onboard or not ?
10. Power Supply for Mother Board AT or ATX or Baby AT.



All the above information can be found from the manual book on the motherboard.

Some types of Socket slot for Socket processors include:

1. Slot 1
2. Slot 2
3. Socket7
4. Slot A
5. Socket A
6. Socket 370
7. Socket 8
8. Socket 423

**Slot1**

Mother Board made to support P-III and Celeron Processor

**Slot2**

Motherboards are made to support the Pentium II Xeon Processor

Socket 7

Mother Board made to support AMD K6-2 Processor, AMD K6-3 and Cyrix M-II and Pentium MMX.

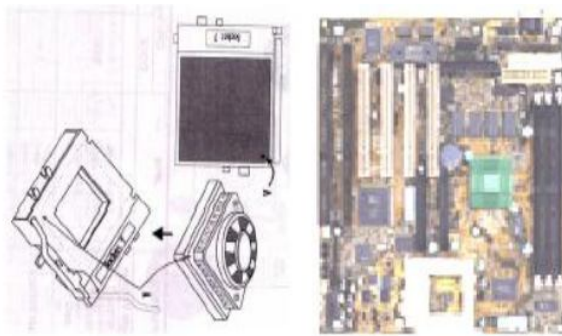


Figure 4.7. Mother Board

**Slot A**

Mother Board made to support AMD Athlon Processor, AMD Thunderbird.

**Socket A**

Mother Board made to support AMD Athlon and AMD Duron Processors.

**Socket 370**

Motherboards designed to support Intel® Pentium® III Processors (Tualatin and Coppermine) / Celeron™

**Socket 8**

Mother Board built to support Pentium® Processor and Pentium® Pro.

**Socket 423**

Mother Board made to support Pentium-4 Processor. MotherBoard Socket7

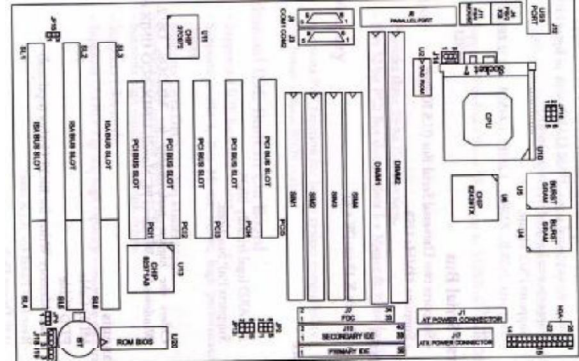


Figure 4.8. Mother Board made to support Pentium-4 Processor

**MotherBoard Slot 1**

**Mainboard Layout with Default Settings**

The default settings of the following figure is for the Pentium II (or Celeron) 233MHz.

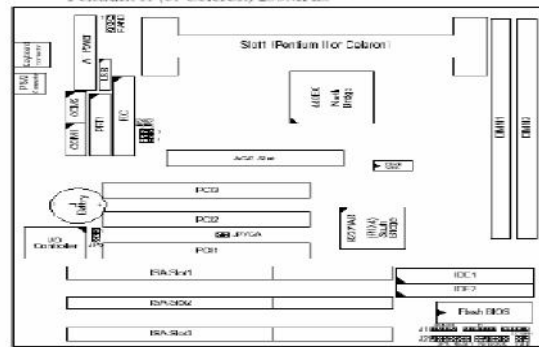


Figure 4.9. MotherBoard Slot 1

**MotherBoard for Pentium 4 Processor**

**untuk Processor Pentium 4**

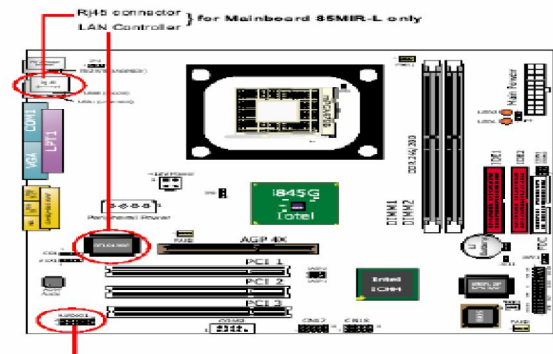


Figure 4.10. MotherBoard for Pentium 4 Processor

**d.2. Client Computer Operations to Students and Other Users.**

1. Turn on the Client computer ('Power' button on Client computer)
2. Wait until the view goes to 'Billing' (USO Login)
3. Computer Client ready to use.
4. To turn off, press once 'Power' button;
5. Or click the 'User' menu in the top right corner> 'Shut Down'> 'Shut Down'.
6. Wait until the computer is completely dead.

## CONCLUSIONS

The conclusions of this study are as follows:

1. Universal Services Obligation Procurement Policy in Rural Area Has Been Performed by the Ministry of Information and Communication of the Republic of Indonesia;
2. Student Interest on E-learning in Rural Areas is High enough;
3. How to Maintenance and Introduction of Computer Devices in Rural Areas Already Performed by the Manager

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