**CHAPTER II  
BASIC OF THEORY**

**II.1 Definition of Hardware CPU**

Physically, the computer consists of several components that constitute system. Systems are components that work together to form a union. If one component is not functioning, it will lead to malfunction of the existing processes with good computer. Computer components are included in the category of hardware element (hardware).

Hardware can work based on predetermined commands available to it, or what is also referred to by the term instruction set. With the commands that can be understood by the hardware, the hardware can perform various activities that have been set by the command.

**II.2 Definition of Motherboard**

A motherboard is one of the most essential parts of a computer system. It holds together many of the crucial components of a computer, including the central processing unit (CPU), memory and connectors for input and output devices. The base of a motherboard consists of a very firm sheet of non-conductive material, typically some sort of rigid plastic. Thin layers of copper or aluminum foil, referred to as traces, are printed onto this sheet. These traces are very narrow and form the circuits between the various components. In addition to circuits, a motherboard contains a number of sockets and slots to connect the other components.



**Figure 2.1 Motherboard (REF :** <http://perangkatkeraskomputer.net/>)

**II.3 History of Hardware CPU**

The computer as we know it today had its beginning with a 19th century English mathematics professor name Charles Babbage.He designed the Analytical Engine and it was this design that the basic framework of the computers of today are based on Generally speaking, computers can be classified into three generations. Each generation lasted for a certain period oftime,and each gave us either a new and improved computer or an improvement to the existing computer.

First generation: 1937 – 1946 - In 1937 the first electronic digital computer was built by Dr. John V. Atanasoff and Clifford Berry. It was called the Atanasoff-Berry Computer (ABC). In 1943 an electronic computer name the Colossus was built for the military. Other developments continued until in 1946 the first general– purpose digital computer, the Electronic Numerical Integrator and Computer (ENIAC) was built. It is said that this computer weighed 30 tons, and had 18,000 vacuum tubes which was used for processing. When this computer was turned on for the first time lights dim in sections of Philadelphia. Computers of this generation could only perform single task, and they had no operating system.

Second generation: 1947 – 1962 - This generation of computers used transistors instead of vacuum tubes which were more reliable. In 1951 the first computer for commercial use was introduced to the public; the Universal Automatic Computer (UNIVAC 1). In 1953 the International Business Machine (IBM) 650 and 700 series computers made their mark in the computer world. During this generation of computers over 100 computer programming languages were developed, computers had memory and operating systems. Storage media such as tape and disk were in use also were printers for output.

Third generation: 1963 - present - The invention of integrated circuit brought us the third generation of computers. With this invention computers became smaller, more powerful more reliable and they are able to run many different programs at the same time. In1980 Microsoft Disk Operating System (MS-Dos) was born and in 1981 IBM introduced the personal computer (PC) for home and office use. Three years later Apple gave us the Macintosh computer with its icon driven interface and the 90s gave us Windows operating system.

As a result of the various improvements to the development of the computer we have seen the computer being used in all areas of life. It is a very useful tool that will continue to experience new development as time passes.

**II.4 History of Motherboard**

Before we discuss this aspect, you need to know what a computer consists of. The most common type of a computer is called IBM-compatible. There are several components that make such a machine work and these are: the motherboard, microprocessor, RAM and other devices usually linked to the motherboard through cables or various other connectors. The main topic of this article is motherboards. They represent the central piece of any desktop computer, because through them all the other devices communicate, synchronize and perform various functions for which they are designed. Let’s talk about computers in their beginning. The first computer that used a motherboard as the central piece was presented on the market in 1981 by IBM – the IBM PC. You may have guessed this, since today’s computers are called IBM-compatible.   
  
 The features of this computer consisted of: 4.77MHz Intel microprocessor, 16K bytes of memory, 8-bit ISA connectors and ports for keyboard and tape. Other ports like serial, parallel and floppy drive connectors could be provided through plug-in boards. All of these features may seam ancient to us now, but at that time they were top of the line. Before the presentation of the IBM PC, all the computers were built using a case and the components were linked using a backplane. This consisted of a set of slots linked together with wires. The difference between a backplanes and motherboards is the lack of on-board power of processing and the CPU is on a separate plug-in card. The cost effectiveness of placing more components onto a single hardware piece became a well-known fact. Therefore, in the late 1980s, motherboards were improved with a set of chips that were capable to support some low-level peripherals like mouse and keyboard, serial and parallel ports, floppy disk drives and more. Today’s motherboards are far more advanced. Since the beginning of the 21st century, it became common for a motherboard to support video, audio, networking and storage functions without needing other expansion cards. For people who wanted higher performances, for example, 3D gaming, a separate graphics card was the only thing they needed. If you want to purchase a new computer, you should purchase it according to your needs. If you want to play advanced video games, than a high performance PC is required. On the other hand, for simple tasks like editing documents and reading email, you do not need to spend a fortune.  
  
 A little information never hurt anybody. Do your homework before you make any purchase and compare the performances of one system with the ones of another! You should also be careful regarding the compatibility of you motherboard with the other components.