

HISTORY OF MICROPROCESSOR AND 8085 INTRODUCTION

1.1 HISTORY OF MICROPROCESSOR

The invention of the transistor in 1947 was a significant development in the world of technology. It could perform the function of a large component used in a computer in the early years. Shockley, Brattain and Bardeen are credited with this invention and were awarded the Nobel prize for the same. Soon it was found that the function this large component was easily performed by a group of transistors arranged on a single platform. This platform, known as the integrated chip (IC), turned out to be a very crucial achievement and brought along a revolution in the use of computers. A person named Jack Kilby of Texas Instruments was honored with the Nobel Prize for the invention of IC, which laid the foundation on which microprocessors were developed. At the same time, Robert Noyce of Fairchild made a parallel development in IC technology for which he was awarded the patent.

ICs proved beyond doubt that complex functions could be integrated on a single chip with a highly developed speed and storage capacity. Both Fairchild and Texas Instruments began the manufacture of commercial ICs in 1961. Later, complex developments in the IC led to the addition of more complex functions on a single chip. The stage was set for a single controlling circuit for all the computer functions. Finally, Intel corporation's Ted Hoff and Frederico Fagin were credited with the design of the first microprocessor.

The work on this project began with an order from a Japanese calculator company Busicom to Intel, for building some chips for it. Hoff felt that the design could integrate a number of functions on a single chip making it feasible for providing the required functionality. This led to the design of Intel 4004, the world's first microprocessor. The next in line was the 8 bit 8008 microprocessor. It was developed by Intel in 1972 to perform complex functions in harmony with the 4004.

This was the beginning of a new era in computer applications. The use of mainframes and huge computers was scaled down to a much smaller device that was affordable to many. Earlier, their use was limited to large organizations and universities. With the advent of microprocessors, the use of computers trickled down to the common man. The next processor in line was Intel's 8080 with an 8 bit data bus and a 16 bit address bus. This was amongst the most popular microprocessors of all time.

Very soon, the Motorola corporation developed its own 6800 in competition with the Intel's 8080. Fagin left Intel and formed his own firm Zilog. It launched a new microprocessor Z80 in 1980 that was far superior to the previous two versions. Similarly, a break off from Motorola prompted the design of 6502, a derivative of the 6800. Such attempts continued with some modifications in the base structure.

The use of microprocessors was limited to task-based operations specifically required for company projects such as the automobile sector. The concept of a 'personal computer' was still a distant dream for the world and microprocessors were yet to come into personal use. The 16 bit microprocessors started becoming a commercial sell-out in the 1980s with the first popular one being the TMS9900 of Texas Instruments.

Intel developed the 8086 which still serves as the base model for all latest advancements in the microprocessor family. It was largely a complete processor integrating all the required features in it. 68000 by Motorola was one of the first microprocessors to develop the concept of microcoding in its instruction set. They were further developed to 32 bit architectures. Similarly, many players like Zilog, IBM and Apple were successful in getting their own products in the market. However, Intel had a commanding position in the market right through the microprocessor era.

The 1990s saw a large scale application of microprocessors in the personal computer applications developed by the newly formed Apple, IBM and Microsoft corporation. It witnessed a revolution in the use of computers, which by then was a household entity.

This growth was complemented by a highly sophisticated development in the commercial use of microprocessors. In 1993, Intel brought out its 'Pentium Processor' which is one of the most popular processors in use till date. It was followed by a series of excellent processors of the Pentium family, leading into the 21st century. The latest one in commercial use is the Pentium Dual Core technology and the Xeon processor. They have opened up a whole new world of diverse applications. Supercomputers have become common, owing to this amazing development in microprocessors.

1.2 INTRODUCTION TO 8085

As discussed earlier, 8085 microprocessor was introduced by Intel in the year 1976. This microprocessor is an update of 8080 microprocessor. The 8080 processor was updated with Enable/Disable instruction pins and Interrupt pins to form the 8085 microprocessor. Let us discuss the architecture of 8085 microprocessor in detail.

Features of 8085 microprocessor

Before knowing about the 8085 architecture in detail, let us briefly discuss about the basic features of 8085 processor.

8085 microprocessor is an 8-bit microprocessor with a 40 pin dual in line package. The address and data bus are multiplexed in this processor which helps in providing more control signals. 8085 microprocessor has 1 Non-maskable interrupt and 3 maskable interrupts. It provides serial interfacing with serial input data (SID) and serial output data (SOD).

It has a set of registers for performing various operations. The various registers include

- Accumulator (register A)
- Registers: B, C, D, E, H and L
- Stack pointer
- Program Counter
- Temporary register
- Instruction register