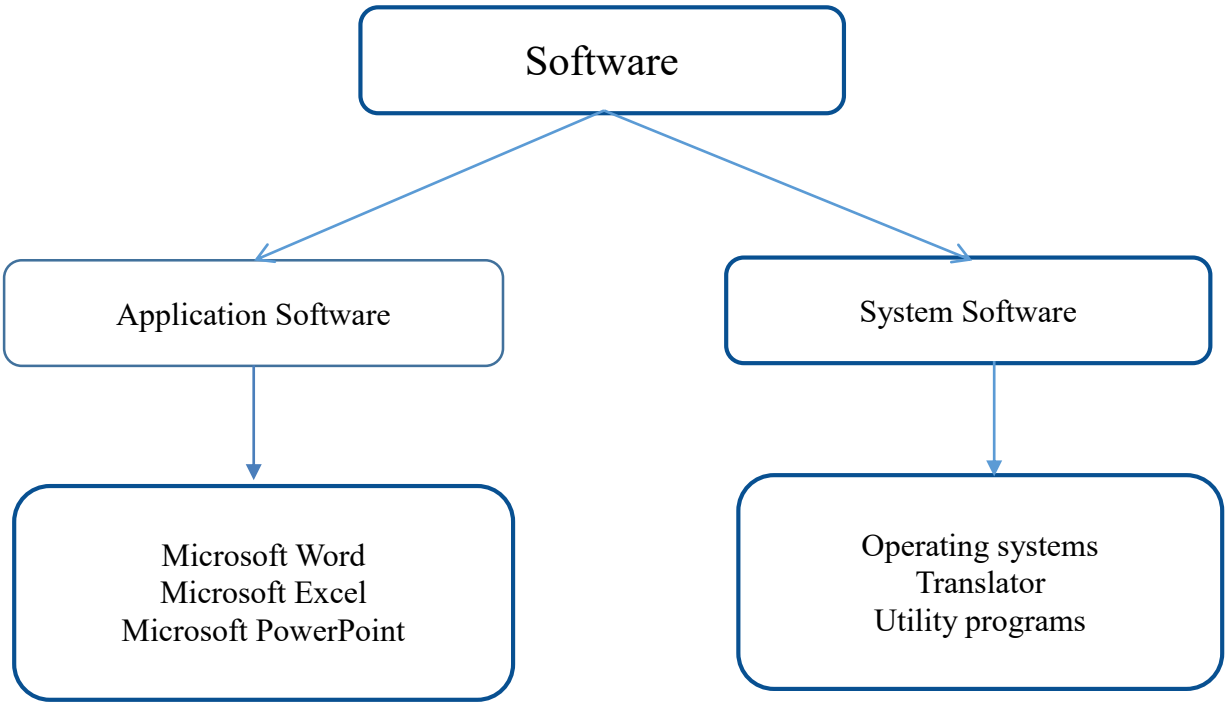
CHAPTER EIGHT

Software - Translators



Application Software:

Programs that help the users to execution a specific task such as Microsoft Word and Microsoft Excel.

System Software

Is a set of programs that manage the resources of a computer system. System Software is a collection of system programs that perform a variety of functions.

Types of systems software:

A. Operating systems.
B. Translators.
C. Utility programs.

A. Operating systems

An operating system, also called an OS, is the important type of system software, which is designed for your computer system to ensure your system is working together smoothly and efficiently.

The operating system (OS) is the first thing loaded onto the computer, without the operating system, a computer is useless.

The primary functions of an operating system are:

1- Loads programs (such as word processing and spreadsheet programs, or game software) into the computer's memory that you can use them.

2- Provide a user interface.

3- Manage system memory.

4- Manage processing tasks.

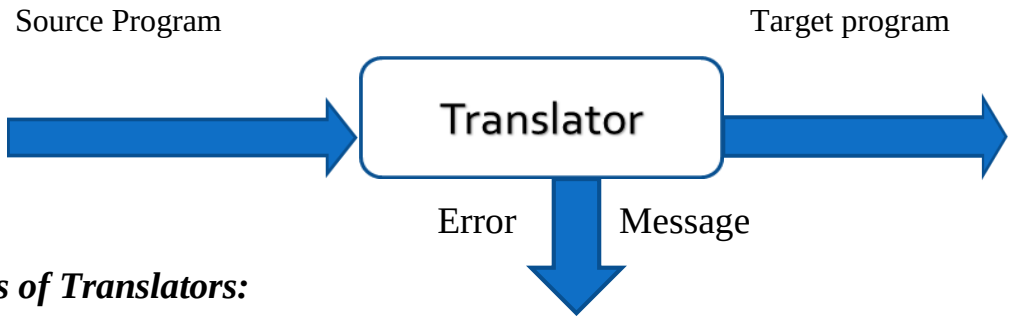
5- Coordinates how programs work with the computer's hardware and other software.

6- Provides ways to manage and organize the way information is stored on and retrieved from disks.

B. Translators

Is a computer program that converts a program written in high language such as Pascal or C++, into a machine language that can be directly executed by the computer.

The Program that written in high language called (Source program) and the program that convert to machine language called (target program or object program).



Types of Translators:

1 – Assemblers:

A computer program which translates from assembly language to machine language

2 – Compilers:

Is a special software program that converts source code into machine language. An important part of any compiler is the detection and reporting of errors.

- **Linker:**

Is a program that takes one or more objects generated by compilers into a single executable program.

- **Loader:**

Is the part of an operating system that is responsible for loading programs to memory, preparing them for execution.

The Phases of a Compiler:

1- Lexical Analysis.

2- Syntax Analysis.

3- Semantic Analysis.

4- Intermediate Code Generation.

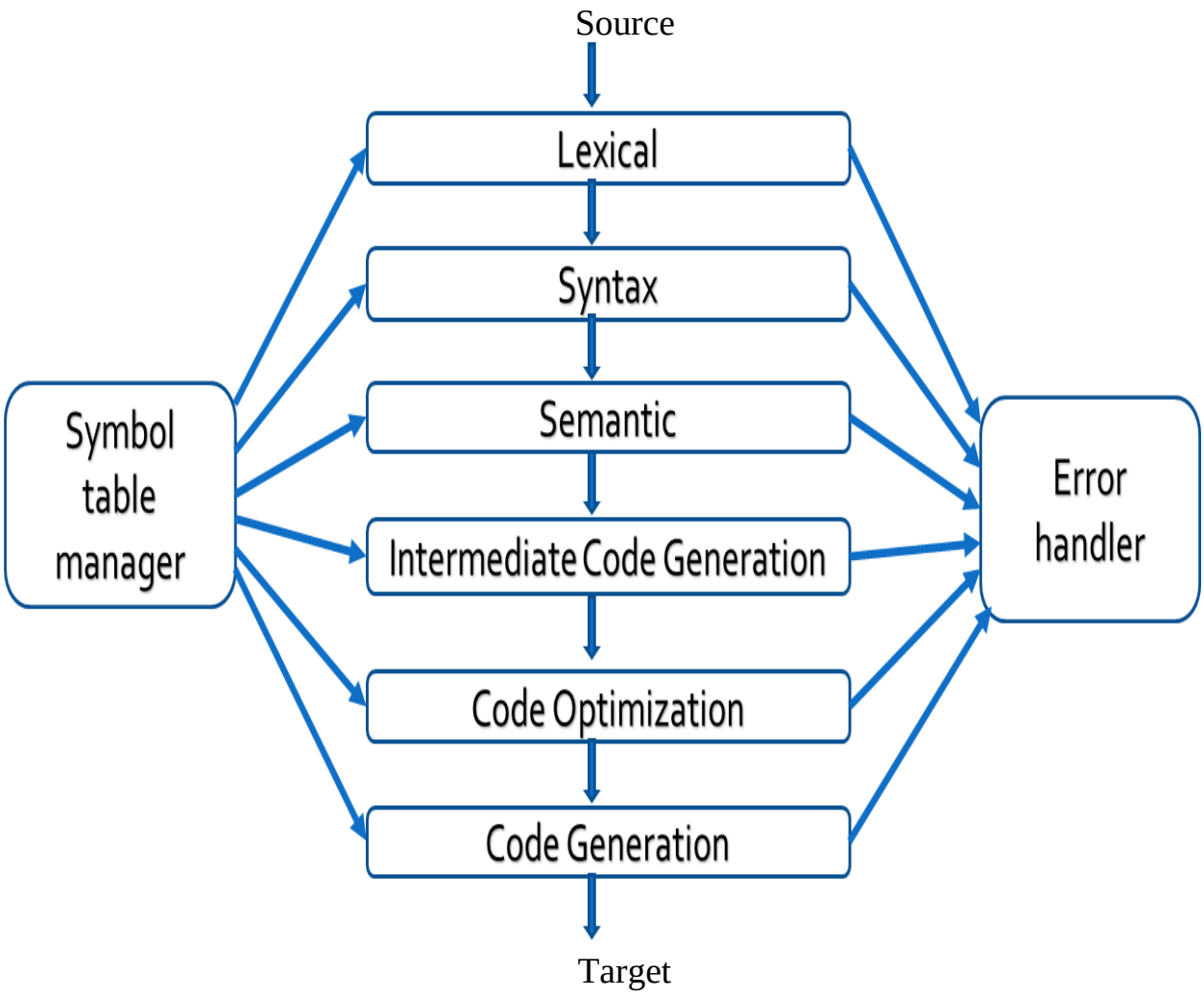
5- Code Optimization.

6- Code Generation

In each phase we need variables, which are taken from a table called (Symbol table manager) and in each phase may generate some errors so it must have a program to process these errors called (Error handler).

Each stage in the compiler has two inputs and outputs, For example the first phase (lexical analysis) the first input is the source program, while the second input it is some of the variables that you need at that stage.

The first output it is the errors that may generate and process in program called error handler, while the second output is the input for the next phase (syntax analysis).


Source
Lexical
Syntax
Semantic
Intermediate Code Generation
Code Optimization
Code Generation
Target
Symbol table manager
Error handler

3 – Interpreters:

Is a program that translates a program line-by-line (statement-by-statement) and carries out the specified actions in sequence and executes the statement immediately before going on to translate the next statement.

C – Utility programs:

Programs that perform a specific task related to the management of computer functions, as password protection, memory management, virus protection, and file compression.