

Overview of Software Engineering

Software Plays Two Roles At Once

Role 01

A Product

- Computing potential itself
- What the machine can actually do for someone

Role 02

A Delivery Vehicle

- Operating systems, networks and development tools that carry other products

Software is an **Information changer** it manages, produces, modifies, displays, and transfers information, from a single bit to full multimedia

Not Just Any Kind of Engineering

01-Plan

- Decide what is being build, and for whom

02-Follow the plan

- Discipline, not improvisation

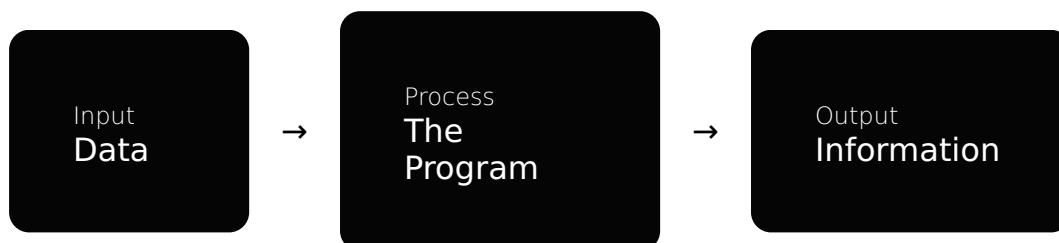
03-Adapt

- Handle the difficulties nobody predicted

Step 3 is where most software project are won or lost.

Introduction to Software Engineering

Program, System, Software



A program

- Instructions that tells the computer what to do

Software

- Sets of instructions written using predefined formats and procedures

GENERIC VS CUSTOMIZED

GENERIC

- For a wider market, requirements are common, stable, well understood
- Example: Operating System Software (OS)

CUSTOMIZED

- For one customer, domain, environment, requirements are unique
- Example: Application Software for a specific client

THREE TYPES OF SOFTWARE

System

- Programs, Languages and Documentations
- Supplied by the manufacturer for computer's own use
- OS, BIOS, Compilers

Application

- Built by professionals for a specific function
- "user-based software"
- payroll, banking, embedded

Utility

- Support software used in developing other programs
- debuggers, interpreters

WHAT IS A GOOD SOFTWARE?

Cost-effectiveness

- Did it return more than it cost?

Usability & Reliability

- Can we use it, and does it hold up?

Maintainability & Efficiency

- Can we live with this code next year?

Bottom Line

- Customer satisfaction, achieved within cost and budget constraints

SOFTWARE THROUGH THE GENERATIONS

Hardware and software advanced together

GENERATION	HARDWARE	SOFTWARE
1st 1944-1955	Vacuum tubes	Machine language
2nd 1956	Transistors	Symbolic language
3rd 1964-1970	Integrated circuits	High-level: FORTRAN, ALGOL
4th 1971-1990	Large-scale ICs	PL/I, BASIC, PASCAL

GENERATION	HARDWARE	SOFTWARE
5th 1990+	Very large-scale integration	C, C++, Visual Basic, FoxPro, DBMS, Prolog, LISP

WHAT IS SOFTWARE ENGINEERING

THE GOAL

MANUFACTURING SOFTWARE THAT IS...

Timely produced

User-friendly

Reliable

Cost-effective

Portable

Versatile

Inter-operable

Maintainable

Reusable

GO BACK