Computer Architecture model

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Subject: Computer Organization

Topic: Computer Architecture Model

Teaching Methodology: Hands on learning through Visual Clues

Fig.1. Explaining Architecture model

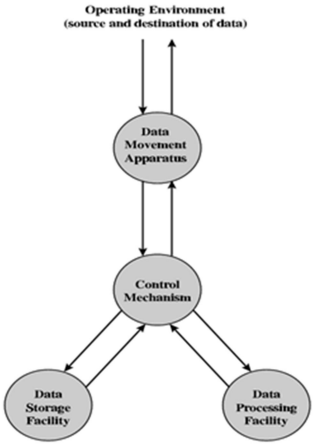
Architecture

- Architecture is those attributes visible to the programmer
  - Instruction set, number of bits used for data representation, I/O mechanisms, addressing techniques.
  - e.g. Is there a multiply instruction?
- Organization is how features are implemented
  - Control signals, interfaces, memory technology.
  - e.g. Is there a hardware multiply unit or is it done by repeated addition?

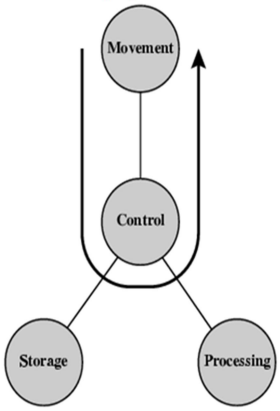
Intel x86 family

- All Intel x86 family share the same basic architecture
- The IBM System/370 family share the same basic architecture
- This gives code compatibility
  - At least backwards
- Organization differs between different versions
- Structure is the way in which components relate to each other
- Function is the operation of individual components as part of the structure
- All computer functions are:
  - Data processing
  - Data storage
  - Data movement
  - Control

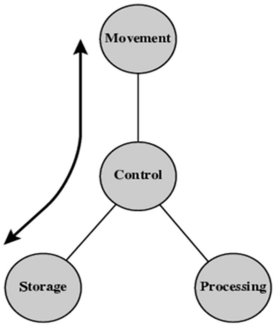
Functional View



Operations (a) Data movement



Operations (b) Storage



Operation (c) Processing from/to

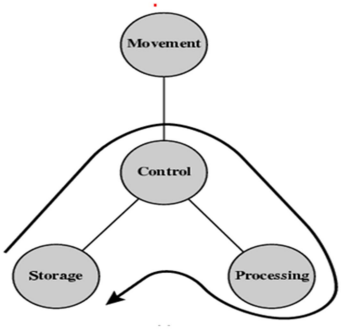


Fig. 2. Data flow operations

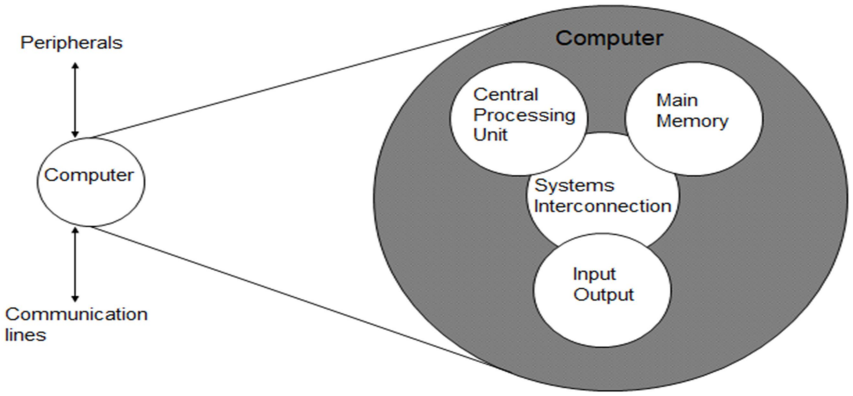


Fig.3. Structure: Top level

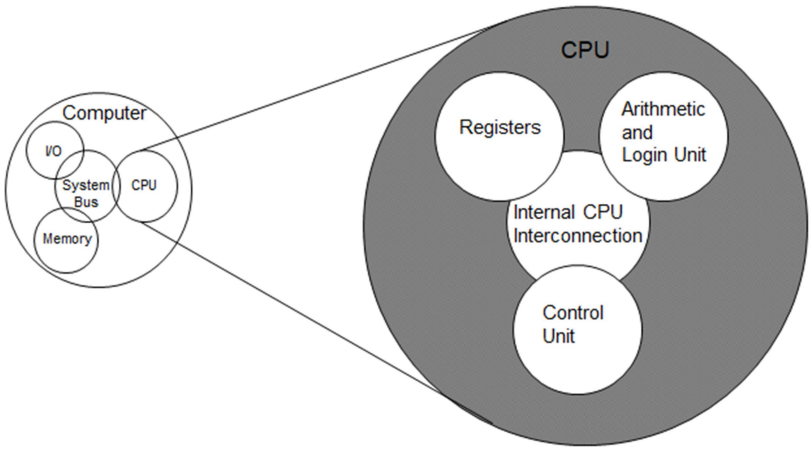


Fig.4.Structure: The CPU

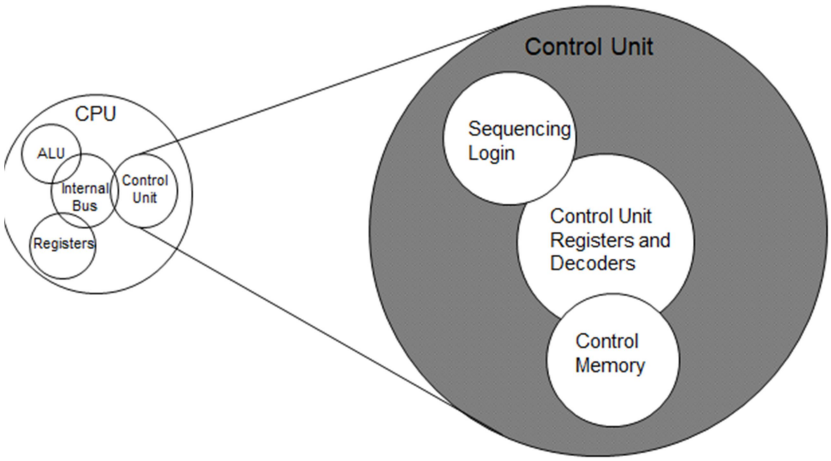


Fig.5.Structrure: The Control unit

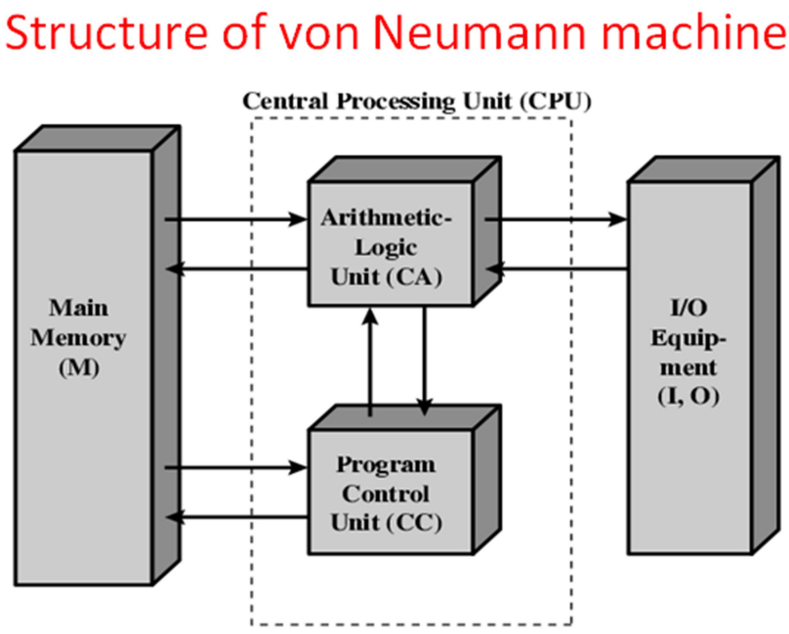


Fig.6. Architecture