Intro

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Software : Collection of executable computer programs (code), their configuration files and associated libraries and their documentations serving a computational purpose.

Software Product : Software when made for a specific or specific group of requirements

Software prefixes/ Types of software

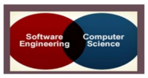
- System software: Software designed to provide a platform for other software
  - OS (linux, macOS, android)
  - SAS
  - Game engines, search engines
- Application software: Software designed to do a user oriented task.
- Generic software: Sold on open market for any customer to buy them, meet many clients requirements.
- Custom software: Developed to meet a client's specific needs.

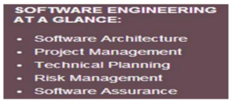
Engineering : Acquiring and using well defined scientific principles and systematic methods for developing products, with economic sense, social perspective and practical considerations.

Software Engineering : Systematic, disciplined, quantifiable approach towards the development, operation, and maintenance of software products and thus supports managing of complexity.

Software Engineering principle : Drives usage of appropriate tools and techniques depending on the problem to be solved, while considering the constraints and resources available.

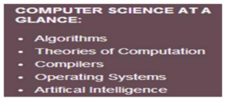
When can a Software Project be defined as a Failure?
1. Did not satisfy the requirements of the customer.
2. Deadline violation (software release was later than scheduled)
3. Too many bugs





SOFTWARE ENGINEERING AT A GLANCE:

- Software Architecture
- Project Management
- Technical Planning
- Risk Management
- Software Assurance

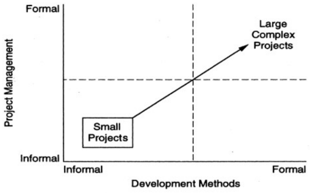


COMPUTER SCIENCE AT A GLANCE:

- Algorithms
- Theories of Computation
- Compilers
- Operating Systems
- Artifical Intelligence

To build a software of high quality, we need to have the following:

1. Interaction with customers and stakeholders on what exactly is needed
2. A clear understanding of the end users
3. Experts in multiple domains
4. Good planning
5. Team work
6. Ability to scale and support



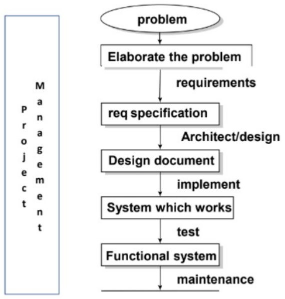
Fundamental Drivers of Software Engineering

- Industrial strength software
  - Must be operational
  - Must be maintainable
  - Must be movable
  - Elaborate documentation
  - Minimal bugs
  - Impactful to business
- Software is expensive
  - Labor
  - Maintenance
- Can influence life or death of a person
- Heterogeneity : Systems should be able to work in a distributed manner
- Diversity : Different types of software systems
- Security & trust
- Scale: Software systems must be scalable
- Business & social changes
  - Ability to change existing software and to develop new software
  - The organizations are becoming global.
- Quality & productivity
  - Quality = FLURPS (Functionality, Localizability, Usability, Reliability, Performance and Security) + Portability + Efficiency/Maintainability
- Consistency & repeatability
- Late & unreliable

Software Project Lifecycle

Software process
A software process is a structured set of activities and associated outcomes (intermediate and final), that produces a software product.

Each activity is defined in terms of:
Entry criteria: What conditions must be satisfied for initiating this phase
Task and its deliverable: What should to be done in this phase
Exit criteria: When can this phase be considered done successful
Who: Who is responsible
Dependencies: What are the dependencies for this phase ..etc.
Constraints: Time schedule



Configuration Management
Change management