Software Engineering

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Software

- Set of computer programs and associated documentation (for specific customer or general market)
- **Attributes of a good software:**
  - Timely Delivery
  - Functionality and Performance
  - Acceptability
  - Usable
  - Dependable
  - Efficiency
  - Maintainable
  - Security

- **Types of Software Products**
  - Generic Products (Ex: accounting systems, management systems, etc.)
  - Customized (Bespoke) Systems (Ex: air traffic control system, robotic system, etc.)

Note: More systems are being built with a generic product as a base which is then adapted to suit customer requirements.

Software Engineering

- First proposed in 1968 while discussing about “software crisis”.
- **Reasons for Software Failures:**
  - Increasing demands
  - Software development taking longer than expected time, more expensive and less reliable
- It is an engineering discipline concerned with all aspects of software production from early stages through system specification, development, to maintaining the system after it has gone to use.

- **Four fundamental activities in Software Engineering:**
  - Software Specification
  - Software Development
  - Software Validation
  - Software Evolution
- **General Issues that may effect many different types of software:**
  - Heterogeneity (different types of hardware, software platforms – OS, programming languages, etc.)
  - Business and social change
  - Security and Trust
  - Legacy Systems
  - Delivery time and cost estimates

- **Different types of software applications:**
  - Stand-alone System
  - Interactive transaction-based System
  - Embedded Control System
  - Entertainment System
  - Modeling and Simulation System
  - Data Collection System, etc.

- **Software Engineering Fundamentals that apply to all system:**
  - Should be developed using managed and understood development process
  - Dependability and performance
  - Understanding and managing Software Requirement and Specification
  - Make effective use of available resources

- **Software Engineering and Web**
  - Most software engineering projects are inclined towards web.
    - Accessibility and easy distribution
    - Timely maintenance and updates
    - Full control over the software and user interactions
  - Examples: Office 365 from Microsoft, Google Suite Applications

- **Software Engineering Ethics**
  - Confidentiality (both employers and clients)
  - Competence (shouldn’t misrepresent level of competence)
  - Intellectual Property Rights (IPR) and Patents
  - Computer Misuse

- **Advantages of using Software Engineering**
  - Improvements in:
    - Quality
    - Requirement specification
    - Cost and schedule estimates
    - Reliability
    - Productivity
  - Well defined process
  - Better use of automated tools and techniques

To Be Continued…