

Software: Its Nature and Qualities

LECTURE 6 WEEK 4

Classification of software qualities

External and Internal

External ---- Visible to the users of the system

Internal ---- Concern of developers of the system

- Deal with the structure of the software

Product and process

Product: The software delivered to the customer

- Other work items?

Process: software production process

Quality Aspects

Correctness

- Mathematical property that establishes equivalence between the software and its specification
- Can be achieved for example by using standard proven libraries/modules, methodologies, processes
- Functional requirements/ non functional requirements
- Absolute quality

Reliability

- Sometimes termed as Dependability
- The probability that the software will operate as expected over a specified period of time interval
- Relative

Robustness

- Software behaves reasonably in case of unexpected input/situation

Quality Aspects (Contd.)

Performance

- How much work does a software perform in a unit time maybe
- Can be equate with efficiency but not same
- Affects usability
- Affects scalability
- Performance evaluation measure— time and space complexity

Efficiency

- How economically the software utilizes the resources of the computer

Usability

- User friendliness
- How well do the human users find the software easy to use

Quality Aspects (Contd.)

Verifiability

- If the properties of the software can be verified
- Testing is easy

Maintainability

- Maintenance cost is 60 percent more than the total cost
- Corrective, perfective, adaptive
- Repairability
 - Can the defects be corrected in reasonable amount of time with a reasonable amount of work?
- Evolvability
 - Can we easily change the software to satisfy a new/changed requirement? economically?

Reusability

Portability

- Can it run in different environments?

Quality Aspects (Contd.)

Understandability

- For the tasks of inherently similar difficulty is the software system easy to understand?

Interoperability

- Ability to coexist and cooperate with other systems

Quality Aspects (Contd.)

Productivity

- Amount of work done by a software team in a unit time
- Efficiency of the process

Timeliness

- Ability to deliver a product on time

Visibility

- Have all steps of the process and their current status been clearly documented?