



GOVERNMENT OF ANDHRA PRADESH COMMISSIONERATE OF COLLEGIATE EDUCATION



DESIGN PROCESS

Software Engineering

Computer Science

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Objectives

- Describe the design process.
- Discuss the quality guidelines
- Discuss the quality attributes.
- Explore the design evolution

Design Process

- During the design process the requirements are translated into the blue print of the system.
- It is an iterative process, earlier iterations represent the system in high level of abstraction.
- In each iteration more and more details are added.
- Later iterations represents the system with much lower level of abstraction.

Software Quality Guidelines and Attributes

- Three characteristics that leads to good design.
 - Design should implement all the explicit and implicit requirements.
 - Design should be readable and understandable guide for developers and testers.
 - Design should provide complete picture of the software from implementation perspective.

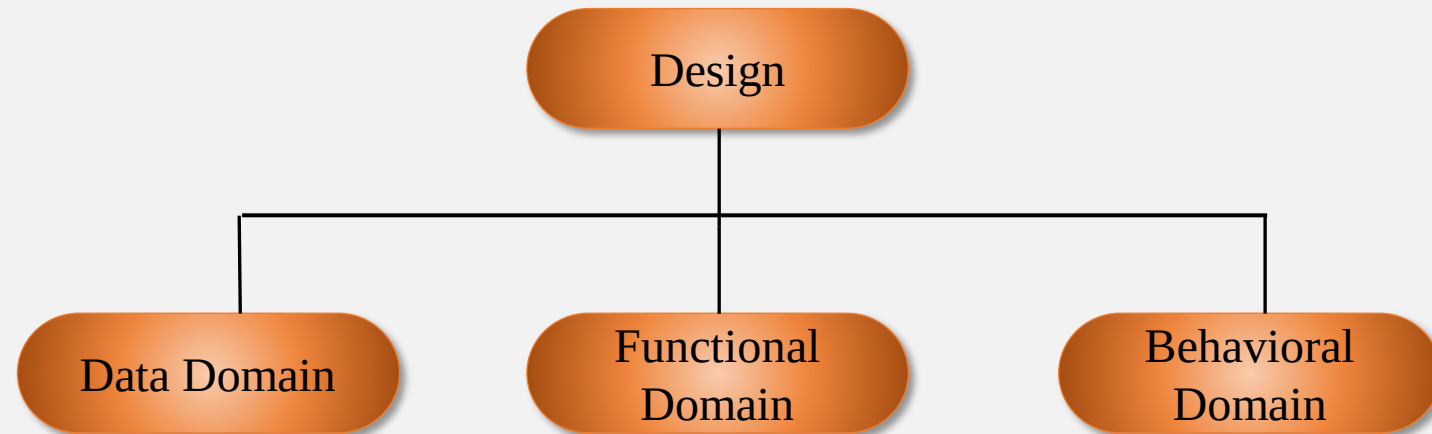


Figure: Implementation Perspectives

Software Quality Guidelines

1. A design should create an architecture that can
 - Use architecture styles.
 - Composed of good components.
 - Be implemented in evolutionary manner.
2. A design should be modular
 - Software elements must be logically partitioned.
3. A design should represent data , architecture, interface and components in well defined manner.

Software Quality Guidelines

4. A design should lead to proper data structure.
5. A design should lead to components with independent functional characteristic.
6. A design should lead to simple interface with minimum connections between the components.
7. A design should be derived iteratively with the obtained information from software requirement analysis.
8. The notations used in design representation should effectively communicates its meaning.

Quality Attributes

The quality attributes are given in the acronym “FURPS”.

Functionality:

It is assessed by evaluating the feature set and capabilities of the program, functionality delivered and security of overall system.

Usability:

It is accessed by considering the human factors, overall aesthetics, consistency and documentation.

Reliability:

It is evaluated by measuring parameters like frequency and severity of failure, accuracy of output result, the mean-time-to-failure(MTTF), recovery from failure and the program predictability.

Quality Attributes

Performance:

It is measured by considering processing speed, response time, resource consumption, throughput and efficiency.

Supportability:

- It combines the ability to extend the program, adaptability, serviceability, these three factors commonly represented with the term maintainability.
- Testability, compatibility and configurability are the terms used with which a system can be easily installed and found the problems easily.
- Supportability also consists of more attributes such as compatibility, extensibility, fault tolerance, modularity, reusability, robustness, security, portability, scalability.

The Evolution of Software Design

- The evolution of software design is a continuing process that has spanned around six decades.
- Early design focus on development of modular programs in top down manner, that is called as structured programming.
- Newer design approaches proposed an object-oriented approach to design that is bottom up manner.
- Each software design method introduces unique approach.

Common characteristics:

- Translation of the requirements model into a design representation
- a notation for representing functional components and their interfaces
- Heuristics for refinement and partitioning.
- guidelines for quality assessment.

Summary

- During the design process requirements are translated into blue print for constructing the software.
- Quality guidelines that lead to good design.
- Quality attributes for assessing the quality of the software.
- The evolution of the software design.

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Thank You



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