T8: Web Engineering

1. Explain briefly in your words: what is Software Engineering? what is Web Engineering?

2. Describe the common Content Architectures of WebApps. Highlight the differences between Content Architecture and WebApp architecture.

3. Describe characteristics of WebApps that must be taken into account by any Web Engineering Process Model.

4. List five important quality dimensions applicable for WebApps, and briefly explain three most important ones to end-users of an online banking system.

5. What are the roles in a Web Engineering Team?

6. What are the four main activities in creating a complete analysis model of WebApps?

T8_Q1_ans: SoftEng vs WebEng

- **Software engineering** (SE) is the profession that creates & maintains software products by applying technologies and practices from computer science, project management, engineering, application domains and other fields.
- Software engineering, like traditional engineering disciplines, deals with issues of cost and reliability.

- Some software products contain millions of lines of code that are expected to perform properly in the face of changing conditions, making them comparable in complexity to the most complex modern machines.
- SE includes a process, a collection of methods(practice) and an array of tools that allow professionals to build high quality software products.
- Follow systematic rules and procedures in developing the software products.

- **Web Engineering** (WE) is the profession that creates & maintains WebApps by applying SE technologies and practices to produce high quality WebApps.
- Applying SE techniques for building industry-quality WebApps.

T8_Q2: Four different content architectures of WebApp

T8_Q2_ans

Linear structure – Such structures are encountered when a predictable sequence of interactions is common. The sequence of content presentation is predefined and generally linear. E.g. product order entry sequence in which specific information must be specified in a specific order.

Grid structure – This structure is applicable when WebApp content can be organized categorically in two (or more) dimensions. Such WebApp architecture is useful only when highly regular content is encountered. E.g. Consider E-commerce site selling golf clubs - the horizontal dimension of the grid represents the type of club to be sold (woods, irons, wedges, putters), and the vertical dimension represents the offerings provided by various gold club manufacturers.

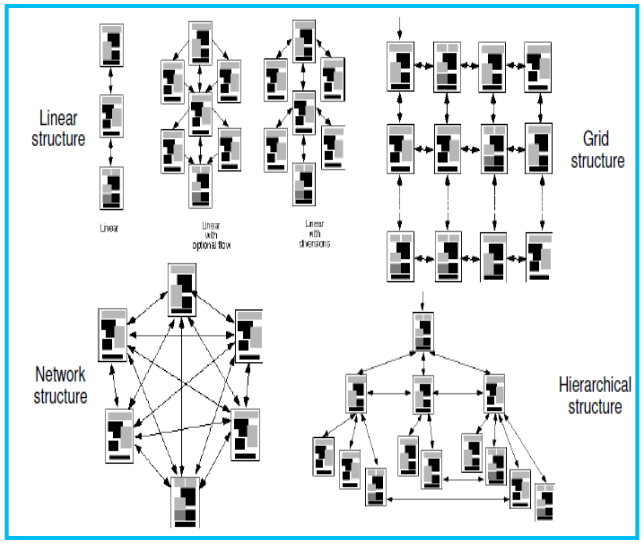
Hierarchical structure – This is the most common WebApp architecture. While the branches of WebApp having hierarchical structure is usually structured top-down, a WebApp hierarchical structure can also be designed in a manner that enables (via hypertext branching) flow of control horizontally or across vertical branches of the structure.

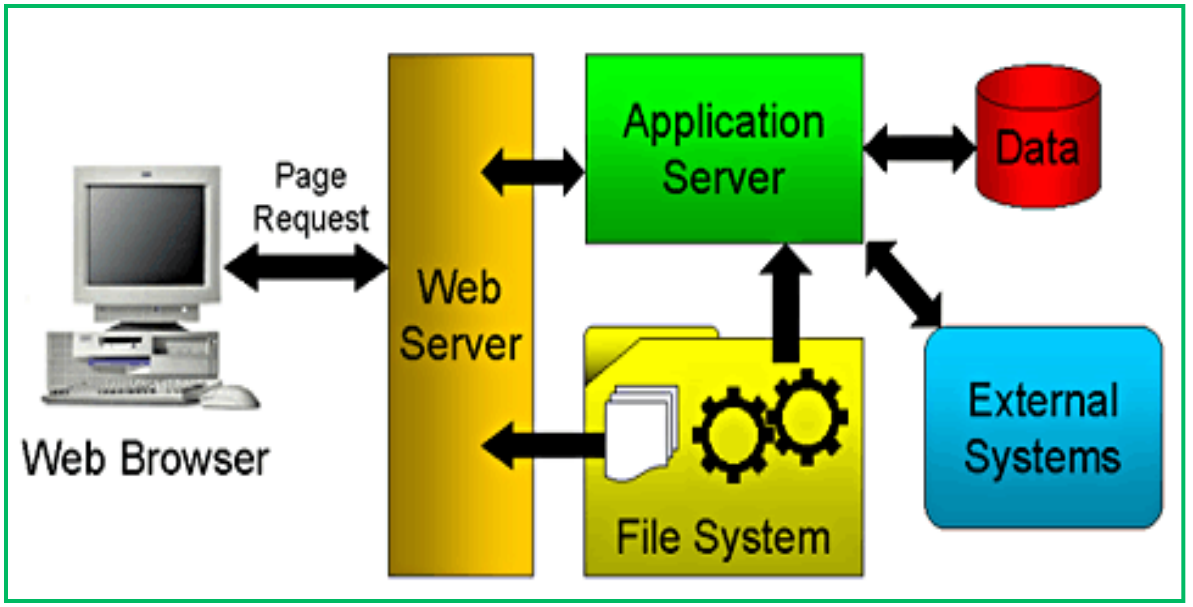
Networked structure – Such type of structures can be confusing to the user as they may pass control (via hypertext links) to virtually every other component in the system, thus allowing considerable navigation flexibility.

T8_Q2ans:

Difference between WebApp architecture and Content architecture:

The architectural designer must identify **content architecture** and **WebApp architecture**. Content architecture focuses on the manner in which content objects (or composite objects such as Web pages) are structured for presentation and navigation. WebApp architecture addresses the manner in which the application is structured to manage user interaction, handle internal processing tasks, effect navigation, and present content.





T8_Q3_ans

Characteristics of WebApps that must be taken into account by any Web Engineering Process Model:

1. WebApps are often delivered incrementally. That is, framework activities will occur repeatedly as each increment is engineered and delivered.
2. Changes will occur frequently. These changes may occur as a result of the evaluation of a delivered increment or as a consequence of changing business conditions.
3. Timelines are short. This mitigates against the creation and review of voluminous engineering documentation, but it does not preclude the simple reality that critical analysis, design, and testing must be recorded in some manner.

T8_Q4 ans

The Quality dimensions applicable to WebApps are:

- Usability (understandable, features, helps)
- Performance (efficiency + interoperability)
- Reliability (security)
- Maintainability (correction, extension, adaption)
- Functionality (navigability, content, structure, function)

The three most important ones to end-users of an online banking system: Reliability, Functionality, Performance.

T8_Q5_ans: **Roles in a Web Engineering Team**

Content developers/providers – Since WebApps are inherently content driven, one role on the WebE team must focus on the generation and/or collection of content.

Web publisher – The diverse content generated by content developers/providers must be organized for inclusion within the WebApp. In addition, someone must act as liaison between technical staff who engineer the WebApp and nontechnical content developers/providers. This role is filled by the Web publisher, who must understand both content and WebApp technology.

Web engineer – A Web engineer becomes involved in a wide range of activities during the development of a WebApp including requirements elicitation, analysis modeling, architectural, navigational and interface design, WebApp implementation, and testing. The Web engineer should also have a solid understanding of component technologies, client/server architectures, HTML/XML, and database technologies and a working knowledge of multimedia concepts, hardware/software platforms, network security, and Web-site support issues.

Business domain experts – A business domain expert should be able to answer all questions related to the business goals, objectives and requirements associated with the WebApp.

T8_Q5_ans_cont:

Support specialist – This role is assigned to the person (people) who have responsibility of continuing WebApp support. Since WebApps continuously evolve, the support specialist is responsible for corrections, adaptations, and enhancements to the site, including updates to content, implementation of new procedures and forms, and changes to the navigation pattern.

Administrator – Often called the "Web Master", this person has responsibility for the day-to-day operation of the WebApp including: developing and implementation of policies for the operation of the WebApp, establishment of support and feedback procedures, implementation of security and access rights, measurement and analysis of Web-site traffic, coordination of change control procedures, and coordination with support specialists. The administrator may also be involved in the technical activities performed by Web engineers and support specialists.

T8_Q6_ans:

The four analysis activities are:

1. Content analysis – Identifies the full spectrum of content to be provided by the WebApp. Content includes text, graphics and images, and video and audio data.
2. Interaction analysis – Describes the manner in which the user interacts with the WebApp.
3. Functional analysis – Defines the operations that will be applied to WebApp content and describes other processing functions that are independent of content but necessary to the end-user.
4. Configuration analysis – Describes the environment and infrastructure in which WebApp resides.