

Book Questions

Chapters 6

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6.1 When describing a system, explain why you may have to start the design of the system architecture before the requirements specification is complete.

Ans: In the process of describing a system, developing the system framework should usually occur before or at least simultaneously along with requirements specification completion. One of the primary reasons is cost estimation. Focusing only on gathering requirement specifications without consulting with the budget requirements would lead to revisiting the specifications gathering process again.

Focusing on system architecture first would allow the different groups within the systems development team to be fully acquainted with the requirements they need from the start of the project. Focusing on the requirements specifications only may stall the progress of certain units within the system architecture team. For example, hardware sourced from overseas suppliers requires sufficient notice for obtaining parts at competitive pricing.

6.3 Explain why design conflicts might arise when designing an architecture for which both availability and security requirements are the most important non-functional requirements.

Ans: When designing a system architecture, the availability requirements of various system processes and components try to ensure that the required data is available on-demand for system usage. Scenarios may arise where-in data may not be readily available to the system because of errors which may arise in functionality of certain components. In such cases, the system architecture should have back-up data on standby ready for prompt access.

The issue with storing back-up data surfaces in the security requirements of the system's architecture. The security requirements will strive to ensure that copies of system data are only made available within the monitored environment of the system and not for external, illegal access. However, this should not pose to be a major issue during system architecture design unless specific departments, such as the requirements gathering unit and security analysis unit within the development team are not working together to learn of the risks or vulnerabilities each unit may individually expose.

6.9 Using the basic model of an information system as presented in Figure 6.18, suggest the possible components of an app for a mobile device that displays information about flights arriving and departing from a particular airport.

Ans: By reading about the information in our textbook and attempting to analyze the user interface of the Kayak[®] iPhone app, the breakdown of the data and processing model may apply as follows:

1. User interface:

The user interface is solely dependent on the information displayed on the mobile app only. For example, choosing options to search for flight trips, flight tracking, flight price alerts and other options.

2. User communications and authentication:

- The user interacts predominantly with the application on the mobile app level itself. There is minimal requirement to obtain or source information from the mobile app's server yet. For example, selection of the flight dates (dates, one-way, return), number of travelers, type of traveler (adult, senior, youth, children, infant), travel class (economy, premium economy, business, first). Current location, nearby airports and airport abbreviations are obtained via geotagging information and the mobile app's server data.
- Users enjoy the flexibility to browse through and select flight schedules before logging in or creating an account. Hence, the authentication process is only necessary if the user has finalized the travel plan.

3. Information retrieval and modification:

The user is presented with detailed flight information which is obtained from the mobile app's remote server. The information is displayed in a manner which is managed by the mobile app's user interface. Therefore, even though the retrieved information will be the same, display options will depend upon the device. For example, airline company, flight departure and landing times, flight duration, cost, lay overs and other information displayed according to the device such as an Apple device (4S, 5, 6, 6S phones or iPad), Android (various screen sizes) or other device type.

4. Transaction management and database:

The user can choose to confirm the flight selection displayed from the host mobile app's database. The mobile app directs the user to the airline's web server to obtain passenger information and transaction details. A combination of security is provided by both the host mobile app and the airline web server as the user transitions through the stages of completing the flight booking.