



You:

You are Sommerville-Software-Engineering-10ed



ChatGPT:

I apologize for any confusion, but I am not specifically Sommerville's "Software Engineering: 10th Edition" book. However, I can provide information and answer questions related to software engineering concepts and topics if that's what you're looking for. Please feel free to ask any questions you have, and I'll do my best to assist you.



You:

Identify and briefly describe four types of requirements that may be defined for a computerbased system. Give me short answer in simple words as 5 marks question which I can write in exam.



ChatGPT:

Certainly, here are four types of requirements for a computer-based system:

1. **Functional Requirements:** These specify what the system should do. They describe the system's functions, features, and interactions with users and other systems. For example, "The system must allow users to log in with a username and password."
2. **Non-Functional Requirements:** These describe the quality attributes of the system, such as performance, security, and usability. They focus on how the system should behave, rather than what it should do. For example, "The system must respond to user requests within 2 seconds."
3. **User Requirements:** These are statements written in natural language that capture what users expect from the system. They help ensure the system meets user needs and expectations. For example, "The user should be able to easily navigate the website."
4. **System Requirements:** These specify the hardware, software, and network components that the system needs to operate. They detail the technical aspects of the system's environment. For example, "The system must run on Windows 10 and require a minimum of 4 GB RAM."

These four types of requirements are crucial in defining and developing a computer-based system to ensure it meets both user and technical expectations.



Discover ambiguities or omissions in the following statement of the requirements for part of a drone system intended for search and recovery: The drone, a quad chopper, will be very useful in search and recovery operations, especially in remote areas or in extreme weather conditions. It will click high-resolution images. It will fly according to a path preset by a ground operator, but will be able to avoid obstacles on its own, returning to its original path whenever possible. The drone will also be able to identify various objects and match them to the target it is looking for. Give me short answer in simple words as 5 marks question which I can write in exam.



Certainly, here are some ambiguities and omissions in the provided requirements statement for the drone system:

1. **Vague Usefulness:** The statement mentions the drone's usefulness in search and recovery operations, but it doesn't specify what "useful" means in terms of performance or capabilities. It lacks concrete criteria for measuring its utility.
2. **No Image Resolution:** It mentions "high-resolution images," but it doesn't define what "high-resolution" means in terms of pixel count or quality. This lack of specificity can lead to misunderstandings.
3. **Obstacle Avoidance Conditions:** The statement mentions the drone's ability to avoid obstacles and return to its path "whenever possible," but it doesn't clarify the conditions or criteria for determining when it's possible or not. This could lead to unpredictable behavior.
4. **Object Identification:** It states the drone can "identify various objects" but doesn't specify how it will do this or what it will do once an object is identified. This ambiguity can affect the system's functionality.

These ambiguities and omissions can lead to misunderstandings and difficulties in developing the drone system as they leave room for interpretation and uncertainty.



Rewrite the above description using the structured approach described in this chapter. Resolve the identified ambiguities in a sensible way. Give me short answer in simple words as 5 marks question which I can write in exam.



Certainly, here's a rewritten description of the drone system requirements using a structured approach to resolve the identified ambiguities:

Requirement 1: Purpose and Usefulness

- The drone, a quad chopper, will be primarily designed for search and recovery operations.
- In remote areas or during extreme weather conditions, it should perform effectively by maintaining stable flight and image capture.
- The drone's usefulness will be measured by its ability to provide real-time data and imagery for search and recovery missions.

Requirement 2: Image Resolution

- The drone will capture high-resolution images with a minimum pixel count of 12 megapixels, ensuring clarity and detail in its pictures.

Requirement 3: Obstacle Avoidance

- The drone will have obstacle avoidance capabilities to navigate around obstacles in its path.
- It will prioritize safety and should only return to its original path if there is a clear and immediate risk, ensuring a balance between safety and mission continuity.

Requirement 4: Object Identification

- The drone will employ onboard image processing to identify various objects during search operations.
- Once an object is identified, it will record its GPS coordinates and transmit this information to the ground operator for further assessment and action.

By structuring the requirements in this way, we have addressed the ambiguities and provided clear, specific criteria for the drone system's performance, functionality, and behavior. This ensures a better understanding of what is expected from the system.



You:

Write a set of non-functional requirements for the drone system, setting out its expected safety and response time. Give me short answer in simple words as 5 marks question which I can write in exam.



ChatGPT:

Certainly, here's a set of non-functional requirements for the drone system, focusing on safety and response time:

Safety Requirements:

1. **Safety Certification:** The drone system must adhere to all relevant safety certifications and regulations for aerial operations.
2. **Obstacle Avoidance:** The drone must have real-time obstacle detection and avoidance mechanisms to minimize collision risks.
3. **Emergency Procedures:** In the event of a critical system failure, the drone should initiate predefined emergency procedures to ensure a safe landing or return to the base.

4. **Weather Conditions:** The drone should be capable of operating in various weather conditions, including rain and wind up to a defined limit, ensuring safe flight.

Response Time Requirements:

1. **Response to Commands:** The drone must respond to operator commands with a latency of no more than 500 milliseconds to ensure prompt control.
2. **Obstacle Detection:** The system should detect obstacles in its path and respond within 200 milliseconds to avoid collisions.
3. **Return to Path:** When diverting from its preset path due to obstacles, the drone should return to the original path within 2 seconds once the obstacle is cleared.
4. **Emergency Response:** In emergency situations, such as low battery or loss of communication with the ground, the drone must initiate an appropriate response within 1 second to prevent accidents.

These non-functional requirements set clear expectations for safety and response times in the drone system, ensuring safe and effective operations.



Using the technique suggested here, where natural language descriptions are presented in a standard format, write plausible user requirements for the following functions: An unattended petrol (gas) pump system that includes a credit card reader. The customer swipes the card through the reader, then specifies the amount of fuel required. The fuel is delivered and the customer's account debited. The cash-dispensing function in a bank ATM. In an Internet banking system, a facility that allows customers to transfer funds from one account held with the bank to another account with the same bank. Give me short answer in simple words as 5 marks question which I can write in exam.



Certainly, here are plausible user requirements for the specified functions presented in a standard format:

Unattended Petrol (Gas) Pump System with Credit Card Reader:

1. **Credit Card Payment:** The system shall allow customers to make payments using a credit card by swiping it through the reader.
2. **Fuel Selection:** Customers must be able to specify the desired amount of fuel they wish to purchase.
3. **Fuel Delivery:** The system shall dispense the specified amount of fuel into the customer's vehicle.
4. **Account Debit:** Following fuel delivery, the system must promptly debit the customer's credit card account for the corresponding fuel purchase amount.

Cash-Dispensing Function in a Bank ATM:

1. **Card Authentication:** The ATM shall require customers to insert their bank card and input their Personal Identification Number (PIN) to access the cash-dispensing function.
2. **Cash Withdrawal:** Customers must have the option to select the desired amount of cash they wish to withdraw.
3. **Cash Dispensing:** The ATM shall dispense the requested amount of cash in the appropriate denominations.
4. **Transaction Confirmation:** After dispensing cash, the ATM must provide a transaction receipt, showing the withdrawal details.

Internet Banking Fund Transfer Facility:

1. **Account Selection:** Customers shall be able to choose the source and destination accounts held with the same bank for the fund transfer.
2. **Transfer Amount:** Customers must specify the amount of money they want to transfer between their accounts.
3. **Transaction Confirmation:** The system shall display a confirmation message detailing the fund transfer, including the source and destination account information and the transferred amount.
4. **Transaction History:** The system should maintain a record of the fund transfer transaction for the customer to review in their account history.

These user requirements define the key functionalities and interactions expected from the specified systems, ensuring a clear understanding of user needs and system capabilities.



Suggest how an engineer responsible for drawing up a system requirements specification might keep track of the relationships between functional and non-functional requirements. Give me short answer in simple words as 5 marks question which I can write in exam.



An engineer responsible for drawing up a system requirements specification can keep track of the relationships between functional and non-functional requirements by:

1. **Creating a Traceability Matrix:** Develop a matrix that maps each functional requirement to its related non-functional requirements and vice versa. This matrix helps ensure that every functional requirement has the necessary non-functional attributes to support it and vice versa.
2. **Using Clear Labels and References:** In the requirements document, use clear labels and references to indicate the connections between functional and non-functional requirements. For example, you can use unique identifiers or tags to link related requirements.
3. **Grouping Requirements:** Group related functional and non-functional requirements together in sections or categories within the document. This makes it easier to see the dependencies and relationships between them.

4. Conducting Reviews: During the review process, involve stakeholders to assess how functional and non-functional requirements align. This can help identify any gaps or inconsistencies in the specifications.

5. Documentation and Updates: Ensure that any changes or updates to requirements are well-documented and include any corresponding adjustments to related requirements. Maintain a version history to track changes over time.

By implementing these strategies, the engineer can effectively manage and track the relationships between functional and non-functional requirements, ensuring that the system meets both its functional and performance expectations.



You:

Using your knowledge of how an ATM is used, develop a set of use cases that could serve as a basis for understanding the requirements for an ATM system. Give me short answer in simple words as 5 marks question which I can write in exam.



ChatGPT:

Certainly, here's a set of use cases for an ATM system based on how it's typically used:

1. **Withdraw Cash:** A customer inserts their card, enters their PIN, and selects the "Withdraw Cash" option to get money from their account.
2. **Check Account Balance:** A customer inserts their card, enters their PIN, and selects the "Check Balance" option to view their account balance.
3. **Deposit Funds:** A customer inserts their card, enters their PIN, and selects the "Deposit Funds" option to add money to their account.
4. **Transfer Money:** A customer inserts their card, enters their PIN, and selects the "Transfer Money" option to move funds between accounts.
5. **Change PIN:** A customer inserts their card, enters their current PIN, and selects the "Change PIN" option to update their personal identification number.
6. **Print Mini Statement:** A customer inserts their card, enters their PIN, and selects the "Print Mini Statement" option to receive a summary of recent transactions.
7. **Bill Payments:** A customer inserts their card, enters their PIN, and selects the "Pay Bills" option to pay bills or make utility payments.
8. **Purchase Prepaid Services:** A customer can buy prepaid services like mobile phone top-ups or gift cards using the ATM.
9. **Card Services:** A customer can activate a new card, report a lost or stolen card, or request a replacement card.
10. **Language Selection:** The ATM should allow users to select their preferred language for the transaction process.

These use cases cover the main interactions a customer has with an ATM system and serve as a foundation for understanding the requirements of such a system.



You:

To minimize mistakes during a requirements review, an organization decides to allocate two scribes to document the review session. Explain how this can be done. Give me short answer in simple words as 5 marks question which I can write in exam.



ChatGPT:

To minimize mistakes during a requirements review with two scribes, here's how it can be done:

1. **Roles and Responsibilities:** Assign specific roles to each scribe. One scribe can focus on documenting the discussions and decisions made during the review, while the other can track action items and issues that need further attention.
2. **Parallel Note-Taking:** Both scribes should take notes in parallel during the review. This means they record the same information independently. Having two sets of notes provides a backup and helps ensure that nothing important is missed.
3. **Regular Check-Ins:** Periodically, the two scribes should compare their notes during the review session. If there are any discrepancies or missing information, they can clarify and correct it immediately.
4. **Documentation Standards:** Ensure that both scribes adhere to the same documentation standards and templates to maintain consistency in the notes they take.
5. **Post-Review Consolidation:** After the review, the scribes can merge their notes into a single comprehensive document. This consolidated document becomes the official record of the review, reducing the chances of errors or omissions.

By having two scribes work in tandem with clear roles, regular cross-checks, and standardized documentation, organizations can enhance the accuracy and reliability of the requirements review process.



You:

When emergency changes have to be made to systems, the system software may have to be modified before changes to the requirements have been approved. Suggest a model of a process for making these modifications that will ensure that the requirements document and the system implementation do not become inconsistent. Give me short answer in simple words as 5 marks question which I can write in exam.



To ensure consistency between the requirements document and system implementation when emergency changes are needed, follow this process:

1. **Initial Documentation:** Document the emergency change request, including the reasons for the change, impact assessment, and the urgency of the situation. Ensure all stakeholders are aware of the emergency.
2. **Temporary Code Modification:** Allow qualified developers to make necessary system software modifications to address the emergency without waiting for formal requirement changes.
3. **Communication:** Notify all relevant stakeholders, including the project manager, business analysts, and quality assurance teams, about the emergency change and the temporary modifications.
4. **Requirement Update:** Simultaneously, initiate a review and update of the requirements document to reflect the emergency changes accurately. Document the change in detail, including how it affects the system's functionality.
5. **Review and Approval:** Convene a rapid review meeting with stakeholders to validate the updated requirements and ensure they align with the system's temporary modifications.
6. **Formal Change Request:** Create a formal change request based on the emergency change documentation, and submit it for approval through the standard change control process.
7. **Testing:** Conduct thorough testing to verify that the temporary system modifications and the updated requirements are consistent and meet the emergency needs.
8. **Implementation:** Once the change request is approved, implement the permanent solution according to the updated requirements.
9. **Documentation Alignment:** Ensure all documentation, including system code, user manuals, and requirement documents, is updated to reflect the approved changes.
10. **Post-Implementation Review:** Conduct a post-implementation review to confirm that the emergency changes have been successfully integrated and that the system remains consistent with the updated requirements.

This process ensures that urgent system modifications can be made to address emergencies while also maintaining consistency between the requirements document and the system implementation through proper documentation and review steps.



You:

You have taken a job with a software user who has contracted your previous employer to develop a system for them. You discover that your company's interpretation of the requirements is different from the interpretation taken by your previous employer. Discuss what you should do in such a situation. You know that the costs to your current employer will increase if the ambiguities are not resolved. However, you also have a responsibility of confidentiality to your previous employer. Give me short answer in simple words as 5 marks question which I can write in exam.



In such a situation where there's a difference in interpretation of requirements between my current employer and my previous employer, here's what I should do:

1. **Clarify the Requirements:** First, I would thoroughly review the requirements document and discuss it with both my current employer and my previous employer. This helps clarify any ambiguities and discrepancies in interpretation.
2. **Document Differences:** I would carefully document the specific points of difference between the two interpretations, noting the potential impact on the project.
3. **Facilitate Communication:** Initiate open and respectful communication between my current employer and my previous employer to discuss the differences in interpretation. This may involve meetings or written correspondence.
4. **Seek Resolution:** Encourage both parties to work together to find a mutually agreeable resolution to the differences in interpretation. This could involve compromises or additional clarification of requirements.
5. **Maintain Confidentiality:** While facilitating the resolution process, I would ensure that I do not disclose any confidential information or proprietary details from my previous employer. My responsibility to maintain confidentiality remains intact.
6. **Cost Assessment:** Assess the potential cost implications of the differences in interpretation and share this information with both parties so they can make informed decisions about how to proceed.
7. **Document Agreements:** Once a resolution is reached, document the agreed-upon interpretation of the requirements and any changes made to the project plan as a result.

By taking these steps, I can help bridge the gap in interpretation, facilitate a productive dialogue, and ensure that both my current employer's and my previous employer's interests are considered while respecting my confidentiality obligations.
