

CS 487 – SOFTWARE ENGINEERING

Homework - 1

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1. Remove Ambiguity from Requirements

a. Original Requirement:

“AI-RE must proactively identify high-level requirements based on an assessment of the current request as compared to previously analysed systems.”

Revised Requirement:

Through analysis of the current project request and comparison with a database of needs from systems that have been previously evaluated, the AI-RE system should automatically provide a list of high-level requirements. To guarantee thorough consideration of all possible criteria, this procedure should involve pointing out parallels and contrasts.

b. Original Requirement:

“AI-RE must interact with users to identify a complete set of their requirements.”

Revised Requirement:

Users should have a structured conversation with the AI-RE system in order to compile an exhaustive list of their requirements. Asking clarifying questions is a necessary part of this interaction to make sure that all user demands are appropriately recorded.

c. Original Requirement:

“AI-RE must document each requirement as a concise and unambiguous statement.”

Revised Requirement:

Every recognized requirement should be recorded by the AI-RE system in a clear, succinct, and unambiguous manner, guaranteeing that every statement is clearly comprehensible and free from any possibility of misunderstanding.

2. Document Test Cases

a. Test Cases for Requirement a:

Test Case 1: Evaluate the AI-RE system's ability to identify requirements for a unique Indian festival management app.

Expected Result: The system should generate relevant high-level requirements by drawing parallels with existing event management systems while accounting for cultural specificities.

Test Case 2: Test the AI-RE system's performance when analyzing a project request for a multilingual educational platform catering to various Indian states.

Expected Result: The system should identify requirements that address language diversity and regional educational needs based on similar systems in its database.

b. Test Cases for Requirement b:

Test Case 1: Assess the AI-RE system's capability to gather requirements from a diverse group of stakeholders for a smart city project in India.

Expected Result: The system should engage effectively with urban planners, government officials, and citizens, asking relevant questions to each group and compiling a comprehensive set of requirements.

Test Case 2: Test the AI-RE system's ability to handle requirement gathering for a traditional Indian medicine (Ayurveda) tracking app.

Expected Result: The system should ask domain-specific questions, recognize unique terminologies, and prompt for clarifications on unfamiliar concepts to ensure a complete set of requirements.

c. Test Cases for Requirement c:

Test Case 1: Evaluate the AI-RE system's performance in documenting requirements for a complex Indian tax compliance software.

Expected Result: Each requirement should be documented clearly and unambiguously, accurately capturing intricate tax rules and regulations without room for misinterpretation.

Test Case 2: Test the AI-RE system's ability to document non-functional requirements for a high-traffic e-commerce platform during Indian festival seasons.

Expected Result: The system should produce concise, measurable statements for performance, scalability, and reliability requirements that address peak usage scenarios.

3. Propose an H-C-I Protocol for AI-RE

a. "Hears" and Comprehends User Statements:

- **Protocol:** Utilize natural language processing (NLP) to understand input from users. Speech-to-text technology should be used by the AI-RE system to translate spoken words into text. Semantic analysis should then be performed to ascertain the meaning and context of user statements.

- **Explanation:** NLP enables the system to precisely "hear" and understand human words, enabling it to react accordingly and guaranteeing that all user inputs are read correctly.

b. Handles "Follow-up" Questions from Engineers:

- **Protocol:** Provide a feedback loop so that engineers can ask the AI-RE system questions about needs. When appropriate, the system ought to ask consumers for further information or offer thorough explanations.

- **Explanation:** By following this protocol, engineers can communicate with the AI-RE system and get any questions answered. The system will be able to revise specifications and make sure they satisfy engineering, and user demands thanks to its capacity to manage follow-up queries.

By implementing these protocols, the AI-RE system will facilitate effective communication between users and engineers, ensuring that all requirements are accurately captured and documented.