**Team 02**

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**1) What is requirements engineering?**

**Ans:** Requirements engineering is the systematic process of collecting, analyzing, documenting, validating, and managing stakeholder needs and constraints to establish precise and understandable requirements for a system. It includes gathering the input from stakeholders, refining it for completeness and feasibility, structuring documentation, validating for accuracy, and managing changes to ensure alignment with the project goals throughout the development lifecycle.

**2) In an agile/iterative software development setting, will you undergo this process once or multiple times?**

**Ans:** In agile/iterative software development, the requirement's engineering process is conducted continuously throughout the project lifecycle, rather than just once at the project's onset. This iterative approach involves ongoing gathering, analysis, documentation, validation, and management of requirements as the project progresses. It allows teams to adapt to evolving priorities and requirements, ensuring that the system remains aligned with stakeholders' needs and enabling effective incorporation of any changes or updates into the project.

**3) What are the different requirements engineering activities?  Who takes part in those activities**

**Ans:** Requirements engineering involves various essential tasks:

* **Requirements Elicitation**: Collecting requirements from stakeholders.
* **Requirements Analysis**: Examining and improving the gathered requirements.
* **Requirements Documentation**: Clearly and understandable documenting requirements.
* **Requirements Validation**: Confirming that documented requirements meet stakeholders' needs.
* **Requirements Management**: Handling changes to requirements throughout the project lifecycle.

Various members of the project team participate in these activities:

* **Business Analysts**: They lead the requirements engineering process, including elicitation, analysis, documentation, validation, and management.
* **Stakeholders**: They provide input during requirements elicitation and validation to ensure accurate capture of their needs.
* **Developers**: They contribute during requirements analysis to ensure technical feasibility and estimate the effort required for implementation.
* **Testers**: They contribute to requirements validation to ensure testability and verifiability of the requirements.
* **Project Managers**: They oversee the requirements engineering process, ensuring effective execution and proper management of any changes.

**4) Define each of the participants in the above activities (example: developer, stakeholder)**

**Ans:**Business Analysts: Understand business needs and translate them into technical plans.

* **Product Owners:** Represent stakeholders' interests and prioritize project requirements.
* **Subject Matter Experts (SMEs):** Provide domain-specific knowledge and insights for project clarity.
* **Developers**: Implement technical solutions based on project requirements.
* **Designers:** Create user-friendly and visually appealing designs aligned with project goals.
* **Testers / QA Engineers:** Ensure the project meets quality standards and functions correctly.
* **Project Managers:** Coordinate and oversee project activities to ensure timely delivery and success.
* **End-users / Customers:** Provide feedback and ensure the project meets their needs and expectations.

**5) For each of the roles in the above two questions, identify who fills those roles (for example, your team is the developer(s), etc).  Remember that one person/group can play multiple roles!**

**Ans:**

|  |  |
| --- | --- |
| **Names** | **Role** |
| Sai Srikar Miriyala | Project Manager |
| Sowmya Reddy Allugari | System Analyst |
| Lakshmi Pravallika Bhupathi | QA Tester |
| Nishchala Namburi | Business Analyst |
| Yaswanth Kanakala | Developer |
| Udaykiranreddy Devarapally | Developer |

**6) Define functional requirement.**

**Ans:** Functional requirements are precise declarations of how a product, process, or system must operate to meet the goals and needs of the user. These specifications, which address both the functional and non-functional elements of the design, usually list the duties, functions, and interactions that the system must carry out. [1]

For a system's design and execution to satisfy the intended functional goals, match business objectives, and deliver the required user experience, functional requirements are crucial. Functional requirements also cover data-related aspects like storage, retrieval, transformation, and output.

**7) Define non-functional requirement.**

**Ans:** Non-functional requirements are essential components that specify a system's availability, interoperability, performance, security, maintainability, and usability. They cover aspects beyond functionality, such as throughput and response time goals, scalability to accommodate growing loads, dependability to guarantee continuous operation, and security features to ward off attacks. While maintainability guarantees the ease of future updates, usability criteria center on the user experience. Compatibility deals with system integration, and availability defines system uptime. Together, these specifications make sure that the system satisfies corporate demands, industry standards, and user expectations all while providing a positive user experience.[2]

**8) What project artifacts (documents, etc) should result from requirements engineering?**

**Ans:** The requirements engineering process typically results in several project artifacts:

* **Requirements Document**: This provides a comprehensive description of both functional and non-functional requirements, encompassing user stories, use cases, and system requirements specifications.
* **Requirement Traceability Matrix (RTM)**: This matrix establishes links between requirements and other project artifacts, ensuring comprehensive coverage throughout the project's lifecycle.
* **Use Case Diagrams**: These diagrams visually represent interactions between users and the system, facilitating a deeper understanding of system behavior.
* **User Stories**: These narratives articulate system functionality from an end-user perspective, adhering to a straightforward template.
* **Prototypes/Wireframes**: These visual representations of the system's user interface assist stakeholders in validating requirements.
* **Change Management Documentation**: This includes change requests, change logs, and impact analysis documents, facilitating the management of requirement changes throughout the project.

**9) Define requirements elicitation**

**Ans:** Requirements elicitation is the systematic gathering of information from stakeholders to understand what they need and expect from a software system. This involves techniques such as interviews, workshops, surveys, and observations to ensure a clear and comprehensive understanding of the system's purpose and functionality. The ultimate goal is to collect accurate requirements that will guide the design and development of the system.[3]

**10) What are the sequence of steps one should take during requirements elicitation?  Which step is potentially the hardest**

**Ans:**  During requirements elicitation, the typical sequence of steps involves

* **Identifying Stakeholders**: Determining who the stakeholders are and involving them in the process.
* **Planning Elicitation Activities**: Deciding which techniques (interviews, workshops, surveys, etc.) to use and scheduling them appropriately.
* **Conducting Elicitation Activities**: Gathering requirements using the selected techniques.
* **Documenting and Analyzing Requirements**: Recording the gathered requirements and analyzing them to ensure clarity, completeness, and consistency.
* **Validating Requirements**: Ensuring with stakeholders that the documented requirements accurately reflect their needs and expectations.
* **Managing Requirements Changes**: Establishing a process for managing changes to requirements as they evolve.
* The most challenging step in requirements elicitation is often validating requirements. This involves confirming that the documented requirements precisely represent the stakeholders' needs and expectations, which can be difficult due to the necessity of effective communication and agreement among multiple parties, potentially with conflicting interests.[4]

**11) What are key things you should try to identify when working with the client?  What kinds of questions should you ask?**

**Ans:** When collaborating with a client, it's crucial to identify the following key aspects:

**Business Objectives and Goals**:

* What are your organization's primary objectives and goals?
* How will the software/system contribute to achieving these objectives?

**User Needs and Expectations**:

* Who will be the main users of the system?
* What tasks or activities do users need to perform with the system?
* What features or functionalities do users expect from the system?

**Constraints and Limitations**:

* Are there any budgetary constraints for this project?
* What are the project's time constraints or deadlines?

**Success Criteria**:

* How do you plan to measure the success of this project?
* What specific outcomes or deliverables are you expecting?

**Stakeholders and Decision-Making Process**:

* Who are the key stakeholders, and what roles do they play?
* What is the decision-making process for this project?

Addressing these points ensures a comprehensive understanding of the client's needs, expectations, and constraints, enabling the collection of accurate and complete requirements for the project.

**References:**

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