**Question 1 – Audits**

**4 Quarterly Audits are planned Q1, Q2, Q3, Q4 for this Project What is your knowledge on how these Audits will happen for a BA?**

**ANSWER:**

Audits are conducted as a part of quality assurance procedure. Quarterly audits ensure that a project stays on track, meets business requirements, and abide compliance and quality standards. These audits are conducted every three months, aligning with different project phases.Quarterly audits help maintaining transparency, track progress, and ensure that project deliverables meet business expectations.

Quarterly audits for a Business Analyst (BA) focus on evaluating project progress, ensuring adherence to business requirements, maintaining accurate documentation, and identifying potential risks or gaps. The BA plays a vital role in these audits by keeping the project aligned with business objectives and user needs.

**Following are templates for Audit Report for 4 Quarters:**

|  |  |
| --- | --- |
| **Stage** | **Quarter 1 Audit Report (Requirement Gathering phase)** |
| **Completed** | 10 Weeks (Week 1- Week 10) |
| **Check list** | Elicitation results document |
|  | BRD Template |
|  | Duplicate requirements report while sorting requirements |
|  | Client signoff Document for grouped functionalities |
|  | E-mail communications to clients/ stakeholders |

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| **Stage** | **Quarter 2 Audit Report (Requirement Analysis phase)** |
| **Completed** | 8 Weeks (Week 16- Week 23) |
| **Check list** | UML Diagram (Use case & Activity diagrams) |
|  | Document on Mapping of Functional requirement from Business requirement. |
|  | Client Signoff on Solution Requirement Specification (SRS) document |
|  | RTM document |
|  | E-mail communications to clients/ stakeholders |

|  |  |
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| **Stage** | **Quarter 3 Audit Report (Design phase)** |
| **Completed** | 8 weeks (Week 28- Week 35) |
| **Check list** | Utilization of tools document |
|  | Stakeholders MOM |
|  | Client communication document evidence |
|  | E-mail communications to clients/ stakeholders |

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| --- | --- |
| **Stage** | **Quarter 4 Audit Report (Development phase)** |
| **Completed** | 20 weeks (Week 40- Week 60) |
| **Check list** | JAD session communication report |
|  | MOM (Minutes of Meeting) between Developer and BA |
|  | End user manual report document |
|  | E-mail communications to clients/ stakeholders |

**Question 2 – BA Approach Strategy**

**Before the Project is going to Kick Start, The Committee asked Mr Karthik to submit BA Approach Strategy.**

**Write BA Approach strategy (As a business analyst, what are the steps that you would need to follow to complete a project – What Elicitation Techniques to apply, how to do Stakeholder Analysis RACI/ILS, What Documents to Write, What process to follow to Sign off on the Documents, How to take Approvals from the Client, What Communication Channels to establish n implement, How to Handle Change Requests, How to update the progress of the project to the Stakeholders, How to take signoff on the UAT- Client Project Acceptance Form ).**

**ANSWER**

The Business Analysis (BA) Approach Strategy is a systematic plan that details how a Business Analyst will perform tasks to collect, assess, and manage requirements throughout the project's lifecycle. It acts as a guiding framework to guarantee that the project aligns with stakeholder expectations and achieves business goals.

**Following steps are followed by BA for implementation of BA Approach Strategy:**

1. **Elicitation techniques**

* Elicitation techniques are methods and strategies used by Business Analysts to collect information, requirements, and insights from stakeholders, users, and other key parties throughout a project. The primary objective is to comprehend their needs, expectations, and constraints to achieve the successful delivery of a product or service. Elicitation techniques serve the foundation in documenting the requirements.
* The various elicitation techniques used by Business Analyst are Brainstorming, Document Analysis, Reverse Engineering, Observation, Interviews, JAD sessions, Focus Group, Prototyping, Workshop, Survey. These appropriate elicitation techniques are chosen based on project requirements.

1. **Perform Stakeholder holder analysis**

* Identify all stakeholders that are impacted by or have an interest in the project, such as clients, end-users, sponsors, and project teams.
* List all stakeholders, define their roles and responsibilities and summarize it.
* Categorize stakeholders and prioritize based on their influence, interest and impact on the project using tools like the RACI Matrix (Responsible, Accountable, Consulted, Informed).

1. **Documents to write**

* BRD (Business Requirement Document) at requirement gathering stage.
* FRS (Functional Requirement Specification) on sorting functionalities.
* Use case documentation while drawing UML diagrams.
* Test case documents

1. **Process to follow to sign off on documents**

* Signoff can be obtained on SRS, which is legal document binding between client and technical team.
* Signoff can be obtained by email confirmation from the client. This document to be stored for future reference.

1. **Take approvals from client**

* Establish a formal meeting with the client keep informed about the updates, keep informed and get continuous feedback.
* Maintain the track record of all communications for future use.

1. **Communication channels to establish and implement**

* Conduct regular stakeholder meetings and Workshops to gather requirements, provide updates, and address concerns.
* Conduct weekly sprint reviews meetings for regular feedback and update on projects.
* Collaboration through tools and platforms Microsoft Teams, or Jira for real-time communication, document sharing, and tracking progress.

1. **Handle change requests**

* Collect fully completed Change Request Form from client including details about the change purpose, scope, and expected outcomes, using a standardized form.
* Conduct Impact Analysis by assess the impact on project scope, timeline, budget, and resources, and identify potential risks and dependencies.
* Present the impact analysis to key stakeholders or the change control board for review and formal approval or rejection.
* Record the change request approval decisions and implementation steps while updating relevant project documentation for future reference.

1. **Update the progress of the Project**

* Conduct weekly status update meeting with stakeholders to discuss progress and gather feedback.
* Conduct review meetings to provide status reports on milestones, deliverables, and risks while maintaining updated project documentation.

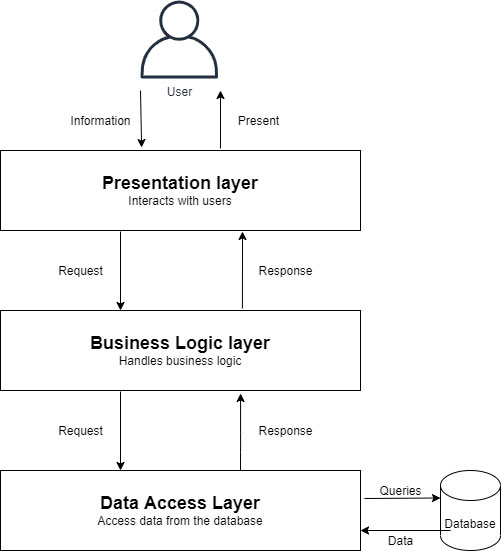
1. **Take signoff on the UAT Client project acceptance form**

* Prepare the UAT Acceptance Form that outline the project scope, test cases, and acceptance criteria to ensure alignment with client expectations.
* Conduct UAT Testing by collaborating with the client to execute test cases, validate functionality, and document any defects or feedback.
* Address and Resolve Issues by fixing identified bugs or discrepancies and perform retesting to confirm successful resolution.
* Review and Verify results to ensure all acceptance criteria are met and obtain client confirmation on satisfactory performance.
* Obtain formal approval to secure the client's signature or written approval on the UAT Client Project Acceptance Form.
* Maintain signed form and related documentation for future reference and audit purpose.

**Question 3 – 3-Tier Architecture**

**Explain and illustrate 3-tier architecture?**

**ANSWER:**



The **3-tier architecture** is a way of designing software that divides an application into three interconnected layers. This method improves flexibility, growth potential, and ease of management.

* **Presentation layer/Application layer**

The topmost layer of 3-tier architecture known as Presentation/Application layer, where the front-end user interacts with the application. This layer processes user inputs, performs basic validation, and sends requests to the business logic layer for further processing. It acts as an intermediary between the user and the underlying logic or data layers, ensuring smooth data flow and response handling.

**Example:** A web page or mobile app interface that displays data and captures user input

* **Business Logic layer**

This layer manages the logic and rules that define how data is processed and how the application behaves. It acts as a bridge between the user interface and the database, ensuring smooth data flow and proper handling of requests. It verifies data accuracy, applies security protocols, and enforces business rules before sending data to the database. It allows for easy updates and modifications to business rules without affecting the user interface or database.

**Example:** An e-commerce application calculating discounts or managing user authentication.

* **Database Layer**

This layer stores, organizes, and manages data in databases, ensuring efficient access and retrieval. It enforces rules to maintain data accuracy and consistency while implementing security measures to protect sensitive information. It processes database queries and manages transactions, such as reading, writing, updating, and deleting data. It performs regular data backups and provides recovery options in case of system failures or data loss.

**Example:** Storing customer information, product details, and order history in a database,

**Question 4 -BA Approach Strategy for Framing Questions**

**Business Analyst should keep What points in his/her mind before he Frames a Question to ask to the Stakeholder**

**( 5W 1H – SMART – RACI – 3 Tier Architecture – Use Cases, Use case Specs, Activity Diagrams, Models, Page designs)**

**ANSWER:**

A Business Analyst should consider the following key points before framing questions for stakeholders, leveraging the **5W 1H Tool, SMART Technique, RACI Matrix, 3-Tier Architecture, UML Modelling etc.** By considering these frameworks and tools, a Business Analyst can effectively gather requirements and align them with the project’s goals.

**5W 1H Tool (Who, Why, Where, When, What and How)**

* 5W1H (Who, What, When, Where, Why, How) is a problem-solving and information-gathering tool that helps in analysing situations, identifying issues, and making informed decisions by asking comprehensive and structured questions.
* For example, In a particular interaction, BA may frame following questions

Identify **who** the key stakeholders are?

Understand **what** the problem or requirement is?

Determine **when** the solution is needed?

Know **where** the solution will be implemented?

Clarify **why** the change is required?

Figure out **how** the solution will work?

**SMART Technique (Specific, Measurable, Attainable, Relevant, Time-bound)**:

* **The SMART** technique helps set clear and achievable goals by ensuring they are Specific, Measurable, Attainable, Relevant, and Time-bound, making objectives well-defined and trackable.
* It improves focus and efficiency by providing a structured approach to goal setting ensuring realistic expectations, better planning, and measurable outcomes.
* Ensure that the questions are **specific** to the business need.
* Focus on **measurable** outcomes.
* Check if the goal is **attainable** within the scope.
* Assess the **relevance** of the question to the project’s objectives.
* Set a **timeframe** for the expected results.

**RACI Matrix (Responsible, Accountable, Consulted, Informed)**:

* RACI charts define who is Responsible, Accountable, Consulted, and Informed for each task in a project, ensuring clear role distribution.
* It improves collaboration and accountability by preventing confusion, avoiding duplication of work, and ensuring smooth decision-making and communication among stakeholders.
* Identify who is **responsible** for the task.
* Determine who is **accountable** for decision-making.
* Know who needs to be **consulted** for input.
* Understand who should be **informed** about progress.

**3-Tier Architecture (Presentation, Business Logic, Database Layer)**:

* The **3-tier architecture** is a way of designing software that divides an application into three interconnected layers
* Ask questions related to **user interface design** (Presentation Layer).
* Understand the **business rules and logic** (Business Logic Layer).
* Ensure clarity on **data management and storage** (Database Layer)

**UML Modeling (Use Cases, Activity Diagrams, and Models**)

* UML (Unified Modelling Language) helps Business Analysts visually represent system requirements, workflows, and processes using diagrams like Use Case, Activity, and Sequence Diagrams, making complex information easier to understand.
* It improves communication between stakeholders, developers, and designers by providing a standardized way to document business processes, system interactions, and functional requirements, ensuring clarity and alignment.
* Identify **use cases** and their specifications to understand user interactions.
* Use **activity diagrams** to visualize workflows and processes.
* Review **data models** and page designs to assess system functionality and user experience.

**Question 5 – Elicitation Techniques**

**As a Business Analyst, What Elicitation Techniques you are aware of? (BDRFOWJIPQU)**

**ANSWER:**

Elicitation techniques are methods and strategies used by Business Analysts to collect information and requirements from stakeholders, users, and other key parties throughout a project. Each technique is chosen based on the project needs, stakeholder availability, and complexity of requirements. As a Business Analyst, I am aware of various elicitation techniques that help gather requirements effectively. Using the acronym **BDRFOWJIPQU**, the techniques include:

* **Brainstorming** – Generating a broad set of ideas from stakeholders. Brainstorming can be done individually or in groups to gather ideas, which are later analysed and included in system requirements if relevant. It is an effective technique for generating many ideas on a specific issue and identifying the best solutions in a relaxed environment. Brainstorming is useful for requirements gathering, helping teams explore multiple ideas and potential solutions to problems. Prioritizing ideas is important, as it helps filter the best solutions from many possibilities. We need to follow 3 steps for conducting brainstorming sessions-a. Prepare for brainstorming session with some preset criteria b. Conduct the sessions and welcome ideas and c. finally wrap up the sessions with rating and prioritizing the ideas.
* **Document Analysis** – Document analysis is a business analysis (BA) elicitation technique used to gather requirements by reviewing existing documentation, such as business process documents, system manuals, policies and reports. It helps understand current processes, constraints and opportunities. It provides historical insights, reduces reliance on stakeholder memory, ensures compliance with regulations and helps identify gaps or inconsistencies in existing documentation. The BA systematically examines relevant documents, extracts useful information, validates findings with stakeholders and integrates the insights into requirement gathering and solution design. This technique is compulsory for any project.
* **Reverse Engineering** –Reverse engineering analysis is an elicitation technique used by Business Analysts (BAs) to analyse an existing system, software, or product to understand its functionality, business rules, and underlying logic when documentation is missing or outdated. BA examines the system’s user interface, database structure, workflows, and code (if accessible) to document its features and behaviours, often using tools like system logs, screenshots, and process mapping.

There are 2 types of reverse engineering – Black box reverse engineering and white box reverse engineering. The black box R.E is studying the system or product without examining its internal structure. In white box R.E, inner structure of the product is studied.

Reverse Engineering is generally used for migration projects.

* **Focus Groups**: A focus group is an elicitation technique where a Business Analyst (BA) gathers insights from a selected group of stakeholders, such as end users, customers, or subject matter experts, to discuss requirements, expectations, and potential solutions. It helps in obtaining diverse perspectives quickly. The participants share their impressions, preferences and need guided by moderator.

Groups are formed based on product requirement. Homogeneous focus group are individual with similar characteristics and Heterogeneous focus groups are individual with different characteristics.

* **Observation** – Observation elicitation involves systematically watching and recording behaviours, interactions, or environmental conditions to gather insights without relying on self-reports. Studying users in their work environment to understand real-world processes.

In **Passive Observation**, observer does not interfere or interact with the subjects, simply watching and recording behaviour’s as they naturally occur to minimize influence on the environment. On the other hand, **active observation** engages observer with the subjects, asking questions or prompting actions to elicit specific responses or insights for gaining information for work procedure.

* **Workshops** – Workshop elicitation gathers diverse stakeholders in a structured session to brainstorm, discuss, and refine ideas, ensuring multiple perspectives are considered.

A facilitator guides the session using techniques like brainstorming, role-playing, or scenario analysis to encourage active participation and idea generation.

Participants engage in hands-on activities, group discussions, and feedback loops to refine requirements, solve problems, or develop new insights collectively. This technique is particularly useful for tackling complex or ambiguous issues, as real-time interaction helps clarify requirements and align expectations.

* **Joint Application Development (JAD)** –Joint Application Development (JAD) is a structured elicitation technique that involves stakeholders, developers, and users working together in facilitated sessions to define system requirements. Accelerated decision-making through focused discussions and real-time feedback, JAD sessions help resolve ambiguities quickly, ensuring faster and more accurate requirement gathering.It reduces miscommunication by involving all key participants from the beginning, JAD minimizes misunderstandings, aligns expectations, and improves the overall quality of the final product.
* **Interviews** – One-on-one or group conversations to gather detailed insights.

Interviews involve one-on-one or group discussions with stakeholders to extract detailed insights, expectations, and requirements for a project. They can be structured predefined or unstructured (open-ended), depending on the depth of information needed.

* **Prototyping** – Creating mock-ups or wireframes to visualize system requirements Prototyping involves creating mock-ups or working models of a system to help stakeholders visualize requirements and provide feedback before full development. Stakeholders review, test, and suggest changes to the prototype, enabling continuous improvements and ensuring the final system meets user needs. prototyping helps clarify vague or complex requirements, reducing misunderstandings and rework.
* **Questionnaires/Surveys** – Collecting structured responses from a large group of stakeholders. Questionnaires use a set of predefined questions to systematically gather information from stakeholders, ensuring consistency and efficiency in requirement elicitation. They can be distributed to a large audience, making them ideal for collecting input from multiple users without requiring direct interviews or meetings.
* **Use case Specification** - A Use Case Specification is a detailed document that describes how a user interacts with a system to achieve a specific goal. It includes the steps, conditions, and variations of the process. It typically contains sections such as actors (users or systems involved), preconditions, main flow, alternate flows, exceptions, and postconditions to fully describe the behaviour of the system. It helps in requirement analysis, system design, and testing by providing a clear, structured description of how the system should behave in different scenarios.

**Question 6 – This project Elicitation Techniques**

**Which Elicitation Techniques can be used in this Project and Justify your selection of Elicitation Techniques?**

**Prototyping**

**Use case Specs**

**Document Analysis**

**Brainstorming**

Fertilizers, seeds, pesticides details from the manufacturers and should be able to display them to the Farmers. To gather the business requirements from the client, you went to SOONY and met Mr. Henry. When Mr. Henry was asked about the project and what are they expecting from the project, Mr. Henry stated that he is expecting to have a login for all its users (fertilizers, seeds, pesticides manufacturers and Farmers), a product catalogue of fertilizers, seeds, pesticides, a search option to search for products, payment process, and delivery tracking.

After doing the stakeholder analysis, you have found out that Peter, Kevin, Ben are the key stakeholders, and you have scheduled an appointment to meet them. After meeting with them and trying to gather the stakeholder requirements, Kevin said that a Farmer should be able to browse through the products catalogue once they visit the website and need to have a search option so that they can search for any product they need. Peter said that, if a farmer wants to buy any product or add them to buy-later list, they need to login first using their email id and password. If it is a new user, then they can create a new account by submitting their email ID and creating a secure password. Ben added saying that, Farmers needs to have an easy-to-use payment gateway which should include cash-on-delivery (COD), Credit/Debit card and UPI options so that the user’s experience should be better. Kevin mentioned that a user gets an email confirmation regarding their order status. A delivery tracker to track the whereabouts of their order.

**ANSWER:**

The elicitation technique can be used in the project are Prototyping, use case specifications, Document Analysis and Brainstorming. Each elicitation technique is justified below:

**1. Prototyping**

The project involves an e-commerce-like platform with features such as login for users, product catalogue browsing, payment options, and delivery tracking, a prototype will help stakeholders visualize the system.

Farmers and manufacturers might not fully explain their requirements verbally, but an interactive prototype will allow them to provide better feedback. It helps validate UI/UX requirements, ensuring ease of navigation and usability for farmers.

**2. Use Case Specifications**

The project involves multiple actors (Farmers, Manufacturers, Admins) with specific interactions, making use case specifications an effective way to document system behaviour.

It clarifies functional requirements like user authentication, product searching, payment processing, and order tracking. It helps development teams understand user interactions clearly and ensures no critical user scenarios are missed.

**3. Document Analysis**

Theproject involves fertilizers, seeds, and pesticides, analysing documents such as product catalogues from manufacturers is essential to ensure accurate product details.

It will help in understanding regulatory requirements, pricing structures, and any compliance standards that may apply. It will also reduce the need for repeated stakeholder meetings by leveraging existing documents.

**4. Brainstorming**

Brainstorming elicitation technique will be useful for gathering additional innovative ideas, such as features that could enhance the platform (e.g., product recommendations, farmer reviews). It engages multiple stakeholders (Henry, Peter, Kevin, Ben) to refine requirements collaboratively. It will also encourage discussion on potential challenges and solutions, ensuring a more comprehensive requirement set.

**Question 7 - Business Requirements**

**Identify Business Requirements (which includes Stakeholder Requirements)**

**BR001 – Farmers should be able to search for available products in fertilizers, seeds, pesticides.**

**BR002 – Manufacturers should be able to upload and display their products in the application.**

**Make suitable Assumptions and identify at least 10 Business Requirements.**

**ANSWER:**

Business requirements are high-level business goals of the enterprise to identify and document what the business wants to achieve, ensuring alignment with strategic objectives.

Stakeholder requirements are needs of stakeholders, which specify how the stakeholder will interact with a solution provided by the IT company.

**Following are 10 business requirements which includes Stakeholder requirements.**

**BR001-** The system should allow users (Farmers and Manufacturers) to register and log in using their email ID and password.

**BR002-** Farmers should be able to search for available products in fertilizers, seeds and pesticides.

**BR003-** Farmers must log in to add products to the cart or "buy later" list.

**BR004-**- Farmers should be able toPay through payment gateway using options like Cash on Delivery, Credit/Debit card and UPI options.

**BR005-** Manufacturers should be able to upload and display their products on the website.

**BR006-** Farmers should be able to browse through the product catalogue without logging in.

**BR007-** The application should have a secure account creation process for new users with password encryption.

**BR008-** Farmer should get confirmation by e-mail regarding order status.

**BR009-** TheDelivery tracking system should be available for farmers to track details of the order.

**BR010**- The system should provide customer support/contact options for assistance with orders, payments, and deliveries.

**Question 8 –Assumptions**

**List your assumptions**

**ANSWER**

An **assumption** is something that is considered true for the purpose of planning and requirement gathering, even though it has not been explicitly confirmed. Assumptions help in defining project scope, system functionalities, and constraints when complete information is not available.

**Following are the assumptions for the Project**

**Assumption 1**– Farmers and manufacturers have internet access to use the web-based application.

**Assumption 2** – The application will be accessible via desktop, tablet, and mobile devices.

**Assumption 3** – A logistics system or third-party delivery service will handle order fulfilment.

**Assumption 4** – The system will support an increasing number of users and products over time.

**Assumption 5** – The application will provide a help desk or support system for users facing issues with payments, orders, or deliveries.

**Question 9 – This project Requirements Priority**

**Give Priority 1 to 10 numbers (1 being low priority – 10 being high priority) to these Requirements after discussions with the stakeholders**

Once the requirements are finalized, as a business analyst, one of the major roles is to act as a liaison between the client and the project team. To gather the requirements correctly from the client side and then to deliver those requirements to the project team in a way they understand to make the project team understand the requirements, you need to convert those requirements into UML diagrams and screen mock-ups.

**ANSWER:**

Project requirement priority is the process of ranking requirements based on their importance and urgency to ensure that the most critical needs are addressed first. It helps team to allocate resources effectively, manage risks, and make informed decisions.

|  |  |  |  |
| --- | --- | --- | --- |
| **Requirement id** | **Requirement name** | **Requirement Description** | **Priority** |
| BR001 | User creation and login | The system should allow users (Farmers and Manufacturers) to register and log in using their email ID and password. | 10 |
| BR002 | User browsing for products | Farmers should be able to search for available products in fertilizers, seeds and pesticides. | 8 |
| BR003 | User login for adding products | Farmers must log in to add products to the cart or "buy later" list. | 7 |
| BR004 | Payment Gateway | Farmers should be able toPay through payment gateway using options like Cash on Delivery, Credit/Debit card and UPI options. | 10 |
| BR005 | Manufacturers can add products to catalogue | Manufacturers should be able to upload and display their products on the website. | 8 |
| BR006 | User browsing for products without logging in | Farmers should be able to browse through the product catalogue without logging in. | 6 |
| BR007 | User account creation security | The application should have a secure account creation process for new users with password encryption. | 10 |
| BR008 | Order status email confirmation | Farmer should get confirmation by e-mail regarding order status. | 7 |
| BR009 | User order delivery tracking system | TheDelivery tracking system should be available for farmers to track details of the order. | 7 |
| BR010 | Customer support handling option | The system should provide customer support/contact options for assistance with orders, payments, and deliveries. | 10 |

**Question 10 – Use Case Diagram**

**Draw use case diagram**

**ANSWER**

* A **Use Case Diagram** is a visual representation in **UML (Unified Modeling Language)** that shows the interactions between **users (actors)** and a **system**. It describes **what** the system does (its functionality), not **how** it does it. Use case diagrams have 4 major elements-> Actors, System boundary, Essential use cases and line that represent relationships.
* **Actors** represent users or external systems that interact with the system.They can be: **Primary actors** (who initiate the use case) and **Secondary actors** (who provide a service to the system)
* **System Boundary** defines what is **inside** and **outside** the system.It isrepresented by a **rectangle** enclosing all use cases.Actors are **outside** the boundary, and **use cases** are **inside**.
* **Essential Use Cases** are **high-level**, **user-goal-driven** interactions that are always required for the system to function.

**Include (<<include>>) is** used when a use case **always uses** another use case. **It s**hows **mandatory** behaviour.

**Extend (<<extend>>) is u**sed when a use case **optionally** extends another.The base use case can function without the extension.

**Generalization (arrow with hollow triangle is** used when an actor or use case **inherits** the behaviour of another.



**Question 11 – (minimum 5) Use Case Specs**

**Prepare use case specs for all use cases.**

**ANSWER:**

Use case specification detail how a system interacts with users (actors) to achieve a specific goal, outlining the steps involved in the process. It captures requirements in a structured format, helping developers understand what the system should do from the user’s perspective. It serves as a clear, shared reference for stakeholders, reducing ambiguity and ensuring everyone has a common understanding of system functionality.

|  |  |  |  |
| --- | --- | --- | --- |
| **Use case id** | **UC 001** | | |
| Use case name | User Registration | | |
| Created by | Mr. XYZ | Last updated by | 11th April 2025 |
| Date created | 10th April 2025 | Last Revision | 13th April 2025 |
| Actors | Primary actor - Users (Farmers & Manufacturers)  Secondary actor- System database | | |
| Description | This use case describes user registration process for online agriculture store website. | | |
| Pre-condition | User has access to registration page with proper internet connectivity  User has valid e-mail address | | |
| Business Rule | A new user can create a new account by submitting their email id and creating a secure password. | | |
| Basic Flow | 1. User navigates to the website and clicks on Register/New User. 2. System displays the registration form. 3. User enters their email id and creates a secure password. 4. User submits the form. 5. System validates the email format and checks if it’s already registered. 6. If validation passes, the system creates a new user account. 7. System confirms registration and optionally sends a welcome/verification email. 8. User is redirected to login or dashboard. | | |
| Alternate Flow | **Email Already Registered:**   1. In step 5, System notifies the user that the email is already in use. 2. User is prompted to log in or recover password.   **Invalid Email Format/Weak Password:**   1. In Step 5, System displays validation errors and prompts the user to correct them. | | |
| Exceptional flow | **Network failure**  Error: Something went wrong, Please check your connection or try again later. | | |
| Post condition | User account is successfully created.  User account is not created. | | |
| Assumption | The user provides a unique and valid email address that is not already registered in the system. | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Use case id** | **UC 002** | | |
| Use case name | User login | | |
| Created by | Mr. XYZ | Last updated by | 11th April 2025 |
| Date created | 10th April 2025 | Last Revision | 13th April 2025 |
| Actor | Primary actor - Users (Farmers & Manufacturers)  Secondary actor- System database | | |
| Description | This use case describes registered user login process using email id and password for online agriculture store website. | | |
| Pre-condition | User has access to registration page with proper internet connectivity.  User is registered and has valid login credentials. | | |
| Business rule | All users should have login (fertilizers, seeds, pesticides manufacturers and Farmers). | | |
| Basic Flow | 1. User navigates to the login page  2. User enters a registered email ID and password.  3. System validates the format of the email and password fields  4. System authenticates the credentials against stored records  5. If valid: System grants access  6. User is redirected to the dashboard or homepage | | |
| Alternate Flow | **a) Invalid Input Format**  1. In step 3, system detects incorrect email format or empty password.  2. System displays an error message.  3. User corrects input and resubmits.  **b) Invalid Login Credentials:**  1. In step 4, Email or password does not match records.  2. System displays “Invalid email or password.”  3. User retries login or requests password reset.  **c) Account Locked or Suspended:**  1. System detects that the account is locked (e.g., due to multiple failed attempts.  2. System informs the user that the account is locked and suggests contacting support or waiting for cooldown period.  **d) Password Reset Flow**  1. User clicks "Forgot Password."  2. System initiates password reset procedure. | | |
| Exceptional Flow | **Backend authentication service fails or times out.**  Display message: "We’re experiencing technical difficulties. Please try again later."  **Network failure**  Error: Something went wrong, Please check your connection or try again later. | | |
| Post condition | User login is successful.  User login failed. | | |
| Assumption | The system is available and capable of verifying user credentials securely. | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Use case id** | **UC 003** | | |
| Use case name | Search product | | |
| Created by | Mr. XYZ | Last updated by | 11th April 2025 |
| Date created | 10th April 2025 | Last Revision | 13th April 2025 |
| Actor | Primary actor - Users (Farmers)  Secondary actor- System database | | |
| Description | This use case describes product search process for Online Agriculture store website. | | |
| Pre-condition | The product catalogue is available and contains product data.  The user (Farmer) has active internet connection for accessing the website or application.  No login is required to search ( not mandatory) | | |
| Business Rule | A product catalogue of fertilizers, seeds, pesticides, a search option to search for products. | | |
| Basic Flow | 1. Farmer navigates to the homepage or product catalogue page.  2. Farmer sees a search bar prominently displayed.  3. Farmer enters a keyword (e.g., " Fertilizer" or "Organic Seeds").  4. System processes the keyword and queries the product database.  5. System displays a list of matching products with name, category, and price.  6. Farmer clicks on a product to view detailed information. | | |
| Alternate Flow | **a) No Matching Products Found:**  1. In Step 4, system matches the entered keyword with available product in database.  2. If not found then,  System displays a message: *"No products found matching your search."*  Suggest similar or related items if possible.  **b) Invalid Search Input (e.g., blank or special characters):**  1. In Step 4, system validates the search field.  2. The entered keyword is either blank or has special characters.  System displays a message: *"Please enter a valid search term."* | | |
| Exception Flow | **System Error While Searching:**   1. System displays an error message: "Something went wrong. Please try again later." 2. Logs the issue for technical investigation.   **Power failure/ Network failure**  Error: Something went wrong, Please check your connection or try again later. | | |
| Post condition | 1. Search results are displayed based on the entered keyword. 2. Farmer can proceed to view, add to cart, or buy-later (if logged in). | | |
| Assumption | 1. Product catalogue is well-organized and searchable. 2. Users have access to a modern browser or device to interact with the site. 3. Search bar is visible and accessible from the homepage or any product-related page. | | |

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| Use case id | **UC 004** | | |
| Use case name | Payment | | |
| Created by | Mr. XYZ | Last updated by | 11th April 2025 |
| Date created | 10th April 2025 | Last Revision | 13th April 2025 |
| Actor | Primary actor - Users (Farmers)  Secondary actor- System database and Payment Gateway | | |
| Description | This use case describes payment process on purchase of product from Online Agriculture store website. | | |
| Pre-condition | The user is logged into the system.  The user has added at least one product to the cart.  The farmer has proceeded to checkout and filled out delivery details. | | |
| Business Rule | Farmers need to have an easy-to-use payment gateway which should include cash-on-delivery (COD), Credit/Debit card and UPI options so that the user’s experience should be better. | | |
| Basic Flow | 1. The farmer proceeds to the checkout page. 2. The system displays the total amount, delivery address, and payment options. 3. The farmer selects a payment method:    * Credit/Debit Card    * UPI    * Cash on Delivery (COD) 4. Based on the selection:    * For Card/UPI: The system redirects to a secure payment gateway.    * For COD: The system skips payment gateway. 5. The farmer completes the payment (if online). 6. The system verifies the payment:    * If successful: Proceeds to order confirmation.    * If failed: Displays an error and allows retry. 7. The system generates an order ID and stores the order details. 8. The system sends an email confirmation to the farmer. 9. The system redirects the farmer to a confirmation page with order summary and delivery tracking link. | | |
| Alternate Flow | **a) Payment Failure**  Online payment fails due to incorrect card details or gateway error.  Display message:  *"Payment failed. Please check your details or try a different method."*  Allow user to retry or select another method.  **b) No Payment Method Selected**  User attempts to place the order without choosing a payment method.  Display message:  *"Please select a payment option to continue."*  Prevent further action until a method is selected.  **c) Payment Gateway Timeout**  The payment service is unresponsive or slow.  Display message:  *"The payment service is currently unavailable. Please try again later."*  Allow retry or switch to COD. | | |
| Exceptional flow | **Power failure/ Network failure**  Error: Something went wrong, Please check your connection or try again later. | | |
| Post condition | 1. Payment is successfully processed or recorded (in case of COD). 2. Order is placed and saved in the system. 3. Farmer receives email confirmation with order and payment details. | | |
| Assumption | 1. The payment gateway supports Credit/Debit Cards and UPI. 2. Cash on Delivery is available based on the delivery location. 3. Email notification system is active and reliable. | | |

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| Use case id | **UC 005** | | |
| Use case name | Track Delivery | | |
| Created by | Mr. XYZ | Last updated by | 11th April 2025 |
| Date created | 10th April 2025 | Last Revision | 13th April 2025 |
| Actor | Primary actor - Users (Farmers)  Secondary actor- System database | | |
| Description | This use case describes delivery tracking process on purchase of product from Online Agriculture store website. | | |
| Pre-condition | 1. User has logged in 2. The user has placed an order. 3. A valid Order ID and Tracking Number has been generated and shared via email. 4. Delivery tracking system is integrated and operational. | | |
| Business Rule | A user gets an email confirmation regarding their order status. A delivery tracker to track the whereabouts of their order. | | |
| Basic Flow | 1. The farmer logs in and navigates to the Track delivery section. 2. The system displays a field for order Id and tracking numbers. 3. The farmer enters either order id or tracking number 4. The system sends a request to the delivery/logistics system using the order id /tracking number. 5. The logistics system returns the real-time delivery status (e.g., Dispatched, In Transit, Out for Delivery, Delivered). 6. The system displays:  * Current delivery status * Estimated delivery date/time * Delivery milestones (e.g., shipped, arrived at hub, out for delivery)   7. The user can optionally receive updates via email/SMS if subscribed. | | |
| Alternate Flow | **Invalid or Expired Tracking Number/ Order id**  Tracking number/Order id is invalid or has expired.  **Display message**  *"Tracking information not found or expired. Please contact support."*  Provide support link/contact.  **Delivery System Unavailable**  Logistics system is down or unreachable.  Display message:  *"Unable to fetch delivery status at the moment. Please try again later."*  Log the error and optionally send retry request. | | |
| Exceptional flow | **System Error While Searching:**  1. System displays an error message: "Something went wrong. Please try again later."  2.Logs the issue for technical investigation.  **Power failure/ Network failure**  Error: Something went wrong, Please check your connection or try again later. | | |
| Post condition | 1. The user can view the status and location of their order. 2. The system displays estimated delivery time and history of order status updates. | | |
| Assumption | 1. Tracking Info is Available 24/7 2. Order Has Been Shipped 3. Unique Tracking Number per Order. | | |

**Question 12 – (minimum 5) Activity Diagrams**

**Activity diagrams**

**ANSWER**

An Activity Diagram is a type of diagram used in Unified Modeling Language (UML) to represent the workflow of activities within a system or a process. It's like a flowchart that shows how tasks or actions flow from one to another, especially useful for modeling business processes and software functions.

Activity diagram describes all activities happening as per system perspective not actor perspective. Activity diagram is drawn to model how the system should function to achieve business logic, business functionality and business objectives.

Activity diagram uses symbols like rounded rectangles (activities), diamonds (decisions), and arrows (flow) to represent the logical flow of control. It helps to visualize how a system behaves dynamically, making it easier to understand and analyse business or software processes.

1. User login



1. **Search products**



1. **Add product to cart**



1. **Payment**



1. **Track Delivery**

