**Question 1** – Audits - 5 Marks

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

**Answer1**- Audits are inspection of work for quality and for progress. It is basically a quality check to ensure project is going smooth. There are different types of audits that are involved in project life cycle, one of them is quality audits. It is a structured and independent process that is used to determine if a project activity complies with the policies, procedures and processes of the organization or project.

It can be done randomly or at a specific schedule and can be conducted by either external or internal auditors.

Below are the benefits of doing quality audits:

* It is used to identify the good and best practices being implemented in the organization or project.
* It is used to determine short comings and gaps of the project.
* It shares the good practices to the organization.
* Provides assistance positively to improve the implementation of different processes to raise the productivity of the team.

As a business analyst we are responsible to update the progress of the project to the responsible stakeholders and concerning documents. Generally, for BA mail communications and documents are checked in Audits.

For Auditing BA’s work following points can be considered or scope of audit can cover the following areas.

1) Whether proper email etiquettes are being followed.

2) Check on verbal and non-verbal communications.

3) how is the participation in project activities.

4) Whether all documents being maintained properly (BRD, SRS, FRS, closure docs, etc.)

5) Are the company’s best practices being followed.

6) Records can be checked for how the concerned stakeholders are being updated.

7) Timely response on all the activities.

8) Client communication.

9) Are the change request being handled properly.

10) Behaviour towards work.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Stage | Q1-Audit Report  (Requirement Gathering Phase) |  | Stage | Q2-Audit Report (Requirement Analysis ) |
| Completed | 90 Days(1 Aug to 31st Oct) |  | Completed | 3o Days(1 Apr to 30st Apr) |
|  |  |  |  |  |
| Check list | BRD Template |  | Check list | UML Diagrams |
|  | Elicitation Results Report |  |  | Business to functional Req. mapping |
|  | Duplicate Requirements Report |  |  | Client Signoff-documents |
|  | Grouping Of Functionalities /Features-Client Sign Off |  |  | RTM document version control |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Stage | Q3-Audit Report (Design) |  | Stage | Q4-Audit Report (Development& Testing) |
| Completed | 30 Days(1May25 to 31May25) |  | Completed | 151 Days(1st Dec 25 to 30th April26) |
|  |  |  |  |  |
| Check list | Utilization of tools |  | Check list | JAD Session Report |
|  | Documented evidence on client communication |  |  | End User Mannual Preperation Document |
|  | Stakeholder MOM |  |  | BA & Developer MOM |
|  | E-mail communication –To, cc, bcc |  |  | Email Communication-To, cc, bcc |
|  |  |  |  | Test Case Summary |
|  |  |  |  | Training Report to end user |
|  |  |  |  | Lessons learnt document |
|  |  |  |  |  |

**Question 2 – BA Approach Strategy - 6 Marks**

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 )

**Your Team**

Project Manager - Mr Vandanam Senior Java Developer - Ms. Juhi

Java Developers - Mr Teyson, Ms Lucie, Mr Tucker, Mr Bravo Network Admin - Mr Mike

DB Admin - Mr John.

Testers - Mr Jason and Ms Alekya

BA - You

Technical Team have assembled to discuss on the Project approach and have finalised to follow 3-tier architecture for this project.

**Answer2:** BA Approach Strategy: A BA (Business Analyst) approach strategy involves several key steps to ensure effective analysis and solution development within a business context.

**A-What Elicitation Techniques to apply?**

Apply Requirement Elicitation Techniques

Any meeting with a client which has a special objective is called elicitation technique. It is the process of digging out the information from the stakeholders. It serves the foundation in documenting the requirements

For this project **Prototyping technique** can be used which can be defined as showing sample of the working model such as screen mock-ups can support the requirement gathering process. Even mock-ups can be carried out so as to help clients visualize the functionality of the system as everyone will be the new and first time user for this application.

Prototyping will be made to make client to give more specific requirement.

**B-How to do Stakeholder analysis?**

**STEP1-**

**Stakeholder analysis:**

**Using ILS technique:**

Identify stakeholders, List down stakeholders, Stakeholders summary.

**Carry out RACI Matrix** to identify who are the Responsible, Accountable, Consulted and Informed stakeholders.

|  |  |  |  |
| --- | --- | --- | --- |
| **Business Stakeholders** | |  |  |
| **Name** | **Position** | **Requirement Sharing** | **Project Co-ordination** |
| Mr. Henry | Owner | A,I,C | R |
| Mr. Pandu | Financial head | A,I,C | R |
| Mr. Dooku | Project  co-ordinator | A,I,C | R |
| Mr. Peter | END user | R | C |
| Mr. Kevin | END user | R | C |
| Mr. Ben | END user | R | C |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project stakeholders.** | | | | | |
| **Name** | **Position** | **BRD** | **MOCKUP** | **Test PLAN** | **Project Plan** |
| Mr. Vandan | Project manager | A | I | A | R |
| Ms. Juhi | Sr. Java developer | I | R | I | I |
| Mr. Tyeson | Java developers | I | I | I | I |
| Ms. Lucie | Java developers | I | I | I | I |
| Mr. Tucker | Java developers | I | I | I | I |
| Mr. Bravo | Java developers | I | I | I | I |
| Mr. Mike | Network Admin | I | I | I | I |
| Mr. John | DB Admin | I | I | I | I |
| Mr. Jason | Tester | I | I | R | I |
| Ms. Alekya | Tester | I | I | R | I |
| Mr. Shivam | BA | R | A | A | C |

* **Sorting the gathered requirement** –process in which scattered requirements are put together and redundancy is removed. The inter related requirements are linked.

**Key Task-**

* Define stakeholder needs
* Identify Business Requirements and divide it into functional and non-functional requirements
* Create group of similar requirements
* Create supporting artifacts-BRD & FRD
* **Prioritising the requirements** –Techniques for queuing the requirements for the development process.
* **100 Dollars Test:** The primary goal of the 100$ Test is to gauge the perceived value of a solution relative to its cost. It helps in determining whether a proposed solution or recommendation is worth pursuing based on its financial implications and the value it provides.
* **Top 10 Requirements**
* **Numerical Assignments**: Assigning numerical values to requirements in sorting processes helps in quantifying and prioritizing them effectively.

Determine the criteria on which requirements will be evaluated. Common criteria include: Business Value, Cost, Urgency, Risk, Feasibility

* **MoSCoW-** Must Have (100% compulsory requirement), Should Have (Equally important requirements, if all pre-requisites available) E.g. Grading System-online exam, Could Have (equally imp. requirements which can be worked upon if they don’t contradict must requirement), Won't Have (low priority requirements, this will be given place in next cycle and not in this cycle)
* **Validating the requirements-**
* **FURPS**-Functionality, Usability, Reliability, Performance, Supportability (extentable , enhancable , testable) -FURPS represents a model for classifying software quality attributes (functional and non-functional requirements).Proposed by HP company.
* **CUCV**-There are several qualities of good requirement that include Clarity, Understandable, Consistent, Verifiable,
* **SMART**-Represents well informed requirement, qualification of requirements i.e. Specific, Measurable, Attainable (achievable), Realistic (understandable), Traceable/Time bound. After this push your requirement to BRD document.
* **CAE**-Complete, Accurate, Executable
* **APVU**-Authorized, Prioritized, Verifiable, Unique

**Requirement Analysis:**

* UML diagrams – Use case & Activity diagram
* Prepares Functional Requirements from Business requirements.
* SRS will have functional requirements and technical requirements.
* Taking sign on SRS from client.
* Preparing RTM from SRS before starting of designing phase.
* BA traces how requirements are dealt in each phase of development lifecycle from design till UAT.

**C-What Documents to Write?**

1) BRD (Business Requirement Document)

2) FRS/FS (Functional Requirement Specification/Functional Specs)

3) SRS (Software Requirement Specification) (Supplementary Support Document(SSD)+FRS)

4) Product backlog

5) RTM (Requirement Traceability Matrix)

**D-What process to follow to Sign off on the Documents?**

* Organize the project documents.
* Prepare the final report.
* Distribute the sign-off sheet.
* Transition remaining items to to-do list.
* Review your lessons learned.

**E-How to take Approvals from the client?**

Approval can be taken in the following format while establishing formal meeting with the clients to keep them informed and get continuous feedback

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Role** | **Name** | **Title** | **Signature** | **Date** |
| Project Manager | Mr Vandanam |  |  |  |
| Senior Java Developer | Ms. Juhi |  |  |  |
| Java Developers | Mr Teyson, Ms Lucie, Mr Tucker, Mr Bravo |  |  |  |
| Network Admin | Mr Mike |  |  |  |
| DB Admin | Mr John. |  |  |  |
| Testers | Mr Jason and Ms Alekya |  |  |  |
| Owner | Mr. Henry |  |  |  |
| Financial head | Mr. Pandu |  |  |  |
| Project co-ordinator | Mr. Dooku |  |  |  |
| END user | Mr. Peter |  |  |  |
| END user | Mr. Kevin |  |  |  |
| END user | Mr. Ben |  |  |  |

**F- What Communication Channels to establish and implement?**

Communication channels are important to define, distribute, update and escalate the information and data from different stakeholders to responsible stakeholders.

**Business communication works on 3W concepts:**  What, Who, When.

**Communication can be of 2 types:**

* Verbal communication: Oral communication, Written communication.
* Non-verbal communication

**G-How to Handle Change Requests?**

As the project processes through time it is inevitable that some things will change, and so the requirements may also change. Whenever a change request comes from the client, first thing will be analysing the change request.

1) Initially BA performs Feasibility Study to accept the Change

2) Then the impact analysis to measure change to project.

3) Finally effort estimation to measure change to the project.

**Whenever a change requirement comes following can be followed:**

1) Documenting the change request.

2) Analyse it is really a change or defect discovered from previous needs.

3) If BA needs to move ahead with the requested change the change manager or the project manager must provide an initial approval.

4) Identify whether the requested change is a complex one or just a minor change.

5) In case the change is complex, it will not only expand the scope of the project but will also increase the delivery time.

6) BA will help the stakeholders to understand the impact, the change request will have on the organization and to help minimize the negative impact.

7) Successful change efforts necessitate the Business Analyst to articulate a realistic or convincing vision that appeals to both internal and external stakeholders.

Along with above following documents can be maintained.

1) Change tracker.

2) Change request log.

**H- How to update the progress of the project to the Stakeholders:**

Weekly or fortnightly updates can be communicated with the client. Also BA will keep updating on each and every stage of the client to the stakeholders.

**I-** **How to take signoff on the UAT- Client Project Acceptance Form:**

User Acceptance Testing (UAT) is a type of testing performed by the end user or the client to verify/accept the software system before moving the software application to the production environment. UAT is done in the final phase of testing after functional, integration and system testing is done.

UAT is the last phase of the software testing process. During UAT, users test the actual software to make sure it can handle required tasks in real-world scenarios, according to specifications.

**UAT Sign–off**: When all defects are resolved, the UAT team formally accepts the software application as developed. The approval shows that the application meets user requirements and is deployable.

**Question 3** – 3-Tier Architecture - 5 Marks

Explain and illustrate 3-tier architecture?

**Answer3-**The three-tier architecture is a well-established software design pattern that separates an application into three distinct layers, each with its own responsibilities.

**1) Application layer:** This is the front-end layer where the user interacts with the application. It includes everything the end-user experiences, such as the graphical user interface (GUI) or web interface. Technologies like HTML, CSS, JavaScript, and frameworks like Angular , React are used for web applications, mobile apps or desktop applications. This layer displays data to the user, sending user inputs to the application logic, and handling user interactions.

**2) Business logic layer-** Also known as application tier, is the heart of the application. In this layer, core functionality of the application resides where information collected in the application layer is processed. The application tier can also add, delete or modify data in the data tier. Programming languages and frameworks like Java, .NET, C#, C, C++, Python, Ruby, Node.js, is used. It acts as an intermediary between the presentation tier and the data tier. The application tier communicates with the data tier using API calls. Major responsibilities of this tier is Implementing business logic, performing computations, and processing data requests.

**3) Data Layer -** This is the back-end layer responsible for storing, retrieving, and managing data. It interacts directly with the database or data storage system. Relational databases like MySQL, PostgreSQL, Oracle, Maria DB, NoSQL databases like MongoDB, Apache Cassandra, Couch base; and data storage solutions like Amazon S3 or Google Cloud Storage re-used as technologies. Major responsibilities of this tier lies in Handling data storage, querying, and transactions. It ensures data integrity and security, and it serves data to the application tier as needed.

(Screens, pages, validation on pages, company specific logic, functionality.)

Application layer

(All reusable components, frequently changing components)

Business logic layer

(Database components connecting to database.)

Data layer

Advantages:

* Faster development
* Improved scalability
* Improved reliability
* Improved security

**Question 4** – BA Approach Strategy for Framing Questions – 10 Marks

Business Analyst should keep what points in his/her mind before he frames a Question to ask to the Stakeholder

(5W1H – SMART – RACI – 3 Tier Architecture – Use Cases, Use case Specs, Activity Diagrams, Models, Page designs)

**Answer 4-**

**1)5W1H Tool:** This is considered as a tool of a BA. 5W1H is a systematic method used for problem-solving, analysis, and information gathering. It helps in breaking down a situation or issue to understand it more thoroughly. It stands for Where, Why, What, Who, When & How, probing in these directions helps to extract requirements. Mainly used during brainstorming.

* **Who**: Identifies the individuals or groups involved or affected.
* **What**: Defines the issue, task, or subject at hand.
* **When**: Specifies the timeline or deadlines associated with the situation.
* **Where**: Determines the location or context where the issue or task is relevant.
* **Why**: Explains the reasons behind the issue or the purpose of the task.
* **How**: Describes the method or process for addressing the issue or completing the task.

Using the 5W1H approach helps to get complete information and in ensuring that all critical aspects of a situation are considered, leading to more comprehensive and effective planning and problem-solving.

**2)SMART:** A well-formed requirement should comply with SMART,

* Specific: The requirement should be clearly defined and unambiguous.
* Measurable: There should be criteria to evaluate whether the requirement is met.
* Achievable: The requirement should be feasible given the available resources and constraints.
* Relevant: The requirement should align with the overall goals of the project or organization.
* Time-bound: There should be a timeline or deadline for implementing the requirement.

By ensuring that requirements are SMART, you enhance clarity, feasibility, and alignment with project goals, leading to more effective planning and execution.

**3)Stake Holder Analysis:** We need to understand stakeholders through RACI or ILS

**Using ILS technique:**

Identify stakeholders, List down stakeholders, Stakeholders summary.

**Carry out RACI Matrix** to identify who are the Responsible, Accountable, Consulted and Informed stakeholders.

**4)Three-tier architecture** is a well-established software application architecture that organizes applications into three layers and while framing question we need to be layer specific.

a) **Application layer** - is the user interface and communication layer of the application, where the end user interacts with the application. Its main purpose is to display information to and collect information from the user. **E.g.** Screens, pages, validation on pages. company specific logic, functionality.

b) **Business logic layer**- It is the heart of the application. In this layer, information collected in the application layer is processed. The application tier can also add, delete or modify data in the data tier. The application tier is typically developed using Python, Java, Perl, PHP or Ruby and communicates with the data tier using API calls. (An API, or Application Programming Interface, is a set of rules and protocols that allows different software applications to communicate with each other. APIs define the methods and data formats that applications can use to request and exchange information.)

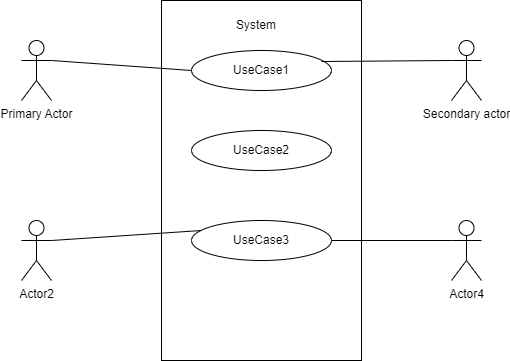
c) **Data Layer** - is where the information processed by the application is stored and managed. This can be a relational database management system such as PostgreSQL, MySQL, Maria DB, Oracle, DB2, Informix or Microsoft SQL Server, or in a NoSQL Database server such as Cassandra, Couch DB or MongoDB.

**5)UML Diagrams-**While framing the questionswe should know about UML diagrams

**a) Use case:** This is a high level and mother of all diagrams. The main focus of the diagram will be on how the external entities interfaces with the proposed IT solution. This interaction will be initiating distinct business functions called a use case and is shown with an ellipse model. Use case diagram can be used to describe the functionality of the system in a horizontal way. UCDs can be used to show all of its available functionality. UCDs should be use to show the functionality of the system from a top down perspective. UCD represent only the positive flow. We should not use UCD to show exception behaviour or when error happens. Or try to illustrate the sequence of steps that must be performed in order to complete a task.

Use Case Diagrams are a static type of diagram used in Unified Modelling Language (UML) to represent the functional requirements of a system. They provide a high-level view of how users (actors) interact with the system and help in understanding the system’s functionality from the user’s perspective.

**4 major elements of use case:**

****

**Actors**: Represented by stick figures or labelled ovals, actors are entities that interact with the system. They can be users or other systems.

**Use Cases**: Represented by ovals, use cases are the specific functions or processes the system performs in response to actor interactions.

**System Boundary**: Represented by a rectangle, it defines the scope of the system and contains the use cases.

**Relationships:**

**Associations:** Lines connecting actors to use cases, indicating which actors interact with which use cases.

**Include:** A relationship where a use case always includes the functionality of another use case. Represented by a dashed arrow with the «include» stereotype.

**Extend:** A relationship where a use case optionally extends the behaviour of another use case. Represented by a dashed arrow with the «extend» stereotype.

**Generalization:** Represents a hierarchy between actors or use cases where one is a specialized version of the other. Represented by a solid line with a hollow triangle pointing to the parent.

**b) Use case specification:**

Every use case will have its own use case description document.

1. Use case name
2. Use case description
3. Actors – Primary & Secondary
4. Basic flow
5. Alternate flow
6. Exception flow.
7. Pre-conditions
8. Post conditions
9. Assumptions
10. Constraints
11. Dependencies
12. Inputs & outputs
13. Business rules
14. Miscellaneous information.

**c)Activity diagrams** are one of the five diagrams in the UML for modelling the dynamic aspect of system. An active to the diagram is essentially a flow chart showing a flow of control from activity to activity. Speaks of or all the activities which are happening in the system through system perspective.

Activity diagrams are typically used for business process modelling, for modelling the logic captured by a single use case or usage scenario or for modelling the detailed logic of our business rule. In many ways UML activity diagrams are the object-oriented equivalent of flowcharts process flow diagrams flow document activity chart control flow graph and activity flow diagrams from structured development.

Activity diagram is UML behaviour diagrams which shows flow of control or object flow with emphasis on the sequence and conditions of the flow. the actions coordinated by activity models can be initiated because other actions finish executing because objects and data become available or because some events external to the flow occur.

An activity diagram is basically a flow chart to represent the flow from one activity to another activity. The activity can be described as an operation of the system. So the control flow is drawn from one operation to another. Activity diagrams are not only used for visualizing dynamic nature of a system but they are also used to construct the executable system by using forward and reverse engineering techniques. The only missing thing in activity diagram is the message part.

**6)Models**:

a) Domain modelling: A domain model is a type of conceptual model that represents the key entities, their attributes, and the relationships within a specific domain or business area. It provides a structured framework for understanding and analysing the core elements and interactions within that domain.

b) Conceptual Model: A conceptual model is an abstract representation of how a system or process works, focusing on the essential components and their relationships rather than on technical details. It’s used to understand and communicate the high-level structure and dynamics of a system, often serving as a bridge between the initial idea and the detailed design.

c)Data Model- A data model is a structured representation of how data is stored, organized, and accessed within a system. It defines the data elements, their relationships, and how they interact, providing a framework for managing and manipulating data effectively. Data models are crucial for designing databases, data warehouses, and other information systems. (If we know what data is handled at each point that we called as data model).

d)DFD- A Data Flow Diagram (DFD) is a graphical representation of the flow of data within a system. It illustrates how data moves from input to output through various processes and storage points, providing a high-level view of the system’s operations. DFDs are useful for understanding and documenting the functional aspects of a system.

e) ER Diagrams- Entity-Relationship (ER) diagrams are a type of data modelling diagram used to visually represent the structure of a database. They show the entities (objects) within the system, their attributes, and the relationships between these entities. ER diagrams are essential for designing and understanding database systems, helping to ensure that data is organized and related in a way that meets the system’s requirements.

**7)Screen/Pages:** These are consequences of Matured Functional Requirements. Page designs can be used to create a sample pages to showcase the same to clients on how the pages will look like. Wire framing tools. Prototyping tools, and screen mock-ups tools can be used for the same. Like Balsamiq, Axure etc.

**Questionnaire:**

1) What problem is this business having that you hope to solve by developing this project?

2) What is the business doing at present to alleviate or solve the issue?

3) What inside resources will this project be utilizing?

4) Vision for the project?

5) What risks do you foresee and are you willing to take them?

6) Are you under any type of time constraint?

7) What is the projected cost of the program?

8) Who is the end user?

9) What are the top 5 major things you would change?

10) What is the projected cost for the project?

11)How many types of login?

12)What should be the homepage feature of each login?

13)What should be the workflows?

14)What type of reports you are looking at for each login?

15)Which form of data is accepted?

**Note:** Questions we ask should fit into one of these sections -3 Tier architecture or UML Diagrams or Models or Pages and Screens.

**Question 5 – Elicitation Techniques - 6 Marks**

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

**Answer5**-Requirement elicitation is the process of digging out information from stakeholders. It serves the foundation in documenting the requirements. Following are the Elicitation techniques:

1. **D**ocument Analysis
2. **R**everse engineering
3. **O**bservation
4. **I**nterview
5. **Q**uestionnaire
6. **B**rainstorming
7. **W**orkshops
8. **F**ocus groups
9. **J**AD – Joint application development
10. **P**rototyping
11. **U**se Case

**1)Document Analysis:**

The document analysis technique is one of the most effective ways of kick-starting the requirements elicitation phase. It is the art of studying relevant business, system and project documentation with the objective of understanding the business, the project background and identifying requirements or opportunities for improvement.

It’s a means of gathering information before scheduling interviews or other elicitation sessions with stakeholders. It can complement other elicitation techniques like workshops, interviews and prototyping by serving as a means of verifying requirements.

To perform document analysis effectively, the analyst should always check the source of documents for possible bias.

Document Analysis is performed in 3 stages:

1) Prepare Stage – this involves identifying which materials are suitable and relevant for analysis

2) Review Stage – this involves studying the material, taking note of relevant information and listing follow-up questions for the stakeholders

3) Wrap up Stage – this stage involves reviewing notes with stakeholders, organising requirements and seeking answers to follow-up questions

**2)Reverse engineering:** The BA can conduct a complete breakdown of an existing product to elicit requirements for the product development. By performing reverse engineering, he can reduce the finished product into its underlying process, components, and attributes. According to the IIBA, there are two categories of reverse engineering:

**a)** Black Box Reverse Engineering: Studying the product without examining its inner structure and functions.

**b)** White Box Reverse Engineering: Studying the inner structure and functions

The BA must examine the cost-benefit ratio of conducting this method, as it can be time consuming if the product or system is complex. The advantage of using reverse engineering is that it results in a complete examination of the end result. This is helpful in determining compatibilities, dependencies, interrelated functions, and design.

Advantages:

* Provides detailed, current information about a product or system.
* Provides a complete starting point to develop initiative or solution.

Disadvantages:

* Can be expensive and time consuming.
* Tools used to decompose the product may be expensive and require training.
* Can infringe on copyright laws if competitor product is used.

Requires specialized skills to:

a) Abstract from specificity to generalization.

b) Make assumptions about business rules.

c) Relate functions used for production to current or future business processes.

**3) Observation:**

An effective method of understanding a stakeholder's needs is through observation of his work environment and process flow. Sometimes called job shadowing, the BA follows a subject matter expert or end user through the business process to be improved or re-engineered. This method establishes a baseline from which modifications can be made.

The observation can either be done passively or actively. Passive observation requires the BA to simply watch the business process without involvement or discussion. Active observation involves discussion with end users and/or performing functions within the flow (hands on approach). The BA must be wary of becoming a disruption while conducting observation. This method can involve either a demonstration or actual work in progress.

Advantages:

* Provides actual and practical insight to current work flows.
* Elicits information that is not captured through documentation or questioning.

Disadvantages:

* Provides requirements only on existing systems, structure, or process.
* May be disruptive to business unit.
* Limited observation period may miss unusual occurrences.
* Responses to issues can be time consuming to observe entire process.

**4) Interview:**

The BA can choose to conduct a one-on-one or group interview to elicit requirements through a series of questions directly asked to stakeholders, end users, or subject matter experts. The interview can be structured or unstructured, conducted in a formal or informal system. Questions are either open-ended (eliciting a thoughtful, expressive response) or closed-ended (requiring a direct, coded response).

The key to accurate requirements elicitation using this method is to determine the most appropriate interview subject and designing the most useful questions. Follow up questioning should be used to clarify vague, incomplete, or hard to understand responses. The interviewer must present the questions in a logical order to enable the BA to understand the complexity and dependencies of the requirements.

Advantages:

* Provides a simple, direct way of eliciting requirements directly from stakeholders.
* Maintains focus throughout the elicitation process.
* Allows for complete explanation and discussion of attributes and needs.

Disadvantages:

* Doesn't allow BA to reach consensus among stakeholders easily. Requires substantial time commitment and stakeholder involvement.
* Interviewer must be highly skilled in order to generate appropriate information.
* Subject responses generally limited to their business domain**.**

**5) Questionnaire:**

If requirements are to be elicited from many stakeholders, the BA may choose to use a survey which provides a questionnaire to be completed. Surveys can be sent simultaneously to stakeholders, end users, and subject matter experts. The questions used, as with the interview method, can be open-ended or closed, depending upon the level of detail sought.

When writing the questions, the BA should keep in mind the following points:

* Communicate the survey's purpose and objectives to provide scope to respondents.
* Be aware of the characteristics of the survey population (for instance, communication skills and terminology).
* Focus on the requirements being elicited.
* Keep survey short (IIBA prefers 10 items or less).
* Make sure wording and syntax can be clearly understood.
* Avoid negative questions.
* Avoid complex concepts or question structure.
* Attempt to elicit as much detail as necessary.
* Avoid questions that may put respondents on the defensive.

Advantages:

* Can be effective at obtaining quantitative as well as qualitative results.
* Yields a large set of results.
* Short surveys can be completed quickly.
* Typically, less expensive and easier to administer than other methods.

Disadvantages:

* Open-end questions can require time to analyze.
* Statistical sampling methods may be required to achieve unbiased results.
* May require follow up interview or re-survey if information is incomplete or missing.
* Not suited to uncover actual work process attributes or unwritten behaviors.

**6) Brainstorming:** Excellent for generating ideas, brainstorming involves bringing stakeholders together to discuss the project's objectives and suggest potential needs. The group's mission is to create a broad set of opinions, ideas, definitions, or to explore possibilities about a requirement set. This method encourages diversity of thought and creative input. The participants will focus on an objective and present as many requirements as possible, then the BA distills those solutions into a defined set of needs.

Advantages:

* Ability to elicit many requirement ideas quickly.
* Allows free thought without restrictions or compartmentalization.

Disadvantages:

* Participants must be creative thinkers

Steps in Brainstorming sessions:

1) Prepare for brainstorming

2) conduct brainstorming sessions

3) wrap up the brain storming sessions.

**7) Workshops:**

The BA can host a requirements workshop, a focused, one-time team event used to scope, define, analyze, and prioritize requirements. This one or two-day event is the fastest method to deliver high quality results. As the participants go through exercises, the requirements that evolve are captured by a team member (called a scribe).

It's important that the BA gather the most appropriate stakeholders to participate, and maintain the focus of the event. The goal of the workshop is to provide the bulk of requirements to be elicited. If he is the facilitator, he must be able to resolve requirements conflicts quickly to reach consensus within the workshop period. And he should make sure that all participants are heard from.

Once the workshop is completed, the BA will analyze the documentation generated and provide a report to the participants, project manager, and other interested parties.

Process:

1) Prepare for workshop

2) Conduct or Run the requirements workshops.

3) Post requirement workshop wrap-up done by the facilitator.

Advantages

* Elicits requirement details quickly.
* Stakeholders can collaborate and reach a mutual understanding.
* Lower costs due to stakeholder consensus during a one-time event.

Disadvantages

* Scheduling can be a challenge.
* Success is highly dependent upon a skilled facilitator and appropriate participants.
* Number of participants can have a negative effect on outcome (too many can slow the schedule; too few can produce low quality requirements).

**8) JAD (Joint application development)**

The joint application development technique is an extended facilitated workshop. It involves Collaboration between stakeholders and system analyst to identify names or requirements in a concentrated and focused effort.

Advantages:

The technique allows for the simultaneous gathering and consolidating of large amount of information. This technique produces a relatively large amount of high quality information in a short period of time. Discrepancies are resolved immediately with the aid of the facilitator. This technique provides a forum to explore multiple points of view regarding topic.

Disadvantages:

Requires significant planning and scheduling effort. requires significant stakeholder commitment of time and effort. That wire strain and experienced personally for facilitation and recording.

JAD process-

•Define session

•Research product

• Prepare

•Conduct session

•Draft the documents

•Roles

**9) FOCUS GROUP:**

When the BA seeks to gather shared attitudes, needs, or preferences, he can form a focus group to elicit requirements. A small collection of stakeholders shares ideas and thoughts with the help of a moderator. A session can be conducted in one room or through an online meeting. The results are generally qualitative, not quantitative. A focus group can convene during any phase of a project life cycle.

The group generally consists of six to twelve participants, and the topic may influence who is chosen to participate. For example, if the group is discussing a business process, then the attendees will likely come from business areas that impact the process.

Group composition can be either homogeneous or heterogeneous. A homogeneous group is made up of members having similar characteristics and perspectives, such as within a single work area. Though this type of group would provide a comprehensive view of a single attribute, it lacks a broad perspective. A heterogeneous group consists of members with diverse characteristics and perspectives. This group can be effective when attempting to gain a broad perspective about the topic (though unfamiliarity with other members may limit the quality of responses).

* Homogeneous individuals – Individuals with similar characteristics
* Heterogeneous individuals – Individuals with diverse backgrounds.

Advantages:

* Can save time and cost by eliciting many requirements in one session.
* A healthy interchange among members is effective to elicit attitudes and perspectives.

Disadvantages:

* Does not generally produce numerical data or other metrics.
* Homogeneity may reduce completeness in gathering requirements.
* Participants may be unwilling to openly share thoughts within the group.
* Scheduling may affect timing of requirements elicitation.

**10) Prototyping:**

When a product or a system tool is to be developed or adapted, building a prototype (model or mock up) can enable the BA to uncover construction attributes and process flow. IT projects usually involve using screen shots and layouts to develop interface stages and functions.

The two objectives the BA seeks to fulfill by using prototyping are:

1) to determine the functional scope of the method and,

2) to determine the use of the prototype.

Within the scope, the prototype is developed in a way that exhibits the depth of the issue or the need that the initiative will address. A horizontal model represents a shallow, but wide view of a product's makeup, for example, a series of computer software screen shots without the functionality behind them.

Once the scope for the prototype has been determined, its use in the product development cycle must be defined. There are primarily two model uses:

1. Throw Away Model. By using rudimentary tools, such as drawings or plastic model parts, the prototyping can quickly reveal the framework of the product from which the attributes can be determined. It is discarded when the final system is in place.

2. Evolutionary Model. As part of the ongoing development, this prototype is extended from an initial design through full implementation. It becomes part of the system.

Advantages:

* Supports visual, multi-dimensional expression of the requirements.
* Allows user interaction with model and early feedback.
* Throw away model can be a quick, inexpensive way to uncover requirements.
* Evolutionary model provides smooth transition to an implemented system.

Disadvantages

* Can be expensive and time consuming if product or system is complex.
* May require numerous invalidated assumptions to design.
* Initial model can lead to unrealistic expectations for final design

**11.Use Case:**  **Uses case** can be followed simultaneously as we can present to the client and the technical team that how the actors are going to interact with the system and we can show a basic flow and alternative flow for the system. We can use the developed use cases to identify additional requirements or uncover new scenarios. For example, a use case might reveal the need for a new feature or integration.

**Question 6**– This project Elicitation Techniques - 5 Marks

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

Prototyping

Use case Specs

Document Analysis

Brainstorming

**Answer6-**For online agriculture stone following elicitation techniques can be used.

1. **Prototyping:** As screen mockups can support the requirement gathering process. Even mockups can be carried out so as to help clients visualize the functionality of the system as everyone will be the new and first time user for this application.

When a product or a system tool is to be developed or adapted, building a prototype (model or mock up) can enable the BA to uncover construction attributes and process flow. IT projects usually involve using screen shots and layouts to develop interface stages and functions.

The two objectives the BA seeks to fulfill by using prototyping are:

1) to determine the functional scope of the method and,

2) to determine the use of the prototype.

Within the scope, the prototype is developed in a way that exhibits the depth of the issue or the need that the initiative will address. A horizontal model represents a shallow, but wide view of a product's makeup, for example, a series of computer software screen shots without the functionality behind them.

**2) Use case specs** can be followed simultaneously as we can present to the client and the technical team that how the actors are going to interact with the system and we can show a basic flow and alternative flow for the system.

1. Bottom of Form

**Question 7** – 10 Business Requirements- 10 Marks

Make suitable Assumptions and identify at least 10 Business Requirements.

**Answer 7-**Below are the 10 business 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

BR003 – User should be able to create a valid login ID and password.

BR004 – User can be able to login using valid email id and password.

BR005 – Search option wherein users can search for various products online.

BR006 – Option for adding and removing items from cart.

BR007 – Online payment gateway with options for COD, Credit/debit card, UPI.

BR008 – Invoice and order confirmation number on successful payment.

BR009 – Email confirmation should be received on registered email id of user.

BR010 – Option to update dispatch confirmation by supplier.

BR011 – Generating shipment tracking ID and dispatch confirmation to user.

BR012 – Online delivery tracking can be done.

BR013 – Confirmation upon delivery of products.

**Question 8** –Assumptions- 5 Marks

List your assumptions

**Answer8** -Assumptions:

1. Valid products to upload on the portal.
2. Users should have valid email id and contact details.
3. Valid card and UPI id for processing payment.
4. Sufficient balance for payments or credit limit in case of credit card payments.
5. Valid and active address for delivery

**Question 9** – This project Requirements Priority - 8 Marks

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

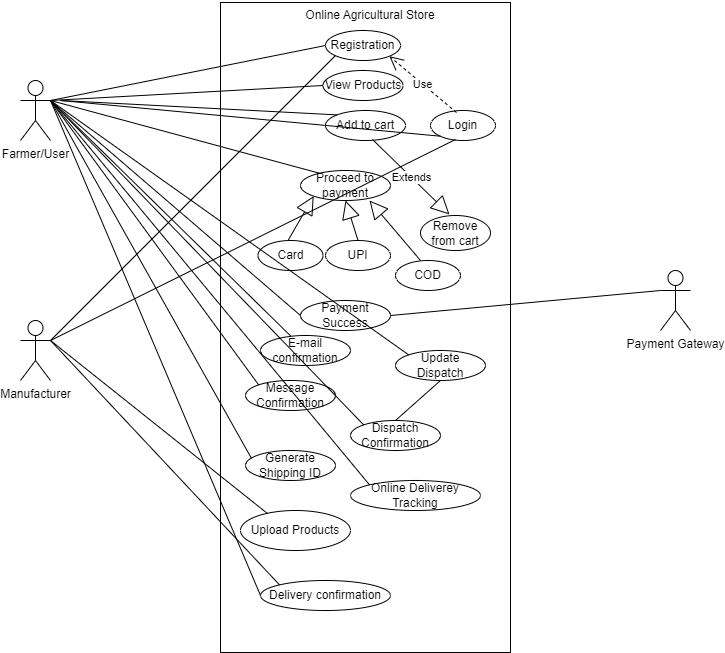
**Answer 9-**

|  |  |  |  |
| --- | --- | --- | --- |
| Req ID | Req Name | Req Description | Priority |
| BR001 | Farmer Search for Products | Farmers should be able to search for available products in fertilizers, seeds, pesticides | 8 |
| BR002 | Manufacturers upload their Products | Manufacturers should be able to upload and display their products in the application | 8 |
| BR003 | Login id creation | User should be able to create a valid login ID and password. | 8 |
| BR004 | Login function | User can be able to login using valid email id and password. | 8 |
| BR005 | Online search | Search option wherein users can search for various products online. | 8 |
| BR006 | Adding items to cart | Option for adding and removing items from cart. | 7 |
| BR007 | Payment gateway | Online payment gateway with options for COD, Credit/debit card, UPI. | 8 |
| BR008 | Invoicing & order confirmation | Invoice and order confirmation number on successful payment. | 7 |
| BR009 | Order confirmation in email | Email confirmation should be received on registered email id of user. | 8 |
| BR010 | Dispatch confirmation | Option to update dispatch confirmation by supplier. | 6 |
| BR011 | Generating tracking ID | Generating shipment tracking ID and dispatch confirmation to user. | 6 |
| BR012 | Delivery tracker | Online delivery tracking can be done. | 8 |
| BR013 | Delivery confirmation | Confirmation upon delivery of products. | 5 |

**Question 10** – Use Case Diagram - 10 Marks

Draw use case diagram

**Answer 10-**



**Question 11 –** (minimum 5) Use Case Specs - 15 Marks

Prepare use case specs for all use cases

**Answer11-**

**Use case specs: 1**

1) **Use case Spec:** Registration

**2) Description:** valid Email Id and phone number

**3) Actors:** customers/farmers/Manufacturers, Traders

**4) Pre-condition:** Active internet connection, mobile device, laptop or PC.

**5) Post -condition:** page requesting for registration details should be displayed.

**6) Basic flow:** Email id and phone number are correct.

**7) Alternate flow:**

a) invalid email id

b) invalid phone number

**8) Exceptional flow**:

a) Wrong OTP entered

**9) Assumptions**: basic android phone, basic operating knowledge of Phone and computers.

**10) Constraint**: User name cannot be name

**11) Dependencies**: Email verification and phone number verification

**12) Input:** Email ID & Phone number.

**13) Output:** Successful registration.

**14) Business rules**: Select Username - can be registered mobile number or email id,

Set Password – should be unique.

**15) Misc. info**: User friendly.

**Use case specs: 2**

1) **Use case Spec:** Login

2) **Description:** User name & Password.

3) **Actors:** customers/farmers/manufacturers/traders

4) **Pre-condition:** Active internet connection, mobile device, laptop or PC.

5) **Post -condition:** Login home page should be displayed to the customer.

6) **Basic flow:** User name & password are correct.

7) **Alternate flow:**

a) Wrong password

b) Wrong user name

c) User name & password are wrong

8) **Exceptional flow:**

a) Forgot user name

b) Forgot password

9) **Assumptions:** Users should have basic computer knowledge, English

10) **Constraint:** User name cannot be names.

11) **Dependencies:** Should be a valid user – complete registration.

12) **Input:** User name & password

13) **Output:** successful login

14) **Business rules:** Username: Valid email id or mobile number.

Password: combination of capital, small letter, special character and number

15) **Misc. info**: User friendly and browser compatible.

**Use case specs:3**

**1)** **Use case Spec:** Product uploads

**2) Description:** Valid products to upload.

**3) Actors:** Manufacturers/traders

**4) Pre-condition:** Active internet connection, mobile device, laptop or PC and valid and verified products.

**5) Post -condition:** jpeg format of standard sizes should be uploaded.

**6) Basic flow:** Products are uploaded.

**7) Alternate flow:**

a) Irrelevant product.

b) uploaded products got rejected.

c) Image verification.

**8) Exceptional flow**:

a) Product details should be mentioned in detailed.

**9) Assumptions**: manufacturer or trader should have a valid product to upload.

**10) Constraint**: Trader should submit authorization certificate from manufacturer.

**11) Dependencies**: Manufacturer or trader should be a valid and registered user.

**12) Input:** valid JPEG images.

**13) Output:** Products are uploaded on portal

**14) Business rules**: Documents verification to be done, images should be verified for copyright images.

**15) Misc. info**: Back end team will verify the images and documents.

**Use case specs:4**

1) **Use case Spec:** View products.

**2) Description:** user should be able to view and search all uploaded products on the portal

**3) Actors:** User.

**4) Pre-condition:** Active internet connection, mobile device, laptop or PC.

**5) Post -condition:** can mark the products as favorite or even add to cart.

**6) Basic flow:** Products can be viewed or added to the cart.

**7) Alternate flow:**

a) Images not visible.

b) Error in adding products to cart

c) product not visible in cart

**8) Exceptional flow**:

a) In cart total value for added products and number of products should be displayed.

**9) Assumptions**: Active internet connection.

**10) Constraint**: Before proceeding for purchase, user should register of sign in if existing user.

**11) Dependencies**: Unregistered user can also view the products.

**12) Input:** scroll through all the product categories.

**13) Output:** Final selection of products can be done.

**14) Business rules**: if unregistered restricted information for accounts and other settings.

**15) Misc. info**

**Use case specs:5**

**1)** **Use case Spec:** Proceed to payments.

**2) Description:** Successful completion of payments.

**3) Actors:** User/Farmer/Manufacturers/traders

**4) Pre-condition:** Active internet connection, valid UPI, card details.

**5) Post -condition: P**age should be diverted to payment portal.

**6) Basic flow:** successful payment.

**7) Alternate flow:**

a) failed payment.

b) wrong account details.

c) wrong UPI id.

**8) Exceptional flow**:

a) Insufficient account balance.

**9) Assumptions**: Sufficient account balance for making payments. Valid card and UPI account.

**10) Constraint**: Coupon payment not accepted.

**11) Dependencies**: before proceeding for payment user should register or should stay signed in if existing user.

**12) Input:** Proceed for payments.

**13) Output:** should be diverted for payment portal and successful payment confirmation to be received.

**14) Business rules**: Payment acknowledgement to be received.

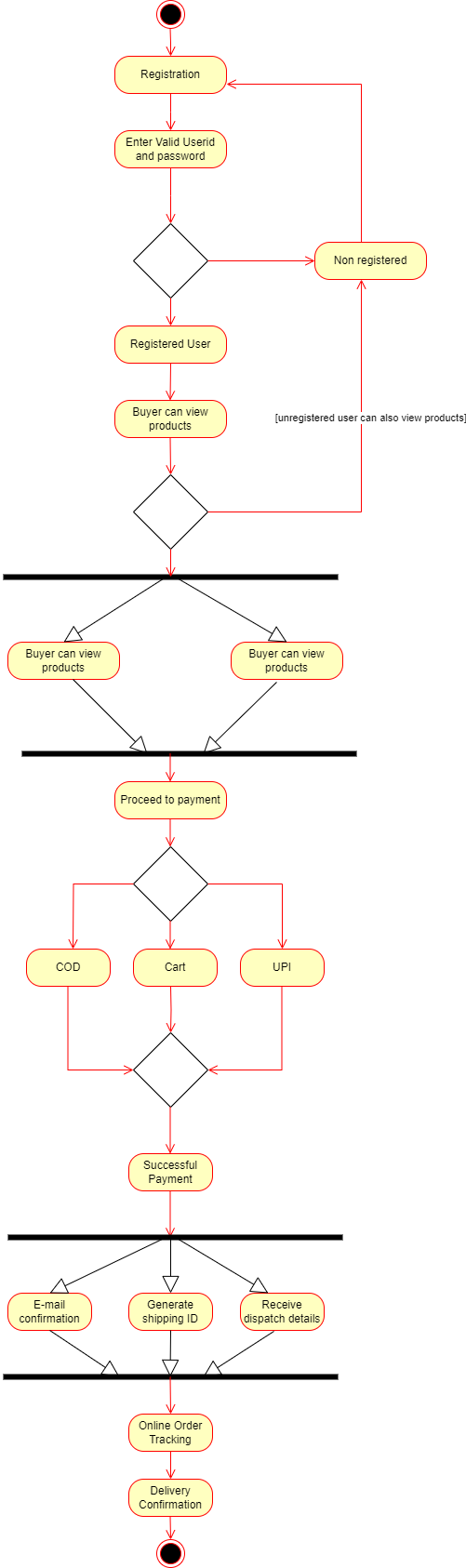
**15) Misc. info**: cross check if not a robot.

**Question 12 –** (minimum 5) Activity Diagrams - 15 Marks

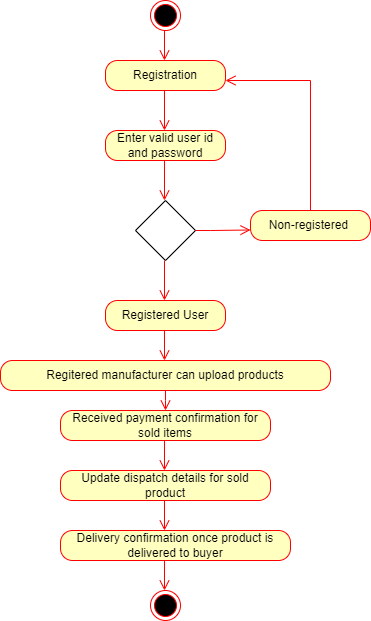
**Answer 12**- An activity diagram is a type of UML (Unified Modelling Language) diagram that illustrates the flow of activities or actions within a system or process. It’s commonly used to represent workflows, business processes, or the sequence of activities in a system.

5 activity diagrams illustrated for below process:

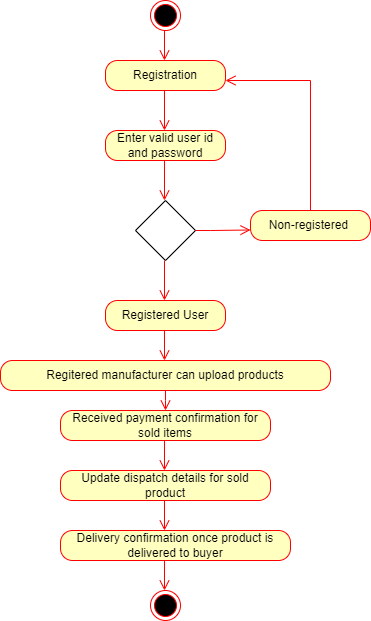
**1) Activity diagram for Buyers and Farmers**



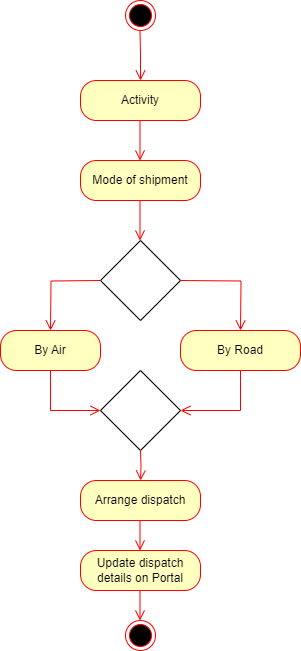
**2)Activity diagram for manufacturers:**

****

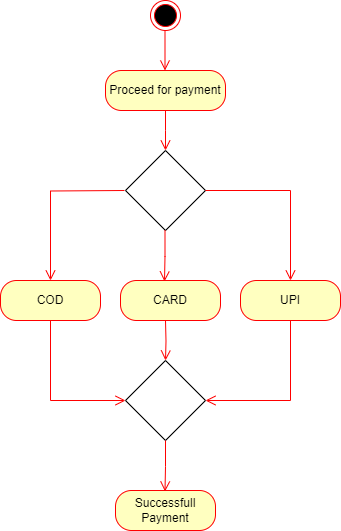
**3)Activity Diagram for Order received by manufacturers:**

****

**4)Activity diagram for dispatch:**

****

**5)Activity diagram for Payment process:**

****