**Question1:** BPM- 5 Marks

Identify Business Process Model for Online Agriculture Store – (Goal, Inputs, Resources, Outputs, Activities, Value created to the end Customer).

**Answer1:** BPM stands for Business Process Modelling. BPM helps us understand the business process. It is a collection of activities that are required to get desired output from specific inputs. It has a goal, specific input and output which provides value to customers and is a result of activities performed in a specific manner using resources.

* **Goal**- To bridge the gap between farmers and manufacturers, help farmers to buy farm products through online web or mobile application.
* **Inputs**-Product details, Marketing Campaigns, Farmers data, Agricultural Products, Manufacturers list.
* **Resources**-Software Application, Internet Connectivity, Gadgets like Mobile/PC/Laptop, Logistic partners, Payment Partners.
* **Outputs**-Working mobile and web application to connect farmers with manufactures to buy agricultural product.
* **Activities**- Login for farmers/buyers and manufactures, partnering with leading manufacturers, listing of products, Search and order of agricultural products, Ease of transaction, delivery of product.
* **Value**-Availability and finding wide range of agricultural products, User friendly software for new users.

**Question 2** – SWOT - 5 Marks

Mr Karthik is doing SWOT analysis before he accepts this project. What Aspects he should consider as Strengths, as Weaknesses, as Opportunity and as Threats.

**Answer2:** SWOT stands for Strengths, Weakness, Opportunities and Threats. It is a model used for planning which helps us to identify influencing factors and affecting an initiative. Here Strengths and Weakness are internal to organisation whereas Opportunities and Threats are external.

**SWOT for online agricultural store-**

**1.Strength:**

* Experience technical team
* Market reputation
* Financial Backup
* Infrastructure
* SME teams

**2.Weakness:**

* Limited budget of 2 CR.
* Deadline for completion of project -18 months.
* Limited admin staff.
* Change request not entertained.

**3.Opportunities:**

* No such innovative product available in ma .
* Unique and innovative idea.
* Market expansion.
* Untapped target market/audience.

**4.Threats:**

* Technology changes
* Whether conditions
* Economic downturns.
* Target audience buying patterns may change.
* Limited logistics, delivery period.

**Question 3 –** Feasibility study - 5 Marks

Mr Karthik is trying to do feasibility study on doing this project in Technology (Java), Please help him with points (HW, SW ,Trained Resources, Budget Time frame) to consider in feasibility Study.

**Answer 3:**

Feasibility study can be defined as preliminary analysis of possibility of doing a project which helps us to decide whether to go ahead with a project or not. It helps us to estimate solution scope of the project considering technical, operational, economical, legal and duration constraints.

**Hardware Resources:** 20 Lakhs

Desktop/laptops with standard configuration, mobile devices for testing, Database servers, Web servers, Data storage and Development Centre.

**Software Resources:** 30 Lakhs

Programming Language (Java), Content Management Software, Payment Gateway, Security Applications

**Trained Resources:** 1.22CR(approx.)

Java Developers, Testers, DB Admin, Network Admin, Delivery Head, Project Manager, Business Analyst

APT IT Solutions

Mr. Karthik –Delivery Head (1.20/Month-21.60 Lakhs)

Mr. Vandanam-Project Manager (1 Lakhs/ Month-18 Lakhs)

Ms. Juhi-Sr. Java Debeloper (75K/Month-13.50 Lakhs)

Ms. Teyson-Java Developer (50K/Month- 9 Lakhs)

Ms. Lucie-Java Developer (50K/Month- 9 Lakhs)

Mr. Tucker- Java Developer (50K/Month- 9 Lakhs)

Mr. Bravo- Java Developer (50K/Month- 9 Lakhs)

Mr. Mike- Network Admin (50 K/Month-9 lakhs)

Mr. John-DB Admin (50K/Month-9 Lakhs)

Mr. Jason-Tester (25k/Month-4.50 Lakhs)

Mr. Alekya-Tester (25K/Month-4.50 lakhs)

Me- BA (75 K/Month-13.50 lakhs)

**Time frame & Budget**: After distributing the tasks and budget required-

* 18 months’ time period is sufficient to carry out the project within the given budget
* Budget- 2 CR
* Cost Estimated- 1.72 CR (approx.)

**Question 4** – Gap Analysis - 5 Marks

Mr Karthik must submit Gap Analysis to Mr Henry to convince to initiate this project. What points (compare AS-IS existing process with TO-BE future Process) to showcase in the GAP Analysis Project Development Approach.

**Answer 4:** GAP analysis is a comparison of current state and desired future state of the organisation or It is a comparison between AS-IS state and TO-BE state of the organisation.

**AS-IS:** In current state there is manual process involved in procurement of any farm products like seeds, fertilizers, pesticides from the manufacturers.

**TO-BE:** Facilitate farmers to buy seeds, fertilizers from anywhere through internet connectivity. The application should be able to accept the product details from the manufacturers and should be able to display them to the farmer. Farmers will browse through these products and select the products that they need and request to buy them and deliver them to farmer’s location.

**Assumptions:** Valid account, Login, relevant product that can be listed on portal, online payment.

**Impacts:** Farmers, manufacturers, Development Team, Testing, Payment Portal.

**MOC (Management of Change):**

1. Manufacturers can be able to list down their products on portal.
2. Unique product ID for every product.
3. Pictures can be added for every product.
4. Rates can be displayed for the products.
5. Farmers and manufacturers can create valid login-id.
6. Valid login ID and password can be generated.
7. Farmers can select the product and add to their cart.
8. After adding product in cart customer to be navigated to check out and order confirmation window.
9. Check for delivery address.
10. Select the payment options through wallet/UPI/COD/Card
11. Redirecting the page to payment portal
12. Generate confirmation receipt after successful payment process.
13. Provide error if payment not deducted.
14. Successful transaction completion receipt along with invoice after payment completion.

**Technical:**

1. Developing and website and mobile application.
2. Able to create a successful login ID and Password.
3. Connect with payment portals.
4. Generating transaction ID.
5. Updating Database.

**Question 5** – Risk Analysis - 10 Marks

List down different risk factors that may be involved (BA Risks and Process/Project Risks).

**Answer 5-** Risk is an uncertain event which can have impact on either cost, time, scope or quality. Risk analysis is the process of identifying, assessing, and prioritizing risks to an organization or project. It is done to determine if the proposed project carries more risk than the organisations capacity to support.

**Internal Risk-**

* Depends on external vendors for product supply and inventory management.
* High operating expenses due to investments on technology and marketing.

**External Risk-**

* Change in government regulations and policies that control the agriculture industry.
* Seasonal changes that might affect the availability of products and buying pattern.

**BA Risk**- This typically refers to risks that are specifically relevant to the activities and responsibilities of a business analyst. These risks can impact the successful execution of business analysis tasks, project outcomes, and overall organizational objectives. Below are some factors involved in BA Risks:

* Lack of stakeholder engagement
* In adequate planning
* Lack of BA domain knowledge
* Improper requirement gathering.
* Change in scope of requirement.
* In adequate time for Business planning and analysis.

**Project Risk-** Project risks are uncertainties or potential events that can impact the successful delivery of a project's objectives. These risks can arise from various sources and can affect different aspects of the project, including scope, schedule, budget, quality, and stakeholder expectations. Below are some factors involved in Project Risks:

* 2 cr. budget may fall short if improper team planning.
* Due to less numbers of java developers and resources switching their jobs, limited time duration of 18 months can be point of concern.
* Technological changes may affect the developed system.
* Non availability of development team.
* Frequent changes asked in projects

**Question6** – Stakeholder Analysis (RACI Matrix) - 8 Marks

Perform stakeholder analysis (RACI Matrix) to find out the key stakeholders who can take

Decisions and Who are the influencers

**Answer6**: Stakeholders are individuals, groups, or organizations that have an interest or concern in a project. Identifying stakeholders and Managing stakeholders effectively is crucial for project success. Stakeholders can be categorised as-

* Project Stakeholders (generally people belongs to IT company)
* Business Stakeholders (Clients)
* 3rd Party (neither belongs to IT company or Client but can influence undergoing project)

**RACI** can bebased on process, functionality, phases, time frame. It identifies the stakeholders who needs to be contacted whenever the changes are made to any document. RACI stands for Responsible, accountable consulted and informed.

* **Responsible:** The person or role responsible for completing and executing the task or deliverable.
* **Accountable:** The person who is ultimately answerable for the correct and thorough completion of the task or deliverable. This is often the person who delegates the work to the responsible party and ensures it is done satisfactorily.
* **Consulted:** Individuals or roles who provide input to the task or deliverable and are consulted before decisions and actions are taken.
* **Informed:** Individuals or roles who are kept informed about progress, decisions, and outcomes related to the task or deliverable.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **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 |
| **Business stakeholders**. | | | | | |
| Name | Position | BRD | MOCKUP | Test PLAN | Project Plan |
| Mr. Henry | Owner | I | I | C | I |
| Mr. Pandu | Financial head | I | I | C | I |
| Mr. Dooku | Project  co-ordinator | I | I | C | I |
| Mr. Peter | END user | I | I | C | I |
| Mr. Kevin | END user | I | I | C | I |
| Mr. Ben | END user | I | I | C | I |

**Question 7** – Business Case Document - 8 Marks

Help Mr Karthik to prepare a business case document.

**Answer7**- A business case is a document or presentation that justifies the start of a new project, initiative, or investment within an organization. It serves as a formal, structured rationale for why a particular course of action should be pursued, outlining the potential benefits, costs, risks, and expected outcomes.

**Business case for Online agriculture store:**

**Why is this project initiated?**

Mr. Henry being a successful and settled businessman wants to help others to fulfil their dreams., Mr. Henry realised that his friends and other farmers staying in remote areas are facing many difficulties in procuring farm products like pesticides, fertilizers, seeds.

**What are the current problems?**

Farmers are facing difficulties in procuring fertilizers, pesticides and seeds for farming. They are based in remote areas where it becomes difficult to connect to manufacturers for procuring farm products.

**With this project how many problems could be solved?**

With this online agricultural store farmer can online place orders for required fertilizers, pesticides and seeds for farming and connect to manufacturers directly and communicate with them. They will be able to get these products even in remote locations.

**What are the resources required?**

To carry this project online working website or application, Internet connection, hardware resources like desktops, laptops, mobile, data storages will be required. Developers, Testers, Data Admins, BA in total 12 people team including 1 Project Manager and a delivery head will be required.

**How much organizational change is required to adopt this technology?**

As there is no existing process for farmers and they are following the manual process so, no organizational change is required.

**What is the Time frame to recover ROI?**

Though the project completion timeline is 18 months but as Project is under CSR activity no particular timeline is set to recover ROI.

**How to identify Stakeholders?**

Detailed RACI matrix will be prepared based on process, functionality, phases, time frame to identify Stakeholders. Mainly stake holders can be categorised into three types:

* Project Stakeholders.
* Business Stakeholders.
* 3rd Party Stakeholders.

|  |  |
| --- | --- |
| Project stake holders. | |
| Name | Position |
| Mr. Vandanam | Project manager |
| Ms. Juhi | Sr. Java developer |
| Mr. Teyson | Java developers |
| Ms. Lucie | Java developers |
| Mr. Tucker | Java developers |
| Mr. Bravo | Java developers |
| Mr. Mike | Network Admin |
| Mr. John | DB Admin |
| Mr. Jason | Tester |
| Ms. Alekya | Tester |
| Mr. Shivam | BA |
| **Business Stakeholders** | |
| **Name** | **Position** |
| Mr. Henry | Owner |
| Mr. Pandu | Financial head |
| Mr. Dooku | Project  co-ordinator |
| Mr. Peter | END user |
| Mr. Kevin | END user |
| Mr. Ben | END user |
| **3rd party stake holders** | |
| SME expert |

**Question 8** – Four SDLC Methodologies - 8 Marks

Mr Karthik explained to Mr. Henry about SDLC. And four methodologies like Sequential Iterative, Evolutionary and Agile. Please share your thoughts and clarity on Methodologies.

The Committee of Mr. Henry, Mr Pandu, and Mr. Dooku and Mr. Karthik are having a discussion on project development approach.

**Answer8**- SDLC stands for Software Development Life Cycle, which is a structured process used by software development teams to design, develop, test, and deploy software applications. The SDLC aims to produce high-quality software that meets or exceeds customer expectations, within time and budget constraints.

SDLC can be understood by methodologies which are set of guidelines which is followed by models to achieve the functionality.

We have four base methodologies:

1. Sequential
2. Iterative
3. Evolu0tionary
4. Agile

**1)**A **sequential methodology** refers to a linear or sequential approach where development activities proceed in a strict order, with each phase typically dependent on the completion of the previous one. In this methodology project is delivered at one go.

Example- for 5-year project starting in 2024, project will be delivered in 2029 directly.

**Characteristics of Sequential Methodology:**

1. **Phased Approach:** The project progresses through distinct phases in a linear sequence
2. **Sequential Flow:** Each phase starts only after the previous one is completed.
3. **Emphasis on Documentation:** Detailed documentation is done at each phase to capture requirements, design specifications, test cases, and deployment.
4. **Predictability:** The project timeline, milestones, and deliverables are planned upfront for structured development process.
5. **Rigidity:** Changes to requirements or design are difficult to accommodate once a phase is completed.
6. **Quality at the End:** Testing and validation occur towards the end of the project lifecycle, after development is complete, to ensure the final product meets requirements.

**2)**An **iterative methodology** in software development refers to an approach where the development process is cyclic or repetitive. In Iterative methodology we split project into multiple modules and module wise we keep on delivering. Every module progresses through series of iterations. Each iteration involves revisiting and refining the software product through repeated cycles of planning, designing, implementing, testing, and reviewing.

Example-Employee module, attendance module, payroll i.e. one module delivered at a time.

### Characteristics of Iterative Methodology:

1. **Repetitive Cycles:** Development occurs in repeated iterations, with each iteration delivering a partial working version of the software.
2. **Incremental Progress:** The software evolves gradually, with each iteration building upon the previous one to add new features or improvements.
3. **Stake Holders Engagement:** Stakeholders provide feedback at the end of each iteration, which informs subsequent iterations and helps refine requirements and design.
4. **Flexibility:** Allows for changes and adjustments to be made throughout the project, accommodating evolving requirements and responding to feedback.
5. **Collaboration:** Cross-functional teams work closely together throughout the entire development process, promoting communication and shared understanding

**3)**In **Evolutionary Methodology** look and feel of the framework is given first and then we keep on adding functionality to it. Evolutionary methodology in software development refers to an approach where software is developed in an incremental and iterative manner, allowing for continuous improvement and adaptation throughout the development process. It emphasizes delivering a working product early and refining it based on feedback and changing requirements.

**Example**-Job Portal initially look and feel of framework is given and then functionality, extra features are added and it goes within scope only.

### Characteristics of Evolutionary Methodology:

1. **Incremental Development:** Software is developed in small, incremental steps or releases, with each iteration adding new features or improving existing functionality.
2. **Iterative Process:** Development cycles are repeated iteratively, allowing for continuous refinement and enhancement of the software product.
3. **Feedback-driven:** Stakeholder feedback taken and incorporated regularly, ensuring alignment with user needs.
4. **Flexible and Adaptive:** Emphasizes responding to change and accommodating evolving requirements and priorities.
5. **Early and Continuous Delivery:** Focuses on delivering working software early and frequently, helps stakeholders to see tangible progress and provide timely feedback.
6. **Collaborative Approach:** Cross-functional teams collaborate closely promoting communication and shared ownership.

**4)Agile Methodology** is a continuous deliverables of executable software. Frequency of delivery is 2 weeks to a month’s mostly its 2 weeks. In this we keep on delivering working software back to the client. Agile is a widely adopted approach in software development that emphasizes flexibility, collaboration, and responsiveness to change throughout the development process.

In agile client directly interacts with developers (6 to 8 developers here form a team) to share requirements through user stories on a post it note and put these post in notes on story board and developer give back in 2 weeks’ time. This time may differ depending on project to project maximum to 2 months. Client will do UAT and take it backs. Here working software is the proof of functionality. There is no documentation, technically there is no BA and Project manager. There is no concept of change request here and it is also posted as User Stories. Agile uses architecture similar to smart phone you can execute what is required and leave the rest.

Limitations in other methodology, delay in delivery of working software application and accepting change request is addressed here in Agile and IT companies adopted to agile through Agile manifesto which has four main values and twelve principles.

**4 Main Values:**

* **Individuals and interactions** over processes and tools.
* **Working software** over comprehensive documentation.
* **Customer collaboration** over contract negotiation.
* **Responding to change** over following a plan.

**12 Principles of Agile:**

1. **Customer satisfaction through early and continuous software delivery**
2. **Accommodate changing requirements throughout the development process**
3. **Frequent delivery of working software**
4. **Collaboration between business stakeholders and developers throughout the project**
5. **Support, trust, and motivate individuals who are involved**
6. **Enable face-to-face interactions**
7. **Working software is the primary measure of progress**
8. **Agile processes promote sustainable development**
9. **Continuous attention to technical excellence and good design**
10. **Simplicity-the art of maximizing the amount of work not done-is essential**.
11. **Self-organizing teams encourage great architectures, requirements, and designs**.
12. **Regular reflections on how to become more effective, then tuning and adjusting behaviour accordingly.**

**Question9** – Waterfall RUP Spiral and Scrum Models – 8 Marks

They discussed models in SDLC like waterfall RUP Spiral and Scrum. You put forth your understanding on these models.

When the APT IT SOLUTIONS company got the project to make this online agriculture product store, there is a difference of opinion between a couple of SMEs and the project team regarding which methodology would be more suitable for this project. SMEs are stressing on using the V model and the project team is leaning more onto the side of waterfall model. As a business analyst, which methodology do you think would be better for this project?

**Answer 9-**

**1)Waterfall Model**- Waterfall follows sequential approach.This is one of the most basic & Primitive model in SDLC also referred to as liner sequential life cycle model.

This model is a collection of different phases and each phase must be completed before beginning of the next phase. Each phase in the model depends on the inputs from the previous phase. All the phases in the waterfall model are followed in a top-down approach.

Following are the phases in the waterfall model:

1. **Requirement Gathering**- BA & PM – Business Requirement Document

BA gather requirement from client keeping Project Manager in loop and result is Business Requirement Document(BRD).

1. **Requirement Analysis** –

* Business Analyst participates and prepare FS/FRS (Functional requirement or Functional Specs).
* Technical Team prepares Non Functional Requirement in SSD (Supplementary Support Document)
* BA will add FS and SSD to form SRS (Software Requirement Specification)
* BA will take sign off from client on SRS
* BA will prepare RTM (Requirement Traceability Matrix)

1. **System design**- Technical Team prepare HDD (High-level Design Document)/ADD (Application Design Document) and Solution Document.

4) **Development(coding)-**Programmers and Developers prepares LDD (Low Level Design Document)/CDD (Component Design Document) and Application is ready.

5) **Testing-** Testers work on Test Document and result is application with less errors.

Test documents include Test Strategy, Test Plan, Test Schedule, Test Cases.

6) **Deployment & Implementation**-This is taken care by Release Engineers, Deployment means moving the code from development environment into production, whereas running the code for very first time in production is called implementation.

**Note:**

* Waterfall model completes at implementation and maintenance (taken care by support team) is not a part of Waterfall model.
* When Waterfall model was introduced there was a concept of Requirement freezing i.e. no change request will be entertained once requirement is gathered and BRD is prepared and client says requirement is freezed.
* Slowly clients started deviating and started giving change request for one process was introduced called as Configuration Management (PM handles this)
* When Waterfall model was proposed Applications were simple now most of the applications are complex which must run on multiple platforms hence to test the functionality multiple test phases were introduced like Unit Testing, Component Testing, System, System Integration and User Acceptance Testing.

**Advantages & disadvantages of the Waterfall model:**

* **Advantages:**

1) Simple & easy to use

2) Works well for smaller projects where requirements are well understood.

3) Clearly defined stages

4) Process and results are well documented.

* **Disadvantages:**

1) Not good for complex models

2) All the requirements must be well known and clearly understood from beginning.

3) Poor model for long and ongoing projects.

4) not suitable for projects where requirements are continuously changing

5) Risk and uncertainty.

**2)Rational Unified Process(RUP)**-It is an iterative software development process. RUP has a flavour of waterfall model and RUP is one of the tools of Rational and Rational is a company which started making tools for each and every resource of an IT company and later on IBM acquired Rational and all these tools became IBM tools. Base of RUP is UML, sometimes RUP is also called as UML extension of project implementation. Used for Object Oriented Model, other name of RUP is Unified Process Model.

RUP is based on set of building blocks or content elements describing what is to be produced, the necessary skills required and the step-by-step explanation describing how specific development goals are to be achieved.

**Following are the main building blocks:**

**Roles (who)** – A role defines a set of related skills, competencies, and responsibilities.

**Work products (what)** – A work product represents something resulting from a task., including all documents and models produced while working through the process.

**Tasks (how) –** A task defines a unit of work assigned to role that provides a meaningful output.

Within each iteration tasks and categorized into 9 disciplines.

**6 engineering disciplines.**

1) Business modelling- Understanding the client’s business process

2) requirements (Requirements Gathering)

3) analysis & design (both clubbed together as same resources will be doing)

4) implementation (means here this project they wanted to be suitable for any project e.g DB project, Networking Project, Testing Project hence instead of saying coding they said Implementation.)

5) test

6) deployment

**3 are supporting disciplines, process:**

7) Configuration & change management

8) project management

9) Environment.

**Four project life cycles:**

1) **Inception** – We discuss with the clients and we agree upon the deliverables.

* Communication and Planning
* Customer requirement identification
* Project Plan, Goal, Risk identification
* Identification of project scope

2) **Elaboration** – We discuss within the team and we agree upon the deliverables. It is agreement within the team as to the architecture and design needed to deliver the agreed system behaviour.

3) **Construction** – We work on the deliverables or we must make team work on the deliverables so that deliverables are ready after construction phase. It is the iterative implementation of a fully functional system.

4) **Transition** – We should make deliverables fits to the next stage. It is delivery, defect correction, and tuning to ensure customer acceptance.

**3)Spiral Model-**Spiral Model follows evolutionary approach. The spiral model is a software development model that combines elements of both iterative development and waterfall model approaches. It was originally proposed by Barry Boehm in 1986 and is particularly well-suited for projects that are large, complex, and have undefined or changing requirements. Spiral indicates increasing in time and increasing in budget.

Before spiral already many models were available in the market. People studied disadvantage of the other models and kept advantages in this model and proposed. Spiral is the best model ever proposed on paper, we can take any concept we have it.

**Spiral is divided into 4 quadrants denoting below 4 phases-**

Planning, Risk analysis, Engineering, evaluation.

**Explanation:**

* The left top corner is for customer interactions where customer will discuss about the requirements.
* The right top corner is for risk analysis and prototyping
* The bottom right corner denotes normal waterfall approach.
* The bottom left corner is cushion time left out for testing and planning purpose.

In spiral model initially client will be giving some information, for that information risk analysis and prototyping is done, then we will come up with the concept of operation and after that they will test it whether it is appropriate and then after understanding they will give one more idea like that the spiral iteration goes on. Spiral Model is used in most of the research oriented or defence projects where accuracy is supreme. In this most of the stake holders are in house and most of them are scientist.

**Advantages:**

1) High amount of risk analysis.

2) good for large and mission critical projects.

3) software is produced early in the software life cycle.

**Disadvantages:**

1) Can be a costly model to use.

2) Risk analysis requires highly specific expertise.

3) Project success is highly dependent on the risk analysis phase.

4) Doesn’t work well for smaller projects.

**4)SCRUM-** SCRUM is a popular agile framework used for managing and developing software projects. It emphasizes iterative development, collaboration, and continuous improvement.

In scrum based projected there is not any specific project manager directing project team tasks, the team is self-directed with co-located team members relying on communication over documentation for effective project delivery. Scrum can be implemented either at the beginning of the project or when the project is falling behind schedule.

**In SCRUM Team there is a below-mentioned (ROLES):**

1) **SCRUM team** – group of team is formed as a scrum team. Each team size will have an average of 5-10 members including developers, one SCRUM master and one Product Owner.

2) **SCRUM master** – He will monitor the performance of the team. All the issues will be raised to him and he will find solutions for the same.

3) **Product owner** – Represents the stakeholders and is responsible for maximizing the value of the product. They prioritize the product backlog and ensure the team delivers value to the business.

**SCRUM Lifecycle:**

1)**Product Vision Meeting**- Initially stakeholders explain product to scrum team which emphasizes on goal, objective, breakdown of the project. All high level discussion happens in this meeting and Product vision document is pulled and signed off.

2)**User story Workshop**- It is conducted by Scrum team and Stakeholders where everyone participates and they write user story. User Story-It is the smallest unit of work which is written in the user’s perspective. It is written by stakeholders. and once user stories are completed client will come up with acceptance criteria. It is like UAT usually test cases we client have to write at the back side of user story and then client will come up with Business Value (which means how important is user story to them), BV is generally given in currency like Dollars and SCRUM developers will write complexity points for each user stories (these are efforts generally required to build that user stories).

Once user Stories has acceptance criteria, Business Value and Complexity points then we can move these User Story to Product Backlog.

**Product Backlog**-It is crucial artefact in scrum framework. Product owner owns and manages product backlog. Features required to develop a software, that is written in the form of user stories are pushed in Product Backlog. Ownership is taken by Product owner to sort, prioritise and validate user stories.

Once product grooming happens and product owner feels that these User Stories are good to go for the sprint to be developed, DOR checklist is checked by Scrum Team.

**Epic**-Epic can be a part of Product backlog. It is collection of related User Stories like login (user login, admin login, vendor login etc. we can have under login feature).

3)**Sprint Planning Meeting**- This is the first meeting before sprint starts. This meeting sets the foundation for a successful sprint. It aligns the team on the sprint goal, ensures clarity on what needs to be delivered.

How many user stories we need to have? How many team members will work in this sprint? All these discussion happens here.

4)**SPRINT**-Once we get sufficient User Stories in Product Backlog, we start SPRINT which is generally of 2 weeks’ duration. Once Sprint is started no user stories can be added. SPRINT will have sub unit known as Scrum Day which is of 1 day. Developers move these User Stories from Product Backlog to Sprint Backlog.

Sprint Backlog is subset of product backlog. It consists of most important user stories that needs to be developed first and Sprint backlog is a collection of multiple sprints and consist of Product Backlog items, Task, WIP, Done State.

Task is unit of work done in 1 Scrum Day by 1 developer. Each developer pics one task put that in WIP and further in done state

5)**Daily Stand-up Meeting/SCRUM Meeting**- SCRUM meeting which is famous as daily stand-up meeting where they discuss about progress and task to do, every developer participates in this.It’s a daily 15-minute time-boxed event for the Development Team to synchronize activities and create a plan for the next 24 hours.

Happens every day and 3 questions will be asked:

1) What did you do today.

2) what will you do tomorrow.

3) are there any impediments.

6)**Sprint Review Meeting**- A meeting at the end of the sprint where the Scrum Team and stakeholders review what was accomplished during the sprint. **All the stakeholders participate** in where challenges and progress is discussed, here at this context they will draw Sprint burn down charts and Product burn down charts.

Incomplete user stories again go to product backlog. It is refined and Sprint cycle is followed. From Sprint Review meeting even some inputs are given for product grooming where client also looks into it and if agrees some user stories will come through user stories workshop and they are induced in the project.

Product burn down: it shows how much work was left at the beginning of each sprint.

Sprint Burn down chart: graphical representation of remaining work v/s the time in an iteration.

7)**Sprint Retrospective Meeting-** **Only scrum developers will participate** to discuss challenges faced and positives faced in all the sprints and precautions need to be taken to not repeat the mistake.

This output is given to Sprint Planning meeting in order to make sure mistake are not repeated and challenges are address well.

After completing all these meeting we will be having DOD (Definition of Done) checklist, before releasing a product. Scrum team will check the particular DOD list and product is released in smaller iterations. When Sprint is completed, from done state, product is given back to client and client will do UAT and accept it back.

**Question 10** – Waterfall Vs V-Model - 5 Marks

Write down the differences between waterfall model and V model.

**Answer10-**

**1) Waterfall model:**

This is one of the most basic & Primitive model in SDLC also referred to as liner sequential life cycle model as it follows sequential methodology.

This model is a collection of different phases and each phase must be completed in its entirety before beginning of the next phase. Each phase in the model depends on the inputs from the previous phase. All the phases in the waterfall model are followed in a top-down approach. NO over lapping of phases.

Following are the phases in the waterfall model:

1) Requirement gathering

2) Requirement analysis

3) System design

4) Development-coding

5) Testing

6) Deployment & implementation.

**Advantages:**

1) Simple & easy to use

2) Works well for smaller projects where requirements are well understood.

3) Clearly defined stages

4) Process and results are well documented.

**Disadvantages:**

1) Not good for complex models

2) All the requirements must be well known and clearly understood from beginning.

3) Poor model for long and ongoing projects.

4) not suitable for projects where requirements are continuously changing

5) Risk and uncertainty.

2)**V- Model**-The V-model is extension of the waterfall model. It emphasizes on sequential and structured approach to software development, where each stage of development is associated with a corresponding testing phase. The V-model is model where the execution of processes happens in a sequential manner in a V-shape. It is also known as Verification and Validation model. The left side of the model is called as verification phase and right side is called as validation phase. And both the phases are combined by coding phase.

At the time of verification phase we side by side plan for test planning of the same and according to this planning we do the subsequent test.

**Structure of the V-model:**

**1)Verification Phase-**

* **Requirement analysis** (Gathering and documenting requirement, captured in SRS)
* **System Design** (overall architecture and design of the software system are defined)
* **Architecture Designs** (Detailed design of the system architecture, to specify how components interact)
* **Module Design** (detailed modules or components that make up the software system which outlines the internal logic and functionality of each module).

**2)Validation Phase-**

* **Unit Testing** (unit testing is performed to validate each module's functionality in isolation from the rest of the system)
* **Integration Testing** (Modules are integrated to form complete system and verifies interaction between modules works as expected)
* **System Testing** (testing the complete, integrated system to ensure it meets specified requirements and functions)
* **Acceptance Testing (**testing the system with real-world users or stakeholders to validate overall usability, reliability, performance)

**Advantage-**

* Time Saving as testing and designing is concurrent.
* Early defect detection.
* Progress can be tracked easily.
* Each phase has specific deliverables and a review process.
* Phases are processed and completed at a time.

**Disadvantage-**

* No feedback so less scope of changes
* Risk analysis is not done
* Not good for big or object oriented projects.
* no working software is produced during the late life cycle.

**Difference between Waterfall and V- Model-**

|  |  |
| --- | --- |
| **Waterfall Model** | **V-Model** |
| Rigid Model-Every Phase is completed before moving to next. | V-Model is little flexible. |
| Testers are involved very late | Tester involvement is right from the beginning. |
| Feedback from customers was very late after deployment. | Testing and feedback goes hand in hand after every phase. |
| Low Cost Model | Expensive Model |
| Simple Model | Complex Model |
| Waterfall model is a sequential execution process. | V-model is a simultaneous process. |

**Question 11** – Justify your choice - 3 Marks

As a BA, state your reason for choosing one model for this project

**Answer 11-** As a BA I would suggest to go with the V model for this project of Online Agricultural Store, since this is a new application being developed of its own kind and also Mr. Henry who is the sponsor for this project and the other committee members are also new for this particular application and as V model is a flexible model as compared to waterfall model and since development and testing happens simultaneously so update, feedback can be given to the and accordingly corrective measures can be applied, hence according to me V-Model is appropriate.

**Question 12**- Gantt Chart - 5 Marks

The Committee of Mr. Henry, Mr Pandu, and Mr Dooku discussed with Mr Karthik and finalised on the V Model approach (RG, RA, Design, D1, T1, D2, T2, D3, T3, D4, T4 and UAT)

Mr Vandanam is mapped as a PM to this project. He studies this Project and Prepares a Gantt chart with V Model (RG, RA, Design, D1, T1, D2, T2, D3, T3, D4, T4 and UAT) as development process and the Resources are PM, BA, Java Developers, Testers, DB Admin, NW Admin.

**Answer 12-**GANTT chart is actually the scheduling or progress report of project. It is prepared by project manager. It represents Work Breakdown Structure(WBS). It can be of 2 types- 1) Phase Wise work distribution into weeks.

2)Resources based GANTT chart.

15% of total time allotted for project life cycle must be given to BA

**Stages**-RG, RA, Design, D1, T1, D2, T2, D3, T3, D4, T4 and UAT

**Resources**- PM, BA, Java Developers, Testers, DB Admin, NW Admin.

|  |  |  |  |
| --- | --- | --- | --- |
| **Start Date** | **End Date** | **Phase** | **Duration** |
| 01-Jan-25 | 31-Mar-25 | RG - BA | 90 |
| 01-Apr-25 | 30-Apr-25 | RA - BA, PM, DB admin, NW | 30 |
| 01-May-25 | 31-Jul-25 | D1 - Java developer | 92 |
| 01-May-25 | 31-Jul-25 | T1 - Tester | 92 |
| 01-Aug-25 | 31-Oct-25 | D2 - Java developer | 92 |
| 01-Aug-25 | 31-Oct-25 | T2 - Tester | 92 |
| 01-Nov-25 | 31-Jan-26 | D3 - Java developer | 92 |
| 01-Nov-25 | 31-Jan-26 | T3 - Tester | 92 |
| 01-Feb-26 | 30-Apr-26 | D4 - Java developer | 89 |
| 01-Feb-26 | 30-Apr-26 | T4 - Tester | 89 |
| 01-May-26 | 31-Jun-2026 | UAT - BA, PM, tester, Dev team | 61 |

**Question 13** – Fixed Bid Vs Billing - 5 Marks

Explain the difference between Fixed Bid and Billing projects

**Answer13-**

**Fixed billing:** In fixed billing budget & time will be fixed.

E.g.

There is a project in which Whole billing is bifurcated in 5 parts.

1st part will be paid after completing documents.

2nd part at the project designing stage

3rd part on completion of testing

4th part on project sample submission

5th part once the project is live.

**Billing projects:** in billing projects all the resources working in the project will be billed to the client on hourly basis. Also called as time and materials projects.

E.g. In a billing project filled time sheets will be submitted to the client wherein all the activity and team’s availability will be checked by the client and accordingly bill will be submitted by the IT company.

**Question 14** – Preparer Timesheets of a BA in various stages of SDLC - 20 marks

➢ Design Timesheet of a BA

➢ Development Timesheet of a BA

➢ Testing Timesheet of a BA

➢ UAT Timesheet of a BA

➢ Deployment n Implementation Timesheet of a BA

**Answer 14-** Designing a timesheet for a Business Analyst (BA) involves capturing relevant information about their daily activities, tasks, and time spent on each task.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Design Timesheet :** |  | | |  |
| **HOURLY TIME SHEET** | | | | |
| **ROLE** | BA | | | **Project**: Online Agricultural Store |
| **DATE** |  | | | **Design** |
| **Time** | **Task** | | | **Remarks** |
| 9-10 | Test case preparation | | |  |
| 10-11 | Test case preparation | | |  |
| 11-12 | Client communication on design and solution | | |  |
| 12-01 | Client communication on design and solution | | |  |
| 01-02 | Lunch | | |  |
| 02-03 | Discussions with design team | | |  |
| 03-04 | RTM Updation | | |  |
| 04-05 | RTM Updation | | |  |
| 05-06 | RTM Updation | | |  |
| **Development timesheet:** | |  | | | |
| **HOURLY TIME SHEET** | | | | | |
| **ROLE** | BA | **Project :** Online Agricultural Store | | | |
| **DATE** |  | **Development** | | | |
| **Time** | **Task** | **Remarks** | | | |
| 9-10 | JAD sessions |  | | | |
| 10-11 | JAD sessions |  | | | |
| 11-12 | JAD sessions |  | | | |
| 12-01 | JAD sessions |  | | | |
| 01-02 | Lunch |  | | | |
| 02-03 | discussion session with tech team |  | | | |
| 03-04 | Client interaction |  | | | |
| 04-05 | Clarification session with technical team |  | | | |
| 05-06 | update RTM |  | | | |
| **Testing Timesheet:** |  | |  | | |
| HOURLY TIME SHEET | | | | | |
| **ROLE** | BA | | **Project** : Online Agricultural store | | |
| **DATE** |  | | **Testing** | | |
| **Time** |  | | **Remarks** | | |
| 9-10 | Test result walk through | |  | | |
| 10-11 | Test result walk through | |  | | |
| 11-12 | High level testing | |  | | |
| 12-01 | High level testing | |  | | |
| 001-02 | Lunch | |  | | |
| 02-03 | Updating end user manual | |  | | |
| 03-04 | Updating end user manual | |  | | |
| 04-05 | Updating end user manual | |  | | |
| 05-06 | Update RTM | |  | | |
| **UAT Timesheet:** |  |  | | | |
| **HOURLY TIME SHEET** | | | | | |
| **ROLE** | BA | **Project :** Online Agricultural store | | | |
| **DATE** |  | **UAT** | | | |
| **Time** |  | **Remarks** | | | |
| 9-10 | Test case preparation |  | | | |
| 10-11 | Test case preparation |  | | | |
| 11-12 | Preparing client for UAT |  | | | |
| 12-01 | Preparing client for UAT |  | | | |
| 01-02 | Lunch |  | | | |
| 02-03 | test data presentation to client |  | | | |
| 03-04 | test data presentation to client |  | | | |
| 04-05 | Test case preparation |  | | | |
| 05-06 | Test case preparation |  | | | |
| **Deployment and Implementation:** | |  | | | |
| **HOURLY TIME SHEET** | | | | | |
| **ROLE** | BA | **Project :** Online Agricultural store | | | |
| **DATE** |  | **Deployment and Implementation** | | | |
| **Time** |  | **Remarks** | | | |
| 9-10 | Creating implementation plan |  | | | |
| 10-11 | Creating implementation plan |  | | | |
| 11-12 | Creating implementation plan |  | | | |
| 12-01 | Planning & organising training sessions |  | | | |
| 01-02 | Lunch |  | | | |
| 02-03 | Planning & organising training sessions |  | | | |
| 03-04 | Final updation on END user manual |  | | | |
| 04-05 | Final updation on END user manual |  | | | |
| 05-06 | Final updation on END user manual |  | | | |