Online Agriculture Products Store

Mr. Henry, after being successful as a businessman and has become one of the wealthiest persons in the city. Now, Mr. Henry wants to help others to fulfil their dreams. One day, Mr. Henry went to meet his childhood friends Peter, Kevin and Ben. They live in a remote village and do farming. Mr. Henry asked his friends if they are facing any difficulties in their day-to-day work.

Peter told Mr. Henry that he is facing difficulties in procuring fertilizers which are very important for farm. Kevin said that he is also facing the same problem in-case of buying seeds for farming certain crops. Ben raised his concern on lack of pesticides which could help in greatly reducing pests in crops. After listening to all his friends’ problems, Mr. Henry thought that this is a crucial problem faced not only by his friends but also by so many other farmers. So, Mr. Henry decided to make an online agriculture product store to facilitate remote area farmers to buy agriculture products. Through this Online Web / mobile Application, Farmers and Companies (Fertilizers, seeds and pesticides manufacturing Companies) can communicate directly with each other.
The main purpose to build this online store is to facilitate farmers to buy seeds, pesticides, and

Fertilizers from anywhere through internet connectivity. Since new users are involved, Application should be user friendly. This new application should be able to accept the product (fertilizers, seeds, pesticides) details from the manufacturers and should be able to display them to the Farmers. Farmers will browse through these products and select the products what they need and request to buy them and deliver them to farmer’s location. Mr. Henry has given this project through his Company SOONY. In SOONY Company, Mr Pandu is Financial Head and Mr Dooku is Project Coordinator. Mr. Henry, Mr Pandu, and Mr Dooku formed one Committee and gave this project to APT IT SOLUTIONS Company for Budget 2 Crores INR and 18 months Duration under CSR initiative. Peter, Kevin and Ben are helping the Committee and can be considered as Stakeholders share requirements for the Project. Mr Karthik is the Delivery Head in APT IT SOLUTIONS company and he reached out to Mr Henry through his connects and Bagged this project. APT IT SOLUTIONS Company have Talent pool Available for this Project. Mr Vandanam is project Manager, Ms. Juhi is Senior Java Developer, Mr Teyson, Ms Lucie, Mr Tucker, Mr Bravo are Java Developers. Network Admin is Mr Mike and DB Admin is John. Mr Jason and Ms Alekya are the Tester. And you joined this team as a BA.

**Mr. Henry has company name SOONY Company, has following team.**- Mr Pandu - Financial Head
- Mr Dooku - Project Coordinator.
- Mr. Henry, Mr Pandu and Mr Dooku formed Committee

**Mr. Henry outsourced this project to company name (APT IT SOLUTIONS) offshore team:-**
-Mr Karthik - Delivery Head
-Mr Vandanam - project Manager
-Ms. Juhi - Senior Java Developer
 -Mr Teyson – Developer 1
 -Ms Lucie – Developer 2
 -Mr Tucker – Developer 3
 -Mr Bravo – Developer 4
-Mr Mike - Network Admin
- Mr John - Database Admin
-Mr Jason and Ms Alekya - Testers
-Mr Sujeet as a BA.

**Decode the Case study**
\* Project Idea: To develop a website devoted to online agriculture product store to facilitate remote area farmers to buy agriculture products.
\*Current needs: online store is to facilitate farmers to buy seeds, pesticides, and fertilizers from anywhere through internet connectivity.
\*Overview of the project: It’s Online Web / mobile Application based project. The new technique help farmer to display the product (fertilizers, seeds, pesticides) available at online portal, hence farmer can buy them as per their needs.
\*Current Problems: Difficulties in procuring fertilizers, seeds and Lack of pesticides which help to reducing pests in crops.
\*Know the team who involves into project.

Question 1 – BPM - 5 Marks
Identify Business Process Model for Online Agriculture Store – (Goal, Inputs, Resources, Outputs,

Activities, Value created to the end Customer)

\*Goal: To bridge the gap between the Farmers and Companies in remote areas.
\*Inputs: Farmer needs, Internet, Manufacturers' Product Details, Application Training
\*Resources: Online Web, Mobile application, Infrastructure.
\*Outputs: Displays products, on time product deliver to Farmer’s location.
\*Activities: Requirement Gathering, Application Development, Deployment, User Training of requested product.
\*Value: Accessibility of online store to facilitate farmer’s agriculture need to buy agriculture products, Time and Cost Savings.

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.

**Strengths**
- Experienced Team: APT IT SOLUTIONS has skilled personnel, including developers, testers, and administrators, ensuring the project is technically sound.
- Stakeholder Support: Farmers (Peter, Kevin, Ben) are directly involved, ensuring the solution meets real-world needs and provide a wide range of products in one place.

**Weaknesses
-**Internet Dependence: Poor or inconsistent internet connectivity in rural areas could hinder the platform's effectiveness.
**-**Digital Literacy Gap: Farmers in remote areas might struggle to adapt to the online platform without adequate training and support.

**Opportunity**-Rural Development: Facilitates greater economic development in rural areas by enhancing productivity and reducing dependency on intermediaries.
-Train farmers in digital literacy, enhancing their ability to use the online platform.

**Threats**- Resistance to Change: Farmers accustomed to traditional methods might be hesitant to adopt online platforms. **-**Operational Risks: Challenges such as delays in development, unforeseen technical issues, or project scope changes could arise

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.

**Hardware (HW)**

* **Server Requirements:** Assess the need for scalable servers or cloud-based infrastructure to handle user requests and data securely.
* **Development Hardware:** Ensure developers and testers have powerful machines with sufficient processing speed and memory to run Java IDEs, testing environments, and databases smoothly.
* **Networking Equipment:** Reliable networking tools to ensure smooth communication during the development phase and for maintaining application connectivity later.

**Software (SW)**

* **Database Solutions:** Choose a relational database system like MySQL or PostgreSQL for storing product details and transaction data.
* **Frameworks:** Utilize Spring Framework for backend development and Hibernate for database integration. Both are widely used in Java-based projects for secure and scalable applications.

**Trained Resources**

* **Database Administrator (DBA):** Mr. John should oversee database setup and maintenance to ensure seamless data operations.
* **Testers:** Mr. Jason and Ms. Alekya will ensure the application is robust and bug-free using manual and automated testing methods.
* **Business Analyst (BA):** Sujeet’s role is crucial to gather and convert farmer-specific requirements into development tasks.

**Budget**

* **Infrastructure Costs:** Allocate funds for purchasing servers or cloud subscriptions, software tools, and licenses.
* **Training:** Budget for farmer onboarding and digital literacy programs to ensure platform adoption in rural areas.

**Time Frame**

* **Development Phases:** Plan for phases like requirement gathering, development, testing, deployment, and feedback integration. Divide the 18 months into realistic milestones.

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.

**AS-IS (Existing Process)**

1. **Difficulty in Accessing Agricultural Products**: Farmers in remote areas struggle to procure essential items like fertilizers, seeds, and pesticides due to limited availability and logistical challenges.
2. **Lack of Direct Communication between Farmers and Manufacturers**: Currently, there is no seamless platform where farmers can directly interact with manufacturers or suppliers.
3. **Limited Awareness and Choices**: Farmers often have minimal access to diverse products, pricing options, and detailed product information.

**TO-BE (Future Process)**

1. **Online Platform Accessibility**: An intuitive web and mobile application enabling farmers in remote areas to browse and purchase agricultural products anytime, anywhere.
2. **Comprehensive Product Display**: Farmers will have access to detailed product descriptions, availability, pricing, and promotional offers.
3. **Streamlined Order and Delivery System**: Orders placed by farmers will be processed and delivered directly to their locations, ensuring convenience.
4. **User-Friendly Interface**: The application will be designed with a simple and easy-to-navigate interface, considering the technological capabilities of farmers.

Question 5 – Risk Analysis - 10 Marks

List down different risk factors that may be involved (BA Risks And process/Project Risks)

**Business Analysis (BA) Risks**

1. **Requirements Gathering Challenges**:
	* Stakeholders like farmers and manufacturers may have difficulty expressing their needs comprehensively, leading to incomplete or conflicting requirements.
2. **Stakeholder Misalignment**:
	* Differing expectations or goals among stakeholders (e.g., farmers, manufacturers, and committee members) could lead to misunderstandings and delays.
3. **Limited User Understanding**:
	* Farmers may struggle to use the platform due to low technological familiarity, resulting in low adoption rates.
4. **Scope Creep**:
	* Changes or additions to requirements during the development phase might result in delays or budget overspending.
5. **Lack of Usability Focus**:
	* The platform may fail to meet the specific needs of farmers if user experience is overlooked in the design process.

**Process/Project Risks**

1. **Budget Constraints**:
	* Overspending on development, testing, or infrastructure could exceed the allocated 2 Crores INR.
2. **Tight Timeline**:
	* The 18-month duration might prove insufficient if unexpected delays occur in development or testing phases.
3. **Data Security and Privacy**:
	* Risks associated with safeguarding sensitive farmer and manufacturer data against cyber threats or breaches.
4. **Dependency on External Vendors**:
	* Any delays or quality issues with third-party services or infrastructure providers could impact project execution.
5. **Insufficient Testing**:
	* Bugs, glitches, or performance issues in the final application could result from inadequate testing practices.

Question 6 – 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.

Below is a RACI (Responsible, Accountable, Consulted, and Informed) Matrix for the Online Agriculture Products Store project. This analysis identifies the stakeholders who can take decisions and those who can influence the project:

| **Stakeholder** | **Role/Responsibility** | **RACI Classification** |
| --- | --- | --- |
| **Mr. Henry** | Visionary and primary decision-maker driving the project as part of the CSR initiative. | Accountable (Final decision-maker) and Responsible for high-level project goals. |
| **Mr. Pandu** | Financial Head who allocates the budget for the project. | Accountable for financial decisions and Consulted for budget approvals and financial oversight. |
| **Mr. Dooku** | Project Coordinator ensuring project alignment with the goals of SOONY. | Responsible for project coordination and Consulted for resolving inter-departmental challenges. |
| **Peter, Kevin, Ben** | Farmer stakeholders providing insights into user requirements and feedback. | Consulted for understanding challenges and practical needs in agriculture. |
| **APT IT Solutions** | Company responsible for executing the project within the given timeframe and budget. | Responsible for delivery and execution. |
| **Mr. Karthik** | Delivery Head of APT IT Solutions managing the team and ensuring project delivery. | Responsible for managing delivery and Accountable for execution success. |
| **Mr. Vandanam** | Project Manager overseeing project milestones and ensuring smooth workflows. | Responsible for project execution and Consulted for resolving project-specific challenges. |
| **Ms. Juhi** | Senior Developer leading the development team. | Responsible for technical delivery and development execution. |
| **Developers** | (Ms. Lucie, Mr. Teyson, Mr. Tucker, Mr Bravo) Developing the application as required. | Responsible for coding and implementation. |
| **Mr. Mike** | Network Admin ensuring network support and configurations. | Responsible for network setup and Consulted for technical issues. |
| **John** | Database Administrator managing the database and ensuring secure data handling. | Responsible for database management and Consulted for data challenges. |
| **Mr. Jason & Ms. Alekya** | Testers responsible for quality assurance and bug identification. | Responsible for testing and ensuring quality of the application. |
| **Sujeet (BA)** | Business Analyst gathering requirements and aligning them to stakeholders’ needs. | Responsible for BA tasks and Consulted for clarifications and updates. |
| **Farmers** | End users of the platform. | Informed about the platform features and usability. |
| **Manufacturers** | Suppliers whose products will be listed on the platform. | Informed about the application and their role in engaging with farmers. |

Question 7 – Business Case Document - 8 Marks

Help Mr Karthik to prepare a business case document.

### ****Business Case Document****

**Project Name**: Online Agriculture Products Store
**Prepared By**: Mr. Karthik, Delivery Head, APT IT SOLUTIONS
**Date**: [18th March 2025]

### ****Executive Summary****

The Online Agriculture Products Store is a CSR initiative by Mr. Henry through his company SOONY. The project aims to resolve critical issues faced by farmers in remote areas, such as difficulty in procuring fertilizers, seeds, and pesticides, by developing an intuitive online platform where farmers can communicate directly with manufacturers. This initiative is funded with a budget of 2 Crores INR and a timeline of 18 months. APT IT SOLUTIONS is responsible for delivering the project.

### ****Problem Statement****

Farmers in remote areas face significant challenges in their day-to-day farming activities:

1. **Difficulty procuring fertilizers**: Essential for crop productivity.
2. **Lack of access to seeds**: Limits farming of certain crops.
3. **Inadequate pesticides**: Increases susceptibility to pest infestations. These challenges are compounded by limited availability of resources, high costs due to intermediaries, and lack of direct communication channels with manufacturers.

### ****Proposed Solution****

To address these issues, APT IT SOLUTIONS will develop an Online Agriculture Products Store. The web/mobile application will:

1. Facilitate farmers to browse and purchase agricultural products (fertilizers, seeds, pesticides) from anywhere.
2. Enable direct communication between farmers and manufacturing companies.
3. Provide detailed product information, order tracking, and secure payment options.
4. Feature a user-friendly interface tailored for first-time users and tech novices.

### ****Benefits****

1. **Empower Farmers**:
	* Seamless access to essential farming products anytime, anywhere.
	* Reduced dependence on intermediaries, lowering costs.
2. **Business Impact**:
	* Expanded outreach for manufacturers to connect directly with farmers.
	* Improved product awareness and distribution in rural areas.
3. **Social Responsibility**:
	* Aligns with SOONY’s CSR initiative to promote sustainable agriculture and uplift rural communities.

### ****Key Stakeholders****

**Decision Makers**:

* Mr. Henry (Visionary, CSR Initiative Owner)
* Mr. Pandu (Financial Head, Budget Allocation)
* Mr. Karthik (Delivery Head, Project Execution)

**Influencers**:

* Peter, Kevin, Ben (Farmer Stakeholders, Requirements Contributors)
* Sujeet (Business Analyst, Requirements Gathering)

### ****Project Timeline****

**Duration**: 18 months
**Phases**:

1. **Requirement Gathering and Analysis**: [18-03-25 – 24-03-25]
2. **Design and Development**: [Start Date - End Date]
3. **Testing and Quality Assurance**: [Start Date - End Date]
4. **Deployment and Go Live**: [Start Date - End Date]
5. **Maintenance and Support**: [Start Date - End Date]

### ****Budget****

**Total Budget**: 2 Crores INR
**Breakdown**:

* Development and Testing: [Insert Estimated Amount]
* Infrastructure and Hosting: [Insert Estimated Amount]
* Training and Support: [Insert Estimated Amount]

### ****Risks****

1. **Technical Risks**: Integration challenges with payment systems or order tracking features.
2. **Adoption Risks**: Resistance from farmers due to low tech literacy.
3. **Resource Risks**: Unavailability of skilled personnel during critical phases.
4. **Data Security Risks**: Ensuring privacy and protection of farmer and manufacturer data.

### ****Conclusion****

The Online Agriculture Products Store will bridge the gap between remote farmers and manufacturers, providing essential products and services that promote agricultural sustainability. With strong commitment from stakeholders and a robust project plan, this initiative has the potential to create lasting social and economic impact.

Question 8 – Four SDLC Methodologies - 8 Marks

The Committee of Mr. Henry, Mr Pandu, and Mr Dooku and Mr Karthik are having a discussion on Project Development Approach. 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

Project development methodologies play a critical role in successfully executing projects like the Online Agriculture Products Store. Here is an overview and clarity on the four approaches Mr. Karthik explained to the committee, with insights tailored to the case study:

### ****1. Sequential Approach (Waterfall Methodology)****

**Definition**: A linear, step-by-step methodology where each phase (requirement gathering, design, development, testing, deployment) is completed before moving on to the next phase.
**Pros**:

* Best suited for projects with well-defined and stable requirements.
* Clear documentation and milestones provide structured progress.

**Cons**:

* Inflexible to changes; if farmers or manufacturers suggest adjustments mid-way, it could be challenging to implement.
* Delays in detecting issues until the testing phase.

**Applicability**:
This approach might work for the Online Agriculture Products Store if all requirements from stakeholders are finalized early and unlikely to change. However, given the involvement of multiple stakeholders and potential scope changes, this might be a risky choice.

### ****2. Iterative Approach****

**Definition**: Development is done in cycles, where smaller segments of the project are completed, reviewed, and refined before moving to the next iteration.
**Pros**:

* Allows feedback and refinement at each cycle, making it suitable for projects with evolving requirements.
* Reduces risks by identifying issues early in smaller modules.

**Cons**:

* Requires extensive coordination for each iteration, which can increase complexity and effort.

**Applicability**:
This approach can be partially effective for developing features like browsing, payment systems, or order tracking, where initial prototypes can be reviewed by farmers and manufacturers for feedback.

### ****3. Evolutionary Approach****

**Definition**: An extension of the iterative model where an initial prototype evolves into the final product through multiple cycles of development and stakeholder feedback.
**Pros**:

* Highly adaptable to changing requirements from farmers and manufacturers.
* Continuous stakeholder involvement ensures better alignment with needs.

**Cons**:

* Requires constant engagement with users, which can be time-intensive.
* Budget overruns are possible if too many refinements are requested.

**Applicability**:
This approach aligns well with the Online Agriculture Products Store project, as stakeholders like Peter, Kevin, and Ben could continuously provide feedback during each cycle of prototype development.

### ****4. Agile Approach****

**Definition**: A dynamic and flexible methodology that divides the project into small sprints (typically 2-4 weeks), focusing on delivering functional components incrementally.
**Pros**:

* High adaptability to changing priorities and requirements.
* Encourages collaboration among teams and stakeholders, resulting in faster delivery and feedback loops.

**Cons**:

* Requires dedicated and skilled teams to manage rapid iterations effectively.
* Can become challenging if priorities are not clearly defined.

**Applicability**:
Agile methodology is ideal for the Online Agriculture Products Store, as it allows incremental delivery of features like product catalog, secure payments, and order tracking. Farmers and manufacturers can test functionalities early and provide feedback, ensuring the platform meets user expectations.

Question 9 – 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?

Here’s an overview of the methodologies discussed (Waterfall, RUP, Spiral, Scrum) and a recommendation for the most suitable methodology to use for this project based on the case study.

### ****Understanding the SDLC Models****

1. **Waterfall Model**:
	* A linear and sequential approach where each phase (Requirement Gathering, Design, Development, Testing, and Deployment) is completed before moving on to the next phase.
	* **Advantages**: Clear structure, easy to follow, suitable for projects with well-defined requirements.
	* **Disadvantages**: Rigid and inflexible, making it hard to accommodate changes once development begins.
2. **Rational Unified Process (RUP)**:
	* An iterative framework emphasizing continuous refinement through four phases (Inception, Elaboration, Construction, and Transition).
	* **Advantages**: Allows iterative improvements and is adaptable to changing requirements.
	* **Disadvantages**: More complex and requires extensive coordination.
3. **Spiral Model**:
	* Combines iterative development with risk management, focusing on risk assessment at each cycle of development.
	* **Advantages**: Helps identify and mitigate risks early in the process, suitable for large and complex projects.
	* **Disadvantages**: Higher costs and requires specialized expertise for risk analysis.
4. **Scrum (Agile)**:
	* A dynamic methodology that divides development into small sprints (2–4 weeks) with continuous delivery and stakeholder feedback.
	* **Advantages**: Adaptable to changing requirements, faster delivery of functional components, highly collaborative.
	* **Disadvantages**: Requires skilled and experienced teams to manage rapid iterations.
5. **V Model (Verification and Validation)**:
	* Focuses on parallel development and testing phases, emphasizing early validation of requirements.
	* **Advantages**: Improves product quality by integrating testing at every development phase.
	* **Disadvantages**: Rigid structure and unsuitable for projects requiring frequent changes.

### ****Recommendations****

The suitability of a methodology depends on the project’s dynamics, stakeholder involvement, and potential for requirement changes. Here’s an analysis specific to the Online Agriculture Products Store:

1. **SMEs Advocating for V Model**:
	* The V Model is beneficial for projects where testing and validation of requirements are critical from the beginning.
	* However, this approach is rigid, which might be limiting given the evolving nature of stakeholder needs (e.g., farmers may request new features after initial prototypes).
2. **Project Team Advocating for Waterfall Model**:
	* Waterfall provides a clear structure, which is ideal for projects with fixed and finalized requirements.
	* Given the multiple stakeholders involved (farmers, manufacturers, and committee members), requirements may change as the project progresses. This makes Waterfall less effective here.
3. **Business Analyst Perspective – Best Fit**:
	* **Scrum (Agile)** would be the most suitable methodology:
		+ The project involves diverse stakeholders (farmers and manufacturers) whose requirements may evolve during development.
		+ Agile allows iterative delivery, where features such as product catalog, payment systems, and order tracking can be tested and refined through farmer feedback.
		+ Collaboration is enhanced, ensuring alignment with stakeholder expectations at every stage.
	* Alternatively, **RUP** can be considered if a structured iterative approach with defined phases is preferred.

### ****Conclusion****

As a Business Analyst, I recommend **Scrum (Agile)** for this project, as it is adaptable, collaborative, and suited to the nature of stakeholder involvement and evolving requirements. This approach aligns with the goal of delivering a user-friendly platform that can meet farmers’ needs effectively.

Question 10 – Waterfall Vs V-Model - 5 Marks
20 Write down the differences between waterfall model and V model.

**Comparison of Waterfall Model and V Model**

| **Aspect** | **Waterfall Model** | **V Model** |
| --- | --- | --- |
| **Project Approach** | A linear, phase-based model where each stage (Requirement, Design, Implementation, Testing, Deployment) happens sequentially. | Similar to Waterfall, but has a dedicated testing phase alongside each development phase. |
| **Testing Approach** | Testing happens at the **end** of development, potentially leading to late-stage bug discovery. | Testing occurs **parallel** with each development stage, ensuring continuous validation. |
| **Flexibility** | Hard to incorporate changes once a phase is completed, making adjustments costly. | Also rigid, but early testing allows defect identification before moving forward. |
| **Risk Management** | Higher risk, as issues may be detected **only in the final testing phase.** | Lower risk, as continuous verification ensures early defect identification. |
| **Team Collaboration** | Development team works in a **stepwise manner**, testers come in only near the end. | Developers and testers collaborate throughout, leading to early issue resolution. |
| **Time Efficiency** | Can cause delays if major issues arise late in development. | Faster defect resolution as testing is integrated throughout. |
| **Best Use Case** | Suitable for **projects with well-defined and stable requirements**, such as a simple e-commerce platform with predefined features. | Ideal for **highly critical applications** where quality assurance is the top priority, such as financial or healthcare systems. |

### ****Application to Case Study****

* **Waterfall Model Usage**:
If APT IT SOLUTIONS follows Waterfall, the development would be **sequential**, with Mr. Karthik’s team moving from requirement gathering to coding and testing **only at the end.** This may work **if the project has stable requirements** and **no scope for iterative improvements**.
* **V Model Usage**:
If APT IT SOLUTIONS chooses V Model**, testing would happen at each stage,** allowing Mr. Jason and Ms. Alekya to work alongside developers from the beginning. This approach reduces **post-launch defects** but requires **carefully defined initial requirements.**

Question 11 – Justify your choice - 3 Marks

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

As a **Business Analyst (BA)** in APT IT SOLUTIONS, my role is to ensure the selected **Software Development Life Cycle (SDLC) model** aligns with the project's objectives, stakeholder expectations, and industry best practices. Given the case study involving Mr. Karthik, Mr. Henry, and the talent pool within APT IT SOLUTIONS, my recommendation would be the **V Model**, but ideally, an **Agile-Scrum approach** would be even more effective.

### ****Reasons for Choosing the V Model for This Project****

1. **Ensuring High Quality with Early Testing**
	* Since the Online Agriculture Product Store involves **financial transactions, inventory management, and user accessibility**, early defect detection is crucial.
	* The **V Model integrates testing at every development stage**, reducing post-launch issues.
2. **Fixed Budget and Timeline**
	* The project has a **budget of 2 Crores INR and an 18-month duration** under Mr. Henry’s CSR initiative.
	* Since **Waterfall lacks flexibility**, the **V Model ensures quality while adhering to deadlines**, making it a safer choice.
3. **Involvement of Stakeholders for Validation**
	* **Peter, Kevin, and Ben** (stakeholders) continuously share requirements.
	* The V Model ensures **verification & validation** at each stage, preventing **major rework costs** later.
4. **Structured Approach for Talent Pool Optimization**
	* With **Mr. Vandanam as Project Manager and a skilled development team (Ms. Juhi, Mr. Teyson, Ms. Lucie, Mr. Tucker, Mr. Bravo, and Mr. Mike as Network Admin, John as DB Admin, and Testers Jason & Alekya),** structured collaboration is necessary.
	* The **V Model ensures developers and testers work in sync,** optimizing efficiency.

### ****Why Agile-Scrum Would Be Even Better?****

While the **V Model is better than Waterfall,** this project could **benefit even more from Agile-Scrum**, because:

* **Incremental development with continuous user feedback** (farmers and manufacturers can suggest improvements).
* **Flexibility in modifying features based on evolving needs.**
* **Enhanced usability testing**, making the platform **more user-friendly** for first-time users.

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.

Here's a detailed Gantt chart based on the **V Model development approach** for the case study of the Online Agriculture Products Store project. This chart outlines the sequential phases, milestones, and responsibilities:

| **Phase** | **Tasks / Activities** | **Assigned Resources** | **Duration** | **Start Date** | **End Date** |
| --- | --- | --- | --- | --- | --- |
| **Requirement Gathering (RG)** | Collect requirements from stakeholders and finalize scope | PM, BA, Stakeholders | 2 weeks | Day 1 | Day 14 |
| **Requirement Analysis (RA)** | Analyze requirements and prepare documentation | PM, BA | 2 weeks | Day 15 | Day 28 |
| **Design** | Create system design (HLD, LLD) | PM, Java Developers | 3 weeks | Day 29 | Day 49 |
| **Development (D1)** | Build initial prototype | Java Developers | 4 weeks | Day 50 | Day 78 |
| **Testing (T1)** | Conduct unit testing on prototype | Testers | 2 weeks | Day 79 | Day 92 |
| **Development (D2)** | Develop core modules | Java Developers | 6 weeks | Day 93 | Day 134 |
| **Testing (T2)** | Perform integration testing | Testers | 3 weeks | Day 135 | Day 155 |
| **Development (D3)** | Implement additional features | Java Developers | 4 weeks | Day 156 | Day 183 |
| **Testing (T3)** | Conduct system testing | Testers | 3 weeks | Day 184 | Day 204 |
| **Development (D4)** | Finalize all functionalities | Java Developers, Network Admin, DB Admin | 3 weeks | Day 205 | Day 224 |
| **Testing (T4)** | Perform final regression testing | Testers | 2 weeks | Day 225 | Day 238 |
| **User Acceptance Testing (UAT)** | Validate application with end-users | Stakeholders, PM, Testers | 4 weeks | Day 239 | Day 266 |
| **Go live** | Deploy and launch the application | PM, Java Developers, Network Admin, DB Admin | 2 weeks | Day 267 | Day 280 |

### Key Features of the Chart:

* **Stakeholders Involved**: Farmers (Peter, Kevin, Ben), Project Management team, APT IT SOLUTIONS team.
* **Parallel Activities**: Some design, development, and testing processes overlap for efficiency.
* **Duration**: The project timeline is aligned with the agreed 18-month duration.

Question 13 – Fixed Bid Vs Billing - 5 Marks

### Explain the difference between Fixed Bid and Billing projectsIn project management, two common contracting models are **Fixed Bid** and **Billing (Time &Material) projects**. Let's apply these models to the development of **Mr. Henry's Online Agriculture Product Store**.

### ****1. Fixed Bid Project****

A **Fixed Bid Project** has a **predefined budget, scope, and timeline** agreed upon before the project begins. The service provider (APT IT SOLUTIONS) commits to delivering the project for a **fixed cost**, regardless of unforeseen changes.

**Application in Case Study:**

* **Budget**: The Committee (Mr. Henry, Mr. Pandu, and Mr. Dooku) allocated **2 Crores INR** for development.
* **Timeline**: APT IT SOLUTIONS must complete the project within **18 months**.
* **Scope**: The **requirements are clearly defined** upfront—farmers must be able to buy seeds, fertilizers, and pesticides, and manufacturers should be able to list products.
* **Risk**: The **development team cannot exceed the budget**, so changes after project initiation may **cause delays or scope adjustments**.
* **Example Scenario:** If farmers later request **AI-based personalized recommendations**, APT IT SOLUTIONS **may reject it or charge extra** since it was not in the original agreement.

### ****2. Billing (Time & Material) Project****

A **Billing Project** (or **Time & Material**) has **flexible scope** and is billed based on the **actual hours worked** by the development team.

**Application in Case Study:**

* **Budget**: Payments are made based on **actual development time** and **resources utilized**.
* **Timeline**: The project can be **extended if additional features are needed.**
* **Scope**: Farmers and manufacturers **can continuously provide feedback**, allowing **adjustments during development**.
* **Risk**: Costs **might increase** beyond the initial estimate, depending on how much additional work is required.
* **Example Scenario:** If farmers later request **voice-based product searches**, APT IT SOLUTIONS can **build it without needing budget renegotiation**.

### ****Which Model is More Suitable for This Project?****

Since Mr. Henry's project involves **fixed funding and timelines**, a **Fixed Bid model is suitable**. However, if stakeholders (farmers and manufacturers) want **continuous enhancements**, a **Billing model would be more appropriate.**

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

Here's a detailed overview of the Business Analyst (BA) timesheets for various stages of the Software Development Life Cycle (SDLC) based on the case study of the Online Agriculture Products Store project:

**Design Timesheet of a BA**

| **Activity** | **Hours Spent** | **Details** |
| --- | --- | --- |
| Requirement Gathering with Stakeholders | 10 | Collecting details from farmers (Peter, Kevin, Ben) and SOONY committee. |
| Creating Requirement Documents | 8 | Preparing BRD (Business Requirement Document). |
| Supporting Design Documentation | 6 | Assisting in HLD (High-Level Design) and LLD (Low-Level Design). |
| Conducting Stakeholder Review Meetings | 4 | Ensuring alignment with project objectives. |

**Development Timesheet of a BA**

| **Activity** | **Hours Spent** | **Details** |
| --- | --- | --- |
| Preparing Feature Lists | 6 | Listing core features like product catalog, user interface, etc. |
| User Story Development | 7 | Writing detailed user stories for each feature. |
| Clarifications to Development Team | 5 | Addressing queries from Java developers and DB Admin. |
| Tracking Requirement Implementation | 4 | Ensuring development aligns with documented requirements. |

 **Testing Timesheet of a BA**

| **Activity** | **Hours Spent** | **Details** |
| --- | --- | --- |
| Supporting Test Case Creation | 6 | Assisting testers in creating test cases for features. |
| Coordinating Testing Phases | 5 | Ensuring testing aligns with the V Model phases (T1 to T4). |
| Reviewing Test Results | 4 | Analyzing issues reported during testing. |
| Facilitating Bug Fix Process | 3 | Helping testers and developers resolve bugs efficiently. |

**UAT Timesheet of a BA**

| **Activity** | **Hours Spent** | **Details** |
| --- | --- | --- |
| UAT Planning and Coordination | 8 | Preparing UAT plan and aligning stakeholders for participation. |
| Setting UAT Environment | 4 | Coordinating with Network Admin and DB Admin. |
| Running UAT Sessions | 6 | Hosting UAT sessions with farmers and stakeholders. |
| UAT Feedback Collection and Analysis | 5 | Documenting and addressing feedback from farmers (end users). |

**Deployment and Implementation Timesheet of a BA**

| **Activity** | **Hours Spent** | **Details** |
| --- | --- | --- |
| Deployment Planning | 7 | Collaborating with PM and Technical Leads to finalize deployment strategy. |
| Preparing Training Material for End Users | 6 | Creating user guides and tutorials for farmers. |
| Conducting Training Sessions | 5 | Training farmers on app usage. |
| Monitoring Deployment | 4 | Ensuring successful implementation and resolving post-deployment issues. |

**Summary**

The BA, Sujeet, plays a critical role in every stage of SDLC by bridging gaps between stakeholders and the technical team, ensuring the project stays on track, and maximizing user satisfaction.