

## **Capestones Project – 1**

### **Online Agriculture Products Store**

**By- Ajaikumar. R**

#### **Online Agriculture Products Store – Case Study**

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 farmers 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.

## **Question 1 – BPM**

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

#### **Goal:**

To make it easy for farmers in villages to buy seeds, fertilizers, and pesticides from their phones or computers without needing to travel far.

#### **Input:**

Product information from merchants (such as seed, fertilizer, and pesticide businesses).

Information about farmers' and suppliers' registration

Purchase orders and product requests from farmers

#### **Resources**

- A team of developers, testers, managers, business analysts, and others who work on a project
- A budget of ₹2 crores
- Systems and tools such as the database, network, mobile support, and app/website
- Services like customer service, email and SMS notifications, and delivery support

#### **Main Activities:**

Farmers and suppliers register and log in.

Farmers look at the goods and pricing.

Farmers use the internet to place orders and pay.

Sellers frequently update product details.

The platform covers customer support and order delivery.

Ratings and comments gathered upon product delivery

#### **Output:**

Quick and secure transportation of agricultural products to farmers

Purchases and platform usage reports

Customer feedback and satisfaction ratings

#### **Value Created for Farmers:**

Saves farmers' time and travel

Cuts out the middlemen and links farmers and businesses directly.

Facilitates farmers' access to high-quality products at reduced costs

Facilitates farmers' ability to plan and enhance their agricultural

**Question 2. 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:**

1. The project has a clear timeframe and strong financial backing, which facilitates planning.
2. A skilled team of developers, testers, and managers has already been deployed.
3. The platform eliminates expensive intermediaries by establishing a direct connection between farmers and manufacturers.

**Weakness:**

1. The usage of digital technologies may be unfamiliar to many target users, who are rural farmers.
2. Remote locations may have sluggish or unreliable shipping and logistics. Farmers may be apprehensive as first regarding internet orders and product quality.

**Opportunities:**

1. This platform can reach out to remote areas where such services are scarce or unavailable.
2. Working together with regional NGOs or government agencies can aid in raising awareness and providing training.
3. Additional services like crop recommendations, weather updates, and live help could be added to the platform in the future.

**Threats**

1. In rural communities, poor or irregular mobile internet could impact usefulness.
2. Competing platforms may strive to provide similar services in the same regions.
3. Product availability and compliance may be impacted by modifications to agricultural regulations or restrictions.

### Question 3

**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:

- **Scalable Infrastructure**  
Adopt cloud-based solutions (such as AWS, Azure, or Google Cloud) to quickly accommodate shifting user numbers, spikes during harvest season, and rapid deployment of new features without incurring significant upfront expenses on physical servers.
- **Device compatibility**  
Ensure that the application functions properly across a range of devices, particularly the inexpensive Android smartphones, tablets, and entry-level desktop computers that are typical in rural areas. Check for performance on slow internet and outdated hardware.
- **Reliable Data Backup and Recovery**  
Implement regular, automated backup solutions that are securely stored in several places to prevent data loss, server outages, and natural disasters, assuring business continuity and data integrity.

#### Software:

- **Robust technology stack**  
Use well-known backend frameworks, such as Java/Spring Boot, for security and maintainability, and take into account responsive front-end frameworks or progressive web apps to accommodate both web and mobile users.
- **Integration capabilities**  
Make sure that third-party APIs, such digital wallets and payment gateways (UPI), email and SMS services for order notifications, and delivery logistics tracking, are simple to integrate.
- **User-friendly, Localized Interface:**  
Create a user-friendly interface with easy navigation, multi-language support, and accessibility features for users with different levels of digital literacy.

Human Resources:

| Sl.No | Name          | Role                   |
|-------|---------------|------------------------|
| 1     | Mr. Karthik   | Delivery Head          |
| 2     | Mr. Vandanam  | Project Manager        |
| 3     | Ms. Juhi      | Senior Java Developer  |
| 4     | Mr. Teyson    | Java Developer         |
| 5     | Ms. Lucie     | Java Developer         |
| 6     | Mr. Tucker    | Java Developer         |
| 7     | Mr. Bravo     | Java Developer         |
| 8     | Mr. Mike      | Network Administrator  |
| 9     | Mr. John      | Database Administrator |
| 10    | Mr. Jason     | Tester                 |
| 11    | Ms. Alekya    | Tester                 |
| 12    | Mr. Ajaikumar | Business Analyst (BA)  |

Budget Total Budget:

₹2 Crores (₹20,000,000)

| Budget Category                             | Proposed Cost (₹) | Approximate Share (%) | Description                                                               |
|---------------------------------------------|-------------------|-----------------------|---------------------------------------------------------------------------|
| Application Development (Web & Mobile)      | ₹68,00,000        | 34%                   | Core system design, coding, UI/UX, and cross-platform compatibility       |
| Personnel Costs (Developers, QA, BA, Admin) | ₹46,00,000        | 23%                   | Salaries and allowances for the entire project team                       |
| Licensing & Third-Party Service Fees        | ₹11,00,000        | 5.5%                  | Fees for development tools, APIs, payment gateways, SMS/email providers   |
| Infrastructure & Cloud Hosting              | ₹16,00,000        | 8%                    | Server rental, cloud services, and bandwidth expenses                     |
| Database Management & Network Operations    | ₹9,00,000         | 4.5%                  | DB setup, security, backups, and network configurations                   |
| User Training & Onboarding                  | ₹4,50,000         | 2.25%                 | Workshops and materials for educating farmers and suppliers               |
| Disaster Recovery & Backup Solutions        | ₹5,50,000         | 2.75%                 | Implementation of resilient backup systems and failover mechanisms        |
| Quality Assurance & Testing                 | ₹7,00,000         | 3.5%                  | Comprehensive testing cycles including unit, integration, system, and UAT |

|                                              |           |       |                                                                                       |
|----------------------------------------------|-----------|-------|---------------------------------------------------------------------------------------|
| Documentation & Localization                 | ₹3,00,000 | 1.5%  | Preparation of user guides, manuals, and translation into local languages             |
| Customer Care Infrastructure                 | ₹4,00,000 | 2%    | Setup of call centres, chat support, and ticket tracking systems                      |
| Logistics & Vendor Integration               | ₹6,50,000 | 3.25% | Coordination systems connecting suppliers, shippers, and platform                     |
| Maintenance, Monitoring & Feedback Gathering | ₹7,50,000 | 3.75% | Continuous support post-deployment, system health monitoring, and user feedback loops |
| Project Coordination & Communication Tools   | ₹2,00,000 | 1%    | Tools and platforms to facilitate project management and team collaboration           |
| Contingency Fund (Unforeseen Costs)          | ₹6,00,000 | 3%    | Reserved to handle unexpected expenses or scope changes                               |

## 5. Timeline :

| Phase                      | Period (Months) | Major Activities                                                                                    |
|----------------------------|-----------------|-----------------------------------------------------------------------------------------------------|
| Initial Discovery          | 1–2             | Meet stakeholders, collect feedback with interviews and surveys, assess language/localization needs |
| Requirements Specification | 3               | Formalize business and technical requirements, document use cases, obtain approvals                 |
| System Architecture        | 4–5             | Design overall platform structure, create database layouts, develop wireframes & security protocols |
| Build & Integration        | 6–11            | Develop backend and frontend modules, interface with vendors & payment systems, set up test servers |
| Quality Assessment         | 12–14           | Conduct phase-wise and combined testing: unit, system, user acceptance, and real-world scenarios    |
| Go-Live & Staff Enablement | 15              | Launch platform for end-users, deliver onboarding workshops, rollout in pilot regions               |
| Ongoing Support & Growth   | 16–18           | Trouble-shooting, provide user training, monitor system, gather feedback for enhancements           |

#### **Question 4.**

**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**

➤ **Problems faced by Farmers:**

Farmers today face a number of difficulties when buying necessary agricultural inputs like seeds, fertilizer, and pesticides, particularly those who live in isolated rural locations. They frequently have to travel significant distances to local markets or businesses, which takes time, money, and effort. Due to the participation of numerous middlemen, the products that are offered to them are typically more expensive and have a smaller selection. Additionally, transactions are typically cash-based or undocumented, and there is no guarantee of quality. This system lacks transparency, resulting in concerns including overpricing, counterfeit items, and delayed access during important crop seasons.

➤ **Gap Identified:**

The proposed TO-BE process includes a user-friendly digital platform (online and mobile app) that allows farmers to explore products, place orders, and make payments from the comfort of their own homes or village centres. Farmers will get access to certified vendors and manufacturers directly, which will increase their alternatives, improve quality control, and lower prices. Additionally, the platform keeps digital purchase records for future use, facilitates order tracking, and solicits client feedback. This permits timely assistance, repeat purchases, and improved agricultural planning. The suggested method closes the key gap between the current, manual procurement process and a technology-driven, simplified supply chain. It replaces inefficiencies and delays with a transparent, accessible, and dependable digital ecosystem for agricultural input procurement, thereby saving farmers time, cutting costs, and increasing production.

### **Question 5.**

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

#### **Business Analyst Risk:**

- **Missing Stakeholder Details:** There is a risk that some critical seller or farmer requirements will be overlooked or under documented, resulting in system design gaps.
- **Limited Stakeholder Engagement:** If stakeholder meetings are brief or poorly organized, significant insights may be lost, limiting the final solution's relevance or efficacy.
- **Incomplete Requirement Gathering:** When requirements are obtained hurriedly or with insufficient follow-up, critical needs may go unspecified, increasing the likelihood of rework or late-stage changes.
- **Domain Knowledge Gaps:** When faced with a new domain, such as rural agriculture, a BA who lacks the necessary experience may struggle with the specifics, resulting in standards that do not entirely line with real-world practices.

#### **Process/Project Risks**

- **Budget Overruns :** Unexpected costs, such as technology, rural deployment, or vendor integration, may exceed the project's ₹2 Crore budget if financial controls are not tightened.
- **Requirement Mismatches:** Because digital agriculture is a new area for stakeholders, their stated requirements may be insufficient, necessitating late adjustments, additional expenditure, or compromises.
- **Regulatory Changes:** Any new government laws or regulatory alterations affecting e-commerce or agricultural products may impede progress, necessitating design and procedure changes.
- **Market Resistance:** Existing middlemen or local traders may reject the new platform if they believe it threatens their conventional business, thereby causing supply shortages or unwanted publicity.
- **Logistics Constraints:** Delivering products to remote or difficult-to-reach places is strongly reliant on efficient transportation and dependable communication; faults here could result in delays, failed deliveries, or undermine users' faith.

**Question 6.**

**Perform stakeholder analysis (RACI Matrix) to find out the key stakeholders who can take Decisions and Who are the influencers.**

Key:

R = Responsible (executes the task)

A = Accountable (final decision-maker, answers for results)

C = Consulted (provides input/expertise; influencers)

I = Informed (updated on progress or outcomes)

| Activity                     | Mr. Henry (Sponsor) | Committee (Mr. Pandu, Mr. Dooku) | Mr. Karthik (Delivery Head) | Mr. Vandanam (PM) | B A | Java Devs | Testers | Farmers/Suppliers (Stakeholders) |
|------------------------------|---------------------|----------------------------------|-----------------------------|-------------------|-----|-----------|---------|----------------------------------|
| Strategic Decision-Making    | A                   | C                                | C                           | I                 | I   | I         | I       | C                                |
| Requirements Collection      | I                   | C                                | C                           | R                 | R   | C         | I       | C                                |
| System Design Architecture   | I                   | I                                | A                           | R                 | C   | R         | I       | I                                |
| Budget Approval              | A                   | A                                | C                           | C                 | I   | I         | I       | I                                |
| Implementation/Development   | I                   | I                                | A                           | R                 | C   | R         | C       | I                                |
| User Acceptance Testing      | I                   | I                                | A                           | R                 | C   | C         | R       | C                                |
| Training & Onboarding        | I                   | I                                | A                           | R                 | C   | C         | C       | R                                |
| Communication/Status Updates | I                   | I                                | A                           | R                 | R   | I         | I       | I                                |

## Question 7

**Help Mr Karthik to prepare a business case document**

|                  |                                  |
|------------------|----------------------------------|
| Project Name     | Online Agriculture Product Store |
| Client           | SOONY Ltd. (CSR Initiative)      |
| Delivery Head    | Mr. Karthik                      |
| Project Timeline | 18 Months                        |

### Executive Summary

Empower Farm is a transformative effort that aims to provide rural farmers with easy access to high-quality agricultural inputs like seeds, fertilizers, and pesticides. This digital marketplace, accessible through mobile and online applications, helps farmers by removing middlemen and ensuring cost-effective, dependable, and timely purchase. APT IT SOLUTIONS is developing a ₹2 Crore project for SOONY Ltd.'s CSR program over an 18-month period.

### Mission Statement

To boost rural agricultural output by providing a user-friendly digital solution that connects farmers directly with certified input suppliers, ensuring ease, affordability, and transparency.

### Description of the Product/Service

Empower Farm will be a multilingual, responsive, mobile-optimized platform that offers:

- Registration/Login for Farmers and Suppliers
- Verified product listings include insecticides, seeds, and fertilizers.
- Intelligent filters for product discovery
- Digital payment gateways (UPI, COD, card/net banking).
- Real-time order tracking and alerts.
- Customer service via chat, SMS, or phone call.
- Language options geared toward rural consumers

### Project Scope:

In Scope

- Development of online and Android-based platforms.
- Seller onboarding and verification
- Core modules include product catalogue, order administration, and payment processing.
- Third-party API integrations (payment and logistics)
- Training materials for end users

- Role-based dashboards and administrative control panels

**Out of scope:**

- Physical Inventory or Warehousing
- International trade and payment systems
- Credit, loan, or crop advisory modules

## 5. Problem Statement

Farmers in rural areas face logistical and financial hurdles in getting agricultural inputs. Issues include:

- Long travel distances.
- Overpriced or low-quality products.
- Limited selection of items.
- No access to digital order tracking or dependable customer service.

## 6. Expected Benefits

- Farmers can save money and time on their travel.
- Improved crop yield through timely product delivery.
- Improved transparency through certified vendors.
- Digital literacy and empowerment through multilingual access
- Structured records for all transactions.
- Stakeholders

| Name         | Role                            |
|--------------|---------------------------------|
| Mr. Henry    | CSR Sponsor & Committee Head    |
| Mr. Pandu    | Financial Controller (SOONY)    |
| Mr. Dooku    | CSR Program Coordinator         |
| Mr. Karthik  | Delivery Head, APT IT SOLUTIONS |
| Mr. Vandanam | Project Manager                 |
| Farmers      | Primary End Users               |

**Financial Analysis:**

| Metric                     | Value                  |
|----------------------------|------------------------|
| Total Investment           | ₹2,00,00,000 (₹2 Cr)   |
| Expected Revenue           | ₹2,10,00,000           |
| Expected Profit            | ₹10,00,000             |
| ROI (Return on Investment) | 5% (₹10L ÷ ₹2Cr × 100) |

**Conclusion:**

- Empower Farm directly contributes to SOONY Ltd.’s CSR objective by bridging the digital divide for rural farmers and increasing agricultural productivity.
- The platform streamlines Agri-product procurement, minimizes reliance on middlemen, and guarantees higher quality and pricing through verified suppliers.
- A clear 18-month strategy and ₹2 Crore budget provide a disciplined project execution with specified scope, timeframes, and ROI visibility.
- The expected 5% ROI in the first year proves both financial viability and high social effect.
- Empower Farm embodies both digital innovation and rural development, making it a viable model for future Agri-tech efforts.

## Question 8

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

### ➤ Sequential Model (Waterfall)

The Waterfall Model takes a step-by-step approach to software development. Each phase must be finished before the next one begins, and there is minimal room for alteration once the process has begun.

Why Use Waterfall?

- When project needs are established and fully understood from the outset.
- When you require a structured and documented procedure.
- Ideal for projects with tight budgets, deadlines, and rules (such as government or CSR-funded projects).

**Phases:**

- a) Requirement Gathering - Determine what the system must do.
- b) System design entails planning the architecture, database, and user interface/user experience.
- c) Implementation (Development): Begin creating the application.
- d) Testing entails determining whether the product functions as intended.
- e) Deployment is the process of becoming live and making it available to users.
- f) Maintenance entails resolving faults and providing support after launch.

**Advantages:**

- Easy to manage and track
- Clear documentation and approvals after each phase
- Ideal for fixed-scope, low-risk projects
- Predictable budget and timetable.

### ➤ Iterative Model

What is it?

The Iterative Model builds the system in small stages (iterations). Each cycle gives a portion of the functionality, which is tested and improved on in next iteration.

Why Use Iterative?

- When the entire system cannot be designed beforehand.
- When you want to provide value quickly and iterate based on feedback.
- Best for those who seek freedom without compromising structure.

**Phases (repeated for each iteration):**

- a) Plan needs for the current iteration.
- b) Design and create features.
- c) Test and get feedback.
- d) Refine and start the next iteration.

**Advantages:**

- You get working software early
- Users can give feedback regularly
- Less risk of total failure—issues are caught early
- Easier to add or refine features

**➤ Evolutionary Model (Spiral)**

The Spiral Model has characteristics of both the waterfall and iterative processes, with a particular emphasis on risk management. It operates in spirals (cycles), with each loop involving planning, risk assessment, development, and evaluation.

Why Use Spiral?

- Suitable for large, complicated, and high-risk projects.
- Useful for dealing with new technologies or uncertain requirements.
- assists in addressing business and technological concerns early.

**Advantages:**

- Effective risk management
- Consistent stakeholder involvement
- Responds better to changes than Waterfall
- Helps make better decisions in the face of uncertainty.

**➤ Agile Framework (Scrum Model)**

What is it?

Agile is a customer-focused, cooperative, and adaptable development methodology. Teams produce functional features on a regular basis, and the work is broken up into time-boxed units called Sprints, which typically last two to four weeks.

### Why Adopt Agile?

- when specifications are subject to frequent changes or alter in response to immediate input.
- when there is a significant level of user interaction.
- Perfect for continual delivery and quick innovation.

### Stages (for every Sprint):

- a) Backlog Preparation: Enumerate jobs or features
- b) Planning for the Sprint: Decide what to build this sprint
- c) Daily Standups: Monitor Your Progress Every Day
- d) Design, develop, and test in a sprint
- e) Sprint Review: Present and solicit input
- f) Retrospective: Consider and get better

### Benefits include:

- Constant delivery of functional software
- Fast reaction to modifications
- Strong team and customer cooperation
- Rapid feature testing and improvement

## **Question 9.**

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

### **1. Waterfall Model**

In the SDLC, the Waterfall model is regarded as the most conventional and uncomplicated method. The reason it's called "Waterfall" is that, once a phase is finished, there's no turning back. The process proceeds in a single path, much like water flowing from one step to the next

#### **Key Features:**

- **Linear and Sequential:** Every step is finished in turn, including requirements, design, development, testing, and deployment.
- **Strict Documentation:** Before moving further, each phase's comprehensive documentation must be approved.
- **No Overlaps:** You complete one phase before beginning the next; phases do not overlap.

#### **Ideal For:**

Projects that have a set schedule, precise, unchanging needs, and a need for thorough documentation, such as government systems, corporate social responsibility initiatives, or industries subject to regulations.

### **2. RUP (Rational Unified Process)**

The more adaptable and organized RUP methodology, created by IBM, combines the discipline of Waterfall with iteration.

#### **Key Features:**

- **Phased & Iterative:** The project moves through four main phases — Inception, Elaboration, Construction, and Transition. Each phase has mini-iterations inside.
- **Role-Based:** Each team member (BA, PM, Developer, Tester) has defined responsibilities.
- **Risk Reduction:** Risk is managed at every step, unlike Waterfall which addresses risks later.

#### **Best For:**

Projects that are large-scale, complex, or where requirements evolve but still need structure, role clarity, and documentation.

### **3. Spiral Model**

The Spiral Model is designed for projects with a lot of risk or uncertainty. It blends the best of Waterfall and Iterative, but adds a strong focus on risk analysis and early feedback. Work is done in spirals or loops, each adding more functionality.

#### **Key Features:**

- Risk-Driven: Each loop involves seeing possible hazards, addressing them, and confirming advancements.
- Prototyping is the process of regularly testing and validating concepts using early working models.
- Refinement Cycle: The system gets clearer, safer, and more sophisticated with each spiral.

#### **Ideal For:**

Projects where you want to fail quickly, learn, and progressively gain confidence, such as those with unclear requirements, security threats, or technological complexity.

### **4. Scrum (Agile Framework)**

Agile's most popular framework is Scrum. It is intended for quick delivery, ongoing enhancement, and tight cooperation between business users and developers. Work is broken down into sprints, which are brief, fixed-length timeboxes that typically last two to four weeks.

#### **Key Features:**

- Sprint-Based Development: Every Sprint delivers a working part of the product.
- Daily Standups: Teams meet daily to share progress and clear blockers.
- Clear Roles: Includes a Product Owner (business side), Scrum Master (coach/facilitator), and Development Team.
- Frequent Feedback: After each Sprint, there's a review and retrospective to improve the next cycle.

#### **Best For:**

Projects with fast-changing requirements, new product ideas, or user-driven enhancements — where speed and flexibility are more important than documentation.

**Question 10.**

**Write down the differences between waterfall model and V model.**

| Point of Comparison      | Waterfall Model                                                                    | V Model (Verification & Validation Model)                                                        |
|--------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| 1. Basic Idea            | The process flows step-by-step from requirements to deployment (like a waterfall). | The process is like a “V” shape — development on the left, testing on the right.                 |
| 2. Structure             | Linear and sequential — you finish one phase before moving to the next.            | Structured and parallel — each development phase has a matching test phase.                      |
| 3. Focus on Testing      | Testing starts after development is complete.                                      | Testing is planned early and happens in parallel with development stages.                        |
| 4. Error Detection       | Errors are found late, during the testing phase.                                   | Errors are caught earlier because testing is planned from the beginning.                         |
| 5. Flexibility           | Low flexibility — changes are difficult once a phase is completed.                 | Also, low flexibility, but better planning reduces the chance of big changes later.              |
| 6. Risk Handling         | Risks may go unnoticed until later stages.                                         | Risks are handled earlier due to continuous validation.                                          |
| 7. Cost of Fixing Issues | High — since bugs are often found at the end, fixing them costs more.              | Lower — because most problems are identified during earlier phases.                              |
| 8. Testing Activities    | Testing is treated as a single phase at the end.                                   | Testing is spread throughout the lifecycle, matched with each phase.                             |
| 9. Project Suitability   | Best for small or simple projects with clear and fixed requirements.               | Best for safety-critical or high-quality projects (e.g., healthcare, aerospace).                 |
| 10. Example              | Suitable for a basic website or internal tool with known features.                 | Suitable for medical software, flight control systems, or any project needing strict validation. |

The Waterfall Model is a straightforward, sequential process in which requirements, design, coding, and testing are all finished one after the other, with testing only being done at the very end. By matching every stage of development with a matching testing phase, the V Model, on the other hand, enhances this and enables improved quality assurance and early error identification. Despite the limited flexibility of both models, the V Model's systematic validation procedure makes it more dependable for essential or high-risk projects. In conclusion, the V Model works best for projects that need high quality and early testing, while Waterfall works best for small, clear-scope projects.

### **Question 11.**

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

The V Model was my choice for the online store selling agricultural products.

There are several benefits to choosing the V Model for the Online Agriculture Product Store project, especially when taking into account the application's planned rural end-user base, numerous stakeholders, and clearly defined scope.

1. **Prioritize Quality Right Away**

Every development stage has a direct connection to a corresponding testing stage thanks to the V Model. This implies that we test as we go along rather than waiting until the finish. We want to prevent glitches and confusion for new users, such as farmers, thus this method helps us identify and address problems early.

2. **Compatible with our fixed plan.**

This project has a rigid 18-month timetable and a fixed budget of ₹2 crores. For planned initiatives like these, when the committee has already established the scope, the V Model works well. A structured model keeps everything on track because there is less room for adjustment.

3. **Reduces the risk of rework.**

By confirming each step along the road, we avoid unpleasant surprises at the end. We identify issues early on if they arise. Because the platform is being supported as part of a CSR drive and we need to be resource-conscious, this saves time and money.

4. **Enhancement of Stakeholder Involvement**

We have many opportunities to include stakeholders like Mr. Henry, Mr. Pandu, and Mr. Dooku in every stage of the V Model. This makes it simpler to obtain approvals before the project is finished and helps guarantee that we are building precisely what is required.

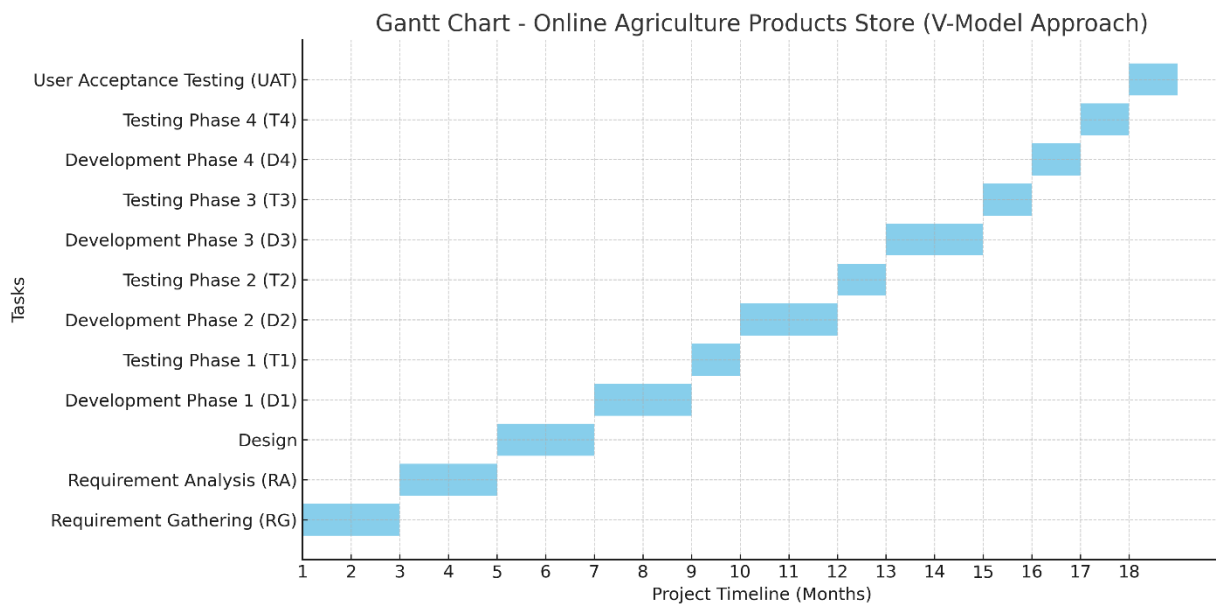
5. **Proper testing and documentation**

The app need to be extensively tested for a project like this, where the user base can encounter technological difficulties. The V Model places a heavy emphasis on test planning and documentation in order to provide a reliable, user-friendly platform that can reliably assist farmers.

Stakeholder interaction, planning, and quality are all balanced in the V Model, which makes it perfect for this project. It guarantees that we produce a reliable and tested product on schedule and within budget that satisfies farmers' needs and SOONY Ltd.'s CSR vision.

### Question 12.

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.



### Question 13.

**Explain the difference between Fixed Bid and Billing projects**

#### A. Fixed Bid Model

In a fixed bid model, all project costs, scope, and schedules are predetermined. Regardless of the actual effort or hours spent, the development team is accountable for completing the agreed-upon job within that budget. A formal change request must be made if any modifications are needed following the agreement.

Key Features:

- The price and deliverables are set from the start.
- Any changes to the scope after approval necessitate a formal change request and a cost agreement.

- There is minimal room for flexibility because project activities adhere to a rigid timeframe.

When Used:

The project specifications are precise, well-defined, and unlikely to alter.

Fixed timeframes and predictable costs are preferred by both the vendor and the client.

## **B. Billing Model (Time & Material)**

Under the Billing or Time & Material model, the client covers the cost of any extra materials as well as the team's real hours or days of work. The project cost is variable and increases as more work is completed.

Important Features:

- Throughout the development process, the project's scope is subject to change.
- Budgets and schedules change in response to new demands or changing priorities.
- When the client is still investigating the solution or anticipates frequent modifications, this model performs admirably.

Ideal Use:

Requirements are subject to change as the project progresses.

Throughout the development process, the client wants to remain active and make constant improvements.

| Parameter           | Fixed Bid                             | Time & Material                         |
|---------------------|---------------------------------------|-----------------------------------------|
| Cost Control        | Pre-agreed, fixed (e.g., ₹2 Crore)    | Variable, billed by time/resources used |
| Scope Flexibility   | Low – Changes require formal approval | High – Can change during project        |
| Risk Responsibility | On the vendor                         | On the client                           |
| Best For            | Well-scoped, stable projects          | Evolving, experimental projects         |

In conclusion, the Fixed Bid approach is the most suitable for this Online Agriculture Product Store project. The scope, timing, and budget (₹2 Crores) are already clearly established. A Fixed Bid contract helps maintain cost control, guarantees on-time delivery, and satisfies the sponsor's objectives under the CSR effort because the project uses a Waterfall/V-Model methodology.

**Question 14.****Prepare Timesheets of a BA in various stages of SDLC****➤ Assumption:**

BA's hourly rate: ₹4,000/hour (approx. \$50/hour)

BA's allocation: Focused contribution during critical phases (RG, RA, Design, Testing, UAT, Deployment)

Total BA time cost: Around ₹8–10 lakhs out of ₹44 lakhs allocated for all personnel (BA, developers, testers, etc.)

|             |                               |
|-------------|-------------------------------|
| Employee    | Ajai Kumar (Business Analyst) |
| Phase       | Requirement Gathering         |
| Supervisor  | Mr. Vandanam (PM)             |
| Hourly Rate | ₹4,000/hour                   |

**➤ Requirement Gathering (RG) – Jan–Feb 2025**

| Date   | Task                                      | Time (hrs) |
|--------|-------------------------------------------|------------|
| Jan 5  | Stakeholder interviews (farmers, sponsor) | 3 hrs      |
| Jan 12 | Created requirement draft & process flow  | 3 hrs      |
| Jan 18 | Facilitated workshops with SMEs           | 2 hrs      |
| Feb 1  | Reviewed farmer personas and pain points  | 2 hrs      |
| Feb 10 | Finalized requirement docs                | 2 hrs      |
| Total  |                                           | 12 hrs     |
| Cost   | ₹4,000 × 12                               | ₹48,000    |

**Requirement Analysis (RA) – March 2025**

| Date  | Task                                     | Time (hrs) |
|-------|------------------------------------------|------------|
| Mar 3 | Functional decomposition & story mapping | 3 hrs      |
| Mar 8 | Use-case modelling and scope alignment   | 2 hrs      |

|        |                                               |         |
|--------|-----------------------------------------------|---------|
| Mar 15 | Approval walk-through with stakeholders       | 2 hrs   |
| Mar 25 | Final sign-off and version control submission | 2 hrs   |
| Total  |                                               | 9 hrs   |
| Cost   | ₹4,000 × 9                                    | ₹36,000 |

#### Design Phase – Apr–May 2025

| Date   | Task                                       | Time (hrs) |
|--------|--------------------------------------------|------------|
| Apr 5  | Review wireframes and screen mock-ups      | 2 hrs      |
| Apr 12 | Validate navigation flow and user journeys | 2 hrs      |
| May 3  | Review API flow with backend team          | 3 hrs      |
| May 18 | Validate data schema with DB admin         | 2 hrs      |

Total: 9 hrs

Cost: ₹4,000 × 9 = ₹36,000

#### ➤ Development Cycles (D1–D4) – Jun–Sep 2025

| Date   | Task                                        | Time (hrs) |
|--------|---------------------------------------------|------------|
| Jun 10 | Clarify module 1 logic with developers      | 2 hrs      |
| Jul 15 | Support user story refinements              | 2 hrs      |
| Aug 22 | Sprint planning and alignment               | 2 hrs      |
| Sep 10 | Support story acceptance & backlog grooming | 2 hrs      |

Total: 8 hrs

Cost: ₹4,000 × 8 = ₹32,000

#### ➤ Testing Cycles (T1–T4) – Jul–Nov 2025

| Date  | Task                                 | Time (hrs) |
|-------|--------------------------------------|------------|
| Jul 5 | Help QA draft test scenarios (T1)    | 2 hrs      |
| Aug 5 | Defect triage and clarification (T2) | 2 hrs      |

|        |                                                 |       |
|--------|-------------------------------------------------|-------|
| Oct 2  | Align test cases to acceptance criteria (T3)    | 2 hrs |
| Nov 10 | Review test summary and regression results (T4) | 2 hrs |

Total: 8 hrs

Cost: ₹4,000 × 8 = ₹32,000

➤ **UAT Phase – Dec 2025**

| Date   | Task                                     | Time (hrs) |
|--------|------------------------------------------|------------|
| Dec 3  | Draft UAT scripts and prepare test data  | 2 hrs      |
| Dec 6  | Facilitate UAT session with stakeholders | 2 hrs      |
| Dec 10 | Document and log feedback                | 2 hrs      |

Total: 6 hrs

Cost: ₹4,000 × 6 = ₹24,000

➤ **Deployment & Support – Jan–Mar 2026**

| Date   | Task                                      | Time (hrs) |
|--------|-------------------------------------------|------------|
| Jan 5  | Prepare user manual and go-live checklist | 2 hrs      |
| Jan 10 | Conduct end-user onboarding               | 2 hrs      |
| Feb 15 | Post-deployment issue triage              | 2 hrs      |
| Mar 3  | Gather feedback for v2 improvement ideas  | 1 hr       |

Total: 7 hrs

Cost: ₹4,000 × 7 = ₹28,000