Capstone Project 1

Business Process Model: Online Agricultural Products store

Goal

To develop a user-friendly online platform that connects farmers with agricultural product manufacturers(fertilizers, seeds, pesticides), enabling farmers in remote areas to purchase products easily and securely through web or mobile applications.

Inputs

Category	Inputs
Business inputs	Problem statements from farmers (difficulty in accessing agricultural products), CSR initiative by Mr. Henry
Project inputs	Budget: ₹2 Crores, Duration: 18 months, Requirements from stakeholders (farmers, companies)
Technical inputs	Internet access, Web & mobile application frameworks, Database, Server infrastructure
User inputs	Manufacturer product details (fertilizers, seeds, pesticides), Farmer purchase requests

Resources

Type	Description
Human Resources	Mr. Henry (Sponsor), Mr. Pandu (Finance Head), Mr. Dooku (Project Coordinator), Farmers (Stakeholders), APT IT Solutions team (Project Manager, Developers, Testers, Admins, BA)
Technical Resources	Development tools (Java, frameworks), Database (SQL), Network and hosting servers, Testing tools
Financial Resources	₹2 Crores CSR budget
Time Resources	18 months project duration

Outputs

Type	Description
Primary output	Fully functional Online Agricultural Product Store (web and mobile)
Secondary Output	Product listings, farmer registrations, active transactions
Documentation Output	Requirement documents, test reports, user manuals

Activities

Phase 1: Planning & Requirement Gathering

1. Form project committee (Mr. Henry, Pandu, Dooku).
2. Assign project to APT IT Solutions.
3. Conduct requirement gathering sessions with farmers (Peter, Kevin, Ben).
4. Define functional requirements — farmer registration, manufacturer registration, product listing, order management, and delivery.
5. Document Business Requirements Specification (BRS).

Phase 2: Design

6. BA and developers design process flow and system architecture.
7. UI/UX designer creates a user-friendly interface for farmers and companies.
8. Database schema design for users, products, and orders.
9. Get design approval from the committee.

Phase 3: Development

10. Developers (Juhi, Teyson, Lucie, Tucker, Bravo) build the frontend and backend modules.
11. Network Admin (Mike) sets up hosting and connectivity.
12. DB Admin (John) configures and maintains the database.

Phase 4: Testing

13. Testers (Jason, Alekya) perform functional, usability, and security testing.
14. Fix bugs and retest until the application meets quality standards.

Phase 5: Deployment

15. Deploy the application on web and mobile platforms.
16. Provide access to farmers and manufacturers.

Phase 6: Operations & Maintenance

17. Farmers register, browse, and purchase products online.
18. Manufacturers upload new product details.
19. Orders are processed, and delivery partners dispatch items.
20. System continuously updated based on feedback.

Values

Type	Value created
Farmer Value	Easy access to quality seeds, fertilizers, and pesticides without traveling to cities.
Manufacturer Value	Direct channel to reach rural markets and increase sales.
Business Value	Enhances SOONY's CSR reputation; supports digital inclusion.
Economic Value	Reduces intermediaries, ensures fair pricing.
Social Value	Improves rural livelihood, increases agricultural productivity.

SWOT Analysis: Online Agricultural Products store

Strengths | Internal positive factors that give the project an advantage

- Strong funding (₹2 Crores) under CSR initiative – ensures financial stability.
- Backed by Mr. Henry, a reputed businessman – high credibility and influence.
- Clear social impact goal – helps farmers and supports sustainable agriculture.
- Experienced development partner (APT IT Solutions) with full in-house team (PM, Developers, Testers, DB/Network Admins).
- Direct connection between farmers and manufacturers eliminates middlemen.
- Easy accessibility via both web and mobile platforms, even from remote areas.
- CSR alignment strengthens the brand reputation of SOONY company.

Weaknesses | Internal limitations or challenges

- Limited digital literacy among rural farmers may affect app adoption.
- Internet connectivity in remote areas could limit usability.
- Requirement gathering depends heavily on feedback from only a few farmers (Peter, Kevin, Ben).

- High dependency on continuous maintenance and updates post-launch.
- Lack of logistics/delivery integration at the initial stage could delay product delivery.
- Need for strong training, support, and multilingual interface to ensure inclusivity.

Opportunities | **External positive factors the project can capitalize on**

- Growing government focus on **Digital Agriculture** and **Rural Empowerment** – potential for collaboration.
- Expansion potential – can add features like crop advisory, weather updates, and e-learning for farmers.
- Partnerships with agri-product companies and NGOs can expand reach and trust.
- Increasing smartphone penetration in rural areas supports scalability.
- Can evolve into a marketplace with revenue via commissions, subscriptions, or advertisements.
- Integration with logistics/delivery services for end-to-end fulfillment.

Threats | **External risks or challenges that could impact success**

- Competition from existing agri-tech startups (AgroStar, KisanKonnect).
- Farmers' reluctance to adopt online systems due to trust or payment concerns.
- Cybersecurity threats or data breaches affecting user trust.
- Policy changes or delays in government permissions for digital agri-services.
- Inflation or cost rise in agri-inputs could affect product pricing and demand.
- Seasonal fluctuations in farming may affect consistent usage.

Feasibility Study: Online Agricultural Products store

Purpose of the study:

To assess whether the proposed online agricultural product store can be successfully developed and implemented using Java-based technology, within the given budget, time frame and available resources.

Project Overview:

- Project name: Online Agricultural Products store
- Objective: Create a web and mobile application that enables farmers to buy fertilizers, seeds, pesticides directly from manufacturers.
- Technology stack: Java (Spring boot framework), HTML/CSS/Javascript Frontend, MySQL database, REST APIs and optional mobile app using Flutter or React Native
- Executing Company: APT IT Solutions
- Sponsor: Mr. Henry (SOONY company CSR initiative)
- Budget: Rs. 2 CR

- Time frame: 18 months

Feasibility Dimensions

Technical Feasibility

Aspect	Assessment
Hardware requirements	- Development and testing servers with minimum 16 GB RAM, 1 TB Storage and high speed internet - Deployment servers(cloud-based) with load balancing and scalability (E.g. AWS, Azure) - Developer workstations with 8-16 GB RAM and Java enabled environments
Software requirements	- Backend: Java SE 17+, Spring boot framework - Frontend: HTML5, CSS3, JavaScript, React/Angular(optional) - Database: MySQL or PostgreSQL - Testing tools: JUnit, Selenium - Version control: GitHub - Deployment: Jenkins, Docker
Compatibility & Accessibility	Application will be compatible with both - web and mobile browsers. A responsive design ensures usability on low-end devices

Resource Feasibility (Trained Human Resources)

Role	Remarks	Availability
Project Manager (Mr. Vandanam)	Experienced in project coordination	Yes
Sr. Java Developer (Ms. Juhi)	Strong in backend development using Java	Yes
Java developers(Teyson, Lucie, Tucker, Bravo)	Skilled team for frontend/backend modules	Yes
Network admin (Mr. Mike)	Can manage deployment servers and connectivity	Yes
DB Admin (John)	Experienced in SQL database setup and maintenance	Yes
Testers (Jason, Alekya)	Skilled in functional and UI testing	Yes

Business Analyst (Me)	Responsible for requirement elicitation, documentation, and coordination	Yes

Economic feasibility (Budget analysis)

Component	Estimated Cost (INR)
Hardware & Infrastructure	INR 30 Lakhs
Software Tools & Licenses	INR 15 Lakhs
Development Team salaries(18 months)	INR 110 Lakhs
Testing, Deployment & Maintenance	INR 20 Lakhs
Training, Support & Documentation	INR 10 Lakhs
Contingency (5%)	INR 15 Lakhs
Total Estimated Cost	**INR 190 Lakhs (~ INR 1.9 CR)**

Conclusion: Economically feasible - project can be completed within allocated funds.

Time feasibility (Schedule analysis)

Phase	Duration	Key Deliverables
Requirement gathering & analysis	2 months	BRD, SRS
Design (System + UI/UX)	3 months	Wireframes, System Architecture
Development	8 months	Working modules
Testing (Unit + Integration + UAT)	3 months	Quality Certified Product
Deployment & Launch	1 month	Go-live version
Feedback & Support phase	1 month	Maintenance plan, bug fixes
Total	**18 months**	**Matches allocated timeline**

Operational feasibility

Aspect	Assessment

User accessibility	Designed for farmers with a simple UI, local language support possible
Maintenance and support	Managed by APT IT solutions with dedicated admins
Scalability	Java-based architecture allows future scalability (add new products, users, or modules easily)
Training	Minimal training required for internal users, help documentation for farmers
Conclusion	Operationally feasible and sustainable for long-term

Overall feasibility Summary

Feasibility type	Status	Remarks
Technical	Feasible	Java-based system suitable and stable
Human Resource	Feasible	Skilled and available team
Economic (Budget)	Feasibile	Within Rs 2 Cr CSR budget
Time (Schedule)	Feasible	18-month timeline is realistic
Operational	Feasible	Easy to maintain and scale

GAP Analysis: Online Agricultural Products store

Objective

To identify the gaps between the current (AS-IS) process of agricultural product procurement and the future (TO-BE)process after implementation of the Online Agricultural Product Store. This helps ensure the new system meets real needs and resolves existing inefficiencies.

As-Is vs To-Be Process Comparison

Process Area	As-is (Existing process)	To-be (Future process)	GAP/Need for improvement
Product procurement	Farmers manually visit local towns/markets to	Farmers can order all required products online from home	Lack of accessibility and convenience -> Need for digital

	buy seeds, fertilizers, and pesticides	using web/mobile app	purchasing solution
Product availability	Limited variety due to dependency on local shops and middlemen	Wide range of products from multiple manufacturers displayed on one platform	Limited options -> Need to connect farmers directly with manufacturers
Pricing transparency	Prices vary by region, often inflated by intermediaries	Transparent pricing displayed online; direct farmer-to-manufacturer transactions	Lack of price transparency -> Need for fair and visible pricing
Communication	Farmers depend on verbal or local dealer interactions for queries	In-app communication or support chat between farmers and manufacturers	Ineffective communication -> Need for direct, traceable digital interaction
Order & Delivery tracking	No tracking once purchase is made from local dealer	Digital order confirmation, payment receipt, and real-time delivery tracking	No visibility post-purchase -> Need for digital order management
Product information	Farmers rely on word-of-mouth knowledge about product quality	Detailed product descriptions, usage info, customer reviews online	Lack of product awareness -> Need for informed decision-making
Payment method	Cash payments at physical stores only	Multiple digital payment options integrated in app	Limited payment methods -> need for secure digital payments
Reach and accessibility	Remote farmers face travel challenges due to poor infrastructure	Platform accessible via smartphones with internet connectivity	Limited access -> Need for digital inclusion in rural areas
Manufacturer reach	Manufacturers depend on distributors to reach rural markets	Manufacturers can list products directly to farmers through platform	Restricted reach -> Need for direct B2F model
Record keeping	Manual receipts or no records for purchases	Automated digital records of orders, payments and invoices	Poor documentation -> Need for traceable, digital records
Customer support	Very limited	Online grievance	Lack of support ->

	after-sales support	system or customer service portal	Need for structured post-purchase assistance

Summary of Gaps Identified

Gap category	Description
Accessibility gap	Farmers lack easy access to quality agricultural products due to geographical and logistical constraints.
Information gar	Farmers have limited knowledge of available products, pricing, and quality.
Process Efficiency gap	The current manual system is time-consuming and inconsistent.
Technology gap	Absence of a digital platform connecting farmers and manufacturers.
Transparency gap	No visibility into product pricing, delivery, or authenticity.
Support gap	No structured customer service for farmers' post-purchase issues.

TO-BE System Benefits

Improvement area	Expected outcome
Digital procurement	Farmers can buy anytime, anywhere
Increased reach	Manufacturers expand into rural markets
Time efficiency	Reduces travel and delays for farmers
Cost efficiency	Removes middlemen, reduces price margins
Transparency	Fair pricing, verified sellers, and order tracking
Data analytics	Enables monitoring of sales, demand and product usage patterns

Conclusion

The gap analysis clearly shows that the current manual process is inefficient, slow, and inaccessible to many farmers.
The future (TO-BE) online store will bridge these gaps by:

- Digitizing the entire product procurement process,
- Enabling real-time communication and transactions,
- Empowering farmers with information, transparency, and accessibility.

Result: The project is necessary, feasible, and high-impact both technologically and socially.

Risk Analysis: Online Agricultural Products store

Business Analyst (BA)–Related Risks

Risk Factor	Description / Example	Possible Impact	Mitigation Strategy
Incomplete Requirement Gathering	Farmers or stakeholders (Peter, Kevin, Ben) might not express all their needs clearly.	Missing critical features; rework later.	Conduct multiple workshops, use visual aids (mockups, user stories).
Miscommunication Between Stakeholders	BA may misinterpret user needs or technical constraints between business (SOONY) and vendor (APT IT Solutions).	Misaligned deliverables.	Use clear documentation (BRD, SRS) and frequent sign-offs.
Unclear Scope Definition	Scope creep due to changing ideas or added features (e.g., logistics, e-learning).	Budget/time overrun.	Create and freeze a Scope Statement; control changes via Change Requests (CR).
Lack of Domain Knowledge	BA may not fully understand agricultural terms, seasonal patterns, or farmer workflows.	Incorrect requirement mapping.	Conduct domain training, field interviews with farmers.

Ambiguous Requirements	Requirements stated in general terms (e.g., “make app easy to use”) without measurable criteria.	Poor UX, stakeholder dissatisfaction.	Convert into SMART (Specific, Measurable, Achievable, Relevant, Time-bound) requirements.
Insufficient Validation of Requirements	Missing review/approval from all stakeholders before design begins.	Rework and conflicts later.	Regular review meetings; sign-off at each milestone.
Change Management Risk	Farmers’ or management’s needs evolve during project execution.	Rework, delays.	Implement formal Change Control Process.
Documentation Delays	Late BRD/SRS submission or incomplete traceability matrix.	Delayed design/development.	Maintain documentation parallel to requirement discussions.
Stakeholder Availability	Key users (farmers or sponsors) not available for feedback on time.	Decision-making delays.	Schedule stakeholder meetings early and maintain communication plan.
Lack of User Acceptance Criteria	BA may not define clear acceptance standards for features.	Difficult UAT (User Acceptance Testing) phase.	Define UAT scenarios and acceptance criteria upfront.

Process / Project Risks

Risk Factor	Description / Example	Possible Impact	Mitigation Strategy
Technical Integration Risk	Integrating different modules (farmer portal, manufacturer portal, payment gateway) may fail.	System downtime, data loss.	Early technical design reviews; API testing.

Infrastructure Risk	Internet issues or limited rural connectivity could restrict use.	Farmers unable to access the app.	Use offline support, lightweight UI, low-data mode.
Budget Overrun	Unexpected technical complexities or changes in scope.	Exceeding ₹2 crore budget.	Regular financial monitoring and contingency fund (~5%).
Timeline Delays	Slippage in design, development, or testing phases.	Missed 18-month target.	Use Agile methodology; track progress in sprints.
Resource Risk	Key developer or tester leaves mid-project.	Work disruption or knowledge loss.	Maintain backup resources and documentation.
Quality Risk	Inadequate testing or overlooked bugs.	Poor user experience, reputational loss.	Define QA plan, include multiple testing levels (unit, UAT).
Data Security Risk	Sensitive data (farmers' personal info, payment details) may be exposed.	Legal and reputational damage.	Implement encryption, secure login, SSL, and privacy policy.
Vendor Coordination Risk	Misalignment between SOONY (client) and APT IT Solutions (vendor).	Project confusion and rework.	Weekly progress reviews and status reports.
User Adoption Risk	Farmers may not adopt the system due to lack of trust or digital skills.	Low usage post-launch.	Conduct awareness drives, provide tutorials in local languages.
Regulatory / Compliance Risk	Failure to comply with government or data regulations.	Fines, project delays.	Consult legal experts; adhere to IT and CSR compliance.
Maintenance & Support Risk	No long-term plan for updates and customer support.	System downtime, user dissatisfaction.	Include post-launch maintenance phase in budget.
Operational Risk	Dependence on logistics partners for deliveries.	Late or failed deliveries affect credibility.	Partner with reliable logistics services and track KPIs.

Risk Summary Table

Category	Risk Level	Impact	Mitigation Priority
BA Risks	Medium	Rework, communication issues	High
Technical Risks	High	System failure, delays	High
Financial Risks	Medium	Budget overrun	Medium
Operational Risks	High	Low adoption, delivery issues	High
Compliance Risks	Low	Legal implications	Medium

Conclusion

The project has moderate to high risk exposure, mainly around:

- Requirement clarity (BA Risk)
- User adoption & infrastructure limitations (Process Risk)
- Coordination between client and vendor

However, with:

- Strong documentation,
- Clear change control,
- Agile monitoring, and
- Continuous stakeholder engagement,

These risks can be effectively identified early, tracked, and mitigated throughout the project lifecycle.

Stakeholder Analysis: Online Agricultural Products store

Key Project Stakeholders

Role/Name	Organization	Role Type / Influence	Description
Mr. Henry	SOONY Company	Sponsor / Decision Maker	Project Initiator and main sponsor; owns final approval and funding.

Mr. Pandu	SOONY Company	Financial Head / Decision Maker	Controls budget, approves financial disbursements.
Mr. Dooku	SOONY Company	Project Coordinator / Influencer	Coordinates between sponsor and vendor; influences requirements.
Peter, Kevin, Ben	Farmers (End Users)	Stakeholders / Influencers	Provide key input for user needs and usability feedback.
Mr. Karthik	APT IT Solutions	Delivery Head / Decision Maker	Responsible for overall vendor-side delivery and timeline.
Mr. Vandanam	APT IT Solutions	Project Manager / Responsible	Leads daily execution, manages team, reports progress.
Ms. Juhi	Senior Java Developer	Technical Lead / Responsible	Leads development; decides architecture, code reviews.
Mr. Teyson, Ms. Lucie, Mr. Tucker, Mr. Bravo	Developers	Team Members / Responsible	Develop front-end and back-end modules.
Mr. Mike	Network Admin	Support / Consulted	Ensures infrastructure, server, and deployment readiness.
Mr. John	Database Admin	Support / Consulted	Designs and manages the database.
Mr. Jason, Ms. Alekya	Testers	Quality Control / Responsible	Ensure product meets requirements and is bug-free.
You (Business Analyst)	APT IT Solutions	BA / Responsible & Consulted	Gather, document, and validate requirements; bridge between business and tech.

RACI Matrix

Project Activity / Deliverable	Mr. Henry (Sponsor)	Mr. Pandu (Finance)	Mr. Dooku (Coordinator)	Farmers (End Users)	Mr. Karthik (Delivery Head)	Mr. Vandanam (PM)	BA (You)	Dev Team (Juhi &	DB Admin (John)	Testers (Jason & Alekya)

								other s)		
1. Approve Project & Budget	A	C	C	I	C	I	I	I	I	I
2. Define High-Level Requirements	A	C	C	C	I	R	R	I	I	I
3. Detailed Requirement Gathering	I	I	C	C	I	A	R	I	I	I
4. Finalize Scope & SRS Document	A	C	C	C	I	R	R	I	I	I
5. UI/UX Design & Review	I	I	C	C	I	A	C	R	I	I
6. Development of Web/Mobile App	I	I	I	I	C	A	C	R	C	I
7. Integration & Database Setup	I	I	I	I	C	A	C	R	R	I
8. Testing (Unit, UAT, System)	I	I	I	C	I	A	C	R	C	R
9. User Training &	A	I	C	C	R	R	C	R	I	C

Deployment										
10. Maintenance & Support Plan	A	C	C	I	R	R	C	R	C	C

Legend:

- **R (Responsible)** – Does the work to complete the task.
- **A (Accountable)** – Ultimately answerable for the correct and thorough completion.
- **C (Consulted)** – Provides input or expertise before decision or action.
- **I (Informed)** – Needs to be kept up to date on progress or decisions.

Stakeholder Power & Influence Map

Stakeholder	Power (Decision-making)	Influence (Impact on Process)	Role Type
Mr. Henry	High	High	Final Decision Maker
Mr. Pandu	High	Medium	Budget Controller
Mr. Dooku	Medium	High	Coordinator / Influencer
Farmers (Peter, Kevin, Ben)	Low	High	Key End-User Influencers
Mr. Karthik	High	High	Vendor Decision Maker
Mr. Vandanam	Medium	High	Execution Leader
You (BA)	Medium	High	Bridge Between Business & Tech
Dev & Test Team	Low	Medium	Executors & Technical Contributors

Conclusion

- Decision Makers: Mr. Henry, Mr. Pandu, Mr. Karthik
- Influencers: Mr. Dooku, You (BA), Farmers (end users)
- Executors: Project Manager, Developers, Testers
- Consulted/Support: DB Admin, Network Admin

The RACI Matrix ensures clear accountability, avoids duplication of effort, and maintains alignment between the sponsor, vendor, and users throughout the 18-month CSR project.

Business Case Document

Project Title: Online Agricultural Product Store (Web & Mobile Application)

Executive Summary

Mr. Henry, a successful businessman, initiated this CSR project after learning about the challenges faced by farmers in remote areas who struggle to procure agricultural inputs such as seeds, fertilizers, and pesticides.

The proposed Online Agricultural Product Store aims to connect farmers directly with manufacturers, enabling them to buy products conveniently through an online platform.

The project will be executed by APT IT Solutions under the sponsorship of SOONY Company, with an approved budget of ₹2 Crores and a timeline of 18 months.

This solution will contribute to rural empowerment, digital inclusion, and agricultural efficiency — aligning with Mr. Henry's CSR vision of "Technology for Rural Growth."

Business Objectives

Objective	Description	Expected Outcome
Enable Direct Access to Agricultural Inputs	Farmers can browse and buy seeds, fertilizers, and pesticides directly from manufacturers.	Reduced dependency on middlemen and better product availability.
Improve Farmers' Convenience	Allow online purchases through web and mobile app.	24×7 access to verified suppliers, reduced travel time.
Empower Rural Economy	Encourage digital adoption among farmers.	Financial inclusion and increased agricultural productivity.
Ensure Transparency	Enable transparent pricing and product information.	Builds trust and ensures fair trade practices.
Fulfil CSR Goals	Use technology for social good under SOONY's CSR initiative.	Enhanced brand reputation and community goodwill.

Problem Statement (Current Situation)

Currently, farmers in remote areas face the following challenges:

- Limited availability of quality seeds, fertilizers, and pesticides.
- High dependency on middlemen and local retailers.
- Lack of awareness about product authenticity and pricing.
- Poor connectivity to urban supply chains and distributors.
- No digital platforms for rural buyers and agricultural manufacturers to connect.

Proposed Solution (Future State)

The proposed Online Agricultural Product Store will be a web and mobile application that:

- Displays verified product listings from manufacturers (seeds, fertilizers, pesticides).
- Allows farmers to browse, compare, and purchase directly.
- Supports multiple payment options (cash on delivery, UPI, wallet).
- Provides local language support for ease of use.
- Enables real-time communication between buyers and sellers.
- Offers order tracking and delivery support.

This will result in a digital marketplace that bridges the gap between supply and demand in rural agriculture.

Stakeholders

Stakeholder Name	Role	Organization	Responsibility
Mr. Henry	Project Sponsor	SOONY	Approves project scope, funding, and direction.
Mr. Pandu	Financial Head	SOONY	Manages CSR budget and expenditure.
Mr. Dooku	Project Coordinator	SOONY	Liaison between sponsor and vendor.
Peter, Kevin, Ben	End Users (Farmers)	—	Provide user feedback and requirements.
Mr. Karthik	Delivery Head	APT IT Solutions	Oversees project execution and delivery.

Mr. Vandanam	Project Manager	APT IT Solutions	Manages project plan, schedule, and resources.
Business Analyst (You)	BA	APT IT Solutions	Elicits, documents, and validates requirements.
Development Team	Developers	APT IT Solutions	Build and implement the application.
QA Team	Testers	APT IT Solutions	Test and ensure quality.

Feasibility Analysis

Aspect	Feasibility Assessment	Remarks
Technical Feasibility	Feasible	Java-based architecture suitable for scalable and secure web/mobile apps.
Hardware Requirements	Feasible	Existing servers and cloud deployment supported.
Software Requirements	Feasible	Use of Java, MySQL, and REST APIs; open-source stack minimizes cost.
Resource Availability	Feasible	Skilled developers, testers, and network/database admins available at APT IT Solutions.
Budget Feasibility	Feasible	₹2 Crore allocated; within range for development and deployment.
Time Feasibility	Moderate Risk	18 months is achievable but requires strict monitoring to avoid slippage.

Expected Benefits

Benefit Type	Description	Measurement
Economic	Reduced cost for farmers through direct procurement.	10–20% cost reduction compared to local middlemen.
Social	Improved farmer livelihood and digital literacy.	Increased online adoption in rural areas.

Operational	Simplified product sourcing and delivery.	Faster procurement process and order tracking.
Reputational	Enhances SOONY's CSR brand image.	Positive PR and stakeholder goodwill.

Risk Summary

Category	Example Risk	Impact Level	Mitigation
BA Risk	Incomplete requirement gathering.	Medium	Conduct user workshops and prototype demos.
Technical Risk	Integration failures between modules.	High	Early technical testing and API validation.
Operational Risk	Farmers' low digital adoption.	High	Training sessions and local-language app.
Financial Risk	Budget overrun due to feature creep.	Medium	Regular financial tracking and scope control.
Timeline Risk	Delayed module delivery.	High	Agile sprints with bi-weekly reviews.

Financial Summary

Component	Estimated Cost (INR)	Remarks
Software Development (Web + Mobile)	₹80,00,000	Core coding and design work.
Testing & Quality Assurance	₹20,00,000	UAT, load, and security testing.
Infrastructure (Hosting, Servers, Cloud)	₹15,00,000	Includes setup and deployment.
Project Management & BA Activities	₹25,00,000	Documentation, coordination, analysis.
Maintenance (1 Year Post Go-live)	₹10,00,000	Bug fixes and upgrades.
Training & CSR Workshops	₹10,00,000	End-user training for farmers.

Contingency (10%)	₹20,00,000	Risk buffer.
Total Estimated Cost	**₹1,80,00,000 (1.8 Crores)**	Within ₹2 Crore CSR budget.

Project Timeline (High-Level)

Phase	Duration	Key Deliverables
1. Requirement Analysis	2 months	BRD, SRS, Scope Approval
2. Design & Architecture	3 months	UI/UX, System Design
3. Development	7 months	Web & Mobile Modules
4. Testing (UAT & QA)	3 months	Test Reports, Fixes
5. Deployment & Training	2 months	Go-Live, User Training
6. Maintenance Phase	1 month	Support & Handover

Recommendation

Given the strong social impact, technical feasibility, and alignment with SOONY's CSR goals, it is recommended to approve and proceed with this project under close monitoring of scope, schedule, and adoption metrics.

The project is expected to:

- Digitally empower farmers in remote areas,
- Strengthen rural supply chains, and
- Enhance SOONY's CSR brand value.

Approval Section

Role	Name	Signature	Date
Project Sponsor	Mr. Henry	_____	_____
Financial Head	Mr. Pandu	_____	_____
Project Coordinator	Mr. Dooku	_____	_____
Delivery Head	Mr. Karthik	_____	_____
Project Manager	Mr. Vandanam	_____	_____

Prepared by:
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Date: 11-10-2025

Four SDLC Methods

What is SDLC?

SDLC (Software Development Life Cycle) is a step-by-step process followed to plan, design, develop, test, and deliver a software system.

It ensures the project is:

- Structured
- Time-bound
- Quality-controlled, and
- Aligned with user needs

The typical SDLC phases are:
Requirement Gathering → Design → Development → Testing → Deployment → Maintenance

Different methodologies define *how* these phases are executed.

Four SDLC Methodologies Explained

Sequential Model (Waterfall Model)

Concept:
Each phase is completed one after another — like a waterfall flowing downward.

Process Flow:

1. Requirements gathered completely upfront.
2. Design the full system.
3. Develop the application.
4. Test it only after development.
5. Deploy and maintain.

Advantages:

- Simple and easy to manage.
- Works well for small, stable projects with clear requirements.

Disadvantages:

- No flexibility once development starts.
- Changes or corrections are expensive.
- Testing happens late — so issues are found late.

Best For:
Government or fixed-scope projects where requirements never change.

Example: Building a payroll management system with predefined rules.

Iterative Model

Concept:
Software is developed in small portions (iterations). Each iteration adds more functionality.

Process Flow:

1. Define partial requirements.
2. Build a basic version (prototype).
3. Review and gather feedback.
4. Improve and add new features in the next iteration.

Advantages:

- Early feedback from users.
- Issues can be fixed quickly in the next cycle.
- Less risk compared to Waterfall.

Disadvantages:

- Requires more communication and planning.
- Can lead to scope expansion if not controlled.

Best For:
Projects where requirements are partially known and can evolve over time.

Example: Developing an online shopping module first, then adding payment and delivery later.

Evolutionary Model

Concept:
Build a prototype early, evolve it continuously based on user feedback, until it becomes the final system.

Process Flow:

1. Develop a prototype (working model).
2. Get user feedback (from farmers, for example).
3. Modify the system repeatedly until it meets all expectations.

Advantages:

- Users see a working model early.
- Requirements become clearer as system evolves.
- Reduces risk of building the “wrong product.”

Disadvantages:

- Time-consuming if changes continue indefinitely.
- Needs active involvement of users.

Best For:
Projects with uncertain or changing requirements and user-centric designs.

Example: Building the Online Agricultural Store — start with seed-purchase module → then add fertilizer, pesticide, and farmer support modules.

Agile Model

Concept:
Agile focuses on flexibility, collaboration, and incremental delivery.
The project is divided into short cycles called Sprints (2–4 weeks). Each sprint delivers a working product increment.

Process Flow:

1. Plan sprint goals.
2. Design and develop small features.
3. Test and demonstrate to stakeholders.
4. Incorporate feedback immediately.

Advantages:

- Rapid, continuous delivery of value.
- Highly adaptable to change.
- Stakeholders see progress frequently.
- Encourages teamwork and communication.

Disadvantages:

- Requires close coordination and skilled team members.
- Scope may expand if not monitored.

Best For:
Dynamic projects with changing requirements, continuous user feedback, and short release cycles.

Example: Developing the Agricultural App in multiple sprints:

- Sprint 1: User Registration & Login

- Sprint 2: Product Browsing
- Sprint 3: Payment Gateway
- Sprint 4: Order Tracking

Summary Comparison Table

Feature	Sequential	Iterative	Evolutionary	Agile
Approach	Step-by-step	Repeated cycles	Continuous evolution	Short sprints
Flexibility	Low	Medium	High	Very High
User Involvement	Low	Medium	High	Very High
Risk Level	High	Medium	Low	Low
Feedback Frequency	End of project	After each iteration	Continuous	Every sprint
Suitable For	Fixed scope	Evolving requirements	User-driven projects	Dynamic & collaborative teams

Recommended Approach for This Project

Given the project's nature:

- Multiple stakeholders (sponsor, farmers, tech team)
- Changing requirements from field feedback
- Focus on user-friendliness and adoption

Recommended Methodology: Agile (with Evolutionary elements)

This approach will:

- Deliver small usable features every few weeks.
- Allow early testing by farmers and stakeholders.
- Enable flexibility for enhancements (e.g., adding new products or payment options).
- Ensure better alignment with CSR goals and end-user satisfaction.

Conclusion:
Among the four SDLC methodologies —

- Sequential is rigid,
- Iterative and Evolutionary are more flexible,
- But Agile best suits this project's dynamic, user-centric, and CSR-driven goals.

Waterfall RUP Spiral and Scrum Models

Understanding SDLC Models

1. Waterfall Model (Sequential Model)

Overview:
The Waterfall model is a linear and sequential approach where each phase (Requirement → Design → Development → Testing → Deployment → Maintenance) must be completed before the next begins.

Key Features:

- Simple and easy to manage.
- Each phase has clearly defined deliverables.
- Best suited for projects with stable and well-defined requirements.

Pros:
Easy to plan and track progress.
Works well for small projects or government contracts.

Cons:
No flexibility to change requirements once development starts.
Testing comes late in the process, so issues may be found too late.

Example use: Banking systems, or compliance-heavy projects where requirements rarely change.

2. RUP (Rational Unified Process – Iterative Model)

Overview:
RUP is an iterative and incremental software development process created by IBM. It divides the project into four phases – Inception, Elaboration, Construction, and Transition.

Key Features:

- Iterations are used to refine and enhance the system progressively.
- Emphasizes risk management, architecture, and stakeholder involvement.
- Documentation and discipline similar to Waterfall, but with flexibility like Agile.

Pros:
Risk reduction through early prototyping.
Continuous improvement across iterations.
Clearly defined roles and artifacts.

Cons:
Can be complex and heavy in documentation.
Requires experienced teams to manage iterations effectively.

Example use: Large enterprise or government projects needing structure + flexibility.

3. Spiral Model (Evolutionary Model)

Overview:
The Spiral model combines Waterfall and Prototyping concepts. It is risk-driven and involves repetitive cycles (spirals) where each loop represents a project phase: planning, risk analysis, development, and evaluation.

Key Features:

- Focuses heavily on risk identification and mitigation.
- Uses prototyping to gather user feedback early.
- Suitable for large, complex, or high-risk projects.

Pros:
Early detection and handling of risks.
Customer feedback is incorporated continuously.
Flexible for requirement changes.

Cons:
Expensive and time-consuming.
Not ideal for small projects.

Example use: Defense, aerospace, or R&D projects where safety and reliability are critical.

4. Scrum Model (Agile Methodology)

Overview:
Scrum is an Agile framework focused on collaboration, flexibility, and delivering value quickly. Work is divided into short, time-boxed cycles called Sprints (typically 2–4 weeks).

Key Features:

- Self-organizing teams and frequent feedback loops.
- Daily Scrum meetings for coordination.
- Deliver working software incrementally.

Pros:
Adapts easily to requirement changes.
Delivers usable product quickly.
High customer satisfaction through regular demos.

Cons:
Requires active stakeholder involvement.
Less documentation; can be difficult for distributed teams.

Example use: Web applications, startups, or any product requiring frequent updates and flexibility.

Summary Comparison Table

Model	Nature	Flexibility	Risk Handling	Customer Involvement	Suitable For
Waterfall	Sequential	Low	Low	Low	Small, fixed-scope projects
RUP	Iterative	Medium	Medium	Medium	Large enterprise systems
Spiral	Evolutionary	High	Very High	High	High-risk, complex projects
Scrum (Agile)	Iterative & Incremental	Very High	Medium	Very High	Dynamic, changing projects

Conclusion (as BA Suggestion):
For Mr. Henry's Online Agricultural Product Store, the Scrum (Agile) model is most suitable. Because:

- Requirements may evolve (farmers' feedback, UI/UX needs, new suppliers).
- Quick delivery of working modules (e.g., product catalog, farmer login).
- Strong collaboration between SOONY Committee and APT IT team.

Waterfall Model vs V-Model

Aspect	Waterfall Model	V-Model (Verification & Validation Model)
Basic Concept	Linear and sequential model where each phase flows downward like a waterfall.	An extension of the Waterfall model where each development phase is directly associated with a testing phase (forming a "V" shape).
Process Flow	Steps proceed one after another — Requirements → Design → Development → Testing → Deployment.	Steps go down one side for verification (development) and come up the other side for validation (testing).
Testing Phase	Testing is done after the implementation phase.	Testing is planned in parallel with development — each stage has a corresponding test activity.

Focus	Focus is mainly on development activities.	Focus is on both development and testing equally.
Error Detection	Errors are found late in the testing phase.	Errors can be found early, as test cases are prepared during design stages.
Flexibility to Changes	Difficult to make changes once a phase is completed.	Also rigid, but slightly better control due to early test planning.
Customer Involvement	Involved mainly at the beginning (requirements) and at the end (delivery).	Involved at multiple stages — verification and validation.
Suitable For	Projects with clear, fixed requirements and no expected changes.	Projects requiring high reliability where testing is critical, like safety or medical systems.
Risk Handling	Risks are not explicitly handled.	Risks are managed better through early testing and validation.
Output Quality	Quality depends on final testing.	Higher quality due to continuous verification and validation.

Reason for Choosing the V-Model (Verification and Validation Model): Online Agricultural Products store

As the Business Analyst on this project, I support the committee's decision to use the V-Model because it provides a structured, disciplined, and quality-focused approach that suits the project's objectives, stakeholders, and development environment.

Clear and Well-Defined Requirements

- The business goals and product scope are already well-understood — to create an online platform connecting farmers with seed, fertilizer, and pesticide companies.
- Requirements are stable and unlikely to change frequently since the project is part of a CSR initiative with a fixed scope, budget (₹2 Crores), and timeline (18 months).
- The V-Model's sequential structure fits well when requirements are clear from the start.

Emphasis on Quality and Validation

- The project involves multiple user types — farmers, manufacturers, and administrators — who require error-free and reliable access to essential features like ordering and payments.
- The V-Model pairs each development phase with a corresponding testing phase, ensuring that:
    - Requirements are verified at every level.
    - Defects are caught early.
    - Each component is validated before moving to the next.

This ensures high-quality, stable delivery — critical for a public-facing system.

Suitable for Fixed Budget and Timeline

- Since the project is under CSR funding, both time and cost are tightly controlled.
- The V-Model allows predictable milestones and clear deliverables, helping the Project Manager (Mr. Vandanam) to:
    - Monitor progress phase by phase.
    - Manage resources efficiently.
    - Avoid scope creep or rework.

Early Test Planning

- In the V-Model, test cases are created during the requirements and design phases itself.
- This means the testing team (Jason and Alekya) can start preparing test scenarios early — reducing last-minute issues and ensuring that the final product meets expectations.

Traceability and Documentation

- The V-Model enforces strong documentation — SRS, design documents, test plans, and traceability matrices.
- This ensures:
    - Each requirement is traceable from design to deployment.
    - Easy tracking of compliance and validation.
    - Clear visibility for stakeholders like Mr. Henry and Mr. Pandu during reviews.

Low-Risk Approach for a First-Time Implementation

- This is the first digital platform for many of the target users (farmers and small manufacturers).
- The structured, phase-by-phase validation of the V-Model minimizes risk by ensuring that each feature is tested and verified before moving forward.

V-Model Approach Selected Phases: Online Agricultural Products store

V-Model Phase	Meaning
RG	Requirement Gathering
RA	Requirement Analysis
Design	System & Database Design
D1, T1	Development Phase 1 and Corresponding Testing Phase 1
D2, T2	Development Phase 2 and Testing Phase 2
D3, T3	Development Phase 3 and Testing Phase 3
D4, T4	Development Phase 4 and Testing Phase 4
UAT	User Acceptance Testing

Resource Roles in the Project

Role	Responsibility
Mr. Vandanam (PM)	Project planning, scheduling, monitoring, communication with stakeholders
Business Analyst (BA)	Requirement gathering, documentation, validation with users
Java Developers (Juhi, Teyson, Lucie, Tucker, Bravo)	Coding and implementation
Testers (Jason, Alekya)	Prepare and execute test cases for each testing phase
DB Admin (John)	Database design, setup, and maintenance
Network Admin (Mike)	Network, server setup, and connectivity support

Illustrative Gantt Chart Structure (V-Model)

(Assume total duration: ~18 months as per project scope)

Phase	Duration (Approx.)	Key Activities	Responsible Roles
RG – Requirement Gathering	1.5 months	Identify business needs, interview farmers & suppliers, collect requirements	BA, PM
RA – Requirement Analysis	1 month	Analyze requirements, prepare SRS, review with committee	BA, PM
Design	2 months	System design, architecture, DB schema, UI mockups	Developers, DB Admin, NW Admin
D1 – Core Module Development	2 months	Develop login, registration, basic dashboard	Java Devs
T1 – Unit & Integration Testing (D1)	1 month	Test login, registration, dashboard	Testers
D2 – Product Management Module	2 months	Product catalog, search & filter, company listings	Java Devs
T2 – Testing (D2)	1 month	Functional & integration testing for D2	Testers
D3 – Order & Payment Module	2 months	Shopping cart, checkout, payment gateway	Java Devs
T3 – Testing (D3)	1 month	Validate transactions, security tests	Testers
D4 – Delivery & Notification Module	1.5 months	Delivery tracking, farmer notifications	Java Devs
T4 – Testing (D4)	1 month	System testing, performance tests	Testers

UAT – User Acceptance Testing	1 month	End-user testing by committee & farmers	BA, PM, Testers
Deployment & Closure	0.5 months	Production setup, sign-off, documentation	PM, NW Admin, DB Admin

Dependency Flow (V-Model Mapping)

Verification Phase	Corresponding Validation Phase
RG ↔ UAT	Requirements validated by user acceptance
RA ↔ T4	System requirements verified during system testing
Design ↔ T3	Design verified via integration testing
D1 ↔ T1	Code units tested individually
D2 ↔ T2	Subsequent modules tested together

Highlights of this Plan

- The V-Model ensures that each development phase (D1–D4) has a corresponding testing phase (T1–T4).
- The BA and PM ensure that requirements are traceable from start (RG) to final validation (UAT).
- The Testers begin test planning during the requirement and design phases, not after coding, reducing defects later.
- The PM (Mr. Vandanam) tracks milestones via the Gantt chart to ensure timelines and dependencies are managed effectively.

Fixed Bid vs Billing: Online Agriculture Products Store

Fixed Bid Project (Fixed Price Project)

Definition:

A Fixed Bid project is one where the scope, cost, and timeline are agreed upon in advance. The vendor commits to deliver the complete project within a predefined budget and schedule, regardless of how much effort or time it actually takes.

Key Characteristics:

Aspect	Description
Scope	Clearly defined and fixed before development starts.
Budget	Fixed — cannot increase unless scope changes.
Timeline	Pre-decided and strictly monitored.
Risk	High for the **vendor/company** (since extra work = no extra pay).
Flexibility	Low — changes in requirements are difficult and require formal change requests.
Client Expectation	Client expects delivery within agreed cost and schedule.

Example:

Mr. Henry's Online Agricultural Product Store project is a Fixed Bid type —
Budget: ₹2 Crores, Duration: 18 months.
APT IT Solutions must deliver the system within that amount and time frame.

Billing Project (Time and Material Project)

Definition:

A Billing (or Time & Material) project is where the client pays for actual effort and resources used — typically hourly, weekly, or monthly rates for each resource (developer, tester, etc.).

Key Characteristics:

Aspect	Description
Scope	Flexible — can evolve as the project progresses.
Budget	Variable — depends on hours or resources consumed.
Timeline	Flexible; can extend based on changing needs.
Risk	High for the **client**, since cost may increase with time.
Flexibility	High — requirements can change anytime.
Client Expectation	Client gets control over priorities and iterations.

Example:

If APT IT Solutions were hired to build a prototype or ongoing enhancement of the platform where the client is billed monthly for developer hours — that would be a Billing project.

Quick Comparison Table

Feature	Fixed Bid Project	Billing (Time & Material) Project
Scope	Fixed and clearly defined	Flexible and evolving
Budget	Fixed	Variable (depends on hours/resources)
Timeline	Pre-decided	Adjustable
Risk	On vendor	On client
Change Requests	Formal process required	Easily accommodated
Best For	Projects with stable, well-known requirements	Projects with changing or unclear requirements
Example	CSR initiative with fixed cost	Product R&D or continuous improvement projects

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Timesheets of a Business Analyst in Various SDLC Stages: Online Agricultural Products Store

Design Phase Timesheet (BA)

Day	Activity Description	Hours Spent	Remarks
Day 1	Review finalized SRS and business requirements	2 hrs	Ensure alignment with stakeholder expectations
Day 2	Participate in high-level design meetings with architects	3 hrs	Discuss system flow and modules
Day 3	Create process flow diagrams and data flow diagrams (DFD)	4 hrs	Support design team documentation
Day 4	Validate wireframes / UI mockups	3 hrs	Check usability and functional alignment

Day 5	Update requirement traceability matrix (RTM)	2 hrs	Link design elements with requirements
	Total	**14 hrs/week (avg)**	—

BA Deliverables:

- Validated Design Documents
- Updated RTM
- Approved Wireframes
- Business Rule Verification

Development Phase Timesheet (BA)

Day	Activity Description	Hours Spent	Remarks
Day 1	Clarify business logic queries from developers	2 hrs	Continuous interaction with dev team
Day 2	Review development progress and compare with BRD	2 hrs	Ensure requirement coverage
Day 3	Participate in sprint review / walkthrough sessions	2 hrs	Provide feedback to development team
Day 4	Update change requests (if any)	3 hrs	Maintain version control
Day 5	Document clarification logs and update RTM	2 hrs	Maintain audit trail of clarifications
	Total	**11 hrs/week (avg)**	—

BA Deliverables:

- Clarification Log
- Updated BRD / Change Log
- Weekly Progress Reports
- Requirement Verification Checklist

Testing Phase Timesheet (BA)

Day	Activity Description	Hours Spent	Remarks

Day 1	Review Test Plans and Test Scenarios	2 hrs	Ensure coverage of all requirements
Day 2	Participate in Test Case Review meetings	2 hrs	Validate test cases align with BRD
Day 3	Support testers during defect triage	3 hrs	Clarify expected vs actual results
Day 4	Analyze defects raised and categorize (BA vs Dev issue)	3 hrs	Support RCA (root cause analysis)
Day 5	Update RTM post testing	2 hrs	Maintain traceability till closure
	Total	**12 hrs/week (avg)**	—

BA Deliverables:

- Reviewed Test Plan & Cases
- Defect Clarification Document
- Updated RTM
- Requirement Validation Report

User Acceptance Testing (UAT) Phase Timesheet (BA)

Day	Activity Description	Hours Spent	Remarks
Day 1	Prepare UAT plan and test data	2 hrs	Align with client's UAT scope
Day 2	Conduct UAT walkthrough with end users	3 hrs	Demonstrate workflows
Day 3	Record user feedback and issues	3 hrs	Maintain feedback log
Day 4	Validate fixes implemented from UAT feedback	2 hrs	Re-test resolved issues
Day 5	Prepare UAT summary and sign-off document	2 hrs	Obtain formal acceptance
	Total	**12 hrs/week (avg)**	—

BA Deliverables:

- UAT Plan & Checklist

- User Feedback Log
- UAT Sign-off Document
- Post-UAT Report

Deployment & Implementation Phase Timesheet (BA)

Day	Activity Description	Hours Spent	Remarks
Day 1	Coordinate go-live readiness meeting	2 hrs	Check deployment checklist
Day 2	Validate migrated data and configurations	2 hrs	Ensure accuracy after deployment
Day 3	Conduct end-user training sessions	3 hrs	Educate farmers and company users
Day 4	Support post-deployment issue resolution	3 hrs	Document any production bugs
Day 5	Prepare project closure & handover documents	2 hrs	Submit final BA deliverables
	Total	**12 hrs/week (avg)**	—

BA Deliverables:

- Go-Live Checklist
- Training Materials / FAQs
- Production Validation Report
- Project Closure Document

Summary of BA's Role Across SDLC

Phase	Key BA Focus Area	Main Deliverables
Design	Requirement Validation, Traceability	RTM, Wireframe Review
Development	Clarifications, Change Control	Clarification Logs, Change Requests
Testing	Validation & Defect Analysis	Test Case Reviews, RTM Updates
UAT	End-user Coordination	UAT Sign-off, Feedback Reports
Deployment	Transition & Training	Training Docs, Closure Report