Capstone Project 1 - Online Agriculture Store

Prepared by: Bhakti Nalawade

BA Training - COEPD

Question 1 - BPM - Identify Business Process Model for Online Agriculture Store - (Goal, Inputs, Resources, Outputs, activities, Value created to the end Customer)

Goal: Facilitate farmers to purchase seeds, fertilizers, and pesticides online.
Inputs: Product details from manufacturers, user registration, payment information.
Resources: Website/app, Java developers, testers, DB admin, network admin, delivery team.
Activities: Product upload → Browsing → Ordering → Payment → Delivery → Feedback.
Outputs: Confirmed order, invoices, delivered products.
Value Created: Easy access to quality products, time saving, improved crop yield for farmers.

Question 2 - SWOT Analysis - 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:
- Java-skilled team
- CSR support
- Known stakeholders
- Rural market opportunity

Weaknesses:
- Low tech-literacy of users
- Logistical challenges in rural areas

Opportunities:
- Digital India push
- Growing agri-tech market

- Future integration with logistics/AI

Threats:
- Competition from agri-tech startups
- Internet connectivity in villages
- Seasonal sales

Question 3 - Feasibility Study - 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.

Feasibility in Tech (Java), HW/SW, Trained Resources, Budget, Time

Hardware (HW): Servers, backup system, user devices (mobile/desktop), payment gateway integration.
Software (SW): Java-based backend, database (MySQL/Oracle), front-end (HTML/CSS/React), test tools.
Resources: Trained Java developers, testers, DB admin, network support team available.
Budget: ₹2 Crores - sufficient for a basic to mid-size web+mobile application.
Timeline: 18 months - reasonable for design, development, testing, UAT & deployment.

Question 4 - GAP Analysis - 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. Compare AS-IS and TO-BE process

AS-IS (Current Process)	TO-BE (Proposed Online System)
Manual purchase from retailers	Online ordering via web/mobile
Limited product availability	Wider range from multiple manufacturers
No price comparison	Transparent pricing & comparison
Time-consuming procurement	Doorstep delivery
No digital records	E-invoices, order history available

Question 5 - Risk Analysis - List down different risk factors that may be involved (BA Risks And process/Project Risks)

1. Business Analyst (BA) Risks

Risk Factor	Description	Impact	Mitigation Strategy
Incomplete Requirements	BA may not capture all user needs due to lack of clarity or stakeholder availability.	High	Conduct regular stakeholder interviews, workshops, and prototyping.
Misunderstanding of Domain	Lack of deep knowledge about agriculture domain may lead to incorrect assumptions.	Medium	Perform domain research, involve SMEs, and validate requirements.
Changing Requirements	Frequent updates or additions during project lifecycle.	High	Use change management process and document change requests properly.
Communication Gaps	Miscommunication between BA and stakeholders or dev team.	Medium	Maintain clear documentation (BRD, SRS), and conduct walkthroughs.
Lack of Stakeholder Involvement	Stakeholders may not actively participate in requirement elicitation.	High	Engage early and maintain regular communication through stand-ups, emails, or meetings.
Ambiguous Requirements	Vague language in requirements can cause wrong implementation.	High	Use SMART criteria for requirements: Specific, Measurable, Achievable, Relevant, Time-bound.
Inadequate Traceability	Requirements may not be mapped to test cases or functionality.	Medium	Use RTM (Requirement Traceability Matrix) to track coverage.
Inaccurate Estimation of Efforts	BA may underestimate or overestimate the time required for tasks.	Medium	Break tasks into subtasks and use past data for better estimation.

2. Process / Project Risks

Risk Factor	Description	Impact	Mitigation Strategy
Scope Creep	Adding features beyond original scope without proper analysis or approval.	High	Define scope clearly in BRD and control changes through CR process.
Delayed Deliverables	Project milestones may be missed due to dependencies or mismanagement.	High	Monitor via Gantt charts, regular sprint reviews, and buffer timelines.
Budget Overrun	Development or operations may exceed the initial budget.	High	Track spending regularly and plan contingency (10–15%).
Poor Quality Deliverables	Low testing or requirement gaps may lead to defects.	High	Ensure QA planning, BA support during testing, and UAT feedback.
Technology Limitations	Chosen tech stack may not support scalability or features.	Medium	Conduct technical feasibility study early in the project.
Data Security	Risk of data breach, especially with payment and personal info.	High	Use secure protocols (HTTPS), encryption, and compliance (PCI-DSS).
Resource Unavailability	Key team members may be unavailable or overloaded.	Medium	Identify backups and ensure task rotation.
Integration Failure	Failure to integrate with third-party tools like payment gateway or logistics.	Medium	Plan early integration testing and fall back options.
Regulatory Compliance	Not adhering to GST, FSSAI, or e-commerce laws.	Medium	Involve legal team in planning and review stage.

Question 6 - Stakeholder Analysis (RACI Matrix) - Perform stakeholder analysis (RACI Matrix) to find out the key stakeholders who can take Decisions and Who are the influencers

Project Activities	Mr. Henry	Mr. Pandu	Mr. Dooku	BA (Bhakti)	PM (Vandanam)	Dev Team	Testers	Peter, Kevin, Ben	Mr. Karthik
Business Case & CSR Funding Approval	A	C	C	I	I	I	I	I	R
Requirement Gathering	I	I	C	R	C	I	I	C	A
Finalizing Scope	A	C	C	R	A	I	I	C	C
Technical Solution Design	I	I	I	C	R	R	I	I	A
Budget Management	C	A	R	I	C	I	I	I	I
Development	I	I	I	C	R	R	I	I	A
Testing	I	I	I	C	C	C	R	I	A
UAT (User Acceptance Testing)	I	I	C	R	C	I	C	R	A
Deployment	I	I	I	I	R	R	C	I	A
Feedback Collection & Enhancement	C	I	C	R	C	C	C	R	A

Question 7 - Business Case Document - Help Mr Karthik to prepare a business case document

Project Title: Online Agriculture Store
Prepared By: Bhakti Nalawade
Date: [Today]
Version: 1.0

1. Executive Summary

The Online Agriculture Store aims to provide a centralized e-commerce platform for farmers, retailers, and agricultural suppliers to buy and sell farming products such as seeds, fertilizers, equipment, and organic produce. This digital platform will bridge the gap between rural producers and urban markets, encouraging fair trade, transparency, and ease of access.

2. Business Need / Problem Statement

Traditional agricultural markets involve middlemen, limited reach, delayed payments, and lack of transparency. Farmers and small suppliers face difficulties in accessing wider markets and getting fair prices. Urban buyers often lack direct access to farm-fresh produce and authentic products.
A digital solution is required to:

- Connect farmers directly to buyers.
- Improve supply chain efficiency.
- Offer convenient online shopping for agricultural inputs and produce.
- Digitally empower the agriculture ecosystem.

3. Project Objectives

- To create an e-commerce platform for agricultural products.
- To facilitate direct farmer-to-consumer (F2C) and farmer-to-business (F2B) transactions.
- To offer real-time product availability, secure payment, and delivery tracking.
- To enable user-friendly access via web and mobile.

4. Project Scope

In-Scope:

- Online store for seeds, fertilizers, tools, organic produce.
- User registration (Farmer, Buyer, Supplier).
- Product listing, cart, payment gateway.
- Order management and tracking.
- Admin panel for managing content, users, and orders.

Out-of-Scope:

- International shipping.
- Warehousing services.
- Loan and insurance integration.

5. Benefits Analysis

Benefit	Description	Type
Wider Reach	Farmers access national markets	Tangible
Cost Saving	Eliminates middlemen	Tangible
Transparency	Traceability of product origin	Intangible
Convenience	Online access and doorstep delivery	Intangible
Empowerment	Digitally literate rural economy	Intangible

6. Risk Analysis

Risk	Probability	Impact	Mitigation
Low adoption by farmers	Medium	High	Provide training and incentives
Technical glitches	Low	Medium	Proper QA & UAT
Payment issues	Medium	High	Use secure and proven gateways
Logistics delay	Medium	Medium	Partner with reliable couriers

7. Financial Analysis / Cost Estimate

Item	Estimated Cost (INR)
Development (Web + Mobile)	₹8,00,000
Hosting and Maintenance	₹1,50,000/year
Marketing and Promotion	₹2,00,000
Training & Support	₹50,000
Total Estimate	**₹12,00,000**

8. Feasibility Study Summary

- **Technical Feasibility:** Use of standard tech stack (e.g., MERN / LAMP / Flutter) ensures smooth development and scalability.
- **Operational Feasibility:** Easy to operate with training; expected high usage by farmers with mobile access.
- **Economic Feasibility:** ROI expected in 2–3 years via commissions and ad placements.
- **Legal Feasibility:** Follows Indian e-commerce, GST, and consumer rights laws.

9. Stakeholders

Stakeholder	Role
Farmers	Product Suppliers
Consumers	End Buyers
Admin	Platform Operator
Delivery Partners	Fulfillment
Technical Team	Development & Maintenance

10. Recommendation

The proposed Online Agriculture Store is a strategically aligned project that fulfils a growing need in the agri-tech sector. It is recommended to move forward with design and development phases with initial rollout in targeted regions.

11. Approval Sign-Off

Name	Designation	Signature	Date
Bhakti nalawade	Business Analyst		Today
Satish K	Sponsor		Today
Sharad Dabhade	PM		Today

Question 8 - Four SDLC Methodologies - 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

Mr. Karthik provided an insightful explanation to Mr. Henry and the committee members—Mr. Pandu and Mr. Doku—about the Software Development Life Cycle (SDLC) and its four key methodologies: Sequential, Iterative, Evolutionary, and Agile. Here's a brief overview of each methodology to provide clarity on the approaches:

1. Sequential Methodology (Waterfall Model)

Definition: A linear and structured approach where each phase (requirement gathering, design, development, testing, deployment, and maintenance) is completed fully before moving to the next.

Best For: Projects with well-defined, stable requirements.

Pros:

Simple to understand and manage.

Clear documentation at every phase.

Cons:

No flexibility to go back and make changes.

Risk of late discovery of issues or requirement gaps.

2. Iterative Methodology

Definition: A repetitive process where the software is developed and refined through repeated cycles (iterations), allowing feedback at each stage.

Best For: Projects where requirements are expected to evolve or are not fully known upfront.

Pros:

Allows partial implementation and early validation.

Continuous improvement possible with each iteration.

Cons:

May require more resources.

Planning and design changes can be frequent and complex.

3. Evolutionary Methodology

Definition: Focuses on developing an initial version (prototype or minimal version) and then gradually improving it based on user feedback and evolving needs.

Best For: Projects with high user involvement or emerging technologies.

Pros:

High customer engagement.

Flexible and adaptive to change.

Cons:

Scope creep is a risk.

Difficult to manage unless tightly controlled.

4. Agile Methodology

Definition: A flexible and collaborative approach that breaks the project into small, manageable units called sprints or iterations, with regular reviews and changes based on customer feedback.

Best For: Dynamic projects with fast-changing requirements.

Pros:

1. Rapid delivery and adaptability.

2. Customer involvement ensures alignment with expectations.

Cons:

1. Requires experienced team members.

2. Needs active stakeholder involvement and time commitment.

Conclusion:

Mr. Karthik helped the team understand that each methodology has its strengths and ideal use cases. The choice of SDLC model depends on various factors like the clarity of requirements, time constraints, project complexity, customer involvement, and resource availability. By understanding these methodologies, the committee can make informed decisions about the best-fit approach for their specific project.

Question 9 - Waterfall, RUP, Spiral, Scrum Models - They discussed models in SDLC like waterfall RUP Spiral and Scrum . You put forth your understanding on these models

Model	Definition	Pros	Cons
Waterfall	Linear phase-wise model	Simple, easy to manage	No flexibility after design
RUP (Rational Unified Process)	Iterative framework with roles and workflows	Customizable, object-oriented	Complex, needs skilled team
Spiral	Combines iterative model with risk handling	Risk reduction	Costly, complex
Scrum	Agile framework with sprints, roles (Scrum Master, Product Owner)	Rapid delivery, customer involvement	Needs high collaboration, not good for unclear teams

Question 10 - Waterfall vs V-Model - Write down the differences between waterfall model and V model. When the APT IT SOLUTIONS company got the project to make this online agriculture product store, there is a difference of opinion between a couple of SMEs and the project team regarding which methodology would be more suitable for this project. SMEs are stressing on using the V model and the project team is leaning more onto the side of waterfall model. As a business analyst, which methodology do you think would be better for this project?

Ans - I would choose the V-Model as it aligns with stable requirements and provides parallel test planning.
It supports early defect detection and traceability, which is important for stakeholder confidence in rural digital initiatives.

Aspect	Waterfall	V-Model
Testing	Done after development	Testing planned in parallel for each stage
Structure	Linear	V-shaped (validation & verification at each level)
Flexibility	Low	Slightly better with early testing
Risk Management	Late error detection	Early error detection
Suitability	Small projects	Medium to large, critical systems

Question 11 - Justify Model Choice - As a BA, state your reason for choosing one model for this project.

I would support V-Model because:

1. Requirements are stable.
2. Parallel test planning allows early defect detection.
3. Project is of medium complexity.
4. Critical application as it directly affects farmers' livelihood.
5. Also, it fits well with the structured, documented style expected by SMEs and stakeholders.

Question 12 - Gantt Chart - The Committee of Mr. Henry, Mr Pandu, and Mr Dooku discussed with Mr Karthik and finalized 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.

Project Timeline (18 Months Approx):

Phases → RG, RA, Design, D1, T1, D2, T2, D3, T3, D4, T4, UAT

RG (Requirement Gathering): Month 1-2
RA (Requirement Analysis): Month 3-4
Design: Month 5-6-7
D1 & T1: Month 8-9
D2 & T2: Month 10-11

D3 & T3: Month 12-13
D4 & T4: Month 14-15
UAT: Month 16-17-18

Month :	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
RG																		
RA																		
DESIGN																		
D1																		
T1																		
D2																		
T2																		
D3																		
T3																		
D4																		
T4																		
UAT																		

Resources: PM, BA, Java Developers, Testers, DB Admin, Network Admin
Each phase overlaps slightly to ensure smooth handoff and accountability.

Resources:
PM – Whole duration
BA – RG to T2
Dev Team – D1 to D4
Testers – T1 to T4, UAT
DB Admin/NW Admin – During Design, D2, D4, UAT

Question 13 - Fixed Bid vs Billing - Explain the difference between Fixed Bid and Billing projects

Fixed Bid Project:
- Predetermined cost and scope.
- Vendor bears the risk.
- Suitable when scope is clearly defined.

Billing-Based Project (Time & Material):
- Cost based on actual hours/resources used.
- Client bears the risk.
- Suitable for evolving or R&D projects.

In this Capstone case, Fixed Bid fits better as the budget is ₹2 Cr with a clear CSR goal and timeline. Fixed Bid is preferred due to defined budget and CSR nature.

Question 14 - BA Timesheets in SDLC –

➢ Design Timesheet of a BA

➢ Development Timesheet of a BA

➢ Testing Timesheet of a BA

➢ UAT Timesheet of a BA

➢ Deployment n Implementation Timesheet of a BA

Phase	Activity	Hours/Week	Deliverables
1. Design Phase	Requirement Gathering	10 hrs	Meeting notes, stakeholder feedback
	Preparing BRD, FRD, Use Cases	15 hrs	BRD, FRD, Use Case Diagrams
	Reviewing Requirements with Stakeholders	5 hrs	Sign-off document, Review Reports
	Participating in Design Discussions	5 hrs	Wireframes, Design Alignment Checklist
Total		**35 hrs/week**	
2. Development Phase	Clarifying Requirements to Developers	10 hrs	Change Logs, Clarification Documents
	Participating in Scrum/Stand-up Calls	5 hrs	Sprint Notes, Daily Logs
	Reviewing Feature Progress	10 hrs	Review Reports, Compliance Checklists
	Documenting Change	5 hrs	CR Log

Phase	Activity	Hours/Week	Deliverables
	Requests		
Total		**30 hrs/week**	
3. Testing Phase	Creating/Reviewing Test Scenarios	10 hrs	RTM, Test Case Traceability
	Supporting QA During Testing	10 hrs	Defect Clarification Notes
	Attending Defect Review Meetings	5 hrs	Bug Reports, Priority Notes
	Ensuring Requirements-Test Case Alignment	5 hrs	Final RTM
Total		**30 hrs/week**	
4. UAT Phase	Coordinating with Business Users for UAT	10 hrs	UAT Plan, Schedule
	Collecting Feedback from Stakeholders	10 hrs	UAT Feedback Sheet
	Assisting in Logging UAT Defects	5 hrs	UAT Defect Log
	Preparing Final Sign-off Document	5 hrs	UAT Closure Report
Total		**30 hrs/week**	
5. Deployment & Implementation	Preparing Training Manuals	8 hrs	User Manuals, FAQs
	Conducting End-User Training	10 hrs	Training Attendance Report
	Supporting Go-Live	10 hrs	Go-Live Checklist, Issue Tracker
	Handling Post-Go-Live Issues	7 hrs	Support Log, Feedback Forms
Total		**35 hrs/week**	