Capstone Project 1- Prep 1/3 – Online Agriculture Store

Question 1: BPM

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

Answer:

1. Goal: To develop a user-friendly Online Web / mobile Application agriculture product store to facilitate remote farmers to buy agriculture products directly from manufacturers, which should be easy to access and efficient in agriculture procurement.

2. Inputs:

Stakeholder and business needs   
IT assets   
Budgetary constraints and regulatory adherence

3. Resources:

Technology  
Human resources like Developer, Tester, BA, PM, Admin etc  
Infrastructure like database, cloud, server, security  
Consistent inputs of stakeholders

4. Outputs: An effective online store featuring communication, order tracking, and product listings.  
Smooth interactions between farmers and manufacturers

5. Actions:  
A prerequisite: Determine the main requirements of farmers and manufacturers  
Design and Development of application  
Testing and Validation  
Deployment

User Training to farmers and manufacturing company.  
Maintenance of application and updated features.

6. Value addition to Farmer:  
Easy access to seeds, pesticides, fertilizers and other agriculture products. Affordable.  
Direct communication with the manufacturer, middle-man expenditure saved.  
This user-friendly app will save efforts, removes struggle occurred due to manual procedure.

Value addition to Manufacturer:

Accessible, affordable and efficient inventory model

No struggle to get customers.

Will get Live inventory update which makes product requirement forecasting easy.

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.

Answer:

1. Strengths:

Technical team with expertise in JAVA, Testing, Networking and Admin.

Stakeholders have made their business requirements clear.

Good timeframe of 18 months and budget of Rs.2 crore.

Great social impact that helps farmers.

Increasing demand for digital agricultural solutions in the market.

Government appreciating such innovative projects which are digitally helping farmers.

1. Weaknesses:

Complicated supply chain integration with logistics and manufacturers.

Farmers may find it difficult to adopt new technologies.

Dependency on internet at remote locations.

Agricultural regulations must be followed.

Laack of agri-tech experience. (if we are taking agri-tech project first time)

1. Opportunities:

Agri-digitalization is supported by the Government and private sectors.

Future expansion into farm equipment and agriculture advisory services.

Success in Agri-tech project would grand benefit APT IT solution to get recognised as Agri-tech solution leader.

Collaborations with financial organizations to help farmers to get loans to buy agri-products from our online application.

1. Threats:

Possibility of project delays due to external factors such as change in government regulations into agriculture.

Challenges by competitors.

Farmers are used to with conventional practices thus they may not adopt new technology easily.

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.

Technical Feasibility:

1. Hardware:

Storage-Database servers.

Server Infrastructure-Cloud-based or on-premise servers.

Networking & Security

2. Software:

MySQL & Cassandra for database, React/Angular for frontend, and Java (Spring Boot) for backend.

APIs & Integration: email/SMS alerts, logistics tracking, and payment gateways.

Web & Mobile Compatibility

Security measures.

Economic Feasibility:

Client’s Budge is Rs.2 Crores.

Development costs include salaries for project staff, developers, and testers.

Infrastructure expenses include servers, cloud storage, and security configuration. Expenses for software licensing and APIs.

Expenses for training to Farmers.

Operational Feasibility:

Time Frame given by Client is 18 Months  
Phase 1 4 months: Requirement gathering, UI/UX design, system architecture  
Phase 2 8 months: Development of web & mobile applications, database setup.  
Phase 3 4 months: Testing, bug fixes, and security audits.  
Phase 4 months: Deployment, user training, and post-launch support.

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

Answer:

Product Procurement:

AS-IS: Farmers depend on middlemen and have limited product availability as they struggle to find pesticides, fertilizers, and seeds.

TO-BE: The online store provides a large selection of goods at affordable costs, allowing direct access to manufacturers.

Ordering & Delivery

AS-IS: Farmers have to travel to suppliers, which results in untracked orders and time-consuming procurement.

TO-BE: Online ordering from any location, with doorstep delivery and real-time tracking.

AS-IS: Expensive because of middlemen, cash transactions, and lack of financing support.

TO-BE: Future plans include safe online payment methods (such as COD, bank transfer, and UPI), and the possibility of agri-loans.

Communication & Support:

AS-IS: Farmers don't have direct contact with manufacturers and rarely have access to product details prior to purchase.

TO-BE: Comprehensive product details, user reviews, live chat, and customer support

Question5: List down different risk factors that may be involved (BA Risks And process/Project Risks)

Answer:

BA Risks:

Missing functionalities could result from incomplete or evolving requirements.

Decisions may be delayed due to stakeholder disputes between the committee, farmers, and manufacturers.

Compliance and product sales may be impacted by regulatory issues.

Adoption issues for users because farmers may find technology difficult to use.

Process Risks:

Delays in deliveries and logistical problems may result from a complex supply chain.

Poor digital infrastructure causes payment failures in rural areas, and problems with internet connectivity may restrict platform access.

Information about farmers and manufacturers must be strongly protected from data security threats.

Issues with product quality and return handling need to be addressed.

Project Execution Risk:

Overruns in the budget because of unforeseen expenses or changes in the scope.

Delays in the timeline if development, testing, or approvals take longer than anticipated.

Difficulties integrating logistics, regulatory systems, and payment gateways.

Team availability issues of resources could slow down project progress.

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

Answer:

Responsible – R-who are responsible for execution tasks

Mr. Vandanam is Project Manager who keeps an eye on project execution.  
Ms. Juhi is Senior Java Developer & Mr Teyson, Ms Lucie, Mr Tucker, Mr Bravo are Java Developers who are responsible for coding and development of app  
Network Admin is Mr. Mike & DB Admin is Mr. John responsible for infrastructure and database management.

Mr. Jason & Ms. Alekya is from testing team responsible for quality assurance

Accountable – A- these are decision makers

Mr. Henry is Project Owner accountable for final project approval (sign off)

Mr. Pandu is Financial Head from Client accountable for Budget and financial decisions.

Mr. Karthik is Delivery Head from APT IT solutions accountable for overall project execution and delivery.

Consulted – C- these are the people from whom we take opinion for the betterment of app

Peter, Kevin, Ben are Farmer Representatives who provide insights on farmer requirement.

Mr. Dooku is a Project Coordinator. He facilitates coordination between SOONY and APT IT SOLUTIONS.

Project Team from APT IT SOLUTIONS shares technical feasibility insights.

Informed- I – these are the stakeholders to whom we inform about high end update

Farmers and Manufacturing organizations are End Users. We keep them updated about the platform’s progress and usability.

Question 7: Business Case Document:

Help Mr Karthik to prepare a business case document

Answer:

Executive Summary of Project

The Online Agriculture Store is an initiative by Mr. Henry under SOONY’s CSR program with a budget of Rs.2 Crores and a timeline of 18 months. The goal is to eliminate middlemen and provide farmers direct access to manufacturers of fertilizers, seeds, and pesticides through an online platform.  
  
  
Key Business Problem:

Farmers face high costs, supply shortages, and logistics challenges.  
Lack of price transparency, digital payment options, and product awareness.

Proposed Solution:  
User-friendly e-commerce platform for direct manufacturer-farmer transactions.  
Real-time order tracking, multiple payment options, and multilingual support.  
Fair pricing, reduced procurement time, and better accessibility.

Feasibility & Risks:

Technology Feasibility: Java-based platform with cloud hosting.

Financial Feasibility: ₹2 Crore budget allocated for development and operations.

Operational feasibility: Skilled technical team

Risks: Payment failures, security threats, supply chain delays, and usability issues

Solution: Mitigated through strategic planning.

Project Execution Plan: (18 months)

Phase 1 (0-3 Months): Requirement gathering & platform design.

Phase 2 (3-9 Months): Development & testing of core features.

Phase 3 (9-12 Months): Pilot launch with selected farmers.

Phase 4 (12-18 Months): Full-scale rollout, marketing, and feedback-driven improvements.

Conclusion & Recommendation:

The Online Agriculture Store will empower farmers, improve agricultural procurement, and enhance supply chain efficiency. With SOONY’s financial backing and APT IT SOLUTIONS' technical expertise, this project is viable and impactful. It is recommended to proceed with the project initiation and begin Phase 1 immediately

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

Answer:

Waterfall Model(Sequential):

Each phase (Requirement, Design, Development, Testing, Deployment, and Maintenance) must be finished before going on to the next in this methodical and sequential approach.

Ideal for clear, consistent requirements that don't change much.

Pros: Timeliness, ease of management, and clear documentation.

Cons: Non flexible, once development begins, it is hard to adapt.

The Iterative:

After each iteration, feedback is incorporated into the software, which is developed and released in small cycles.

Ideal for: Projects with changing requirements.

Pros: enables early product delivery, adapts to modifications and reduce risk.

Cons: May cause scope creep as constant ongoing stakeholder involvement is required.

Evolution:

Begins with a functionally basic version and gradually enhances it based on user input and improvements.  
Ideal for Projects that require a rapid MVP (Minimum Viable Product) and ongoing improvement

Pros: quicker time to market, adaptability to user needs, and incremental improvements.

Cons: Needs continuous development resources and user feedback cycles

The Agile Model:

A very adaptable and flexible approach in which development takes place in brief sprints (one to four weeks), with regular reviews and real-time cooperation.  
Ideal for: Complex and dynamic projects that require constant modification.  
Pros: quicker time to market, a focus on the customer, and a high degree of adaptability.

Cons: the need for close teamwork and the potential for scope changes to raise project costs.

Question 9: Waterfall RUP Spiral and Scrum Models

They discussed models in SDLC like waterfall RUP Spiral and Scrum . You put forth your understanding on these models When the APT IT SOLUTIONS company got the project to make this online agriculture product store, there is a difference of opinion between a couple of SMEs and the project team regarding which methodology would be more suitable for this project. SMEs are stressing on using the V model and the project team is leaning more onto the side of waterfall mode

Answer:

Clients were explained about four SDLC model:

Waterfall Model: A linear approach, best for well-defined projects with minimal changes but lacks flexibility.

RUP (Rational Unified Process): An iterative model balancing structure and adaptability, suited for medium to large projects.

Spiral Model: A risk-driven iterative approach, ideal for complex projects with evolving requirements but costly.

Scrum (Agile Framework): A flexible, fast-paced approach, best for dynamic projects needing frequent updates.

I would recommend V-Model is a better choice than the Waterfall Model

Reasons:  
Early testing lowers future risks by identifying flaws early.   
Improved quality gaurantees that there is a testing phase for each stage of development.   
Reduced Rework: Validation occurs early, preventing problems at the last minute.

However, if requirements are 100% fixed and no major changes are expected, Waterfall could work. But given that user needs might evolve, V-Model provides better risk control.

Question10: Write down the differences between waterfall model and V model.

Answer:

Development Method: V-Model is V-shaped with parallel testing, whereas Waterfall is sequential and linear.

Testing: V-Model tests at every stage, while Waterfall tests after development.

Flexibility: Waterfall is rigid and makes modifications challenging. The V-Model can detect defects early, it is flexible than waterfall model.

Risk management: V-Model tackles risks early, whereas Waterfall detects them later.

Error Detection: V-Model detects errors early, minimizing rework, whereas Waterfall detects errors late, raising costs.

Cost & Time Efficiency: V-Model saves cost by identifying problems early, whereas waterfall can be costly if flaws appear later.

Best Suitable For: V-Model is best suited for important, high-quality projects, while Waterfall works for stable, straightforward projects.

Project Complexity: V-Model works well for intricate, safety-critical applications, while Waterfall is best for simple projects.

When to use: Waterfall for simple, predictable projects and V-Model for complex, high-risk projects needing continuous validation.

Question 11: As a BA, state your reason for choosing one model for this project

Answer:

For the following reasons, as a business analyst, I advise applying the V-Model (Verification & Validation Model) to this Online Agriculture Product Store project  
  
Early testing at every stage will assist in identifying flaws prior to development completion, as this platform will manage inventory, logistics, and financial transactions.  
  
This system will be used by farmers and manufacturers to supply vital agricultural products. It is essential to continuously validate the system to ensure that it is stable and free of bugs.  
  
The structured V-Model works better because the project's requirements such as buying and selling agricultural products are clearly stated.  
  
The V-Model permits testing at every stage, lowering the likelihood of costly rework. This is in contrast to Waterfall, where flaws are discovered later.

Question13: Explain the difference between Fixed Bid and Billing projects

Answer:

Billing (Time &Material) expenses change according to the amount of work completed, whereas Fixed Bid has a set budget.

Billing permits continuous scope modifications, while Fixed Bid enforces stringent scope control.

The client assumes cost risks in billing, while the vendor assumes cost risks in fixed bid.

Billing works best for long-term or evolving projects, while fixed bid works best for clearly defined projects.  
Method of billing in Fixed Bid is predetermined when in Billing actual work hours and resources are used to determine billing.

Billing has flexible timelines, while Fixed Bid adheres to rigid deadlines.  
Resource Allocation in Billing permits dynamic adjustments, while Fixed Bid has pre-allocated resources.  
Client Involvement while billing requires active participation, fixed bid requires little client input.

Billing enables real-time feedback based on quality, while fixed bid guarantees quality within budget.

Fixed Bid used for predictable projects, Billing for ongoing or changing projects.

Question 14: Question 14 – Preparer Timesheets of a BA in various stages of 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

Below is the timesheet breakdown of a Business Analyst (BA) in different stages of the Software Development Life Cycle (SDLC).

1. **Design Timesheet of a BA**

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Estimated Hours** |
| Requirement Gathering | Meeting with stakeholders (Mr. Henry, Peter, Kevin, Ben, Committee, Project Manager) to gather requirements | 12 |
| Business Requirement Document (BRD) | Documenting business requirements and functional specifications | 16 |
| Use Case Diagrams | Creating use case diagrams to define system interactions | 10 |
| Workflow Diagrams | Preparing process flows for the application | 8 |
| Review & Approval | Reviewing documents with stakeholders and getting approvals | 6 |

**2.Development Timesheet for BA**

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Estimated Hours** |
| Requirement Clarifications | Addressing queries from developers regarding requirements | 8 |
| User Story Refinement | Breaking down requirements into detailed user stories | 10 |
| Backlog Grooming | Prioritizing features and assisting in sprint planning | 6 |
| Coordination with Developers | Ensuring developers understand business logic | 8 |
| Review & Feedback | Validating early-stage development progress | 6 |

1. **Testing timesheet for BA**

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Estimated Hours** |
| Test Case Review | Reviewing test cases created by testers | 6 |
| Requirement Traceability | Ensuring test cases align with requirements | 8 |
| Defect Triage | Analyzing reported defects and clarifying expected behavior | 10 |
| UAT Support Preparation | Preparing for user acceptance testing (UAT) | 6 |
| Coordination with QA Team | Ensuring proper test execution and defect resolution | 8 |

1. **UAT timesheet for BA**

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Estimated Hours** |
| UAT Test Planning | Planning UAT with stakeholders | 8 |
| UAT Execution Support | Assisting stakeholders in executing UAT test cases | 10 |
| Defect Resolution Support | Clarifying business rules for fixing UAT defects | 6 |
| Stakeholder Feedback Gathering | Collecting feedback and suggesting improvements | 6 |
| Final Approval | Ensuring stakeholders sign off on UAT | 6 |

1. **Deployment timesheet for BA**

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Estimated Hours** |
| Go-Live Checklist Review | Ensuring all pre-deployment activities are complete | 6 |
| Training & Documentation | Preparing user manuals and training farmers on the system | 12 |
| Deployment Monitoring | Ensuring successful deployment with minimal issues | 8 |
| Post-Go-Live Support | Assisting users with queries and addressing minor fixes | 10 |
| Final Project Closure | Closing project documentation and gathering feedback | 6 |

**Always keep buffer while preparing for project timeline. Ideally it should be 30-40 percent and may vary according to complexity of project.**

|  |
| --- |
| Delays as stakeholders not available |
| Delays in approval |
| Downtime |
| Tech issues |
| Ambiguity with requirements |
| Market intel |
| Complexity |
| Buffer time keep between 30% to 40%  Rough Estimation:  4 months(Design) + 8 months (Deployment) + 4 months (Testing) + 2 months (Deployment) = 18 months |

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.

Answer:

|  |  |  |  |
| --- | --- | --- | --- |
| **Phase** | **Resources** | **Start Date** | **End Date** |
| RG (Requirement Gathering) | PM, BA |  |  |
| RA (Requirement Analysis) | PM, BA |  |  |
| Design | BA, Java Developers, DB Admin, NW Admin |  |  |
| D1 (Development Phase 1) | Java Developers, DB Admin, NW Admin |  |  |
| T1 (Testing Phase 1) | Testers, BA |  |  |
| D2 (Development Phase 2) | Java Developers, DB Admin, NW Admin |  |  |
| T2 (Testing Phase 2) | Testers, BA |  |  |
| D3 (Development Phase 3) | Java Developers, DB Admin, NW Admin |  |  |
| T3 (Testing Phase 3) | Testers, BA |  |  |
| D4 (Development Phase 4) | Java Developers, DB Admin, NW Admin |  |  |
| T4 (Testing Phase 4) | Testers, BA |  |  |
| UAT (User Acceptance Testing) | BA, Testers, Stakeholders |  |  |