**Nurturing Process - Capstone Project1 – Part -1/3 V2D1- Mar2024**

**Online Agriculture Products Store**

Question 1 – BPM - 5 Marks

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

**Answer**-

**Goal**- To bridge the gap between buyers (farmers) and sellers (manufacturers)

**Inputs**- Availing services to the farmers in the form of seeds, pesticides and fertilizers.

**Resources**- Warehouse, application software, office spaces.

**Outputs**- Generating revenue and supporting remote farmers.

**Activities**- Excellent customer service, providing the best services to the client.

**Value**- Customer satisfaction, helping farmers.

Question 2 – SWOT - 5 Marks

Mr. Karthik is doing SWOT analysis before he accepts this project. What Aspects he Should consider as Strengths, as Weaknesses, as Opportunity and as Threats.

**Answer**

**Strength (S)- >** Strong brand recognition

 > Supplying items and services to remote locations.

**Weaknesses**- > Dependencies on external vendors (manufacturers)

 > Difficulties in reaching the remote locations.

**Opportunities**- > Expansion in supplying the best services to the buyers (farmers)

 > Expansion in the market

**Threats**- > Changes in seasonal demands

 > Customers' consistency in buying the products

Question 3 – Feasibility study - 5 Marks

Mr Karthik is trying to do feasibility study on doing this project in Technology (Java), Please help him with points (HW SW Trained Resources Budget Time frame) to consider in feasibility Study.

**Answer**

**Technology**- Payment gateways, user-friendly mobile application development (JAVA).

**Hardware**- Network infrastructure, storage of product details, security hardware.

**Software**- Product management, payment gateways, shopping cart software.

**Resources**- Project management team, Business Analyst, software developers, testers.

**Budget**- Software licensing, infrastructure setup, marketing and training, development and engineering costs.

**Time** **Frame**- Based on the time given to the project, starting from gathering requirements to the development and maintenance.

Question 4 – Gap Analysis - 5 Marks

Mr Karthik must submit Gap Analysis to Mr Henry to convince to initiate this project. What points (compare AS-IS existing process with TO-BE future Process) to showcase in the GAP Analysis

**Answer**

**Current** **State (AS IS)**- > Farmers struggle to find fertilizers and pesticides in remote areas.

 > Farmers need to travel a long distance to buy farming supplies.

 > Farmers transport goods themselves, causing delays.

 > Farmers lack awareness about online purchasing options.

**Desired State (TO BE)**- > Farmers can browse and purchase products online through their mobile phones from multiple suppliers.

 > Farmers can order products online anytime, anywhere.

 > Doorstep delivery of products.

 > User-friendly mobile application with multilingual support.

Question 5 – Risk Analysis - 10 Marks

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

**Answer- Internal Risk**

> Resources may be busy with other projects, causing the delay.

> Unexpected cost may exceed the allocated 2 Cr. INR budget.

> Server crashes, downtime.

> Poor communication between the project team and stakeholders.

**External Risk**

> Farmers may have limited access to a stable internet connection for application usage.

> Other Agri tech startups or e-commerce may enter the market.

> Manufacturers ar delivery providers may fail to meet the demands and supply.

**BA Risk**

> Incomplete requirement gathering resulting in delay in implementation.

> Farmers' needs may not be fully understood or addressed.

**Project-Based Risk**

> Coding, testing and integration phases may take longer than planned.

> Issues while connecting payment gateways, logistics tracking and inventory system.

> Slow application performance due to high traffic.

> Incomplete testing could lead to critical bugs in production.

Question 6 – Stakeholder Analysis (RACI Matrix) - 8 Marks

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

**Answer**

|  |  |  |
| --- | --- | --- |
| RACI | Name of Stakeholder | Designation |
| Responsible  | Mr. HenryMr. PanduMr. DookuMs. ManjuMs. JuhiMr. TeysonMs. LucieMr. TuckerMr. BravoMr. JasonMs. AlekyaMr. Karthik | SponsorFinancial HeadProject CoordinatorBusiness Analyst Senior JAVA DeveloperJAVA DeveloperJAVA DeveloperJAVA DeveloperJAVA DeveloperTesterTesterDelivery Head |
| Accountable | Mr. HenryMr. PanduMr. DookuMs. ManjuMs. JuhiMr. TeysonMs. LucieMr. TuckerMr. BravoMr. JasonMs. AlekyaMr. KarthikFarmers | SponsorFinancial HeadProject CoordinatorBusiness AnalystSenior JAVA DeveloperJAVA DeveloperJAVA DeveloperJAVA DeveloperJAVA DeveloperTesterTesterDelivery HeadEnd Users |
| Consulted | Ms. ManjuMr. PanduMr. DookuMr. JasonMs. AlekyaMr. KarthikMs. JuhiMr. TeysonMs. LucieMr. TuckerMr. BravoMr. JasonMs. AlekyaMs. ManjuMr. Vandanam | Business Analyst Financial HeadProject CoordinatorTesterTesterDelivery HeadSenior JAVA DeveloperJAVA DeveloperJAVA DeveloperJAVA DeveloperJAVA DeveloperTesterTesterBusiness AnalystProject Manager  |
| Informed | Mr. HenryMr. PanduMr. DookuMs. ManjuMs. JuhiMr. TeysonMs. LucieMr. TuckerMr. BravoMr. JasonMs. AlekyaMr. Karthik | SponsorFinancial HeadProject Coordinator Business Analyst Senior JAVA DeveloperJAVA DeveloperJAVA DeveloperJAVA DeveloperJAVA DeveloperTesterTesterDelivery Head  |

Question 7 – Business Case Document - 8 Marks

Help Mr Karthik to prepare a business case document

**Answer**

Business Case Document

Project Name: Online Agriculture Product Store

Prepared By: Mr. Karthik (Delivery Head)

**1. Why is this project initiated?**

This project is initiated to solve the difficulties faced by farmers in procuring essential agricultural products like fertilizers, seeds, and pesticides. The initiative aims to build an online web/mobile application to enable farmers to buy agricultural supplies directly from manufacturers, eliminating supply chain inefficiencies and improving accessibility for remote area farmers.

**2. What are the current problems?**

* Farmers in remote areas struggle to procure fertilizers, seeds, and pesticides due to distance and lack of supply chain infrastructure.
* Manufacturers have no direct platform to interact with farmers and understand their needs.
* Farmers need to travel long distances, wasting time and resources.

**3. With this project, how many problems will be solved?**

* This platform will help connect farmers directly with manufacturers.
* Saves time and resources by enabling online ordering and doorstep delivery.
* Ensures availability of genuine and high-quality agricultural products through verified suppliers.

**4. What are the resources required?**

Project Sponsor: Mr. Henry

Project Coordinator: Mr. Dooku

Project Manager: Mr. Vandanam

Development Team: Ms. Juhi (Senior Java Developer), Mr. Teyson, Ms. Lucie, Mr. Tucker, Mr. Bravo

Database Administrator: Mr. John

Network Administrator: Mr. Mike

Testing Team: Mr. Jason, Ms. Alekya

Business Analyst: Ms. Manju

Stakeholders: Farmers (Peter, Kevin, Ben), Agricultural Companies

Technology Stack: Java

Hardware: Cloud Servers, Secure Payment Gateway Integration

Software: Development Tools

Financial Resources: Total Budget INR 2 Crores

CSR Funding from SOONY Company

**5. How much organizational change is required to adopt this technology?**

* Farmers need to get training on using mobile/web applications for ordering agricultural products.
* Integration with the platform to display product listings and manage inventory.
* Adoption of real-time tracking and automated delivery management.
* The platform aims to be user-friendly and intuitive.

**6. What is the time frame to recover ROI?**

After releasing the application, it may take 12 to 24 months to generate ROI.

**7. How to identify stakeholders?**

Primary Stakeholders: Directly involved in the project execution and decision-making.

Mr. Henry (Sponsor)

Mr. Pandu (Financial Head)

Mr. Dooku (Project Coordinator)

APT IT SOLUTIONS Team (Developers, PM, Testers, DB & Network Admins)

Secondary Stakeholders: Influence the project's success and usability.

Farmers (Peter, Kevin, Ben, and other end-users)

Agricultural Manufacturers (Suppliers of seeds, fertilizers, pesticides)

Logistics & Delivery Partners

Regulatory & Compliance Bodies: Government regulations on online commerce for agriculture.

Question 8 – Four SDLC Methodologies - 8 Marks

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

Mr Karthik explained to Mr. Henry about SDLC. And four methodologies like Sequential Iterative, Evolutionary and Agile. Please share your thoughts and clarity on Methodologies.

**Answers**

The Software Development Life Cycle (SDLC) consists of the following key phases:

**Requirement Gathering & Analysis (RG, RA)**

* Understand and document the business needs.
* Meet stakeholders to gather functional and non-functional requirements.

**Design**

* Convert requirements into technical architecture and system design.
* High-level (HLD) and low-level (LLD) design documents are created.

**Development (Coding)**

* Developers write the actual code based on the design documents.
* This phase results in working software modules.

**Testing**

* Testers validate the developed system for bugs, performance, and adherence to requirements.
* Includes unit testing, integration testing, system testing, and defect fixing.

**Deployment**

* The system is moved to a live environment for real-time use.
* May involve phased rollout, pilot testing, or full launch.

**Maintenance & Support**

* After deployment, the system is monitored and updated for issues, enhancements, or changing requirements.
* Includes bug fixes, updates, and technical support.

**Sequential Model (Waterfall)**

**Key Features**: Each phase must be completed before the next begins.

No overlapping or going back to previous phases.

Suitable for projects with clear, fixed requirements.

**Pros**: Easy to understand and manage.

Clear documentation at every stage.

**Cons**: No flexibility for changes once the development starts.

Testing is late, so bugs are found later.

**Best used for**: Small, simple projects with well-defined scope.

**Iterative Model**

**Key Features**: Development is done in cycles (iterations).

Each iteration includes: Requirement → Design → Coding → Testing.

Feedback is gathered after each cycle to improve the next one.

**Pros**: Early working versions of the product are available.

Easier to detect and fix issues early.

Flexible to changes in requirements.

**Cons**: May require more resources and time than planned.

Not ideal if requirements are completely unknown in the beginning.

**Best used for**: Medium to large projects where requirements evolve with time.

**Evolutionary Model (Prototype-based)**

The Evolutionary Model is an SDLC approach where a basic prototype of the application is developed early and then continuously refined based on user feedback.

* It allows gradual improvement of the system over multiple iterations.
* Helps in clarifying and finalizing unclear or evolving requirements.
* Ensures users are involved in the development process.

 Best suited for projects where the end-user needs are not fully known at the beginning.

**Agile Model**

The Agile Model is an iterative and incremental approach to software development that emphasizes:

* Flexibility and customer collaboration
* Frequent delivery of small, working software modules (called sprints)
* Continuous feedback and adaptation to change
* Close coordination between cross-functional teams

Best suited for dynamic projects where requirements may change frequently and fast delivery is needed.

Question 9 – Waterfall RUP Spiral and Scrum Models – 8 Marks

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

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

**Answer**

1. **Waterfall Model**
* Linear and Sequential approach.
* Each phase (Requirements → Design → Development → Testing → Deployment) must be completed before moving to the next.
* Best suited for: Projects with well-defined and unchanging requirements.
* Pros: Simple to manage, clearly defined stages.
* Cons: Not flexible for changes; late discovery of issues.
1. **Rational Unified Process (RUP)**
* An iterative and incremental model developed by IBM.
* Divided into 4 phases: Inception, Elaboration, Construction, Transition.
* Focuses on risk management and continuous integration.
* Best suited for: Complex and large-scale enterprise systems.
* Pros: Emphasizes architecture and documentation, adaptable.
* Cons: Requires skilled teams and more documentation.
1. **Spiral Model**
* Combines features of Waterfall and Prototyping, with strong risk analysis.
* Consists of repeated cycles (spirals) with four stages: Planning, Risk Analysis, Engineering, Evaluation.
* Best suited for: High-risk projects or projects needing frequent refinement.
* Pros: Risk is managed early, flexible for changes.
* Cons: Can be expensive and complex to manage.
1. **Scrum (Agile Model)**
* Part of the Agile family, focuses on collaboration, flexibility, and iteration.
* Work is divided into Sprints (2–4 weeks).
* Roles: Product Owner, Scrum Master, Development Team.
* Best suited for: Projects with evolving requirements.
* Pros: Fast delivery, regular feedback, adaptable.
* Cons: Requires an experienced and committed team; scope creep possible.

As a Business Analyst, I would recommend the V-Model over the Waterfall Model for this project, considering the project's critical need for quality assurance, structured development, and early defect detection. Here's why:

V-Model (Verification & Validation Model) - Recommended Choice

* Each development phase has a corresponding testing phase, ensuring early identification of defects.
* Quality Assurance: Since this is an online platform handling agricultural transactions, the need for a secure and bug-free system is high. The V-Model ensures thorough testing at every stage.
* Unlike Waterfall, where testing happens at the end, issues in the V-Model are caught early, saving time and costs.
* Works Well for Defined Requirements: Since the primary requirements (agriculture product listing, order management, and delivery) are already clear, the V-Model fits well.

When is the V-Model NOT Suitable?

If requirements are highly dynamic (frequent changes), then Agile or Scrum would be a better fit.

Waterfall Model - Why Not the Best Choice?

Late Testing: Since testing happens after the development phase, critical issues might be discovered too late.

Rigid Structure: Waterfall is not flexible, and any change request in later stages can be costly and time-consuming.

Higher Risk: If an error is found in the final stages, reworking the entire system may cause project delays.

Question 10 – Waterfall Vs V-Model - 5 Marks

20Write down the differences between waterfall model and V model.

Answer

|  |  |  |
| --- | --- | --- |
| Feature | Waterfall Model  | V-Model |
| Development & Testing  | Testing is done after the development phase.  | Testing happens in parallel with development. |
| Flexibility | Very rigid; changes are difficult to accommodate later.  | Slightly more flexible as testing happens at each stage. |
| Risk Management  | High risk as defects are found late in the process.  | Lower risk as defects are detected early. |
| Cost of Fixing Bugs  | High since errors are identified at the end.  | Lower because testing is done early. |
| Suitability | Best for projects with well-defined, stable requirements.  | Best for projects where quality and reliability are critical. |
| Process Flow  | Sequential flow (linear model).  | Parallel flow with a direct relationship between development and testing. |
| Customer Involvement  | Less involvement; feedback comes only after full development.  | More involvement since testing occurs at each stage. |
| Complexity Handling  | Suitable for simple and small projects.  | Suitable for complex projects requiring high quality. |
| Documentation & Planning  | Requires detailed documentation before development starts.  | Also requires extensive documentation, but integrates testing in each phase. |
| Example Use Cases  | Manufacturing, Construction, and Simple web applications.  | Medical software, Aerospace, Banking applications, and any critical system. |

Question 11 – Justify your choice - 3 Marks

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

**Answer**

Justification for Choosing V-Model

As a Business Analyst (BA), I recommend the V-Model for this project due to the following key reasons:

Early Defect Detection & Quality Assurance – Testing is integrated at every phase, ensuring early issue identification and reducing post-development errors.

Cost & Time Efficiency – Fixing errors in earlier stages prevents costly rework and ensures smooth project execution within budget.

User-Centric Approach – Since farmers may not be tech-savvy, validating requirements early improves usability and minimizes rework.

Regulatory Compliance – The structured verification process ensures the platform adheres to agricultural regulations.

Strict Budget & Timeline – With a ₹2 Crore INR budget and 18-month timeline, the V-Model ensures controlled progress and timely delivery.

The V-Model guarantees quality, reduces risk, enhances user satisfaction, and ensures compliance, making it the best fit for this critical agricultural platform.

Question 12 – Gantt Chart - 5 Marks

The Committee of Mr. Henry, Mr Pandu, and Mr Dooku discussed with Mr Karthik and finalised on the V Model approach (RG, RA, Design, D1, T1, D2, T2, D3, T3, D4, T4 and UAT)

Mr Vandanam is mapped as a PM to this project. He studies this Project and Prepares a Gantt chart with V Model (RG, RA, Design, D1, T1, D2, T2, D3, T3, D4, T4 and UAT) as development process and the Resources are PM, BA, Java Developers, testers, DB Admin, NW Admin.

**Answer**



Question 13 – Fixed Bid Vs Billing - 5 Marks

Explain the difference between Fixed Bid and Billing projects

**Answer**

|  |  |
| --- | --- |
| A project where the total cost is agreed upon before starting and remains fixed.  | A project where the client is billed based on actual hours worked and materials used. |
| Limited scope changes; predefined requirements.  | High flexibility; scope can change during execution. |
| Well-defined projects with clear deliverables.  | Evolving projects where requirements may change. |
| Fixed timeline, strict deadlines.  | Time may fluctuate based on complexity. |

Question 14 – Preparer Timesheets of a BA in various stages of SDLC - 20 marks

➢ Design Timesheet of a BA

➢ Development Timesheet of a BA

➢ Testing Timesheet of a BA

➢ UAT Timesheet of a BA

➢ Deployment n Implementation Timesheet of a BA

**Answer**

Timesheet of a BA

|  |  |  |
| --- | --- | --- |
| Date | Task Description | Time Spent (Hours) |
| Day 1 | Gather requirements from stakeholders | 4 |
| Day 2 | Conduct feasibility analysis | 3 |
| Day 3 | Prepare Business Requirement Document (BRD) | 5 |
| Day 4 | Create Use Case Diagrams & Workflow Models | 4 |
| Day 5 | Review and finalize requirement specifications | 4 |

Development Timesheet of a BA

|  |  |  |
| --- | --- | --- |
| Date | Task Description | Time Spent (Hours) |
| Day 6 | Collaborate with developers on functional requirements | 3 |
| Day 7 | Conduct walkthroughs with developers | 3 |
| Day 8 | Support developers with clarifications | 4 |
| Day 9 | Validate system design against business needs | 5 |
| Day 10 | Assist in API and integration documentation | 3 |

Testing Timesheet of a BA

|  |  |  |
| --- | --- | --- |
| Date | Task Description | Time Spent (Hours) |
| Day 11 | Develop User Acceptance Test (UAT) cases | 5 |
| Day 12 | Validate functional test cases with QA team | 4 |
| Day 13 | Conduct initial round of testing with QA | 4 |
| Day 14 | Document defects and log change requests | 4 |
| Day 15 | Review testing reports and provide feedback | 3 |

UAT Timesheet of a BA

|  |  |  |
| --- | --- | --- |
| Date | Task Description | Time Spent (Hours) |
| Day 16 | Organize UAT sessions with stakeholders | 5 |
| Day 17 | Assist users in executing test cases | 4 |
| Day 18 | Collect feedback and document required changes | 4 |
| Day 19 | Ensure that all business requirements are met | 3 |
| Day 20 | Provide sign-off for UAT completion | 2 |

Deployment n Implementation Timesheet of a BA

|  |  |  |
| --- | --- | --- |
| Date | Task Description | Time Spent (Hours) |
| Day 32 | Coordinate with IT and DevOps for deployment | 4 |
| Day 22 | Conduct final validation post-deployment | 3 |
| Day 23 | Ensure business continuity & risk assessment | 4 |
| Day 24 | Prepare user training & support documentation | 5 |
| Day 25 | Monitor application performance & collect feedback | 3 |