**CAPSTONE PROJECT-1**

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

**Goal:** To create an online agriculture product store to help remote area farmers to buy agricultural products

**Inputs:** fertilizers, seeds, pesticides

**Resources:** Henry, Pandu, Dooku, Peter, Kevin, Ben, Karthik, Vandanam, Juhi, Teyson, Lucie, Tucker, Bravo, Mike, John, Jason, Alekya and Sriram(myself).

**Outputs:** Online agricultural store which sells fertilizers, seeds, pesticides to farmers

**Activities:**

Customer Engagement & Order initiation

Browsing for product, product selection, adding the product to the cart, checkout and payment

Processing the order

Verify the payment, Confirmation of the order, Inventory Check and Allocation of order to specific warehouse

Delivery and post-delivery activities

Tracking the order, delivery confirmation, returns and support

Customer feedback

Feedback Collection, Analysis and optimization

**Value created to the end customer**

Farmer convenience and accessibility, Order delivery and fulfilment, Enhanced Market reach, Less Travel, Easy procurement of seeds, fertilizers, pesticides.

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

|  |  |
| --- | --- |
| Strengths   * Wide Range farm Products Availability * Convenience and accessibility * Lower operational costs * Scalability | Weaknesses   * Dependency on suppliers * Delivery challenges (remote areas) * Trust issues * Refunds/returns complexity |
| Opportunities   * Expansion into new markets * Getting government support * Growing Ecommerce adoption * Increased awareness | Threats   * Supply chain Disruptors * Cybersecurity risks * Regulatory challenges |

**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.**

**Executive Summary:**

This study will help understand and assess the viability of the online agriculture platform. The online platform will provide wide variety of seeds, fertilizers, pesticides.

**Market Feasibility**

Target Market: Small- and large-scale farmers, farming enthusiasts

**Market Demand**

lack of access to agricultural supplies in remote areas

digital adoption in agriculture

**Technical Feasibility**

Agriculture Platform:

* E commerce website with a good user interface and experience
* Secure payment methods/gateways
* Collaboration with logistics companies
* Tracking system for the orders

IT infrastructure

* Cloud-based hosting for scalability
* Cybersecurity measures to protect user data
* 24/7 customer service chatbots and support

**Hardware:**

For an online agriculture store, HW includes web servers, cloud hosting, and secure data storage devices to run the website efficiently.

**Software:**

An online agriculture store needs e-commerce software, payment gateway integration, and inventory management systems to function smoothly.

**Financial Feasibility**

|  |  |  |
| --- | --- | --- |
| **Type of investment** | **Estimated cost** | **Percentage** |
| **Development and maintenance** | **90,00,000** | **45%** |
| Java developers (5) | 40,00,000 | 20% |
| Database administrator (John) | 10,00,000 | 5% |
| Network administrator | 8,00,000 | 4% |
| Project Manager | 12,00,000 | 6% |
| Business Analyst | 8,00,000 | 4% |
| Testers (2) | 12,00,000 | 6% |
| **Operations & Logistics** | **65,00,000** | **32.5%** |
| Delivery Head | 10,00,000 | 5% |
| Delivery staff | 35,00,000 | 17.5% |
| Vehicles and maintenance | 10,00,000 | 5% |
| Other logistic expenses | 10,00,000 | 5% |
| **Platform infrastructure** | **35,00,000** | **17.5%** |
| Cloud Hosting (AWS etc.) | 15,00,000 | 7.5% |
| Domain, security | 5,00,000 | 2.5% |
| Third party API integrations | 8,00,000 | 4% |
| Software licenses and tools | 7,00,000 | 3.5% |
| **Miscellaneous costs** | **10,00,000** | **5%** |
| Legal, compliance | 5,00,000 | 2.5% |
| Unforeseen expenses | 5,00,000 | 2.5% |

**Revenue Streams:**

* Sale of agricultural products like seeds, pesticides, fertilizers will make generate revenue for suppliers
* Sponsored ads for agricultural product providers

**Operational Feasibility**

Supplier connects/partnerships, Stock management, Customer service, Return & Refund policy

**Legal and Regulatory Feasibility**

* Website license
* Compliance with agricultural products
* Adherence to data privacy and cybersecurity laws

**Project Timeline**

|  |  |
| --- | --- |
| **Stages** | **Duration** |
| Market Research | 1 month |
| Platform Development | 3 months |
| Supplier Onboarding | 2 months |
| Beta Testing and full launch | 2 months |

**Risk Analysis**

* Logistic challenges can be mitigated by partnering with reliable delivery services
* Cybersecurity threats can be deal by investing in secure IT infrastructure
* Lower Marketing adoption can be mitigated by stronger marketing techniques

**Recommendations:**

* The described online agricultural platform is financially and technically viable
* Better investment in logistics and technology will help in smooth operations
* It is highly recommended to proceed with development of the platform as soon as possible
* This CSR initiative will also help the company in the eyes of the public and to get better deals in the future

**5.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**

**Objectives of this project (future state)**

* Develop a functional agricultural platform to help farmers
* Better access, quick and reliable delivery of farm products to rural areas
* Platform will be integrated with secured payment gateways
* Advisory support through AI chat bots

**Assessment of current state**

* No e-commerce platform developed yet.
* No supplier partnerships for inventory.
* Understanding the problems has been done
* No logistics or delivery system is in place.
* No customer support infrastructure

**GAP analysis**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Area** | **Desired State** | **Current State** | **Gap identified** | **Priority level** |
| Online agriculture platform | Functional online platform | No platform | Need to develop a online platform | high |
| Suppliers | Partnerships with multiple suppliers | No suppliers in remote areas | Need to onboard suppliers for platform | high |
| Payment system | Integrated payment methods | No payment gateway integrated | Need to setup secure payments | medium |
| Logistics & delivery | Reliable delivery system | No logistics system | Need to partner with providers | high |
| Customer Support | AI chatbots and customer service | No customer support | Need to setup chatbot and support team | medium |

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

**Business Analyst Risks**

Requirement Risks

* Unclear or Changing Requirements – Stakeholders may change requirements frequently, leading to project delays.
* Incorrect Market Research – Failure to identify target farmers' needs and preferences.
* Wrong Technology Selection – Choosing an inappropriate e-commerce platform, leading to performance issues.

Stakeholder Risks

* Lack of Stakeholder Engagement – Suppliers, logistics partners, or farmers may not be actively involved.
* Conflicting Interests – Different stakeholders (farmers, suppliers, investors) may have conflicting priorities.

2. Process/Project Risks

Technical Risks

* Platform Downtime & Security Issues – Cyberattacks or system failures could disrupt sales.
* Integration Failures – Issues in integrating payment gateways or logistics tracking systems.

Supply Chain & Logistics Risks

* Supplier Delays – If suppliers fail to deliver products on time, the store may lose customers.
* Inefficient Logistics & Delivery – Delays in delivering products to rural/remote areas may lead to dissatisfaction.

Customer Experience Risks

* Low Customer Adoption – Farmers may not be familiar with online purchases, leading to low sales.
* Poor User Experience (UX/UI) – A complex or slow website may discourage users.

Project Management Risks

* Delays in Development – Missing deadlines in website/app launch could lead to missed market opportunities.
* Lack of Skilled Resources – Not having trained staff for tech support, logistics, and marketing.
* Scope Creep – Adding too many features without planning can lead to project failure.

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

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Task | PC | BA | Java developers | Network admin | DB admin | Delivery head | Financial head |
| Requirement gathering | A | R | C | I | I | C | C |
| Online platform development | R | C | A | C | C | I | I |
| Database management | I | C | C | C | R | I | I |
| Security & Compliance | A | R | C | R | R | I | C |
| Payment gateway | C | C | R | I | C | I | A |
| Risk Management | A | R | C | R | R | C | A |
| Financial planning | C | C | I | I | I | C | R |
| Stakeholder management | A | R | I | I | I | C | C |

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

**Executive Summary**

The Online Agriculture platform project aims to develop a robust e-commerce platform for farmers living remotely to buy seeds, pesticides and fertilizers from suppliers. The platform will streamline supply chain processes, enhance accessibility, and provide a convenient online marketplace for agricultural needs.

**Business Problem**

Farmers staying in remote areas face several challenges, including limited access to markets, inefficient logistics, high operational costs, and unreliable supply chains. Traditional retail channels in big cities do not effectively bridge the gap between agricultural producers and end-users.

**Objectives**

* Develop a user-friendly online platform for agricultural products.
* Enable integration with logistics and payment gateways.
* Improve market accessibility for farmers.
* Ensure secure transactions and reliable delivery services.

**Business Opportunity**

* A scalable business model that connects suppliers and buyers.
* Reduced dependency on physical markets.
* Increased profitability and efficiency for farmers and suppliers
* Enhanced transparency in product pricing and availability.

**Financial Analysis**

|  |  |  |
| --- | --- | --- |
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**Risk Analysis**

Process/Project Risks

Technical Risks

* Platform Downtime & Security Issues – Cyberattacks or system failures could disrupt sales.
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Supply Chain & Logistics Risks

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* Scope Creep – Adding too many features without planning can lead to project failure.

**Stakeholder Engagement Plan**

|  |  |  |
| --- | --- | --- |
| Stakeholder | Role | Engagement |
| Investors | Funding, Decision making | Progress updates and reports |
| Farmers | Product buyers | Customer support |
| Logistics | Delivery management | Partner agreements |
| Suppliers | Product suppliers | Onboarding support |

**Implementation plan**

|  |  |
| --- | --- |
| **Stages** | **Duration** |
| Market Research | 1 month |
| Platform Development | 3 months |
| Supplier Onboarding | 2 months |
| Beta Testing and full launch | 2 months |

**Conclusion**

The Online Agriculture platform presents a high-potential business opportunity that leverages technology to improve the agricultural supply chain. With strategic planning, strong partnerships, and an efficient implementation roadmap, the project can drive significant growth in the agricultural e-commerce sector and help farmers living in remote areas.

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

**Sequential (Waterfall) Approach**

* Requirements are gathered up-front and approved before design and development.
* Phase-wise approach (Requirements, Design, Development, Testing, Deployment).
* Ideal for projects with clear, unchanging requirements.
* Pros: Structured, easy to manage, good documentation.
* Cons: Less flexibility, high cost of changes.

**Iterative Approach**

* Requirements and solutions evolve through repeated cycles (iterations).
* Each iteration delivers a portion of the final product.
* Feedback is incorporated in future iterations.
* Pros: Early delivery of parts of the system, better risk management.
* Cons: Requires more planning and user feedback.

**Evolutionary Approach**

* Starts with basic functionality and evolves with continuous refinements.
* Focus on user feedback and system evolution.
* Prioritizes business value over time.
* Pros: Strong user involvement, better alignment with business goals.
* Cons: May lead to scope creep if not managed properly.

**Agile Approach**

* Focus on collaboration, customer feedback, and rapid delivery.
* Development is done in sprints (2-4 weeks).
* Changes are welcomed even late in development.
* Pros: Highly adaptive, user-focused, fast delivery.
* Cons: Requires high team involvement and discipline.

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?

|  |  |  |
| --- | --- | --- |
| Criteria | Waterfall model | V model |
| Testing Approach | Testing is done only after the development phase | Testing is planned in parallel with each development stage. |
| Complexity of the System | Linear flow can miss interdependencies. | V-Model focuses on verification and validation at each level |
| Risk Management | Risks are often discovered late | Early test planning improves risk identification and traceability |
| Requirement Stability | Best for very stable requirements | Still assumes stable requirements, but mitigates some risk via early testing |

From the analysis since the Online Agriculture Store has:

* Defined requirements,
* Multiple critical modules (e.g., transactions, inventory, logistics),
* A need for secure and robust delivery, and requires stakeholder trust in functionality from day one,

**The V-Model is a more reliable and quality-assured choice over the traditional Waterfall.**

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

**Waterfall Model**

It is a linear and sequential approach which is divided into multiple phases like requirements, design, implementation, testing, deployment and maintenance, each stage must be completed one after another. The process is downward without overlap or iteration.

It is best suited for projects with defined requirements and limited risk to change

**RUP (Rational Unified Process)**

It is an iterative and incremental process development framework that is use case driven, it has four phases in it, including inception, Elaboration, Construction, Transition. In RUP you can revisit phases repeatedly through iterations allowing refinement and risk mitigation.

It is best suited for complex projects where there are constant changes in requirements, changes added to the process.

**Spiral Model**

It is an Iterative risk driven process, it organised the project into multiple spirals where each one is divided into four activities, Planning, Risk Analysis, Engineering, Evaluation. It is designed to handle evolving requirements through multiple iterations and at stage there is high emphasis on identifying and mitigating risks.

It is best suited for projects with high risk and uncertainty, where requirements are not understood in the start.

**Scrum model:**

It is an agile framework for managing and completing complex projects, it has short iterations known as sprints, they are typically 2-4 weeks and they rely on continuous feedback and improvement.it includes key roles like Product owner, Scrum master, Development team.

It is best suited for dynamic projects where there is rapid delivery, collaboration and adaptability are vital. They value constant feedback and continuous improvement.

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

|  |  |  |
| --- | --- | --- |
| **Aspect** | **Waterfall Model** | **V-Model** |
| Development Phase | Linear and sequential | Sequential with corresponding testing phases at each stage |
| Testing Phase | Starts after development phase is completed. | Testing is planned alongside development |
| Risk Management | Higher risk due to late feedback | Lower risk due to early testing and validation |
| Flexibility | Very rigid | Slightly better due to early test planning. But not flexible |
| Error Detection | Late, during testing phase | Early, during validation and verification stages. |

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

From the analysis since the Online Agriculture Store has:

* Defined requirements,
* Multiple critical modules (e.g., transactions, inventory, logistics),
* A need for secure and robust delivery, and requires stakeholder trust in functionality from day one,

**The V-Model is a more reliable and quality-assured choice over the traditional Waterfall.**

**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.**



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

**Fixed Bid Projects**

The client and company agree on a fixed price for the entire project scope, regardless of the time or resources used.

* Great when everything is clearly defined upfront.
* Not much wiggle room, if the client changes their mind mid-way, it could get messy.
* More risk on the developer’s side, if things take longer than planned, it cuts into their profit.
* Works well for short-term, predictable work.

**Billing Projects**

Billing projects are also called Time & Material Projects, the client pays based on the actual time spent and resources used (hourly or daily rates).

* Only pay for what gets done.
* Super helpful when requirements are still evolving.
* The client has more visibility and control over the process.
* Works well for long-term or agile-style projects.

**14.Preparer Timesheets of a BA in various stages of SDLC**

Design Timesheet of a BA

|  |  |  |
| --- | --- | --- |
| **Week** | **Activity** | **Estimated Hours** |
| WEEK1 | |  |  | | --- | --- | | * Review and refine functional requirements with the development team |  |  |  |  |  | | --- | --- | --- | |  | * Assist in drafting wireframes or screen mock-ups |  |  |  |  |  | | --- | --- | --- | |  | * Participate in system architecture discussions (as a business rep) |  |  |  |  |  | | --- | --- | --- | |  | * Review design documents for alignment with business needs |  | | 13 hrs |
| WEEK2 | |  |  | | --- | --- | | * Walkthrough of low-fidelity wireframes with stakeholders |  |  |  |  | | --- | --- | |  | * Collect feedback and update functional flow documents |  |  |  |  | | --- | --- | --- | |  | * Collaborate with UI/UX designers on page layout and navigation |  |  |  |  | | --- | --- | |  | * Align technical feasibility with the dev team | | 13 hrs |
| WEEK3 | |  |  | | --- | --- | | * Finalize business rules and validation criteria |  |  |  |  |  | | --- | --- | --- | |  | * Participate in integration point discussions |  |  |  |  |  | | --- | --- | --- | |  | * Map data flow between modules |  |  |  |  | | --- | --- | |  | * Review technical design docs | | 13 hrs |
| WEEK4 | * Organize and lead design sign-off meetings * Resolve last-minute clarifications from dev and QA team * Final updates to the Business Requirements Document (BRD) or user stories | 11hrs |

**Development Timesheet of a BA**

|  |  |  |
| --- | --- | --- |
| **Week** | **Activities** | **Estimated Hours** |
| Week 1–2 | Assist developers in understanding business requirements | 20 hrs |
| Clarify functional specs and edge cases |
| Attend development planning and scrum/demo meetings |
| Week 3–6 | Ongoing support for dev team | 25hrs |
| Collaborate with DB Admins for data mapping and requirements |
| Review interim builds or screens for feedback |
| Track and document change requests |
| Week 7–10 | Work with developers on refining user stories and use cases | 20hrs |
| Validate interim features with stakeholders |
| Ensure business rules are correctly implemented |
| **Week 11–16** | Final walkthroughs before test hand-off | 24hrs |
| Final clarifications for developers |
| Assist in drafting traceability matrix |
| Coordinate with QA team to align business and test cases |

**Testing and UAT Timesheet of a BA**

|  |  |  |
| --- | --- | --- |
| **Week** | **Activity** | **Estimated Hours** |
| Week 1-2 | * Review and validate test plans and test cases against business requirements * Participate in Test Case Review meetings with QA team * Clarify business logic and edge cases to QA | 18hrs |
| Week 3–4 | * Assist in reviewing test execution results * Help triage defects and align issues with original requirements * Update business documentation based on QA feedback | 14hrs |
| Week 5–6 | * Retesting support and follow-up clarification for defect fixes * Ensure change requests are reflected in updated test cases * Help QA validate integrations | 16 hrs |
| Week 7–8 | * Coordinate and plan User Acceptance Testing with stakeholders * Prepare UAT scenarios and guide end users through testing * Collect feedback and document defects/suggestions * Manage final business sign-off documentation | 20hrs |

**Deployment n Implementation Timesheet of a BA**

|  |  |  |
| --- | --- | --- |
| **Week** | **Activities** | **Estimated Hours** |
| Week 1 | * Final validation of business workflows in staging * Collaborate with technical team for production readiness checklist * Coordinate with stakeholders for go-live schedule and communication | 10 hrs |
| Week 2 | * Participate in production deployment planning meetings * Validate core business flows post-deployment * Assist users in onboarding and setting up roles/access | 10 hrs |
| Week 3 | * Monitor user issues and gather post-deployment feedback * Coordinate issue resolution with dev and QA teams * Document any business-side process changes post-implementation | 10 hrs |