**CAPSTONE PROJECT – 1**

1. **Business Process Model For Online Agriculture Store**

Goal:

To develop a user friendly online platform where farmers in remote areas can directly connect with manufacturers of agricultural products to easily procure essential farming supplies.

Inputs:

1. Information Inputs:
* Farmers requirements like fertilizers, seeds and pesticides
* Manufacturers’ product details like availability, specification & pricing
1. Financial Inputs:
* Budget of 2 crores INR provided by SOONY company
1. Human Inputs:
* Mr. Henry (Sponsor)
* Mr. Pandu (Financial Head)
* Mr. Dooku (Project Coordinator)
* Farmers (Stakeholders and users)
* Peter, Kevin, Ben (Stakeholders and requirement providers)
* APT IT Solutions (Implementation Team)

Resources:

* Technology infrastructure like web and mobile application development tools.
* Internet connectivity for usage and deployment
* Expertise of APT IT Solutions in application development
* Feedback and guidance from stakeholders
* CSR funds for development and operations

Outputs:

1. An online platform (web and mobile app) with following features:
* Manufacturers can upload product details
* Farmers can browse, select and order agricultural products
* Delivery system integrated to transport goods to farmers’ location
1. Improved access for farmers to agricultural products
2. Enhanced communication between farmers and manufacturers.

Activities:

1. Requirement Gathering:
* Collect detailed requirements from farmers and manufacturers
* Define the scope of the application
1. Design and Development:
* Create a user-friendly interface for both web and mobile platforms.
* Ensure proper categorization of products like fertilizers, seeds,pesticides
* Implement search and filter functionality for easy navigation
* Add a secure payment gateway
1. Testing and Deployment:
* Conduct rigorous testing of the application for usability, performance and reliability
* Deploy the application for public use
1. Support and Maintenance:
* Provide ongoing support to resolve issues.
* Update the application with feedback from users

Value Created to End Customer:

* Easy access to fertilizers, seeds and pesticides without travelling long distances.
* Timely access to quality agricultural products enhances farming efficiency.
* Reduction in procurement time and effort leading to better focus on farming activities.
* Direct communication with manufacturers reduces dependence on intermediaries.
* Encourages farmers in remote areas to adopt digital solutions for their needs.
1. **SWOT Analysis**

Strengths:

* The project addresses a significant issue faced by farmers, promoting social welfare under CSR initiatives.
* The project is well funded with a budget of ₹ 2 crores.
* A dedicated committee(Mr. Henry, Mr. Pandu, and Mr. Dooku) is backing the project, ensuring proper guidance and oversight
* Farmers like Peter, Kevin and Ben are directly involved providing valuable insights into user requirements.
* High potential for user adoption due to the increasing importance of agriculture and technology integration.
* The platform can be expanded to include other agricultural needs or connect with additional manufacturers.

Weakness:

* Farmers in remote areas may lack technical knowledge or access to reliable internet, potentially limiting adoption.
* 18 months could be tight for developing and deploying a fully functional and user-friendly application in a rural setting.
* ₹2 crores might be insufficient if unexpected complexities arise such technical glitches or marketing needs.
* Farmers may need training and awareness programs to understand and trust the platform

Oppurtunities:

* The project aligns with broader trends of digitalization in agriculture, opening opportunities for further innovation.
* The platform can expand beyond the initial scope to include additional products, services or even financial solutions for farmers.
* Possibility to partner with government schemes to reach more farmers and secure additional funding.
* SOONY and APT IT SOLUTIONS can enhance their reputations by contributing to a noble cause.
* Incorporating technologies like AI for product recommendations or blockchain for supply chain transparency could differentiate the platform.

Threats:

* Other companies or startup may already be working on or launch similar platforms.
* Issue like poor connectivity in remote areas or app performance could hinder adoption.
* Farmers accustomed to traditional methods may hesitate to adopt online purchasing.
* Delivering products to remote locations efficiently and affordable could be a challenge.
* Complying with agricultural product regulations and data privacy laws might complicate operations.
* Unforeseen economic downturns or price volatility in the agriculture sector could affect the platform’s success.
1. **Feasibility Study**
2. Hardware Requirements:
* High-performance servers to host java based application, database and APIs. Consider cloud solutions such as AWS, Azure or GCP for scalability.
* Separate servers or cloud resources for development and quality assurance.
* Ensure compatibility with basic smartphones and low-cost devices as farmers in remote areas may use older hardware.
* Internet connectivity should be optimized for low-bandwidth usage.
* High-availability systems and regular backups to ensure no downtime and data safety
1. Software Requirements:
* Programming Frameworks:
* Java(Springboot for backend)
* Frontend framework: Angular, React, or simple JSP based frontend for better user experience.
* Database:
* MySQL, PostgreSQL or any cloud managed database like AWS RDS or Firebase.
* APIs:
* Restful APIs for communication between the frontend, backend and mobile applications
* Mobile Application:
* Native (Android:Java/Kotlin) or cross-platform development
* Devops Tools:
* Jenkins for CI-CD, Docker for containerization, Kubernetes for orchestration
* Security:
* SSL certificates, user authentication/authorization
* Role-based access control for farmers, companies and administrators
1. Trained Resources:
* Development Team:
* Java Developers: Experience in Spring boot, Hibernate and REST APIs
* Frontend Developers: Familiarity with responsive UI design.
* Mobile App Developers: Android development or cross platform frameworks.
* Database Administrators: Expertise in relational databases.
* Devops Engineers: Expertise in CI-CD pipelines, cloud infrastructure and monitoring tools.
* Project management:
* Agile methodology with a dedicated Scrum Master
* Support and Maintenance
* A team to handle bugs, updates and customer queries post-launch
1. Budget:

Estimated Distribution of 2 crores INR Budget

* Development: ₹1 Crore (50%)
* Software licensing, frameworks/tools setup, development costs
* Hardware/Infrastructure: ₹40 lakhs (20%)
* Cloud hosting, storage and backup systems.
* Training and Resource Hiring: ₹30 lakhs (15%)
* Training the development and support teams
* Testing and Quality Assurance: ₹20 lakhs (10%)
* Marketing and Outreach: ₹ 10 lakhs (5%)
* Promotion of the app among farmers
1. Time Frame:
* Overall Timeline: 18 months
* Phases:
* Requirement Analysis and Feasibility Study: 1 month
* UI/UX Design: 2 months
* Backend and Frontend Development: 8 months
* Mobile App Development: 3 months
* Testing and Quality Assurance: 3 months
* Deployment and Training: 1 month
* Support and Maintenance Setup: Ongoing
* Other points in Feasibility:
* The application must have an intuitive interface, considering farmers’ limited tech exposure
* Support for multiple languages spoken in rural areas.
* Ensure the application can handle an increasing number of users and products.
* Develop a cost- effective model for long-term maintenance and upgrades
1. **GAP Analysis**

AS-IS Process (Existing Process)

1. Product procurement challenges:
* Farmers like Peter,Kevin and Ben face challeges in sourcing essential farming inputs like fertilizers, seeds and pesticides
* These products are not easily available in remote villages, leading to delays and increased costs.
1. Dependency on Middlemen:
* Farmers often rely on intermediaries to procure agricultural products, resulting in higher prices and lower quality assurance.
1. Limited access to Manufacturers:
* Farmers have little to no direct communication or transactions with manufacturers
* No platform exists for farmers to compare products or prices.
1. Lack of Technological Integration:
* No digital system is in place for farmers to view, select and order products.
* Farmers have to physically travel long distance to procure supplies.
1. Delivery Limitations:
* Logistics and delivery to remote areas are inefficient or non-existent, adding to the farmers struggles.
1. Knowledge gap:
* Farmers lack information about available products, their usage and benefits leading suboptimal farming outcomes

TO-BE Process (Future Process)

1. Online Agricultural Product Store:
* A user friendly web and mobile application connecting farmers directly with manufacturers of fertilizers, seeds and pesticides
1. Direct Farmer-Manufacturer Interaction:
* Farmers can browse, compare and communicate with manufacturers directly eliminating the dependency on middlemen
1. Efficient Product Display and Ordering:
* Manufacturers can list product details, prices and availability on the platform.
* Farmers can view and place orders with just a few clicks
1. Improved Accessibility:
* Products can be ordered from anywhere with internet connectivity
* The application provides search and filtering options for specific product needs.
1. Streamlined Logistics:
* The application integrates delivery services, ensuring that products reach the farmers’ locations efficiently
1. Enhanced Product Awareness:
* Farmers can access product descriptions, usage instructions and benefits through the application
* Additional resources like expert advice and reviews can be provided.
1. Cost and Time Savings:
* Reduced dependency on intermediaries leads to cost savings
* Farmers save time as they no longer need tom travel long distances to procure products
1. Economic and Social Impact:
* Improved access to quality agricultural inputs increases crop productivity and profitability for farmers.
* Strengthens rural economies and enhances the standard of living for farmers

The Gap Analysis should emphasize the inefficiencies in the current system and demonstrate how the proposed application bridges these gaps.

1. **Risk Analysis**

BA Risks:

1. Unclear or Incomplete Requirements:
* Farmers or manufacturers may not clearly articulate their needs or requirements.
* Stakeholders may lack technical knowledge leading to ambiguous requirements.
1. Changing Requirements:
* Stakeholders might change their requirements during the project, causing delays or rework.
1. Miscommunication:
* Misunderstandings between farmers, manufacturers, and developers regarding the features or workflow of the application.
1. Limited Stakeholder Engagement:
* Key stakeholders (e.g., farmers) may not participate actively, leading to gaps in understanding their challenges.
1. Cultural and Educational Barriers:
* Farmers in remote areas might face difficulties using a digital application due to lack of technical expertise or literacy.
1. Regulatory and Compliance Risks:
* Misalignment with agricultural regulations or e-commerce laws could delay or halt the project.
1. Localization Challenges:
* Farmers in different regions may require application support in multiple languages or dialects.

Process/Project Risks

1. Budget Overrun:
* The allocated budget of 2 Crores INR may not be sufficient due to unforeseen costs like infrastructure, additional features, or training
1. Time overrun:
* The 18-month timeline may be unrealistic if the scope of the project expands or development faces delays.
1. Technical Challenges:
* Integration issues between the app and the farmers’ devices or companies’ systems.
* Connectivity issues in remote areas where the target audience resides.
1. Vendor Performance:
* APT IT Solutions may not deliver the required quality or fail to meet deadlines.
1. Lack of Testing:
* Insufficient testing could lead to technical bugs or usability issues post-launch.
1. Resistance to adoption:
* Farmers and manufacturers may resist switching to the online platform from traditional methods due to comfort with existing practices.
1. Scalability Concerns:
* The application might not handle a large number of users if the adoption rate is higher than anticipated.
1. Security Risks:
* Sensitive data (e.g., payment details, personal information) might be exposed to cyber threats if security measures are not robust.
1. Training and Support:
* Lack of proper training or technical support for farmers to use the application effectively.
1. External Risks:
* Natural calamities or pandemics affecting farmers’ ability to participate in the program.
* Economic fluctuations that may increase manufacturing costs, affecting product availability or affordability.
1. Stakeholder Conflicts:
* Differing priorities between farmers, manufacturers, and the SOONY committee could lead to delays or disputes.
1. **Stakeholder Analysis**

Key Stakeholders:

1. Mr. Henry: Visionary, fund provider, and decision-maker for the project.
2. Mr. Pandu: Financial Head and part of the decision-making committee.
3. Mr. Dooku: Project Coordinator, responsible for project management and execution.
4. Peter, Kevin and Ben: Farmers and stakeholders representing end-users; provide inputs and validate requirements.
5. APT IT Solutions: Vendor/Implementation team, responsible for developing the application.
6. Manufacturers: Suppliers of fertilizers, seeds, and pesticides, providing the product details for the platform.
7. Farmers: End-users who will use the application to buy products; their feedback is essential for usability and functionality.

RACI Matrix:

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Task** | **Mr.****Henry** | **Mr.****Pandu** | **Mr.****Dooku** | **Peter,****Kevin,****Ben** | **APT IT****Solutions** | **Manufacturers** | **Farmers** |
| Define Project vision and Objectives | A | C | R | C | I |  I |  I |
| Approve Budget and Funding | A  | R  | C | I | I |  I | I |
| Gather Requirements | I | C | R | C | R |  C | C |
| Design Application Architecture | I | I | C | C | R |  I | I |
| Develop the application | I | I | C | I | R |  I | I |
| Provide product details (seeds, fertilizers,pesticides) | I | I | I | I | C |  R | I |
| Test application usability | I | I | C | C | R |  I | C |
| Approve final product | A | C | R | C | I |  I | I |
| Promote Application adoption | R | I | C | C | I |  I | C |

Explanation of Roles:

* R (Responsible): The individuals or teams doing the work to complete the task.
* A (Accountable): The individuals with decision-making authority; they ensure task completion.
* C (Consulted): The individuals who provide input and expertise; often stakeholders or subject-matter experts.
* I (Informed): The individuals kept informed of progress but not directly involved.

Key Points:

* Decision-Makers: Mr. Henry, Mr. Pandu, and Mr. Dooku, as part of the committee, hold the authority to make final decisions.
* Influencers:
* Peter, Kevin and Ben: Represent the farmers’ perspective and influence application requirements.
* Farmers: Their adoption and feedback will influence the success of the application.
* Manufacturers: Their participation in providing accurate product details is crucial for application usability.
1. **Business Case Document**

Executive Summary:

Mr. Henry, a successful businessman and philanthropist, has identified significant challenges faced by farmers in remote areas including access to essential agricultural products such as fertilizers, seeds and pesticides. To address this issue, Mr. Henry plans to develop an Online Agriculture Product Store, enabling farmers and manufacturing companies to interact directly through a user-friendly platform. The project spearheaded by SOONY Company under its CSR initiative, has been assigned to APT IT Solutions with a budget of 2 crores INR and a timeline of 18 months

Purpose:

The primary purpose of this project is to:

* Facilitate easy access for farmers to essential agricultural products.
* Bridge the gap between farmers and manufacturers.
* Empower remote farmers with technology for better productivity and efficiency.

Objectives:

* Develop a user-friendly web and mobile application.
* Enable manufacturers to list products with details (fertilizers, seeds, pesticides).
* Allow farmers to browse, select, and order products.
* Implement secure and reliable delivery systems for product distribution.
* Foster communication and collaboration between stakeholders.

Project Scope

In Scope

* Development of a web and mobile application.
* Features for product listing by manufacturers.
* Browsing and ordering functionalities for farmers.
* Payment gateway integration.
* Delivery tracking system.
* Training sessions for farmers to use the platform effectively.

Out of Scope

* In-house manufacturing of agricultural products.
* Offline operations and transactions.

Stakeholders

1. Primary Stakeholders:
* Farmers: End-users who will benefit from the platform.
* Manufacturers: Companies supplying fertilizers, seeds, and pesticides.
1. Project Committee:
* Mr. Henry (Initiator and Sponsor)
* Mr. Pandu (Financial Head).
* Mr. Dooku (Project Coordinators)
1. Other Contributors:
* Peter, Kevin and Ben (Stakeholders representing farmer requirements)
* APT IT SOLUTIONS (Project Implementation Partner).

Financial Overview:

* Budget: 2 Crores INR
* **Funding Source**: SOONY Company’s CSR initiative.
* **Cost Breakdown:**
* Application Development: 1 Crore INR
* Infrastructure Setup: 50 Lakhs INR
* Marketing and Farmer Training: 30 Lakhs INR
* Contigency Reserve: 20 Lakhs INR

Benefits:

Tangible Benefits:

* Improved access to agricultural products for remote farmers.
* Increased productivity due to timely availability of quality products.
* Revenue generation through platform commissions.

Intangible Benefits

* Enhanced trust and collaboration between farmers and manufacturers.
* Socio-economic upliftment of remote farming communities.
* Contribution to agricultural sustainability and growth.

Key Risks and Mitigation Strategies

|  |  |  |  |
| --- | --- | --- | --- |
| **Risk** | **Likelihood** | **Impact** | **Mitigation Strategy** |
| Low adoption by farmers | Medium | High | Conduct training sessions and awareness campaigns |
| Technical Challenges in development | Medium | High | Regular progress reviews with APT IT Solutions |
| Logistic issues in remote areas | High | Medium | Partner with local delivery services |
| Budget overrun | Low | High | Maintain strict financial monitoring |

Timelines:

* Phase 1 (0-3 months): Requirement gathering and stakeholder meetings
* Phase 2 (4-9 months): Application design and initial development
* Phase 3 (10-12 months): Application testing and feedback collection
* Phase 4 (13-15 months): Full scale deployment and training
* Phase 5 (16-18 months): Monitoring, evaluation and project handover

Conclusion:

The Online Agriculture Product Store is a transformative project aimed at addressing a critical need in the agricultural sector. By leveraging technology, the platform will empower farmers, enhance productivity, and contribute to socio-economic development in remote areas. With robust planning, execution, and stakeholder collaboration, the project will achieve its intended impact within the allocated budget and timeline.

1. **Four SDLC Methodologies**
2. **Sequential Methodology (Waterfall Model)**
* The project is divided into sequential phases: **Requirements, Design, Development, Testing, Deployment, and Maintenance**.
* Each phase must be completed before moving to the next.
* Emphasis on documentation and upfront planning.

 Advantages:

* Clear structure and well-documented processes.
* Easier to manage in cases where requirements are stable.
* Suitable for projects with a fixed scope and minimal changes.

 Disadvantages:

* Inflexibility: Changes are difficult and costly once a phase is completed.
* Delayed delivery of the product for use and feedback.
* Not suitable for projects with evolving requirements.

 Suitability:

* If the project requirements are clear and unlikely to change (not ideal in this case since stakeholders like farmers may have evolving needs).
1. **Iterative Methodology**
* The project is broken into smaller iterations, with each iteration delivering a part of the system.
* Each iteration goes through the phases of requirements, design, development, and testing.
* Feedback is incorporated into subsequent iterations.

 Advantages:

* Allows partial delivery of functional software early.
* Easier to incorporate feedback in subsequent iterations.
* Reduces risk by addressing complex aspects early.

 Disadvantages:

* Requires careful planning and management of iterations.
* May become inefficient if iterations are not well-defined.

 Suitability:

* A good fit if initial requirements are clear, but some aspects might evolve.
1. **Evolutionary Methodology (Prototype or Spiral Model)**
* Focuses on developing prototypes or incremental releases based on feedback.
* Emphasizes risk analysis and stakeholder engagement at every phase.
* Each cycle improves the system until it meets stakeholder expectations.

 Advantages:

* Stakeholders can visualize the product early and provide input.
* Risk management is integrated into the process.
* Encourages adaptability to changes.

 Disadvantages:

* Can be more expensive and time-consuming if the prototyping phase is prolonged.
* Requires active involvement from stakeholders throughout.

 Suitability:

* Highly suitable for this project, given the involvement of farmers as stakeholders and their evolving needs.
1. **Agile Methodology**
* Focuses on iterative and incremental delivery of working software.
* Promotes collaboration between cross-functional teams and stakeholders.
* Adapts quickly to changes in requirements.

 Advantages:

* Delivers working software in short timeframes (sprints).
* Highly adaptable to changing requirements.
* Continuous stakeholder feedback ensures the product meets expectations.

 Disadvantages:

* Requires high involvement and collaboration from stakeholders.
* Less emphasis on documentation, which may cause challenges in long-term maintenance.
* Needs experienced teams for successful execution.

 Suitability:

* Ideal for projects where requirements are likely to change, and there is a need for regular feedback. Considering this project's complexity and stakeholders' active involvement, Agile can be a strong choice.

**Recommendation for Mr. Henry’s Project**

Given the nature of this project:

* The involvement of multiple stakeholders (farmers, manufacturers, committee members) with evolving requirements.
* The necessity for user-friendly, iterative refinement.
* The need to ensure active feedback loops for usability.

Agile Methodology is the most suitable, potentially combined with elements of Evolutionary (prototyping) for early visualization. This hybrid approach would ensure that:

* Farmers and manufacturers see early versions of the application and provide feedback.
* Development adapts to any unforeseen challenges or changes in requirements.
* The product is delivered incrementally, reducing risk and ensuring usability.
1. **Waterfall RUP Spiral and Scrum Models**

SDLC Models:

1. Waterfall Model:
* Sequential Approach: Each phase (Requirement gathering, Design, Implementation, Testing, Deployment) must be completed before the next phase begins.
* Pros**:** Easy to manage, clear milestones, suitable for well-defined projects.
* Cons: Not flexible for changes, testing occurs late in the lifecycle.
1. V- Model (Verification and Validation):
* Simultaneous Testing: Testing is planned alongside each development phase.
* Pros: Defects can be detected early, ideal for projects with clear and fixed requirements
* Cons: Not flexible for changes; expensive for iterative requirements
1. RUP (Rational Unified Processs):
* Phases Overlapping: Divided into Inception, Elaboration, Construction, and Transition phases.
* Pros: Iterative and incremental, adaptable to changing requirements.
* Cons: Requires expertise, can be costly for small teams.
1. Scrum (Agile):
* Iterative and Incremental: Focused on delivering value in sprints (short cycles).
* Pros: Highly flexible, continuous feedback, suitable for evolving requirements.
* Cons: Requires active customer involvement and skilled teams.

Recommended methodology for this project:

Given the context of the project and the stakeholders involved, the V-Model is better suited than the Waterfall model for the following reasons:

1. Fixed and Well-Defined Requirements:
* The project aims to solve a specific problem—facilitating farmers to access agricultural products.
* Requirements are relatively stable, making the V-Model's simultaneous development and testing effective.
1. Early Testing and Validation:
* The V-Model ensures that testing begins alongside development, helping identify defects early.
* As the system must be user-friendly for new users, early validation ensures that usability issues are caught early.
1. Critical Functionality:
* Ensuring accurate product listings, transactions, and deliveries is critical for the success of the platform.
* The V-Model's emphasis on early testing reduces risks of critical failures after deployment.
1. Stakeholder Involvement:
* SMEs and stakeholders (Peter, Kevin, Ben) provide clear requirements upfront, aligning with the structured nature of the V-Model.

Conclusion:

The V-Model aligns better with the project's requirements, emphasizing early defect detection, structured testing, and clear alignment with fixed requirements. This will enhance the delivery quality within the budget and timeline constraints.

1. **Differences between Waterfall and V Model**

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| **Aspect** | **Waterfall Model** | **V- Model** |
| Structure | Sequential model where each phase is completed before moving to the next. | Extension of the Waterfall model, but emphasizes testing at every stage of development. |
| Focus | Development-centric, focusing on completing phases in sequence. | Development and testing are equally important and happen in parallel. |
| Testing Phase | Testing is performed only after the development phase is completed. | Testing is planned and executed alongside each corresponding development phase. |
| Feedback Loop | Feedback is incorporated at the end of the development cycle, often leading to higher costs if issues arise. | Feedback is provided throughout the lifecycle, reducing the cost of fixing defects. |
| Suitability | Suitable for projects with well-defined and stable requirements. | Suitable for projects where verification and validation at every stage are critical. |
| Risk Management | Risks are identified late, often during testing or deployment. | Risks are identified and mitigated early due to continuous testing and validation. |
| Documentation | Extensive documentation is required for each phase. | Extensive documentation is also required, but testing documents play a more central role. |
| Efficiency in Error Detection | Errors are identified late, increasing cost and effort to fix them. | Errors are identified early, reducing cost and effort for fixing them. |
| Example Applications | Useful in smaller, less complex projects or projects with clear and unchanging requirements. | Useful in projects that require high-quality assurance, such as medical, aerospace, or safety-critical systems**.** |

1. **Reason for choosing one model for this project**

As a Business Analyst, I would recommend the Waterfall Model.

Reasons for Choosing Waterfall Model:

1. Well-Defined Requirements:

The project's requirements are clearly outlined from the beginning, such as facilitating farmers to buy fertilizers, seeds, and pesticides, and enabling manufacturers to display and sell their products. Waterfall is suitable for projects where requirements are stable and unlikely to change significantly during development.

1. Linear and Sequential Process:

The Waterfall model follows a step-by-step approach, starting with requirement gathering, analysis, design, development, testing, and deployment. This suits the project because it has a clear scope, timeline, and budget (18 months and 2 Crores INR).

1. Stakeholder Involvement at Defined Stages:

Key stakeholders like Mr. Henry, Peter, Kevin, and Ben can provide their inputs during the requirement gathering and review phases. Once requirements are finalized, there will be minimal disruptions during later phases, which aligns with Waterfall principles.

1. Predictable Timeline and Budget:

The project has a fixed budget and timeline. The Waterfall model allows for accurate estimation of costs and schedules since the entire scope is defined upfront.

1. Focus on Delivery:

Since the goal is to deliver a complete and functional system (an online agriculture product store), the Waterfall model’s focus on delivering a finished product at the end of the cycle ensures all requirements are met before deployment.

1. Simplicity in Implementation:

Waterfall is easy to understand and implement for all parties involved, including developers, testers, and stakeholders. The project's nature, involving straightforward processes (accepting product details, displaying them, and enabling purchase and delivery), aligns well with the simplicity of the Waterfall model.

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

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| **Aspect** | **Fixed Bid Project** | **Billing Project** |
| Definition | A project with a pre-agreed budget and scope of work. | A project where payment is based on the actual hours worked and resources used. |
| Cost | Fixed and agreed upon at the beginning of the project. | Variable, depending on the actual work hours and resources used. |
| Risk | The vendor bears the risk of overruns in cost or time. | The client bears the risk as costs can increase with project scope or delays. |
| Flexibility | Limited flexibility; scope changes can trigger renegotiation. | High flexibility; scope and requirements can evolve as the project progresses. |
| Scope | Well-defined and agreed upon upfront; minimal changes during execution. | Can be loosely defined and adjusted throughout the project. |
| Payment Terms | Usually milestone-based, with payments made after specific deliverables. | Payments are made based on timesheets or invoices submitted periodically. |
| Examples of Usage | - Developing a defined web application. - Building a small product. | - Ongoing maintenance projects. - Large-scale or agile development. |

1. **Preparer Timesheets of a BA in various stages of SDLC**
* **Design Timesheet of a BA**

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| --- | --- | --- |
| **Activity** | **Description** | **Hours** |
| Requirement Elicitation | Conducting detailed sessions with stakeholders (Peter, Kevin, Ben, etc.) to gather requirements. | 10 hours |
| Requirement Documentation | Preparing Business Requirement Document (BRD) and Functional Requirement Document (FRD). | 15 hours |
| Requirement Validation | Reviewing requirements with SOONY’s committee and key stakeholders for approval. | 5 hours |
| Use Case/Workflow Design | Creating use cases, user stories, process flows, and mock-ups for the application. | 10 hours |
| Presentation to Developers & QA | Explaining the requirements and workflows to the development and QA teams. | 5 hours |

* **Development Timesheet of BA**

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| **Activity** | **Description** | **Hours** |
| Requirement Clarification | Addressing queries from the development team regarding requirements and workflows. | 8 hours |
| Change Request Analysis | Evaluating and documenting any change requests from stakeholders during development. | 6 hours |
| Collaboration Meetings | Participating in sprint planning, daily stand-ups, and review meetings with the development team. | 10 hours |
| Gap Analysis | Identifying gaps in development versus requirements and  | 5 hours |

* **Testing Timesheet of BA**

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| **Activity** | **Description** | **Hours** |
| Test Case Review | Reviewing test cases prepared by QA to ensure they align with requirements | 5 hours |
| User Acceptance Criteria Validation | Ensuring all test cases meet the agreed user acceptance criteria.. | 5 hours |
| Supporting Functional Testing | Collaborating with QA during functional testing to validate features against requirements. | 10 hours |
| Reporting Bugs | Reporting and tracking bugs to closure in collaboration with the development and QA teams. | 5 hours |

* **UAT Timesheet of BA**

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| **Activity** | **Description** | **Hours** |
| UAT Planning | Assisting stakeholders in creating a User Acceptance Testing (UAT) plan. | 5 hours |
| UAT Facilitation | Coordinating UAT sessions with stakeholders, including Peter, Kevin, and Ben. | 10 hours |
| Issue Logging | Documenting issues identified during UAT and prioritizing them for resolution. | 5 hours |
| UAT Sign-off Documentation | Preparing and obtaining sign-off on UAT results from stakeholders and SOONY’s committee. | 5 hours |

* **Deployment and Implementation Timesheet of BA**

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| **Activity** | **Description** | **Hours** |
| Release Notes Preparation |

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| Preparing detailed release notes, including features, fixes, and known issues. |

 | 4 hours |
| User Training | Conducting training sessions and creating user manuals for farmers and manufacturers. | 8 hours |
| Post-Implementation Support | Addressing early-stage issues and providing ongoing support to end-users. | 6 hours |
| Project Closure Documentation | Creating final reports and documenting lessons learned. | 5 hours |

1. **Gantt Chart**

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