Online Agriculture Products Store

Mr. Henry, after being successful as a businessman and has become one of the wealthiest persons in the city. Now, Mr. Henry wants to help others to fulfil their dreams. One day, Mr. Henry went to meet his childhood friends Peter, Kevin and Ben. They live in a remote village and do farming. Mr. Henry asked his friends if they are facing any difficulties in their day-to-day work. Peter told Mr. Henry that he is facing difficulties in procuring fertilizers which are very important for farm. Kevin said that he is also facing the same problem in-case of buying seeds for farming certain crops. Ben raised his concern on lack of pesticides which could help in greatly reducing pests in crops. After listening to all his friends’ problems, Mr. Henry thought that this is a crucial problem faced not only by his friends but also by so many other farmers. So, Mr. Henry decided to make an online agriculture product store to facilitate remote area farmers to buy agriculture products. Through this Online Web / mobile Application, Farmers and Companies (Fertilizers, seeds and pesticides manufacturing Companies) can communicate directly with each other. The main purpose to build this online store is to facilitate farmers to buy seeds, pesticides, and fertilizers from anywhere through internet connectivity. Since new users are involved, Application should be user friendly. This new application should be able to accept the product (fertilizers, seeds, pesticides) details from the manufacturers and should be able to display them to the Farmers. Farmers will browse through these products and select the products what they need and request to buy them and deliver them to farmers location. Mr. Henry has given this project through his Company SOONY. In SOONY Company, Mr Pandu is Financial Head and Mr Dooku is Project Coordinator. Mr. Henry , Mr Pandu , and Mr Dooku formed one Committee and gave this project to APT IT SOLUTIONS company for Budget 2 Crores INR and 18 months Duration under CSR initiative. Peter, Kevin and Ben are helping the Committee and can be considered as Stakeholders share requirements for the Project. Mr Karthik is the Delivery Head in APT IT SOLUTIONS company and he reached out to Mr Henry through his connects and Bagged this project. APT IT SOLUTIONS company have Talent pool Available for this Project. Mr Vandanam is project Manager, Ms. Juhi is Senior Java Developer, Mr Teyson, Ms Lucie, Mr Tucker, Mr Bravo are Java Developers. Network Admin is Mr Mike and DB Admin is John. Mr Jason and Ms Alekya are the Tester. And you joined this team as a BA.

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

**Goals :**

The primary goal of the Online Agriculture Store is to create an online platform / store that facilitates farmers in remote areas to buy essential agricultural products like fertilizers, seeds, and pesticides from manufacturers directly. This online store aims to solve procurement challenges, provide access to quality agricultural products, and make the buying process easy and efficient. Also, toprovide farmers access to a wide range of agricultural products and ensure timely delivery to remote locations by enabling direct communication between manufacturers and farmers for better support, education, and product recommendations.

**Inputs:**

These are the building blocks required for the online agriculture store to function. Following are some of the essential inputs:

* **Product Details from Manufacturers:** Information about fertilizers, seeds, and pesticides provided by companies. This includes product descriptions, pricing, availability, and usage guidelines.
* **End-User Data:** Information from farmers, such as location, type of crops they grow, and specific product needs.
* **Technology and Infrastructure:** Internet connectivity, servers, database systems, and mobile/web application platforms.
* **Budget:** INR 2 Crores allocated for the development, implementation, and marketing of the platform.
* **Human Resources:** Skilled personnel like developers, testers, project managers, financial heads, sales and marketing and other support staff.

**Resources:**

Resources are the assets that will be used throughout the process to build, deploy, and maintain the platform.

* **Human Resources:**
* Project Manager - Mr. Vandanam
* Senior Java Developer – Ms. Juhi
* Java Developers - Mr. Teyson, Ms. Lucie, Mr. Tucker, Mr. Bravo
* Database Administrator - Mr. John
* Network Admin - Mr. Mike
* Testers - Mr. Jason and Ms. Alekya
* Financial Head - Mr. Pandu
* Project Coordinator - Mr. Dooku
* Stakeholders - Peter, Kevin, Ben for providing input on product requirements.
* **Technological Resources:**
* Software Tools: Development tools like Java, testing frameworks, etc.
* Web and Mobile Platforms: User-friendly mobile/web application interface.
* Database Systems: For storing product details, user data, and transaction records.
* Servers and Cloud Infrastructure: For hosting the application and ensuring scalability.
* **Financial Resources:**

INR 2 Crores budget for developing and deploying the application, managing operations, and marketing.

**Outputs:**

The outputs are the results of the process, i.e., the final products and services that the online agriculture store delivers to the farmers and other stakeholders.

* **Product Listings:** A digital catalogue of fertilizers, seeds, and pesticides available for purchase by farmers.
* **Online Platform:** A fully functional web/mobile application for browsing, purchasing, and delivering agricultural products.
* **Farmer Orders:** Orders placed by farmers for selected products (fertilizers, seeds, pesticides).
* **Communication Logs:** Records of interactions between farmers and manufacturers for product inquiries and support (Queries raised , chats etc).
* **Delivery Reports:** Tracking and confirmation of product deliveries to the farmers’ locations.

**Activities:**

1. **Requirements Gathering:**
* Conduct interviews and meetings with stakeholders (Peter, Kevin, Ben) to understand the types of products and features required.
* Gather input on product categories, payment methods, and delivery requirements.
1. **Platform Design:**
* Design the user interface (UI) to make the platform simple and easy to navigate for farmers.
* Develop product catalogue features for displaying fertilizers, seeds, and pesticides.
* Incorporate filtering and sorting options for farmers to easily find and choose products.
1. **Product Data Collection:**
* Manufacturers provide details of their products, including descriptions, prices, and availability.
* Implement a mechanism for manufacturers to upload or update product information on the platform.
1. **Platform Development:**
* Develop the mobile and web application (using Java, as handled by Ms. Juhi and other Java developers).
* Set up databases to store product, user, and transaction data (handled by Mr. John).
* Implement payment gateway and order placement features.
* Integrate communication features for farmers and manufacturers to interact.
1. **Testing and Quality Assurance:**
* Test the platform for functionality, security, and performance (led by Mr. Jason and Ms. Alekya).
* Perform user acceptance testing (UAT) to ensure the platform is user-friendly for farmers, especially those with limited tech experience.
1. **Launch and Marketing:**
* Once the platform is ready, promote the online store to farmers through advertisements, social media, and community outreach.
* Establish partnerships with agricultural companies to ensure a steady supply of products.
1. **Order Management and Delivery:**
* Farmers browse and select products, place orders, and make payments.
* The platform forwards orders to companies, which then arrange for product delivery to farmers’ locations.
1. **Customer Support and Feedback:**
* Provide ongoing support for any issues related to product delivery, payment, or product queries.
* Collect feedback from farmers to improve the platform and add new features.

**Value Created for the End Customer (Farmers):**

The end user in this process is the farmer, and the value created for them revolves around the convenience and empowerment the platform provides.

* **Access to Products:** Farmers can buy essential products like fertilizers, seeds, and pesticides from anywhere, even in remote areas, without needing to travel long distances to physical stores.
* **Time and Cost Savings:** The platform helps farmers save time and money by providing competitive prices and eliminating the need to visit multiple physical stores.
* **Improved Agricultural Practices:** By easily accessing high-quality products, farmers can enhance their farming practices, leading to improved crop yields.
* **Direct Communication with Manufacturers:** Farmers can interact directly with product manufacturers, asking questions and gaining expert advice about products.
* **Convenient Delivery:** Products are delivered directly to the farmers' location, which is especially useful in rural areas with limited transportation options.
* **User-Friendly Interface:** A simple, intuitive design ensures that even farmers with limited tech knowledge can easily navigate the platform and place orders.
1. **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.**

In this scenario, Mr. Karthik, the Delivery Head of APT IT SOLUTIONS, is performing a **SWOT analysis** before accepting the project. The SWOT analysis involves evaluating the **Strengths**, **Weaknesses**, **Opportunities**, and **Threats** related to the project. Here’s how Mr. Karthik can approach each aspect:

* **Strengths:**

These are the internal factors that give the project an advantage:

1. **Urgent Market Need**: There’s a strong demand for an online platform that connects farmers with suppliers of fertilizers, seeds, and pesticides, addressing a gap in the market.
2. **Support from Stakeholders**: Mr. Henry, a successful businessman, and local farmers (Peter, Kevin, Ben) are actively involved in the project, which indicates a strong backing and understanding of the requirements.
3. **Experienced and Skilled Team**: The project has a talented and capable development team, including:
	* **Project Manager (Mr. Vandanam)**: Experienced in managing projects and coordinating teams.
	* **Skilled Developers (Ms. Juhi, Mr. Teyson, etc.)**: Proficient in Java, ensuring a strong technical foundation for the application.
	* **DB Admin (Mr. John)**: Can ensure the data management and storage for a large volume of product details and user interactions.
	* **Network Admin (Mr. Mike)**: Ensuring secure infrastructure of the network for the application to function effectively.
4. **Financial Support**: A budget of **2 Crores INR** and a **18-month duration** for project completion ensures enough resources for development and implementation.
5. **Corporate Social Responsibility (CSR)**: The project being under CSR initiative provides a sense of social value and goodwill, which may also attract positive attention and support.
	* **Weaknesses:**

These are the internal factors that might pose challenges or constraints:

1. **User-Friendliness for New Users**: The platform is meant for farmers, many of whom might not be technologically well-versed. Ensuring a user-friendly interface could be challenging and require extensive design modifications which might prove to become costly.
2. **Dependence on Internet Connectivity**: Farmers in remote areas may face connectivity issues, which could limit the accessibility and usability of the platform.
3. **Limited Experience in Agriculture E-commerce**: The company might not have previous experience in developing e-commerce solutions for agriculture, which could lead to unforeseen challenges.
4. **Integration of Multiple Suppliers**: Handling various suppliers of seeds, fertilizers, and pesticides may lead to coordination issues, managing stock levels, product descriptions, and pricing can be complex.
5. **Cultural and Demographic Factors**: Farmers from remote areas may have varying levels of trust in online platforms. Overcoming this could take time.
* **Opportunities:**

These are external factors that can be utilised for success:

1. **Untapped Market in Remote Areas**: The project is aiming to serve a remote and under-served market, which presents a significant opportunity for growth and expansion.
2. **Digitalization of Agriculture**: There’s an increasing push to digitalize agriculture and empower farmers with technology, making this project timely and in alignment with broader industry trends.
3. **Partnership with Agri-companies**: The project could attract partnerships with fertilizer, seed, and pesticide manufacturing companies, increasing the product portfolio and market reach.
4. **Sustainability and CSR**: Since this project is part of a CSR initiative, there’s an opportunity to create positive brand recognition and goodwill, which can lead to future opportunities in other sectors.
5. **Government Initiatives**: The government may have programs or incentives to support digital platforms in agriculture, which could provide financial or operational support.
* **Threats:**

These are external factors that may hinder the project’s success:

1. **Competition**: Other companies or start-ups might also be eyeing the same market, making it challenging to establish dominance and secure a loyal user base.
2. **Legal Challenges**: There might be legal and regulatory challenges associated with selling agricultural products online, especially in different states or countries with varying agricultural laws.
3. **Internet Access Issues in Remote Areas**: If internet access in remote areas is insufficient, the platform’s reach may be limited, thus reducing the effectiveness of the project.
4. **Resistance to Change**: Farmers who are used to traditional methods of procuring products might be resistant to adopting an online platform, limiting the project’s success.
5. **Logistical Challenges**: Delivery logistics, especially in remote locations, can be a significant challenge. Ensuring timely and safe delivery of products may require an extensive network and infrastructure, which could add operational costs and risks.
6. **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.**

When conducting a **feasibility study** for implementing the project using **Java technology**, Mr. Karthik should evaluate various factors under **Hardware, Software, Trained Resources, Budget**, and **Time Frame** to ensure that the project is technically feasible and can be executed successfully. Here's how Mr. Karthik can approach each of these areas:

**1. Hardware (HW) Considerations:**

The hardware requirements are critical to ensure the application can perform efficiently and handle the expected load. The feasibility study should cover:

* **Server Infrastructure**:
	+ **Web Server and Database Server**: Consider the hardware specifications for servers that will host the web application and the database. This will include things like CPU, RAM, disk storage, etc.
	+ The platform will be accessed by farmers using mobile or web devices. Mr. Karthik should consider the hardware capabilities of these devices, ensuring that the app is optimized for various screen sizes and works well even on lower-end devices, especially in rural areas with limited access to high-end technology.
	+ Ensuring reliable and fast internet connectivity is crucial, particularly for remote areas where network infrastructure might be lacking. Will the hardware infrastructure support stable and uninterrupted internet connectivity?
1. **Software (SW) Considerations:**

The software stack needs to be compatible, efficient, and scalable. Key points to consider:

* **Operating System Compatibility**:
* Mr. Karthik needs to ensure that the server environment (Windows, Linux, or other OS) where the application will run is compatible with Java and other necessary software components.
* He should choose better databases (SQL) based on scalability, reliability, convenience and ease of navigation.
* Build better User Interface (UI) for the farmers from rural areas to understand the working the working of the software application.
* **Encryption** for sensitive user data (farmers' information, payment details).
* **Authentication/Authorization**: Custom authentication systems for secure login or two factor or multi-factor authentication for information security.
* **Timely app updates and back – ups to Google drive or any cloud based storage to prevent loss of information.**
1. **Trained Resources (Human Resources):**
* **Java Development Expertise**:Ms. Juhi - Senior Java Developer, Mr Teyson, Ms Lucie, Mr Tucker, Mr Bravo are Java Developers. The team should be proficient in **Java** and relevant frameworks.
* **Database Administrator (DB Admin - John)**: The project requires an experienced DB admin to handle database management and backup strategies.
* **Testing and QA**: Testing is vital to ensure the application functions correctly. **Testers (Jason and Alekya)** should be familiar with testing Java applications, performing unit tests, integration tests, and end-to-end tests.
* **Network Admin (Mike)**: They will need to ensure that the servers hosting the application are optimized and secure, particularly when dealing with remote locations.
* Training will be necessary for all stakeholders (e.g., farmers – Peter, Kevin and Ben) who will use the application. The interface should be easy to use, and training materials may need to be provided.
* **Project Manager (Mr. Vandanam):** Who must capable of overseeing the project progress and address issues if any creep up diligently.
* **Financial Head (Mr. Pandu):** Who must be able to allocate proper budget financials accordingly and must ensure that costs are utilised effectively.
* Project Coordinator (Mr. Dooku): Who must essentially coordinate between different departments and resources involved and should ensure the smooth operation of the Project.
1. **Budget Considerations:**

The feasibility study should outline the financial resources needed for the project:

* **Initial Development Costs**:
* The cost of development tools, hardware infrastructure, and cloud services for hosting the platform.
* Salaries for the development, design, and testing team over the 18-month period.
* Budget for training and support for farmers in remote areas.
* **Ongoing Maintenance Costs**:

Monthly/annual costs of hosting the servers, managing storage, and paying for the development team to provide support and updates.

* **Contingency Budget**:

It's always good to account for unexpected expenses (e.g., software bugs, unanticipated technical challenges, additional features).

* **Marketing and Promotion**:

To ensure the platform’s success, funds may be needed to market the product, especially to farmers in remote areas.

1. **Time Frame:**
* **Requirement Gathering and Analysis** (1-2 months): This phase would include detailed meetings with stakeholders (Mr. Henry, Peter, Kevin, and Ben) and the design team to finalize requirements.
* **Design and Architecture** (2-3 months): Architecture design for the platform (front-end and back-end), database design, and system architecture.
* **Development** (10-12 months): Main coding phase for implementing core features (user management, product listing, cart system, payment integration).
* **Testing** (3-4 months): Extensive testing phase including unit testing, integration testing, and end-user acceptance testing.
* **Deployment and Launch** (1 month): Final deployment, training, and go-live.
* **Buffer or Contingent Time**: Accounting for potential delays in case of unexpected technical issues, especially when dealing with remote locations and internet connectivity issues.
1. **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.**

In the **Gap Analysis** report, Mr. Karthik will need to compare the **AS-IS** (current) process of procurement and distribution of agricultural products with the **TO-BE** (future) process enabled by the new online platform. The goal is to showcase the gaps in the current system and demonstrate how the proposed solution will bridge those gaps to offer a more efficient, scalable, and user-friendly solution for farmers.

**1. Procurement of Agricultural Products**

* **AS-IS Process (Current Process)**:
	+ Farmers (like Peter, Kevin, and Ben) often face challenges in accessing fertilizers, seeds, and pesticides. They rely on local stores or middlemen to purchase these products.
	+ Product availability is inconsistent and farmers are at the mercy of local suppliers, which may result in delays, poor-quality products, and inflated prices.
	+ Farmers typically travel long distances to access stores, adding time and transportation costs.
	+ Product information (e.g., quality, price, and availability) is often unclear or difficult to verify.
* **TO-BE Process (Future Process)**:
	+ The new online platform will allow farmers to directly access product listings from manufacturers of seeds, fertilizers, and pesticides, making the procurement process more transparent.
	+ Farmers can check availability, product details, and prices in real-time.
	+ Farmers can place orders directly from the platform and have products delivered to their doorstep, saving time and transportation costs.
	+ The platform will ensure that only verified products from reputable manufacturers are listed, improving quality assurance.
1. **Accessibility and Convenience**
* **AS-IS Process**:
* Limited access to products due to geographical constraints, with many farmers living in remote areas with poor connectivity.
* Farmers have to rely on local suppliers or physical stores, which may not offer a wide variety of products or offer competitive prices.
* If there’s a problem with the purchased products, the farmer has to personally visit the store or supplier to address it.
* **TO-BE Process**:
* The online platform is accessible from any location with internet connectivity, breaking down geographical barriers and providing 24/7 access to agricultural products.
* Even farmers with basic mobile phones can access the platform (if a mobile app or mobile-friendly web version is provided).
* A user-friendly interface ensures that farmers can easily browse, order, and receive support without needing advanced tech knowledge.
1. **Supply Chain and Delivery Process**
* **AS-IS Process**:
	+ Product delivery is often handled manually, with no centralized system for tracking or managing deliveries.
	+ Delivery is unreliable and subject to delays, especially for farmers in remote areas.
	+ Many middlemen are involved, which can inflate prices and increase the complexity of the supply chain.
* **TO-BE Process**:
	+ The platform will facilitate **direct transactions** between farmers and product manufacturers, eliminating unnecessary intermediaries and reducing costs.
	+ The delivery system will be integrated within the platform, allowing farmers to track their orders and receive timely deliveries.
	+ Inventory management, product availability, and real-time shipping updates will be streamlined to ensure timely and reliable delivery to remote locations.
1. **Product Selection and Variety**
* **AS-IS Process**:

Farmers are often limited to a small selection of products at local stores, which may not meet their specific needs or preferences. They may not have access to a variety of product brands or specialized agricultural solutions for their crops.

* **TO-BE Process**:

The platform will provide a wide variety of products (fertilizers, seeds, pesticides) from multiple manufacturers, ensuring farmers have access to a larger pool of options. The online store will allow farmers to compare products based on their requirements, ensuring they get the most suitable products for their crops.

**5. Pricing:**

* **AS-IS Process**:
	+ Pricing is often unclear, and farmers may pay higher prices due to the presence of middlemen or local suppliers charging inflated costs.
	+ There may be little to no transparency regarding product pricing or discounts available.
* **TO-BE Process**:
* The online platform will provide **transparent pricing** for all listed products. Farmers can compare prices across different suppliers and make informed purchasing decisions.
* **Bulk discounts, seasonal offers**, and promotions can be highlighted on the platform, allowing farmers to save money.

**6. Order Tracking and Notifications**

* **AS-IS Process**:
	+ Farmers have limited visibility into the status of their orders, often relying on the supplier to update them on delivery or stock status.
	+ No system for tracking products or receiving updates on delays.
* **TO-BE Process**:
	+ The online platform will offer order tracking features, allowing farmers to monitor the progress of their orders from placement to delivery.
	+ Automated notifications will be sent to keep farmers informed about product availability, order status, and delivery schedules.

**7. User Education and Training**

* **AS-IS Process**:
	+ Farmers often lack knowledge about new agricultural products or technologies available in the market.
	+ There is no centralized source for educating farmers on best practices for product use.
* **TO-BE Process**:
	+ The platform can incorporate **educational resources** such as tutorials, how-to guides, and product usage instructions.
	+ **Farmers’ training programs** could be implemented through the platform to familiarize them with digital tools and improve their product knowledge, helping them make informed decisions.

**8.Communication and customer support**

* **AS-IS Process**:
* Communication with suppliers is often informal, relying on phone calls or face-to-face visits, which can be inefficient and lead to misunderstandings.
* Customer support is minimal, and farmers may struggle to get assistance in case of issues with their purchases.
* **TO-BE Process**:
* Direct communication via the platform allows farmers to easily connect with suppliers for queries or support (via chat, email, or call).
* A robust customer support system will be built into the platform to assist with order issues, refunds, or product returns, providing a better overall user experience.
1. **Approachability:**
* **AS-IS Process**:

The current process of procurement is limited by geographical and logistical constraints, and local stores or suppliers may not be able to scale operations to meet the needs of a larger customer base.

* **TO-BE Process**:

The platform is scalable, allowing new product manufacturers and farmers from other regions to join the system.

1. **List down different risk factors that may be involved (BA Risks And process/Project Risks).**
* **BA Risks**
1. **Requirements Gathering Risks:**
	* Incomplete or unclear requirements from stakeholders (farmers, manufacturers) may lead to misunderstanding and development delays.
	* Miscommunication with stakeholders, like Peter, Kevin, and Ben, regarding their needs and expectations.
	* Overlooking some key requirements of farmers due to language, geographical, or technological barriers.
	* Changes in requirements during the project due to evolving stakeholder needs.
2. **Stakeholder Alignment Risks:**
* Different expectations between Mr. Henry, the committee, and the developers on the project scope, timeline, and deliverables.
* Difficulty in managing expectations of various stakeholders, including the end-users (farmers) and product suppliers.
* Lack of clarity on user roles, which could lead to a system that doesn’t meet the needs of both manufacturers and farmers.
1. **User Experience Risks:**
* The application may not be intuitive or easy to use for farmers, who may not be technologically sound.
* Not including enough features that are specifically tailored for remote-area users with limited internet access.
1. **Data Collection and Analysis Risks:**

Poor data gathering from manufacturers and farmers may lead to incorrect or outdated product information being displayed on the platform.

1. **Documentation Risks:**

Inadequate documentation of requirements, processes, and system functionalities could result in project delays and confusion later on.

* **Process/Project Risks**
1. **Timeline Risks:**
	* The 18-month project timeline may be tight for a fully functional platform, especially if new requirements emerge or unforeseen challenges arise.
	* Delays in approvals from stakeholders or the project committee could lead to the project falling behind schedule.
2. **Budget Risks:**
* The budget of 2 Crores INR may not be sufficient if the scope of the project increases or unexpected costs occur (e.g., unexpected hardware costs, additional developer resources, etc.).
* The allocation of funds might not be appropriate for all the phases of the project, leading to overspending or financial shortfalls.
1. **Technical Risks:**
* Difficulties in integrating the online platform with farmers’ existing systems, including potential issues with internet connectivity and mobile usage in remote areas.
* Technological glitches, especially if the app is accessed by large numbers of farmers at once, could lead to slow performance or crashes.
* Technical challenges related to securing data, particularly payment details and personal information of farmers.
* Compatibility issues with various devices, especially mobile phones used by farmers in remote areas.
1. **Team Risks:**
* Potential communication gaps between the team members (developers, testers, DB admin, etc.), especially with a diverse team from different backgrounds.
* Overwork or burnout among team members due to project complexity or tight timelines.
* Knowledge gaps or under-utilization of team members' skills, leading to inefficiencies or quality issues.
1. **Quality Assurance Risks:**
* Insufficient testing or lack of proper user acceptance testing (UAT) could lead to bugs or system failures after the application is launched.
* The application may not be fully compatible with different mobile platforms (iOS, Android), causing issues for farmers using different devices.
1. **Vendor Dependencies Risks:**
* Dependencies on manufacturers to provide timely and accurate data regarding products could affect project timelines and user experience.
* Delays or failure from third-party vendors (payment gateway providers, shipping/logistics partners) could impact the app’s ability to deliver products to farmers on time.
1. **Security** **Risks:**

Farmers and manufacturers may be concerned about sharing sensitive information online, especially if the system is not perceived as secure.

1. **Compliance Risks:**

The project may need to adjust to government policies on online agricultural sales, taxes, or logistics that could impact the app's operations.

1. **Market Adoption Risks:**
	* Low adoption of the platform due to a lack of awareness among farmers about the new system.
	* Challenges in educating farmers about how to use the platform or the benefits of using it over traditional methods.
2. **Perform stakeholder analysis (RACI Matrix) to find out the key stakeholders who can take decisions and who are the influencers.**

To perform a **stakeholder analysis** using the **RACI Matrix** (Responsible, Accountable, Consulted, and Informed), we first need to identify the key stakeholders involved in the project and then map their roles in relation to the key activities in the project.

* **Key Stakeholders:**
1. **Mr. Henry** - CEO of SOONY, Project Sponsor
2. **Mr. Pandu** - Financial Head (SOONY)
3. **Mr. Dooku** - Project Coordinator (SOONY)
4. **Peter, Kevin, Ben** - Farmers (End-users, Stakeholders)
5. **Mr. Karthik** - Delivery Head (APT IT SOLUTIONS)
6. **Mr. Vandanam** - Project Manager (APT IT SOLUTIONS)
7. **Ms. Juhi** - Senior Java Developer (APT IT SOLUTIONS)
8. **Mr. Teyson, Ms. Lucie, Mr. Tucker, Mr. Bravo** - Java Developers (APT IT SOLUTIONS)
9. **Mr. Mike** - Network Admin (APT IT SOLUTIONS)
10. **John** - DB Admin (APT IT SOLUTIONS)
11. **Mr. Jason, Ms. Alekya** - Testers (APT IT SOLUTIONS)
* **Key Activities in the Project:**
* **Requirements Gathering**: Collecting detailed information from stakeholders (farmers, manufacturers).
* **Design**: Architecting the platform.
* **Development**: Coding and building the application.
* **Testing**: Quality assurance, bug fixes, user acceptance testing (UAT).
* **Deployment**: Launching the application.
* **Maintenance and Support**: Post-launch monitoring, bug fixing, and updates.
* **Budget Management**: Managing the project budget.
* **Communication and Stakeholder Management**: Keeping everyone informed and managing expectations.

**RACI Matrix**

| **Activity** | **Mr. Henry** | **Mr. Pandu** | **Mr. Dooku** | **Peter, Kevin, Ben** | **Mr. Karthik** | **Mr. Vandanam** | **Ms. Juhi** | **Mr. Teyson, Ms. Lucie, Mr. Tucker, Mr. Bravo** | **Mr. Mike** | **John** | **Mr. Jason, Ms. Alekya** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Requirements Gathering** | A | C | C | R | C | C | C | C | I | I | C |
| **Design** | C | C | C | C | A | R | R | R | I | I | C |
| **Development** | I | C | C | C | A | C | R | R | I | I | C |
| **Testing** | I | I | C | C | C | C | C | C | I | I | R |
| **Deployment** | A | C | C | C | R | C | C | R | I | I | C |
| **Maintenance and Support** | A | C | C | I | R | C | C | C | R | I | C |
| **Budget Management** | I | A | R | I | C | C | I | I | I | I | I |
| **Communication and Stakeholder Management** | A | C | R | C | C | C | C | C | I | I | I |

* **R (Responsible)**: The person(s) who actually do the work to complete the task.
* **A (Accountable)**: The person who is ultimately accountable for the completion of the task and decision-making. This is the person who has the final say.
* **C (Consulted)**: The person(s) who provide input and advice, and are typically subject matter experts or advisors.
* **I (Informed)**: The person(s) who need to be kept informed of progress and decisions but are not directly involved in the task.

**Stakeholder Analysis:**

1. **Key Decision-Makers** (Responsible and Accountable):
	* **Mr. Henry** (CEO of SOONY): As the project sponsor, Mr. Henry is accountable for the overall project success and key decisions regarding the project scope, budget, and major changes.
	* **Mr. Karthik** (Delivery Head): Responsible for the technical aspects and successful delivery of the project, including design, development, and deployment.
	* **Mr. Pandu** (Financial Head): Accountable for managing the project budget, ensuring financial resources are allocated correctly.
2. **Influencers and Advisors** (Consulted):
	* **Mr. Dooku** (Project Coordinator): Involved in ensuring alignment between the project team and stakeholders, managing progress, and addressing issues that might arise. Consulted for overall coordination.
	* **Mr. Vandanam** (Project Manager): Influences design, development, and testing phases. Ensures that the team is following the proper process.
	* **Ms. Juhi** (Senior Java Developer) and **Java Developers**: Provide technical expertise during the design and development phases.
	* **Farmers (Peter, Kevin, Ben)**: Their feedback will shape requirements although they do not directly make decisions.
	* **Mr. Mike** (Network Admin) and **John** (DB Admin): Provide insights and consultation during the technical architecture and deployment phases.
3. **Informed Stakeholders**:
	* **Testers** (Mr. Jason, Ms. Alekya): They need to be kept informed about development progress to test the application accordingly.
	* **Farmers**: They are kept informed about the progress of the project, and receive updates during UAT (User Acceptance Testing), as they will use the final product.
4. **Help Mr Karthik to prepare a business case document.**

**Business Case Document for the Online Agriculture Product Store**

**Project Title:**
Online Agriculture Product Store for Farmers

**Prepared By:**
Business Analyst - [Sreevidya L N Sharma]
Date: [10-03-2025]

**Approved By:**
Mr. Henry (Project Sponsor)
Mr. Pandu (Financial Head)
Mr. Dooku (Project Coordinator)

**1. Summary**

The proposed project aims to develop an online platform (web and mobile application) for farmers and agricultural product manufacturers (fertilizers, seeds, pesticides) to connect directly, allowing farmers to purchase these products with ease from remote areas. This platform will simplify procurement processes for farmers, provide access to a wide variety of products, and streamline logistics and supply chain management.

The project is initiated by Mr. Henry’s company, SOONY, under a CSR initiative, with the goal of improving the livelihood of farmers in remote areas. The project has a budget of INR 2 Crores and a timeline of 18 months for development.

**2. Business Problem Statement**

Farmers, especially in remote villages, face challenges in procuring essential farming products like fertilizers, seeds, and pesticides. This results in lower agricultural productivity, which affects their livelihood. The existing procurement methods are inefficient and limited, causing delays and price hikes due to the intermediaries involved.

**The core problem faced by the farmers:**

* Difficulty in procuring fertilizers.
* Difficulty in buying seeds for specific crops.
* Limited availability of pesticides for pest control.

**3. Project Objective**

The objective of this project is to create an online agricultural product store that connects farmers and product manufacturers directly, thereby facilitating:

* Easy access to seeds, fertilizers, and pesticides.
* Improved supply chain for agricultural products.
* Transparent and competitive pricing.
* Quick delivery to remote areas.
* User-friendly interface catering to both tech-savvy and non-tech-savvy farmers.

**4. Scope of the Project**

The scope of this project includes the following key functionalities:

1. **Product Management:**
Manufacturers can upload product details, including price, description, and availability.
Categories include fertilizers, seeds, and pesticides.
2. **Farmer Registration and Login:**
Farmers will be able to create an account to track their orders and maintain purchase history.
3. **Search and Browse Functionality:**
Farmers can browse through products based on category, brand, and price. Search filters will help them find the right product.
4. **Order Placement and Tracking:**
Farmers can select products, place orders, and track their delivery status.
5. **Payment Gateway:**
Secure payment integration for online transactions via various methods (credit card, debit card, UPI, etc.).
6. **Delivery:**
Logistics and delivery services for timely and efficient product delivery to farmers.
7. **Admin Dashboard:**
A dashboard for admins (manufacturers) to monitor product availability, orders, and customer queries.
8. **User Support:**
A customer service function for farmers to resolve issues or ask questions.

**5. Benefits to Stakeholders**

* **Farmers:**
	+ Easy access to quality agricultural products.
	+ Convenience of online shopping with home delivery.
	+ Transparent pricing and competitive offers.
	+ Reduced reliance on local suppliers.
* **Manufacturers:**
	+ Direct connection with farmers for better sales opportunities.
	+ Increased market reach beyond local areas.
	+ Streamlined order and inventory management.
* **Project Team:**
	+ Opportunity to work on a meaningful project with a large social impact.
	+ Collaboration with a highly skilled and diverse team.
	+ A chance to build a solution that improves the agricultural supply chain.

**6. Financial Analysis**

The total budget allocated for this project is INR 2 Crores. This will cover (Figures are approximate):

* **Development Cost:**
	+ Design and Development: INR 1 Crore
	+ Testing & Quality Assurance: INR 30 Lakhs
	+ Product Integration and Deployment: INR 40 Lakhs
* **Operational Cost:**
	+ Platform Hosting and Maintenance: INR 10 Lakhs annually
	+ Marketing and Customer Support: INR 20 Lakhs

The expected revenue from the platform will come from:

* **Commission on Sales:** A small commission fee will be charged for every transaction made between farmers and manufacturers.
* **Subscription Plans for Manufacturers:** Manufacturers can subscribe to the platform to list their products for visibility.

**7. Project Timeline**

The project will be executed over 18 months, with the following milestones:

* **Month 1-3:** Requirement Gathering & Analysis, Initial Design Phase
* **Month 4-7:** Development of Core Features (Product Management, Registration, and Login)
* **Month 8-11:** Integration of Payment Gateway and Logistics System
* **Month 12-15:** Testing and Quality Assurance
* **Month 16-17:** User Acceptance Testing and Feedback
* **Month 18:** Final Deployment and Go-Live

**8. Risk Management**

Some potential risks include:

* **Technical Risks:**
	+ Compatibility issues with different mobile and web browsers.
	+ Delays in feature development.

**Mitigation:**

* + Continuous integration and testing during development.
	+ Clear documentation and version control.
* **Market Risks:**

Farmers' reluctance to adopt new technology.

**Mitigation:**

Comprehensive training sessions for farmers on how to use the platform and easy-to-navigate interface to cater to farmers with varying technical expertise.

* **Operational Risks:**

Delays in delivery due to logistics challenges.

**Mitigation:**

Partnering with reliable logistics companies and ensuring buffer times for deliveries.

**9. Assumptions**

* All stakeholders (farmers and manufacturers) have internet access or basic mobile phone connectivity.
* Manufacturers will be able to supply products consistently.
* Delivery services will be available to remote areas.

**10. Conclusion**

This project has the potential to revolutionize the agricultural procurement process for farmers in remote areas by offering a seamless, efficient, and accessible platform. With the backing of Mr. Henry, SOONY, and APT IT SOLUTIONS, this initiative can significantly impact the farming community by making essential agricultural products easily accessible and affordable.

By bridging the gap between farmers and manufacturers, this online agricultural product store will help improve agricultural productivity and contribute to the overall economic well-being of the farming community.

**Prepared by:**
[Sreevidya L N Sharma]
Business Analyst, APT IT SOLUTIONS

**Approvals:**

* **Mr. Henry** (Project Sponsor)
* **Mr. Pandu** (Financial Head)
* **Mr. Dooku** (Project Coordinator)
* **Mr. Karthik** (Delivery Head, APT IT SOLUTIONS)
* **Mr. Vandanam** (Project Manager, APT IT SOLUTIONS)
1. **The Committee of Mr Henry, Mr Pandu, 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.**

As a Business Analyst (BA) in this project, your role is crucial in understanding and aligning the project's goals with the best development methodology. Here are the four methodologies mentioned by Mr. Karthik (Sequential, Iterative, Evolutionary, and Agile) to help you clarify which one might work best for this online agricultural product store project.

**1. Sequential Methodology (Waterfall Model)**

* **Overview**: In the Sequential (Waterfall) methodology, each phase of the development process happens in a strict, linear sequence. The project moves from one stage to the next, like a waterfall.
* **Phases**: Requirements gathering, design, development, testing, deployment, and maintenance, all happen in distinct steps without going back to the previous phase once it's completed.
* **Pros:**
	+ Simple and easy to understand.
	+ Clear milestones and deliverables.
	+ Ideal for projects where requirements are well-defined and unlikely to change.
* **Cons**:
	+ Less flexibility; if there are changes or new requirements, it can be difficult to accommodate them.
	+ Can be slower if any issues arise late in the process.
* **Suitability for this Project**:

This may not be the best fit for the online agricultural store project. The project is likely to involve iterative feedback from farmers and manufacturers during development, meaning flexibility is required, which makes Sequential less ideal.

1. **Iterative Methodology**
* **Overview**: In the Iterative approach, the project is divided into smaller cycles or iterations. Each cycle goes through the phases of planning, design, development, and testing, delivering a working product at the end of each iteration.
* **Pros**:
	+ Allows for early prototypes and regular feedback from stakeholders, especially useful when you don’t have fully defined requirements at the start.
	+ Flexibility to make changes and improvements based on feedback.
	+ Each iteration improves upon the last one, allowing for continuous improvement.
* **Cons**:
	+ Can lead to scope creep if the changes and improvements are not properly managed.
	+ Requires strong communication with stakeholders throughout.
* **Suitability for this Project**:

This approach could work well for the project since stakeholders like Peter, Kevin, and Ben will likely have ongoing feedback as the application is being built. Early versions of the application could be developed and improved iteratively.

1. **Evolutionary Methodology**
* **Overview**: The Evolutionary model allows for continuous evolution of the product through incremental releases. This model typically includes an initial prototype, followed by continual iterations based on user feedback and emerging needs.
* **Pros**:
	+ Excellent for situations where you don't have a complete understanding of the final requirements at the beginning.
	+ Can adapt to changing business needs over time.
	+ Useful for projects that have ambiguous or evolving requirements.
* **Cons**:
	+ Requires continuous involvement of stakeholders to steer the evolution.
	+ May lead to extended development timelines if scope and requirements are not well managed.
* **Suitability for this Project**:

This methodology can be a good fit, particularly since the application may evolve over time with new features or adjustments based on user experience and feedback from farmers. Since Mr. Henry and his team are helping to shape the project, evolutionary development allows room for changes as it moves forward.

1. **Agile Methodology**
* **Overview**: Agile is an iterative and incremental development approach. It focuses on delivering small, functional parts of the project (called increments) regularly, typically every 1-4 weeks. Agile emphasizes collaboration, flexibility, and customer feedback.
* **Pros**:
	+ Fast delivery of working software.
	+ Strong focus on user feedback and frequent revisions based on that feedback.
	+ Encourages close communication between developers, business stakeholders, and users.
	+ Well-suited for complex projects where requirements are likely to evolve.
* **Cons**:
	+ Requires close cooperation with stakeholders (such as farmers, manufacturers) to give regular feedback and ensure the product is evolving as needed.
	+ Can be difficult to manage scope creep if not properly tracked.
* **Suitability for this Project**:

Agile would be an excellent choice for this project, especially given the diverse needs of the farmers and manufacturers. Agile allows you to build the application incrementally with user feedback at each stage. Given that there are many unknowns, especially in terms of how farmers will interact with the platform, iterative development is ideal for refining features like the product catalogue, order requests, and delivery systems based on ongoing feedback.

**Key Considerations for This Project:**

* **User Engagement**: Since the application will be used by farmers in remote areas, user feedback is crucial. Agile or Iterative methodologies can help accommodate this feedback effectively throughout the development.
* **Stakeholder Involvement**: Mr. Henry, Peter, Kevin, Ben, and other stakeholders should remain closely involved throughout the development. Agile and Iterative approaches support this well by integrating feedback at regular intervals.
* **Scope and Flexibility**: Given that the project is likely to face evolving needs (like adding new products, handling different delivery locations, etc.), a flexible development methodology like Agile or Evolutionary could support the long-term growth of the application.
* **Complexity of the Platform**: The online store will likely have complex features such as product listings, user accounts, payment systems, and delivery logistics, all of which benefit from iterative development with room for changes and enhancements.

Given the project’s need for flexibility, continuous stakeholder input, and evolving requirements, **Agile** is likely the most appropriate methodology for Mr. Henry’s online agricultural product store project. Agile’s iterative nature and frequent feedback loops will help refine the product based on real user needs and challenges faced by farmers in remote areas.

1. **They discussed models in SDLC like waterfall RUP Spiral and Scrum. You put forth your understanding on these models.**
* **Waterfall Model:**
The **Waterfall** model is one of the oldest and most traditional SDLC models. It is a **linear and sequential** approach where each phase of development must be completed before the next one begins.
* **Phases**:
	1. Requirements Gathering
	2. System Design
	3. Implementation
	4. Testing
	5. Deployment
	6. Maintenance
* **Strengths**:
	+ Simple and easy to understand.
	+ Well-defined stages with clear objectives and deliverables.
	+ Works well for smaller projects or projects with clear, fixed requirements.
	+ Easier to manage due to its structure and documentation.
* **Weaknesses**:
	+ Not flexible: changes are difficult to incorporate once the project has started.
	+ Testing is done late, meaning issues might only be discovered towards the end, making them harder to address.
	+ Not ideal for complex projects where requirements evolve over time.

**Best Use Case**: When project requirements are well understood from the beginning and unlikely to change.

* **RUP (Rational Unified Process)**

RUP is a comprehensive and iterative software development process framework that incorporates elements from multiple methodologies, including **iterative development** and **agile practices**. It divides the development process into phases and focuses on continuous improvement and risk management.

* **Phases**:
	1. Inception (Identify project scope, feasibility)
	2. Elaboration (Refine the architecture and requirements)
	3. Construction (Iterative development of the system)
	4. Transition (Move the system to production)
	5. Production (Ongoing support and updates)
* **Strengths**:
	+ Highly customizable to meet the specific needs of a project.
	+ Focus on **risk management** and identifying potential problems early.
	+ Iterative approach, allowing for continuous refinement and improvements.
	+ Provides strong emphasis on documentation and quality assurance.
* **Weaknesses**:
	+ Can be complex to implement and manage due to its wide range of processes and tools.
	+ Requires experienced teams and a thorough understanding of RUP practices.
	+ May be not suitable for smaller or less complex projects.

**Best Use Case**: Large and complex projects where there are multiple stakeholders and a need for a highly iterative and flexible approach.

* **Spiral Model**

The **Spiral** model is an **iterative** and **risk-driven** approach to software development. It combines elements of both the Waterfall model and iterative development. The project is divided into **spirals** (phases) where each iteration includes planning, risk assessment, development, and testing.

* **Phases**:
	1. **Planning**: Define objectives, alternative solutions, and constraints.
	2. **Risk Analysis**: Identify and assess risks, propose mitigation strategies.
	3. **Design**: Design, build, and develop the system incrementally.
	4. **Testing**: Validate the product, integrate feedback.
	5. **Evaluation**: Review progress, plan the next cycle.
* **Strengths**:
	+ Focus on **risk management** and **early detection** of potential issues.
	+ Allows for **continuous feedback** from users and stakeholders.
	+ Very adaptable, with the ability to change project direction in response to evolving requirements.
	+ Suitable for large, complex, and high-risk projects.
* **Weaknesses**:
	+ Can be difficult to manage due to the continuous cycles and high level of documentation required.
	+ Requires experienced developers and project managers.
	+ Risk analysis and iteration may take significant time, leading to delays in product release.

**Best Use Case**: Large, complex projects with high risks, where frequent refinements and risk assessments are required.

* **Scrum (Agile Methodology)**

**Scrum** is an **agile** methodology focused on delivering working software in short, iterative cycles called **sprints**. Scrum emphasizes **collaboration**, **flexibility**, and **continuous feedback** from stakeholders to ensure the development aligns with the users’ evolving needs.

* **Phases**:
	1. **Product Backlog**: A list of all features and tasks required for the project.
	2. **Sprint Planning**: Plan and prioritize tasks for the upcoming sprint (typically 2-4 weeks).
	3. **Sprint**: Develop and deliver a usable product increment.
	4. **Daily Standups**: Quick daily meetings to check progress, blockers, and goals.
	5. **Sprint Review**: Demonstrate the completed work to stakeholders.
	6. **Sprint Retrospective**: Reflect on the sprint and identify areas of improvement.
* **Strengths**:
	+ Highly flexible and adaptable to changing requirements and customer feedback.
	+ Encourages collaboration and direct communication between team members and stakeholders.
	+ Frequent deliverables ensure continuous feedback and progress tracking.
	+ Focus on customer needs and delivers value early and often.
* **Weaknesses**:
	+ Requires significant stakeholder involvement and feedback, which can be time-consuming.
	+ Teams need to be well-disciplined and experienced in agile practices.
	+ Projects may lack clear structure if not carefully managed, especially with larger teams.

**Best Use Case**: Projects where requirements are likely to change frequently, and there is a need for rapid, continuous delivery of software. It works well for projects that require frequent interaction with customers, as in this case, where farmers and manufacturers need to collaborate.

For a project like the **online agriculture product store**, which involves varied stakeholders and possibly evolving requirements, **Scrum** is likely the most suitable choice due to its iterative nature, focus on collaboration, and ability to adapt to user feedback throughout the development process.

**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?**

As a Business Analyst (BA) in this project, the primary responsibility is to ensure that the project meets the requirements of all stakeholders while considering the practical aspects of project delivery, timelines, and quality. Given the details of the project — an online agriculture product store — the methodology chosen should align with the project’s goals, stakeholders’ needs, and the overall development and delivery process.

* **Waterfall Model:**
* **Structure**: The Waterfall model is a linear and sequential approach where each phase (Requirements Gathering, Design, Development, Testing, and Deployment) is completed before moving on to the next.
* **Suitability:**
	+ It works well when the requirements are clear from the beginning and are unlikely to change.
	+ It is easier to manage due to its structured and rigid phases.
	+ Best suited for smaller projects with well-defined needs and minimal changes.
* **Limitations**:
	+ Difficult to accommodate changes once development begins.
	+ Testing occurs late in the process, which can delay the identification of issues.
	+ It assumes that the entire project scope is known upfront, which may not be the case in complex or evolving systems.

For this project, since it's an online agriculture product store with potential variations in product types and user interactions, the requirements might evolve as the team interacts with stakeholders. The Waterfall model, with its rigid structure and late testing phase, may not accommodate these evolving needs as flexibly as needed.

* **V-Model:**
* **Structure**: The V-Model, also known as the Verification and Validation model, is an extension of the Waterfall model but with a focus on testing. Each development phase corresponds with a testing phase, ensuring early validation.
* **Suitability**:
	+ Like the Waterfall model, it is suited for projects where requirements are clear and stable.
	+ The V-Model ensures that testing happens in parallel with development, which reduces the chances of undetected defects.
	+ It is good for projects where high-quality outputs are crucial, as the validation process ensures that each stage meets predefined requirements.
* **Limitations**:
	+ Like Waterfall, it assumes the requirements are fixed and may not be adaptable to change as easily.
	+ It can be rigid and doesn’t allow flexibility in response to changing business needs or user feedback.

While the **V-Model** and **Waterfall Model** are both viable options for structured, well-defined projects, the **Scrum/Agile** methodology stands out as the more suitable choice for the **online agriculture product store** project. Given the evolving nature of the product and the need for flexibility to accommodate the requirements of both farmers and manufacturers, **Scrum** will allow for continuous feedback, collaboration, and adaptability, which are critical for the success of this initiative.

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

|  |  |  |
| --- | --- | --- |
| Point of Difference | Waterfall Model | V - Model |
|

|  |
| --- |
| Process Flow |

|  |
| --- |
|  |

 | Linear and sequential; one phase must be completed before moving to the next | Sequential with parallel testing phases |
| Testing | Testing occurs after the development phase is completed. | Testing is done in parallel with development, corresponding to each phase |
| Flexibility | Limited flexibility; difficult to accommodate changes once a phase is completed | Limited flexibility; changes are also difficult, but parallel testing allows for early detection of issues |
| Feedback | Feedback is received only after development is completed and testing starts | Continuous feedback is received during each phase of development and testing |
|

|  |
| --- |
| Risk Management |

|  |
| --- |
|  |

 | Risk management is reactive, with issues discovered late in the process | Risk management is proactive due to early and continuous validation and verification |
| Cost of Fixing Errors | High cost to fix defects found late in the process | Lower cost to fix defects because issues are detected early in parallel testing phases |
| Best Suited for | Projects with well-defined and fixed requirements | Projects requiring high reliability and early defect detection, such as safety-critical systems |
| Testing | Testing comes after coding | Testing is integrated throughout the development process |
| Scale of the Project | Suitable for smaller projects or projects with well-understood requirements | Suitable for large, complex, or critical projects where quality is essential |
| Documentation | Heavy documentation at each phase | Extensive documentation, especially for testing and validation phases |

This table summarizes the key differences between the **Waterfall Model** and the **V-Model**, focusing on process flow, testing, flexibility, and overall approach.

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

For a project like the **online agriculture product store**, which involves varied stakeholders and possibly evolving requirements, **Scrum** is likely the most suitable choice due to its iterative nature, focus on collaboration, and ability to adapt to user feedback throughout the development process.

* **Scrum (Agile Methodology)**

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	+ Teams need to be well-disciplined and experienced in agile practices.
	+ Projects may lack clear structure if not carefully managed, especially with larger teams.

**Best Use Case**: Projects where requirements are likely to change frequently, and there is a need for rapid, continuous delivery of software. It works well for projects that require frequent interaction with customers, as in this case, where farmers and manufacturers need to collaborate.

1. **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).**

**V-Model Phases:**

1. **Requirements Gathering (RG):**
The first phase where all project requirements are gathered from stakeholders.
2. **Requirement Analysis (RA):**
Analysing the gathered requirements and preparing a detailed analysis document.
3. **Design (Design):**
Creating the system design based on the gathered and analysed requirements.
4. **Development Phases (D1, D2, D3, D4):**
The coding and development of the application. D1 is for the initial development, followed by incremental phases D2, D3, and D4 for each subsequent feature or module of the system.
5. **Testing Phases (T1, T2, T3, T4):**
Testing each corresponding development phase. T1 focuses on unit testing, T2 on integration testing, T3 on system testing, and T4 on acceptance testing.
6. **User Acceptance Testing (UAT):**
Final testing phase to validate the solution with the end-users (farmers and manufacturers) to ensure it meets their needs.

**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.**

* **Resources Involved:**
* **PM (Project Manager)**: Responsible for overall project management, monitoring timelines and coordination.
* **BA (Business Analyst)**: Responsible for gathering and analysing requirements, ensuring alignment with stakeholders' needs.
* **Java Developers**: Responsible for coding and implementing features in the development phases.
* **Testers**: Responsible for ensuring the quality of the product through various testing phases.
* **DB Admin**: Responsible for managing the database, ensuring its performance, security, and reliability.
* **Network Admin**: Responsible for managing the network infrastructure, ensuring smooth deployment, and handling any technical network-related issues.

**Gantt chart** structure that Mr. Vandanam can use for this project. For understanding, we will break the timeline into **weeks** or **months**, but the actual timeline depends on the project scope and duration (18 months as per the project description).

| **Phase** | **Week 1-4** | **Week 5-8** | **Week 9-12** | **Week 13-16** | **Week 17-20** | **Week 21-24** | **Week 25-28** | **Week 29-32** | **Week 33-36** | **Week 37-40** | **Week 41-44** | **Week 45-48** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Requirements Gathering (RG)** | PM, BA |  |  |  |  |  |  |  |  |  |  |  |
| **Requirement Analysis (RA)** | BA | PM, BA |  |  |  |  |  |  |  |  |  |  |
| **Design (Design)** |  | PM, BA, Java Devs | Java Devs |  |  |  |  |  |  |  |  |  |
| **Development Phase 1 (D1)** |  |  | Java Devs, DB Admin |  |  |  |  |  |  |  |  |  |
| **Testing Phase 1 (T1)** |  |  |  | Testers |  |  |  |  |  |  |  |  |
| **Development Phase 2 (D2)** |  |  |  | Java Devs, DB Admin |  |  |  |  |  |  |  |  |
| **Testing Phase 2 (T2)** |  |  |  |  | Testers |  |  |  |  |  |  |  |
| **Development Phase 3 (D3)** |  |  |  |  | Java Devs, DB Admin |  |  |  |  |  |  |  |
| **Testing Phase 3 (T3)** |  |  |  |  |  | Testers |  |  |  |  |  |  |
| **Development Phase 4 (D4)** |  |  |  |  |  | Java Devs, DB Admin |  |  |  |  |  |  |
| **Testing Phase 4 (T4)** |  |  |  |  |  |  | Testers |  |  |  |  |  |
| **User Acceptance Testing (UAT)** |  |  |  |  |  |  |  | Testers, PM, BA, Farmers, Manufacturers |  |  |  |  |

1. **Week 1-4:**
	* Focus on **Requirements Gathering (RG)** and **Requirement Analysis (RA)** by the PM, BA, and stakeholders.
	* BA and PM will work together to ensure that all requirements are captured and analysed in-depth.
2. **Week 5-12:**
	* **Design (Design)** begins with input from Java Developers and the BA for system and application design.
	* After design, **Development Phases (D1, D2, D3, D4)** are initiated sequentially.
	* Corresponding **Testing Phases (T1, T2, T3, T4)** start after the development phase for each module.
3. **Week 13-40:**
	* Multiple development and testing cycles will overlap to ensure iterative and continuous progress.
	* Testing (unit, integration, system) will be continuous and tied to each development phase, ensuring the system is being validated at each step.
4. **Week 41-48:**

The final phase will be **User Acceptance Testing (UAT)**, involving the BA, PM, testers, and the end-users (farmers, manufacturers). This is crucial for validating that the application meets user needs and is ready for deployment.

* **Resource Allocation:**
* The resources (PM, BA, Java Developers, Testers, DB Admin, and NW Admin) will be allocated according to the phase they are required in. Each resource will contribute according to their role.
* The **Project Manager (PM)** will oversee the entire process and ensure that timelines are adhered to, and risks are managed.
* The **BA** will be involved in all requirements, analysis, design, and UAT stages to ensure alignment with stakeholder needs.
* **Java Developers** will primarily be involved in the design and development phases (D1-D4), while **Testers** will be actively involved in all testing phases (T1-T4, UAT).
* The **DB Admin** will be involved in all development and testing phases that require database management.
* The **Network Admin** will assist in the deployment and infrastructure setup.

This Gantt chart will help visualize the entire project timeline, assign responsibilities, and track progress efficiently through all phases of the V-Model development lifecycle.

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

A **Fixed Bid Project** (also called a **Fixed Price Contract**) is one in which the client and the contractor agree on a set price for the entire project at the outset. This price remains the same, regardless of the actual time or resources needed to complete the project. It is a type of contract where the scope of work, budget, and timeline are clearly defined and agreed upon in advance.

**Features of Fixed Bid Projects:**

* **Pre-defined Scope and Deliverables**: The project’s scope and deliverables are defined and agreed upon before the contract is signed. Any changes to the scope after the project begins are typically treated as "change orders" and may incur additional costs.
* **Budget and Cost Control**: The contractor agrees to deliver the project for a fixed amount of money. This gives the client cost certainty but can be risky for the contractor if the project runs into unexpected problems or requires more work than anticipated.
* **Payment Structure**: Typically, payments are made based on milestones or the completion of certain stages in the project. The final payment is made once the project is fully completed.
* **Risk**: The contractor bears most of the risk since they have to manage any unforeseen challenges within the agreed price. If they underestimate the time or resources needed, it can reduce their profit margin.

For Mr. Henry’s online agriculture product store project, if APT IT SOLUTIONS agrees to a Fixed Bid of 2 Crores INR for the entire project, that’s the total amount they will receive for completing the project, regardless of how much time or effort it takes.

* **Billing Projects**

A **Billing Project** (often referred to as a **Time and Materials** contract) is one where the client is billed based on the actual time spent and the materials or resources used to complete the project. The pricing is not fixed, and it can fluctuate depending on the project's progress, with the client paying for hours worked and resources consumed.

* **Flexible Scope**: The scope of work may not be fully defined at the beginning, and it can evolve over time. The project can change or expand based on the client’s needs or new requirements.
* **Time and Resources Based Billing**: Clients are billed for the actual hours worked by the team members (e.g., developers, testers, etc.) and the resources consumed (e.g., software licenses, hardware, etc.). The rates for these resources are usually agreed upon in advance.
* **Budget Uncertainty**: Since the final cost depends on the time and resources spent, the budget can change during the course of the project. This model is generally used when the project's scope is unclear or likely to change over time.
* **Risk**: The client bears more of the risk in a Billing project, as the final cost can escalate based on the project's evolution and additional work required.

If APT IT SOLUTIONS were to charge Mr. Henry for the project on a Billing basis, they might bill him for the hours worked by their team members (e.g., Mr. Vandanam, Ms. Juhi, Mr. Teyson, etc.) and any additional resources required (such as databases, licenses, etc.). The final cost could be higher or lower than the original estimate depending on how much time is needed to complete the work.

| **Feature** | **Fixed Bid Projects** | **Billing Projects (Time and Materials)** |
| --- | --- | --- |
| **Scope of Work** | Well-defined and fixed at the beginning | Flexible and can change during the project |
| **Pricing** | Set price for the entire project | Billed based on actual time and resources used |
| **Budget Certainty** | High certainty, client knows the cost upfront | Low certainty, the final cost can vary |
| **Risk** | Contractor bears the risk if the project exceeds the budget | Client bears the risk of escalating costs |
| **Flexibility** | Less flexible to changes in scope | Highly flexible to changes in scope and requirements |

In the case of Mr. Henry’s project, since it involves creating a fixed platform with a well-defined scope, a **Fixed Bid** model would likely be more appropriate, as both the cost and timeline are predefined. However, if any unforeseen changes or additional requirements arise during development, a **Billing Project** model might be considered for those additional features.

1. **Prepare 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**
* **Design Timesheet of a BA**

The design phase involves understanding the requirements, creating detailed design documents, and ensuring that business requirements are translated into system designs.

|  | **Task** | **Hours Spent** | **Details** |
| --- | --- | --- | --- |
|  | Requirements Gathering | 4 | Collecting initial business requirements from stakeholders. |
|  | Process Flow Design | 5 | Designing business process flows and workflows. |
|  | Design Document Review | 3 | Reviewing design documents for alignment with business requirements. |
|  | Communication with UI/UX Designers | 2 | Collaborating with UI/UX team to ensure design meets user expectations. |
|  | Creating Business Rules Document | 4 | Drafting and finalizing business rules that will be implemented in the system. |
|  | **Total Hours** | **18 Hours** |  |

* **Development Timesheet of a BA**

During the development phase, the BA works closely with developers to clarify requirements, ensure alignment with business goals, and support development activities.

|  | **Task** | **Hours Spent** | **Details** |
| --- | --- | --- | --- |
|  | Requirement Clarification with Developers | 3 | Meeting with developers to clarify ambiguous requirements. |
|  | Reviewing Developer Queries | 4 | Addressing developer queries related to requirements. |
|  | Participating in Sprint Planning | 2 | Attending sprint planning meetings to help prioritize tasks. |
|  | Writing Use Cases and User Stories | 5 | Drafting and reviewing detailed use cases and user stories for the team. |
|  | Assisting in Data Mapping and Integration | 3 | Ensuring that business requirements are aligned with the data integration process. |
|  | **Total Hours** | **17 Hours** |  |

* **Testing Timesheet of a BA**

In the testing phase, the BA ensures that the system works as expected, aligns with the business needs, and validates the functionality against requirements.

|  | **Task** | **Hours Spent** | **Details** |
| --- | --- | --- | --- |
|  | Test Case Review and Preparation | 3 | Reviewing test cases and ensuring alignment with business requirements. |
|  | Assisting in Test Execution | 4 | Supporting the testing team by executing test cases or providing clarifications. |
|  | Defect Identification and Documentation | 4 | Identifying defects and documenting them for further resolution. |
|  | Verification of Fixed Defects | 3 | Verifying that defects are fixed and retesting the relevant features. |
|  | Participating in Regression Testing | 2 | Ensuring that changes don’t affect existing functionalities. |
|  | **Total Hours** | **16 Hours** |  |

* **User Acceptance Testing (UAT) Timesheet of a BA**

In the UAT phase, the BA plays a key role in facilitating the testing process, gathering feedback from end users, and ensuring that the product meets business needs.

|  | **Task** | **Hours Spent** | **Details** |
| --- | --- | --- | --- |
|  | Preparing UAT Test Plan and Scenarios | 3 | Creating UAT plans and test scenarios based on business requirements. |
|  | Conducting UAT with Stakeholders | 5 | Facilitating UAT sessions and supporting end users during testing. |
|  | Collecting Feedback from UAT Participants | 4 | Gathering feedback from users and documenting issues or enhancements. |
|  | Validating UAT Results and Tracking Defects | 3 | Analysing UAT test results and tracking identified defects or improvement areas. |
|  | Finalizing UAT Sign-Off | 2 | Finalizing UAT report and assisting with UAT sign-off. |
|  | **Total Hours** | **17 Hours** |  |

* **Deployment and Implementation Timesheet of a BA**

In the deployment and implementation phase, the BA ensures that the solution is successfully rolled out, provides training, and supports the transition to production.

|  | **Task** | **Hours Spent** | **Details** |
| --- | --- | --- | --- |
|  | Preparing Deployment Plan and Rollout Strategy | 4 | Creating and reviewing the deployment strategy to ensure smooth rollout. |
|  | Supporting Training Sessions for End Users | 5 | Assisting in training sessions to ensure that users understand the new system. |
|  | Monitoring Deployment and Issue Resolution | 3 | Supporting the deployment process and resolving any immediate issues that arise. |
|  | Post-Implementation Support | 3 | Providing support after deployment to address any system-related concerns. |
|  | Collecting Post-Deployment Feedback and Suggestions | 2 | Gathering feedback from users post-deployment for continuous improvement. |
|  | **Total Hours** | **17 Hours** |  |

* **Design Phase**: 18 Hours
* **Development Phase**: 17 Hours
* **Testing Phase**: 16 Hours
* **UAT Phase**: 17 Hours
* **Deployment and Implementation Phase**: 17 Hours

This provides a clear overview of the typical time allocation for a Business Analyst in different stages of the SDLC. These timesheets can be adjusted based on specific project needs and the BA's involvement in each phase.