CAPSTONE PROJECT – 1

ONLINE AGRICULTURE PRODUCT STORE

1. Identify Business Process Model for Online Agriculture Store – (Goal, Inputs, Resources, Outputs, Activities, Value created to the end Customer)
	* A business process model is a collection of activities designed to produce a specific output for a particular customer or market segment
		+ Goal: Build an online platform for farmers to procure fertilizers, seeds, and pesticides directly from manufacturers.
		+ Input: Requirements from farmers, product details (name, price, availability) from manufacturers, and internet connectivity.
		+ Resources: APT IT Team, technology resources like database tools, networking tools, financial resources, stakeholders
		+ Output: A web/mobile application connecting farmers and manufacturers for product purchase and doorstep delivery.
		+ Activities: Requirement gathering, design and planning, database setup, testing, deployment, integrating payment methods
		+ Value: Improve the Access of essential agricultural products from remote locations which help to improve farmer efficiency and yield.
2. Mr Karthik is doing SWOT analysis before he accepts this project. What Aspects he Should consider as Strengths, as Weaknesses, as Opportunity and as Threats.
	* SWOT stands for strength, weakness, opportunity and threats

# STRENGTH

* + - The project solves a critical problem faced by farmer in the remote location.
		- The unique selling point is that we made a user-friendly app which is easy to use to buy the fertilizers, seeds and crops for the farmers in the remote area
		- Involvement of the stakeholders(farmer) which will help to develop user focused application.
		- Mr. henry is one of the richest persons in the city and this project is given by his company SOONY so it will do the marketing
		- APT-IT solution which have a dedicated team of good developers experience in delivering IT projects and ensure smooth execution

# WEAKNESS

* + - As farmers are the primary users, which lack knowledge about the digital world, so need to give the training or make an easy UI
		- Remote area will have limited internet access, affecting the use of the application
		- They use the traditional way of buying product will they adopt the change and adopt the digital platform

# OPPORTUNITY

* + - There is possibility of adding new features in the app which shows the crops to grow according to the season
		- Will get the data of the farmers as well can tap in the new segment where we can add a feature where the farmer can also their finished product to the end customer.
		- Generate revenue by adds on the app or become a third party where we have taken the cut when the customer buying organic product directly from the farmer
		- Can collab with the local authority so that the application can have better reach

# THREATS

* + - There can be a similar app which is already in the market
		- Bugs or scalability issue and downtime can have negatively impact user experience and trust
		- Data privacy where we need to protect the sensitive user data which is critical for example transaction history
1. 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.
* Feasibility study for this project
	+ Hardware: Development server for development and testing, production sever for hosting the live application, back up system for the loss of data
	+ Software: JAVA to code and develop, database to store customer data, testing tools
	+ Trained resources: java development team, database administration, testing team, network admin, business analyst
	+ Budget: Hosting server cost, marketing and educating about the application, salaries for the people working
	+ Time frame: Requirement gathering, development, testing, deployment and after launch bug fixing
1. Mr Karthik must submit Gap Analysis to Mr Henry to convince to initiate this project. What point (compare AS IS existing process with TO BE future Process) to show case in the GAP Analysis
* Gap analysis that Mr Karthik needs to submit to Mr. henry to convince to initiate this project AS IN:
	+ Procurement Process in which farmers are facing challenge procuring necessary product like fertilizers, seeds and pesticides
	+ Lack of direct communication with the manufacturer, farmers need to depend upon the local players
	+ Accessibility because of the remote location which in terms lead to delay and farmers have to pay more to get the products
	+ No adoption of digital platform To BE
		- Procurement process via a online platform where farmer can browse and buy seeds, fertilizers and pesticides
		- Direct communication with the manufacturer which can reduce the cost, buy bulk order and queries
		- Door to door delivery which means increase of accessibility
		- Digital platform with user friendly UI and Mobile app
1. List down different risk factors that may be involved (BA Risks And process / Project Risks)
* The factors that involved are:

BA Risks

* + Incomplete or change in the requirement
	+ Farmers not want to adapt the new technology
	+ Unclear or misinterpreted the requirement due to lack of domain knowledge
	+ Difficulty in requirement Prioritization like balancing feature both farmer and manufacturer may lead to conflicts
	+ Usability issue as the farmer who are not that educated may have problem in understanding technical term

Process/project Risk

* + Logistics problem as the timely delivery to the farmer door step could be problematic
	+ Application down time due to bug
	+ Lack of coordination between the team leads may lead to miss the deadline
	+ Integration of any third-party payment mode can be a challenge
	+ Budget exceed 2 crores due to any reason
	+ Poor coordination between the Soony and apt it solution may lead to project shut down
	+ If the project does not meet the CSR goals than it impacts Soony reputation
1. Perform stakeholder analysis (RACI Matrix) to find out the key stakeholders who can take Decisions and Who are the influencers
* The RACI matrix of the key stake holder who take decision and who are the influencers

## Decision-Makers:

* + **Mr. Henry** (Business Owner & Project Sponsor)
	+ **Mr. Pandu** (Financial Head)
	+ **Mr. Dooku** (Project Coordinator)
	+ **Mr. Karthik** (Delivery Head, APT IT SOLUTIONS)

## Influencers:

* + **Peter, Kevin, Ben** (Farmers, End-User Representatives, Stakeholders)

## APT IT SOLUTIONS Team:

* **Mr. Vandanam** (Project Manager)
* **Ms. Juhi** (Senior Java Developer)
* **Development Team** (Mr. Teyson, Ms. Lucie, Mr. Tucker, Mr. Bravo)
* **Network Admin** (Mr. Mike)
* **DB Admin** (John)
* **Testers** (Mr. Jason, Ms. Alekya)
	+ Business Analyst

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| **Activity** | **Mr. Hen ry** | **Mr****.Pa nd****u** | **Mr.Dook u** | **Mr.karti k** | **Peter, kevin, ben** | **Mr.Van danam** | **Develo pment team** | **Network & DB admin** | **Tester** | **BA** |
| Project goal and vision | A | C | C | R | I | C | I | I | I | R |
| Approve budget and timeline | C | A | C | R | I | I | I | I | I | I |
| GatherRequirement | C | I | I | I | I | R | I | I | I | R |
| Design the application | I | I | I | I | I | R | R | I | I | C |
| Database andinfrastructure | I | I | I | I | I | C | I | R | I | I |
| Testing and quality | I | I | I | I | I | I | C | I | R | C |
| Provide feedback onusability | I | I | I | I | C | C | I | I | I | R |
| Final product delivery | A | I | C | A | I | R | I | I | I | I |

1. Help Mr Karthik to prepare a business case document
* Mr. henry who is a successful business man has identified a significant issue face by the remote area farmer in procuring seeds, fertilizers and pesticides. To address this issue mr henry issue a CSR project through his company SOONY to build an online platform where the farmers can directly buy and communicate with the agriculture product manufacturer. The project is given to APT IT solution to build an online platform with a budget of 2crores and a tome frame of 18 months

Current problem

* + Procurement Process in which farmers are facing challenge procuring necessary product like fertilizers, seeds and pesticides
	+ Lack of direct communication with the manufacturer, farmers need to depend upon the local players
	+ Accessibility because of the remote location which in terms lead to delay and farmers have to pay more to get the products
	+ No adoption of digital platform TO BE:
		- Procurement process via a online platform where farmer can browse and buy seeds, fertilizers and pesticides
		- Direct communication with the manufacturer which can reduce the cost, buy bulk order and queries
		- Door to door delivery which means increase of accessibility
		- Digital platform with user friendly UI and Mobile app

The primary Stakeholders are Mr. Henry (Project Sponsor), Mr. Pandu (Financial Head, SOONY), Mr. Dooku (Project Coordinator, SOONY), Peter, Kevin, and Ben (Farmer Representatives)

The Secondary Stakeholders are Mr. Karthik (Delivery Head), Mr. Vandanam (Project Manager), Ms. Juhi (Senior Java Developer), Development Team (Mr. Teyson, Ms. Lucie, Mr. Tucker, Mr. Bravo), Mr.

Mike (Network Admin), Mr. John (DB Admin), Testing Team (Mr. Jason, Ms. Alekya), End-users: Farmers and Agricultural Product Manufacturers

The budget is given of 2 crores for the development of the application, for testing and for marketing and training support. The project timelines of the requirement gathering, design and prototype, development, testing and quality assurance, deployment and training, also there are some risk of the farmers not adapting with the new technology, delivery issue at the remote area, application downtime due to bug

The overall the final project Is the online agriculture product store is a strategic initiative aimed at empowering farmer in the remote area and addressing critical challenges of supply chain and in the procurement of pesticides, seeds and fertilizers

1. The Committee of Mr. Henry, Mr Pandu, and Mr Dooku and Mr Karthik are having a discussion on Project Development Approach. Mr Karthik explained to Mr. Henry about SDLC. And four

methodologies like Sequential Iterative Evolutionary and Agile Please share your thoughts and clarity on Methodologies

* The Software development life cycle methodology for this project, it’s crucial to choose the most appropriate approach that aligns with the project's goals, budget, timeline, and stakeholders' expectations

The four methodologies are

* + Sequential Methodology (Water fall)

This is a linear and structured approach where each phase (Requirements, Design,

Implementation, Testing, Deployment, Maintenance) is completed sequentially. This has

clear structure and well-defined stages; this is best for the project where the requirement is well defined

* + Iterative methodology

This approach develops the system in small parts (iterations), where each iteration includes some of the project’s functionality, after finishing one functionality, you review it, get feedback, and then write the next one while improving the previous function. This can help to identify the issue in the development phase.

* + Evolutionary Methodology

Similar to iterative, but focuses more on developing a working prototype early, refining it based on user feedback until the final system emerges this can reduce the risk of developing a product that doesn’t meet the user needs

* + Agile

Agile is a flexible and iterative approach to software development that focuses on delivering the project in small, manageable increments called sprints, typically lasting 2-4 weeks. In each sprint, a functional part of the application is developed, tested, and delivered to stakeholders for feedback. This feedback is then used to refine existing features and guide the development of new ones.

1. They discussed models in SDLC like water fall RUP Spiral and Scrum. You put forth your understanding on these models. When the APT IT SOLUTIONS company got the project to make this online agriculture product store, there is a difference of opinion between a couple of SMEs and the project team regarding which methodology would be more suitable for this project. SMEs are stressing on using the V model and the project team is leaning more onto the side of waterfall model. As a business analyst, which methodology do you think would be better for this project?
* The four models of SDLC are:
* Waterfall: The Waterfall model is one of the simplest and most traditional approaches in the SDLC. It follows a linear, sequential process where each phase must be completed before moving on to the next one. The phases typically include planning, design, development, testing, deployment, and maintenance. This model works well for projects with well-defined requirements that are unlikely to change, but it can be inflexible when adjustments or changes are needed during the project.
* RUP: The Rational Unified Process (RUP) is an iterative and flexible software development model that divides the process into four distinct phases: inception, elaboration, construction, and transition. The RUP model emphasizes risk management, iterative development, and adaptability, with each phase being revisited and refined as needed. This model allows for regular feedback and adjustments, making it ideal for complex or large-scale projects where changes may occur frequently.
* Spiral: The Spiral model is a risk-driven approach that combines elements of iterative development and incremental delivery. It focuses on assessing and managing risks at every stage of the project. The model is structured around repeating cycles (or spirals), where each cycle involves planning, risk analysis, engineering, testing, and evaluation. This allows for continuous refinement of the software based on regular risk assessments and feedback, making it suitable for large, complex projects.
* Scrum: Scrum is an Agile framework that prioritizes flexibility, collaboration, and incremental delivery. In Scrum, the project is divided into small, time-boxed iterations called sprints, typically lasting 1-4 weeks. At the beginning of each sprint, teams plan and commit to delivering specific features or functionalities. Daily meetings (called stand-ups) keep everyone aligned, and regular reviews and retrospectives ensure continuous improvement. Scrum allows teams to respond quickly to changing requirements and deliver working software at the end of each sprint.

As a business analyst I would recommend a V model for this project over the waterfall model considering the specific nature of the project and the requirement because there are two phase which goes side by side the development and the testing as soon as the development is completed immediately it goes for testing and then move to the next stage

* Requirement Gathering: collect detailed requirement from the stakeholder (farmer, SME and other stakeholder), define clearly the functional and non-functional requirement
* Design: Work on the requirement and develop a design like the system architecture, components and interface, break down the design into smaller modules and plan of individual model to meet the requirement
* Implementation: Developers write the code as per the design
* Testing: Testing will be done for individual phases before we move to the next phase

This model is better we can have a clear trace of the project as the testing is done after each phase which can help to detect the defect early and also the method is sequential so we will not skip any stage, aslo we have to take the suggestion from the stakeholder (peter Kevin and ben) which will lead to changes and in water fall method changes are difficult as the testing phase is after the development which will increase the cost and we have to make an application which is user friendly as most of the users are from remote area who are not into technology so V model become better where we can test and make changes if required as per the suggestion from the stakeholders

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

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| V model | Water fall model |
| The V-Model is an extension of the Waterfall model that integrates corresponding testingphases for each development phase. | The Waterfall model is a sequential design process where progress flows in a process one phase afterthe other. |
| Testing is planned and conducted in parallel with development phases. | Testing is conducted only after the development phase is complete. |
| Errors are detected early during development, reducing the cost of fixing defects. | Errors are often detected late, during the testing phase, increasing the cost of fixes |
| Better risk management due to early andcontinuous testing. | Higher risk as issues is often discovered late in thelifecycle. |
| Clear traceability between development and testing phases which will help to detect the error early | Traceability is weaker as testing is not directly linked to specific development phases. |
| Complex than Waterfall due to parallelvalidation and verification processes. | Simpler and easier to manage due to its linearstructure. |
| Projects requiring High quality and low risk | Small-scale projects with fixed and unchanging requirements. |
| Customers can be involved in validation atvarious stages, such as during UAT. | Customers are usually involved only at the end,during delivery or final testing. |

1. As a BA, state your reason for choosing one model for this project
* As a Business Analyst (BA) in this project, the reason for choosing the V-Model (Verification and Validation Model) for the development of the online agriculture product store is as follows:
	+ **Clear Requirements & Early Testing**: Ensures precise, well-understood requirements from stakeholders to meet their expectations.
	+ **Parallel Development & Testing**: Detects and fixes errors early, ensuring smooth functionality for users.
	+ **User-Centric Design**: Focuses on usability for farmers who don’t know the technology , ensuring a user-friendly experience.
	+ **Risk Mitigation**: Reduces risks by reviewing and validating at each step to prevent later issues.
	+ **Traceability**: Maintains strong links between requirements and deliverables, ensuring the project stays aligned with goals.
1. Gantt chart
2. Explain the difference between Fixed Bid and Billing projects
* The difference between fixed bid and billing projects
	+ Fixed bid: A Fixed Bid Project is a contract where the service provider agrees to complete the entire project for a set price, based on a clearly defined scope, timeline, and deliverables. This approach works well for projects with well-understood requirements and minimal changes expected during execution. The service provider carries the risk of any unforeseen issues or additional work, as they cannot adjust the price once agreed. Fixed Bid projects offer clients budget predictability, but they come with limited flexibility if the scope needs to change during the project.
	+ Billing project: A billing project involves billing the client for the actual hours worked and materials used, often at an agreed-upon hourly or daily rate. This model is ideal for projects with evolving or unclear requirements, as it allows the scope to change over time based on new insights or client needs. Both parties share the risk in this case, as the client pays for the work completed, and the service provider is paid for actual time and resources spent. While this provides flexibility for ongoing adjustments, it can lead to cost unpredictability, as the final price is determined by the total time and materials spent. Billing projects require more oversight from the client to manage costs, whereas Fixed Bid projects may create tension if unforeseen complexities arise.
1. Preparer Timesheets of a BA in various stages of SDLC
* Design timesheet for BA

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| TASK | DESCRIPTION | HOURS |
| Functional Specific Creation | Documenting detailed functional requirements in FRD. | 8 |
| Use case development | Developing use case for farmer and manufacturer | 6 |
| Process flow | Like ordering, purchasing and delivery | 4 |
| Meeting | Review meeting to check the details | 4 |
| Approvals | Finalizing the design document | 2 |

* Development timesheet for BA

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| TASK | DESCRIPTION | HOURS |
| Requirement Clarification | Addressing queries of developer on specification | 6 |
| User story | Validation user story | 5 |
| Feature Review | Reviewing the feature as per the requirement | 4 |
| Status update | Providing progress to stakeholder | 2 |

* Testing time sheet

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| TASK | DESCRIPTION | HOURS |
| Test Case Review | Reviewing test cases prepared by testers. | 5 |
| Functional Testing | Ensuring developed features meet businessrequirements | 6 |
| Bug Reporting and feedback | Identifying and reporting any issues during testing and take feedback | 3 |
| Retesting | Verifying resolved issue and retesting | 2 |

* UAT time sheet

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| TASK | DESCRIPTION | HOURS |
| UAT Planning | Coordinating with stakeholders to prepare for UAT. | 4 |
| UAT Test Case Execution | Assisting stakeholders during User Acceptance Testing. | 6 |
| Issue ResolutionCoordination | Working with the UAT issues as per the feedback | 3 |
| Final Approval Sign-Off | Obtaining approval from stakeholders for deployment. | 2 |

* Deployment n Implementation Time sheet of a BA

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| TASK | DESCRIPTION | HOURS |
| Deployment Support | Assisting in deployment activities | 5 |
| Training andDocumentation | Preparing user manuals and conducting trainingsessions for farmers and manufacturers. | 6 |
| Post-Deployment Support | Addressing initial issues post-implementation. | 4 |
| Final Handover | Completing project handover and closure documentation. | 2 |
| Feedback Collection | Collecting final feedback for continuousimprovement. | 2 |