Capstone Project 1 – Part 1/3

**Online Agriculture Product Store**

Decoding the Case Study:

* Project Idea: To create an Online Agriculture Product Store where farmers can buy the products (pesticides, seeds, fertilizers) directly from the manufacturers easily using their mobile/computer.
* Current needs: The farmers need a user-friendly platform to buy agriculture products, internet access
* Overview of the Project: This is an e-commerce project aiming to create a digital marketplace that connects farmers with agriculture products manufacturers.
* Current Problems: Farmers are finding it difficult to get seeds, pesticides and fertilizers for their crops due to remote location.

Stakeholders involved in the Project:

* Farmers (Stakeholders) – Peter, Kevin, Ben
* Mr. Henry (a successful businessman) initiated this project through SOONY Company:
	+ - Mr. Pandu – Financial Head (Soony company)
		- Mr. Dooku – Project Co-Ordinator (Soony Company)
	+ Mr. Henry gives the project to APT IT SOLUTIONS:
		- Mr. Karthik – Delivery Head
		- Mr. Vandanam – Project Manager
		- Ms. Juhi – Sr. Java Developer
		- Mr. Teyson, Ms. Lucie, Mr. Tucker, Mr. Bravo – Java Developers
		- Mr. Mike – Network Admin
		- John – Database Admin
		- Mr. Jayson and Ms. Alekya – Testers
		- Me – Business Analyst

Question 1 – BPM

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

Answer 1 -

**Business Process Model**

* **Goal:** To provide farmers an easy access to fertilizers, seeds and pesticides and bridge the gap between farmers and agriculture product manufacturers with the help of a user-friendly online Agriculture store.

* **Inputs:** Needs of farmers,manufacturers details, mobile application/ website, payment gateways
* **Resources:** Technology,logistics & delivery, trained employees
* **Outputs:** Fully functional Online Agriculture product store application, farmers can buy products from anywhere, manufacturers can list and sell products easily, smooth payment and delivery process at farmers location
* **Activities:** Manufacturers register and lists their products on the app, farmers login to the platform, browse and select their required product, farmers place order and make payment, Manufacturer processes and delivers order, farmers receive product at their location.
* **Value Created to the End Customer:** Easy and convenient method to order, farmers get access to variety of different products on the platform, affordable prices and discounts, secure payment, fast delivery, building trust and transparency.

Question 2 – SWOT

Mr. Karthik is doing SWOT analysis before he accepts this project. What aspects he should consider as Strengths, Weaknesses, Opportunities and Threats.

Answer 2 –

* Similar online stores may already exist.
* Farmers may not trust online buying instead of local markets
* Poor connectivity in rural areas may limit the adoption.
* Customer dissatisfaction due to delivery problems.
* Inflation or Economic problems of farmers may limit their buying capacity
* Less engagement of farmers on the app
* More farmers are using smartphones and are being aware of internet, digital payments.
* Government may grant subsidies and funding to agriculture initiative.
* Can expand products on platform like farming equipment’s and machinery.
* Demand in the market may increase as it provides better access to farmers
* Internet issues in remote areas.
* Farmers might struggle to use digital platform.
* Farmers may require training to use the app and how to make online payments.
* Delivery problem may arise due to remote locations.
* Security risks with online payments and data.
* Skilled team to develop the online platform.
* Farmers can buy directly from manufacturers as there are no middlemen involved.
* Strong funding and support from Mr. Henry and his committee
* User-friendly app for farmers
* Farmers can explore latest and different products available on the platform
* CSR (Corporate Social Responsibility) helps to build trust.

**Strengths**

**Weaknesses**

**Threats**

**Opportunities**

It is a model used to understand the influencing factors that may affect the project.

Question 3 – Feasibility Study

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

Answer 3 –

**Feasibility Study**

* **Hardware:** Cloud basedServers or physical servers (AWS, Azure), Laptops/ computers with good storage, secure and stable network.
* **Software:** Backend-Java (Spring boot), Frontend – React.js/Angular, Database – MySQL/PostgreSQL, other security software’s
* **Trained Resources:** 4-5 Developers (Backend- Java, Frontend – UI/UX), 1 Network Admin, 1 Database Admin, 1 Business Analyst, 1 Project manager, 2 testers
* **Budget:** 2 Crores INR: -
* Servers & software – 50 lakhs
* Development team salaries – 1.2 crore
* Other: Software license, Marketing, Farmer training – 30 lakhs
* **Time frame:** 18 months: -
* 3 months - Requirement Gathering and analysis, planning and design
* 6 months – Backend and Frontend Development
* 3 months – Testing
* 3 months – Integration, User training
* 3 months – Deployment and Implementation

Question 4 – GAP Analysis

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

Answer 4 –

**GAP Analysis**

|  |  |  |
| --- | --- | --- |
|  | **Current State**(AS-IS existing process) | **Desired State**(TO-BE future process) |
| 1 | Farmers travel long distance to buy seeds, pesticides and fertilizers | Farmers can buy products online from their home |
| 2 | Limited product choices in remote areas | Wide variety of products available |
| 3 | High prices due to middlemen | Direct buying from manufacturing companies |
| 4 | Product availability is uncertain in the nearby stores | Real-time product availability visible online |
| 5 | No direct contact with manufacturers, thus no interaction with sellers. | Farmers can directly interact with sellers online using platform |
| 6 | Products are not delivered at home. | Products will be delivered directly at the farmer’s location |
| 7 | Limited payment options, cash transactions only available | Online payments via UPI, net banking, debit/credit cards |
| 8 | Not much options to compare prices | Farmers can compare prices of as many similar products before buying |
| 9 | Small sellers have limited reach | Sellers can sell to more farmers in different regions |

Question 5 – Risk Analysis

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

Answer 5 –

**BA Risks:**

1. Incomplete/Unclear Requirements – Farmers and sellers may not clearly express what they need.
2. Limited Domain Knowledge – If BA does not understand the farmers needs, some key feature can be missed in the app.
3. Stakeholder conflicts – As there are different people involved (IT company, farmers, henry and company) there can be different expectations and opinions causing delay in project.
4. Miscommunication – If requirements are not properly documented, developers may build wrong system.
5. Lack of BA experience – can impact requirement gathering, weak documentation skills, inability to handle changes and risk management.

**Process / Project Risks:**

1. Scope creep situation – Project may not get completed within 18 months
2. Change in Requirements – Can affect project timeline, cost and resources
3. Technical challenges – system failures or performance issues
4. Budget may exceed over Rs. 2 crores if expenses not tracked properly.
5. Data security – Risk of hacking and data leak if security measures are weak
6. Lack of end user involvement – Less farmers using the app as they may find it difficult to understand
7. Regulatory compliance – The app must follow agricultural and e-commerce laws to avoid legal problems.
8. Less Internet Accessibility in rural areas – If farmers have slowed or no internet in remote locations, they might struggle to use the app.

Question 6 – Stakeholder Analysis (RACI Matrix)

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

Answer 6 –

**Stakeholder Analysis - RACI Matrix**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Stakeholders** | **Role** | **Responsible** | **Accountable** | **Consulted** | **Informed** |
| Peter, Kevin, Ben | Farmers(Stakeholders) |  |  | X | X |
| Mr. Henry | Project Sponsor |  | X | X | X |
| Mr. Pandu | Financial Head (Soony Company) |  |  | X | X |
| Mr. Dooku | Project Co-ordinator (Soony Company) |  |  | X | X |
| Mr. Karthik | Delivery Head (APT IT Sol.) | X | X | X | X |
| Mr. Vandanam | Project Manager (APT IT Sol.) | X |  | X | X |
| Ms. Juhi | Sr. Java Developer (APT IT Sol.) | X |  |  | X |
| Mr. Teyson, Ms Lucie, Mr. Tucker, Mr. Bravo | Java Developer (APT IT Sol.) | X |  |  | X |
| Mr. Mike | Network admin (APT IT Sol.) | X |  |  | X |
| John | Database admin (APT IT Sol.) | X |  |  | X |
| Mr. Jason, Ms. Alekya | Testers (APT IT Sol.) | X |  |  | X |
| Me | BA (APT IT Sol.) | X |  | X | X |

**Decision Makers** – Mr. Henry (Project Sponsor), Mr. Karthik (Delivery Head)

**Influencers** – Mr. Pandu (Financial Head), Mr. Dooku (Project Co-ordinator), Farmers, Mr. Vandanam (Project Manager), Me (BA)

Question 7 – Business case Document

Help Mr Karthik to prepare a business case document

Answer 7 –

**Business Case Document**

1. Why is this project initiated?
* Farmers in remote locations struggle to buy fertilizers, pesticides and seeds. This project will connect farmers with manufacturers online which will solve this issue.
1. What are the current problems?
* Difficulty in procuring agricultural products which are essential for farming.
* Lack of pesticides necessary to reduce pests in crops
* No direct communication between farmers and manufacturers
1. How many problems could be solved with this project?
* Farmers can directly buy products from the manufacturers.
* Costs will be reduced as there are no middlemen
* Products will be directly delivered to farmer’s location.
* Availability of farming products will improve
1. What are the resources required?
* Hardware: Servers, hosting and network infrastructure
* Software: Java technology, databases, API’s
* Project Team: Developers, Testers, Database admin, BA, Network admin
* Budget: As per proposed – Rs. 2 crores.
1. How much organizational change is required to adopt this technology?
* Farmers must adapt to using online website/ apps.
* Manufacturing companies must integrate their products into the system
* Training and support should be provided to new users.
1. What is the timeframe to recover ROI?
* Expected ROI recovery is within 4-5 years based on adoption and sales growth.
1. How to identify Stakeholders?
* Decision Makers – Mr. Henry (Project Sponsor), Mr. Karthik (Delivery Head)
* Influencers – Mr. Pandu (Financial Head), Mr. Dooku (Project Co-ordinator), Farmers, Mr. Vandanam (Project Manager), Me (BA)
* Responsible Team – Developers, Testers, Network and Database Admin, BA
* Users – Famers and Manufacturing companies

Question 8 – Four SDLC Methodologies

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.

Answer 8 –

The four SDLC methodologies are:

1. **Sequential**
* Process – step-by-step process, each phase must be completed before next phase begins.
* It is best suitable for projects with clear requirements.
* Advantages: Simple to understand and use, structured approach
* Disadvantages: Difficult to make changes once a phase is completed
1. **Iterative**
* Development happens in cycle with risk management and improvements in each iteration.
* It is best suitable for projects in which requirements change over time.
* Advantages: Feedback is taken in each cycle
* Disadvantage: It requires more time and resources
1. **Evolutionary**
* A risk driven software model which emphasizes iterative development.
* In this process, a prototype is built first and improved based on feedback.
* It is best suitable for projects where users need to see the working version early.
* Advantages: Good for large projects, high amount of risk analysis is done, software is produced early in the life cycle.
* Disadvantages: Can be expensive and require highly specific expertise.
1. **Agile**
* Development happens in sprints with continuous improvement.
* It is best suitable for dynamic projects with evolving requirements.
* Advantages: Fast delivery of working software, flexibility and better customer involvement
* Disadvantages: Need strong collaboration and active participation

Question 9 - Waterfall RUP Spiral and Scrum Models

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

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

Answer 9 –

My understanding about the SDLC models:

1. **Waterfall model: -**
* It is the most common linear-sequential life cycle model.
* It follows a strict sequence (Requirement-Design-Development-Testing-Deployment-Implementation).
* In this model, each phase must be completed in its entirety before next stage begins.
* A review takes place at the end of each phase to determine if project is on right track.
* It is simple to understand and use.
* Used where requirements are well-defined. It is easy to manage and well structured.
* Example – Banking systems
1. **Rational Unified Process (RUP) :-**
* RUP is a structured iterative software development framework.
* Uses Iterative phases (Inception, Elaboration, Construction and Transition) with continuous improvement.
* Used in complex projects.
* It manages risk in better way.
* Best practices – develop iteratively with risk management, manage requirements, model software visually, continuously verify quality.
* Example – E-learning platforms
1. **Spiral Model: -**
* It is a risk driven software development model that emphasizes iterative development.
* It is an evolutionary model that has four phases (Planning, Risk Analysis, Engineering and Evaluation).
* A software project passes through these phases in iterations (called spirals).
* As high amount of risk analysis is done in this model, it is good for large and critical projects.
* Example – Military or aerospace software
1. **Scrum: -**
* It is implemented either in the beginning of the project or when you sense that the project is falling behind schedule.
* Work is divided into small sprints (2-4 weeks) with frequent feedback and adaptations.
* Develops software product in each sprint.
* Example – E-commerce platforms

As a Business analyst, I think V-Model is best suitable for Online Agriculture Store, because–

* The project has well-defined and clear requirements.
* Each phase has specific deliverables and a review process so defects will be detected early and worked on.
* Phases will be processed one at a time, making it easy to track progress.
* Testing is done at every stage. This minimizes costly changes later.
* Helps maintain high software quality software with continuous testing.
* It follows a structured approach so the project can be maintained with decided budget (2 crores) and time (18 months).
* This project involves multiple stakeholders like farmers, sellers, logistics, payments, V-model is reliable for large scale projects.

Question 10 –

Write down the differences between waterfall model and V model.

Answer 10 –

|  |  |
| --- | --- |
| **Waterfall Model** | **V model** |
| * Step-by-step process, one phase completes before next starts.
 | * Each phase has specific deliverables and review process.
 |
| * Testing is done at the end after development
 | * Testing is done at every stage
 |
| * Difficult to make changes once a phase is completed
 | * Issues are identified early making it slightly flexible model
 |
| * Moves in Linear-sequential approach
 | * Verification and validation at each phase
 |
| * Less customer involvement
 | * More customer involvement
 |

Question 11 – Justify your choice

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

Answer 11 –

Reasons for choosing a V Model –

* V model works well in this online agriculture store project as the requirements are well understood, structured and clear.
* Early defect detection - Testing is done at every stage reducing errors and improving quality.
* Each development phase has a corresponding testing phase ensuring that the farmers requirements are met.
* Better quality and reliability is ensured which is important for carrying out financial transactions and product deliveries.
* Fixing issues in early stages saves time and cost.
* V model builds a strong error free system for farmers and sellers.

Question 12 – Gantt Chart

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

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

Answer 12 –

**GANTT Chart**



Question 13 - Fixed Bid Vs Billing

Explain the difference between Fixed Bid and Billing projects

Answer 13 –

|  |  |
| --- | --- |
| **Fixed Bid Projects** | **Billing Projects** |
| * These are milestone-based projects
 | * Based on Timesheet and delivery
 |
| * Budget and timeline are fixed at the start of the project
 | * More flexible as requirements change during the project.
 |
| * Scope and deliverables are predefined.
 | * Scope of project and deliverables can be changed as the project evolves.
 |
| * Best for projects with well-defined and clear requirements
 | * Best for projects with evolving or unclear requirements
 |

Question 14 – Prepare Timesheets of a BA in various stages of SDLC

* Design Timesheet of a BA
* Development Timesheet of a BA
* Testing Timesheet of a BA
* UAT Timesheet of a BA
* Deployment n Implementation Timesheet of a BA

Answer 14 –

* Design Phase – BA Timesheet:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tasks** | **Actionable Items** | **Start Time** | **End Time** | **Duration** |
| Requirement Gathering | Identify Stakeholders, conduct meetings, Documenting requirements, Sorting, prioritize and validate requirements | 9.00 AM | 11.30 AM | 2.5 hours |
| Requirement Analysis | Analyse, feasibility study, prepare functional requirements | 12.00 PM | 2.00 PM | 2 hours |
| BRD & SRS Documentation | Prepare Business Requirement Document (BRD), prepare Software Requirement Solution (SRS) | 2.30 PM | 5.30 PM | 3 hours |
|  |  |  |  | 7.5 hours |

* Development Timesheet of a BA:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tasks** | **Actionable Items** | **Start Time** | **End Time** | **Duration** |
| Functional Clarifications | Support developer team to understand requirements | 9.00 AM | 12.00 PM | 3 hours |
| Change Requests | Document & analyse new change request, manage change | 12.30 PM | 2.30 PM | 2 hours |
| Review development progress | Ensure the developments aligns with business needs | 3.00 PM | 5.00 PM | 2 hours |
|  |  |  |  | 7 hours |

* Testing Timesheet of a BA:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tasks** | **Actionable Items** | **Start Time** | **End Time** | **Duration** |
| Review Test cases | Review test cases prepared by Testing team | 9.00 AM | 12.00 PM | 3 hours |
| UAT Preparation | Ensure that the business scenarios are covered in testing | 12.30 PM | 2.30 PM | 2 hours |
| Work on defects | Discuss defects and ensure correction with developers & testers | 3.00 PM | 5.00 PM | 2 hours |
|  |  |  |  | 7 hours |

* UAT Timesheet of a BA:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tasks** | **Actionable Items** | **Start Time** | **End Time** | **Duration** |
| Drive UAT | Work with end users to execute test cases | 9.00 AM | 11.30 AM | 2.5 hours |
| Bug reporting | Document issues and communicate with developers | 12.00 PM | 2.30 PM | 2.5 hours |
| Feedback collection | Gather feedback from user and refine system | 3.00 PM | 5.00 PM | 2 hours |
|  |  |  |  | 7 hours |

* Deployment n Implementation Timesheet of a BA:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tasks** | **Actionable Items** | **Start Time** | **End Time** | **Duration** |
| Go-Live support | Assist in system to go live in real world | 9.00 AM | 12.00 PM | 3 hours |
| Training & Documentation | Complete and share end user manuals, organize training sessions for end users | 12.30 PM | 3.30 PM | 3 hours |
| Post-deployment review | Document and analyze system performance & gather feedback | 4.00 PM | 5.30 PM | 1.5 hours |
|  |  |  |  | 7.5 hours |