**Capstone Project 1**

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

Answer: - Below is the Business Process Model for Online Agriculture Store.

1. **Goal** – The goal here is to provide farmers, Consumers and others good agriculture products like Fertilizers, Seeds and Pesticides and other services online. Also provide the farming products in reasonable pricing and delivered at their place.
2. **Input** – A Online Platform for Agriculture Products, Partnership with Supplier, Technical infrastructure to support the buying and selling activities.
3. **Resources** – E-Commerce Platform, Supply Chain Partnership, Logistics for delivery of products, Warehouse to store the products.
4. **Output** – Order Processed and Delivery, Information about agriculture products, Easy and efficient website / Mobile application for buyer and seller for their activities.
5. **Activities** – Building Online store, Listing Products with their detailed features, Inventory Management, Handling queries and complaints from farmers and businesses, Order processing, packaging and delivery.
6. **Value** – Easy access of products, Online Discounts, video of the products (How to use), less cost compares to the market and on time delivery.

Question 2 – **SWOT Analysis**

Answer – **Strength**:

1. Cost Efficiency – Lower cost compares to the offline store
2. Market Reach – Online store can serve remote areas as well
3. Educational Component – Opportunity to integrate farming knowledge resources via online videos to attract more customers
4. First mover advantage - Assuming there is no online app for this activity they can have the first mover advantage.

**Weakness**:

1. Technology Challenges – High Dependence on the efficient platform and technical support for the seamless operation which can be a challenge for the business.
2. Internet availability – If there is no internet in the remote areas users can face challenge in using the online application.
3. Logistics Dependency – Sellers can face challenges in timely delivery of products in the rural or remote areas.
4. Trust issues – farmers may prefer to go to physical stores as they are more familiar with the stores and also, they may not use online platform due to the trust issues on the online seller.

**Opportunity**:

1. Rising Demand – There could be a rising opportunity for good agriculture products due to its cost effectiveness
2. Value added services – Training, farmer networking could be value added services
3. Growing Internet usage – Due to the online application digital activity can be increased amongst rural users
4. Government Help – Government may also help in the CSR activity to increase the modernization and online activities

**Threat**:

1. Competition – There could be a competition if others are already having same kind of services.
2. Pricing factors – Fluctuations in the pricing can impact the business
3. Trust barrier – There could be no trust amongst farmers on the online services as they might prefer the traditional purchasing methods.
4. Weather – The agriculture business is highly dependent on the weather so the demand and supply can be impacted by the climate conditions.

Question 3 - **Mr Karthik is trying to do feasibility study on doing this project in Technology (Java), Please help him with points (HW SW Trained Resources Budget Time frame) to consider in feasibility Study.**

Answer – Below are the points should be considered by Mr Karthik while doing the feasibility study.

1. **Hardware** – Network infrastructure should be reliable for high-speed internet connection so that operations can be seamless. Also ensure that servers are sufficient in processing with power, memory and can handle the extra load.
2. **Software** – He needs to ensure that latest version of Java is used while coding the application also selection of database is important like SQL, MY SQL.
3. **Trained Resources** – Mr. Karthik also needs to ensure that all the resources like Java Developers, Architects, Database Administrators, Network engineers, Testers are trained and self-motivated to complete the project within the deadline.
4. **Budget** – He needs to budget for the following activities.

Development Cost – Salaries of the development team and contractors.

Infrastructure Cost – Expense for servers, Cloud Services and other Hardware requirements

Maintenance cost – He also needs to ensure the cost of maintenance is also included

Marketing Cost – Promoting the platform to the target audience

(V) **Time Frame** –

Development Time – Mostly 6-9 Months should be dedicated for the development of the platform.

Testing – Typically 2-3 months for the Testing activities

Deployment Phase – 1-2 months for the deployment phase

Post – Launch support – 3-6 months of support is required after the launch of the platform.

Question 4 - 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 – Below is the GAP Analysis in order to initiate the project.

**AS IS** – Currently farmers reach out to physical stores for their requirements which may be far from their place causing delay and travel cost. Once they reach to the store, they may find that stock is not available or price has increased due to the ongoing demand of the products. Additionally, there is no guidance or support provided to the farmers choosing the best product. All these points make the current state time consuming and also not cost effective to the farmers.

**To BE** – On the other hand an online platform provides instant access of the desired products and services with in the cost to the farmers. They may also request the product to be made available if they notice that its out of stock which reduces his travel time / cost visiting the offline store. Also, educational support can be provided to educate the farmers.

**Question 5 - List down different risk factors that may be involved (BA Risks And process/Project Risks)**

Answer – Below are the risk factors involved in the project.

1. BA Risk – Following are the risk associated with the BA.

* **Stakeholder Mismanagement** : Miscommunication or conflicting goals among stakeholders leading to unclear requirements as there are different stakeholders involved with different requirements.
* **Incomplete Requirements**: Failure to gather complete and accurate requirements, resulting in project scope changes.
* **Changing Priorities** : Frequent shifts in stakeholder priorities causing delays or rework.
* **Technology Gaps** : Lack of understanding of the technical feasibility of Java or other tools.
* **Limited End-User Input**: Inadequate feedback from farmers or customers may lead to a platform that doesn't meet their needs.
* **Regulatory Risks:** Misinterpretation of legal or compliance requirements for an agriculture-based e-commerce platform.

1. Project Risk – Following are the risk associated with the project.

* **Budgeting :** Exceeding the allocated budget due to unforeseen expenses or underestimations during planning.
* **Time Delays :** Missing deadlines caused by unforeseen challenges, scope creep, or resource unavailability.
* **Resource Constraints :** Insufficient or untrained resources leading to inefficiencies or errors.
* **Technical Challenges :** Issues with Java frameworks, integration with third-party tools, or performance optimization.
* **Dependence on Suppliers:** Delays or disruptions from suppliers impacting inventory availability.
* **Logistics Failures:** Challenges in delivering products to remote areas efficiently.

**Question 6 – Stakeholder Analysis (RACI Matrix)**

Responsible Stakeholders: Peter, Kevin & Ben

Accountable Stakeholders: Mr. Pandu & Mr. Doku

Consulted Stakeholders: Mr. Henry & Mr. Karthik

Informed Stakeholders: IT Development Team

**Question 7 – Business Case Document**

Answer: Here is the Business Case for the project.

1. **Overview: Brief overview of the Project.**

* Objective: Objective of the project is to build online platform for farmers and sellers of the agriculture products.
* Importance: The project addresses the challenges like easy access of agriculture products like Fertilizers, Seeds & Pesticides.
* Benefit: Increased convenience for farmers, improves supply chain and boost the agriculture productivity.

1. **Business Problem / Challenges**

* Current Challenge: Difficulty in procuring essential farming products in the remote areas and Limited communication channel between farmers and manufacturers.
* Alternative Solutions: Create an online platform for farmers and sellers of agriculture products to bridge the gap. Also empowering the rural population and to support the sustainable growth. Educate them with the new methods of farming so that they can be more beneficial in their farming business.

1. **Project Objectives**

* The objective of the project is to develop user friendly web / mobile application for farmers to view and buy the agriculture products.
* Enable manufacturers to list their products with details and interact directly with the farmers.
* Ensure that payment is secure and deliver is efficient and within the deadlines.

1. **Scope of the Project**

* Development of the e-commerce platform to feature Product Catalogue, Order Placement, Secure Payment, Delivery tracking & Delivery of the Product.
* However, visiting the physical store is out of the scope.

1. **Budget & Timeline**

* Total budget to execute this project is 2 Crores and should not exceed beyond the budget and should be completed in 18 months as per the contract.

1. **Risk**

* Resistance for digital adoption amongst farmers.
* Limited Internet availability in the remote areas.

1. **Conclusion**

* Project should be initiated as it will help farmers in their day-to-day farming activities and also will help them in understanding the new methods of farming.

**Question 8 – Four SDLC Methodologies**

1. **Sequential Methodology:** This is the most common Software Development Life cycle method and also called as Waterfall method. It is very easy to understand and use. In this method different phases are there and each phase must be completed before starting the next phase. At the end of each phase a review takes place to determine if the project is on the right direction whether to continue with it or adopt a new method. Below are the stages of Waterfall Method.

* **Requirement gathering**: At the starting of the project Business Analyst gather the requirements from the stakeholders.
* **Requirement Analysis**: Once the Requirement is gathered project team analyse the requirements.
* **Design** – After Analysis phase Designing of the software get started by the Technical Architect team
* **Development** – Once Designing is completed developers actually develop the software.
* **Testing** – After Development testers test the software in UAT environment to check if it is good to be deployed in production.
* **Deployment** – Once the testing is successfully completed software is deployed in PROD environment for the end users

Advantage

* Simple and easy to use
* Easy to manage due to the rigidity of the model
* Phases are processed and completed one at a time
* Works for smaller projects where requirements are not in changing nature

Disadvantages

* Not a good model for long and complex projects
* Software is not developed until the last phase
* No adjustment is done between the phases
* Poor model for the project where requirements are changing

1. **Iterative Methodology**: In this software development method, Software developed in different cycles which is also called as iterations. Each cycle creates a working version of the software and then improved in the next iteration. This process continues until the final version of the software is not developed.

Advantage

* This model is flexible and allows changes in the software in the next version.
* Risks are identified and mitigated at the early stages of the development
* Easy for large and complex software application

Disadvantage

* Additional Resources are required due to the multiple iteration cycles.
* Not suitable for small projects
* Frequent changes can lead to the over budget and delay in development

1. **Agile Methodology**: Agile method emphasizes on collaboration with stakeholders, flexibility and client centricity. This method has four main values which are Individual and interactions over process and tools, Working Software over comprehensive documents, customer collaboration over contract negotiation and Responding change over following a plan. This method follows an incremental approach which is called Sprints.

Advantage

* This model is implemented where faster delivery is required.
* No exhaustive documents.
* Suitable for the project where requirements are frequently changes.
* In every sprint working software is developed.

Disadvantage

* Since focus is more on working projects over documents it can be a challenged for a new person.
* Daily meetings and face to face communications can be difficult in large company.
* Not suitable for very small project where requirements are not changing.

1. Evolutionary - This model is also called as Spiral method which gives more emphasis on Risk analysis. This model has four phase Planning, Risk Analysis, Engineering and Evolution. A software project repeatedly goes through these phases in iterations called spirals in this model.

Advantage

* High amount of risk analysis.
* Good for large and mission critical projects.
* Software is produced early in the Software life cycle.

Disadvantage

* Can be a costly model to use.
* Risk analysis requires highly expertise.
* Project success is dependent on risk analysis phase.
* Does not work well for smaller projects.

**Question 9 – Waterfall RUP Spiral and Scrum Models**

1. **Waterfall Model -** This is the most common Software Development Life cycle method and also called as Waterfall method. It is very easy to understand and use. In this method different phases are there and each phase must be completed before starting the next phase. At the end of each phase a review takes place to determine if the project is on the right direction whether to continue with it or adopt a new method. Below are the stages of Waterfall Method.

* **Requirement gathering**: At the starting of the project Business Analyst gather the requirements from the stakeholders.
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* **Testing** – After Development testers test the software in UAT environment to check if it is good to be deployed in production.
* **Deployment** – Once the testing is successfully completed software is deployed in PROD environment for the end users

Advantage

* Simple and easy to use
* Easy to manage due to the rigidity of the model
* Phases are processed and completed one at a time
* Works for smaller projects where requirements are not in changing nature

Disadvantages

* Not a good model for long and complex projects
* Software is not developed until the last phase
* No adjustment is done between the phases
* Poor model for the project where requirements are changing

1. **RUP –** The rational Unified Process is an iterative software development process created Rational Software Corp which was later acquired by IBM in 2003. RUP is based on building blocks or content elements, describing what is to be produced, the necessary skills required and step by step explanation describing how specific development goals are achieved. **The main content elements are following.**

**Roles:** A role defines a set of related skills, competencies and responsibilities**.**

**Work Product:** A work product represents something resulting from a task including all the documents and models produced while working through the process.

**Tasks:** A task is unit of work assigned to a role that provides a result.

**Advantage**

* RUP provides good documentation which complete the process itself.
* Provides risk management support.
* RUP reuses the components hence total time duration is less.

**Disadvantage**

* Team of expert professional is required as the process is complex.
* Complex and not properly organized process.
* More dependency on risk management
* Hard to integrate

1. **Spiral** - This model is also called as Spiral method which gives more emphasis on Risk analysis. This model has four phase Planning, Risk Analysis, Engineering and Evolution. A software project repeatedly goes through these phases in iterations called spirals in this model.

Advantage

* High amount of risk analysis.
* Good for large and mission critical projects.
* Software is produced early in the Software life cycle.

Disadvantage

* Can be a costly model to use.
* Risk analysis requires highly expertise.
* Project success is dependent on risk analysis phase.
* Does not work well for smaller projects.

1. Scrum - Scrum is an **Agile methodology** primarily used in software development to enhance collaboration, adaptability, and efficiency. It focuses on iterative progress, where work is delivered in smaller, manageable chunks called **sprints**—typically lasting 1-4 week. Scrum can be implemented either beginning of the project or when you sense that projects is falling behind.

Scrum team – Project resources are grouped as scrum team which comprises of BAs, Developers, Testers. Each team size will on average be 7-8.

Product Owner – He will decide what needs to be in the product and will be responsible for how the product has to be. He will regularly interact with customers and BA.

Scrum Master – He will monitor the performance of the team within the sprint. Team will raise any issue or concern to him and he will provide the solutions.

Meetings are very crucial in scrum and there are 4 meetings in this method which are Spring Planning, Daily Scrum meeting, Sprint Review and Sprint Retrospective meeting.

**Question 10 – Waterfall Vs V-Model**

**Answer –** Please find below difference between Waterfall and V model.

|  |  |  |
| --- | --- | --- |
| **Characteristics** | **Waterfall Model** | **V Model** |
| Flexibility | It is rigid and less adaptable to change | More flexible, allows changes during development |
| Testing | Testing is done after development leading to potential late discovery of defects. | Testing is done throughout the process, ensuring early detection of issues |
| Cost | Low cost due to the simplicity of the process | High cost due to extensive testing and validation |
| Customer Involvement | Less customer involvement, mainly at the beginning | More customer involvement, ensuring alignment with requirement |
| Risk Management | Risks are addressed in later stages, which can lead to higher costs for bug fixing. | Early identification and mitigation of risks through continuous testing |
| Suitability | Suitable for projects with well-defined and stable requirements | Suitable for projects requiring high quality assurance and early defect detection |
| Project Size | Waterfall model is best suited for large products | V Model is suited for small or medium size projects |
| Timeframe | Development timeframe in waterfall model is longer | Development in V model is short due to parallel testing and development |
| Reliability | Waterfall model is less reliable | V Model is more reliable |
| Feedback | Feedback is available after the testing phase | Continues feedback is available throughout the project |

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

Answer – As a BA I believe both the models are suitable for the projects however V model is more suitable for this project because of the following reasons.

* **Requirement Clarity** – In this project requirements are well defined and unlikely to change. The V-Model is suitable in such scenario.
* **Focus on Quality** – V-Model integrates testing and validation at every phase of the development process. This ensures that errors are identified early leading to a high quality project.
* **Critical Deliverables** - The project involves essential features like accepting product details from manufacturers, displaying them to farmers, and ensuring an easy purchasing process. The V-Model's systematic approach ensures these features are thoroughly verified and validated at each phase.
* **End users usability** - Since the application targets farmers, many of whom might not be technically savvy, usability is a top priority. The V-Model's rigorous validation ensures the application aligns with user needs from the outset.

**Question 12 Explain the difference between Fixed Bid and Billing projects**

**Fixed Bid** - A Fixed Bid project has a predetermined budget and timeline agreed upon between the client and the service provider. The cost of the project remains fixed regardless of the actual time and resources used to complete it.

**Billing Project** - Billing projects operate on a **time and material basis**, where the client pays based on the resources and time utilized during the project

**Question 13 – Gantt Chart**

|  |  |  |  |
| --- | --- | --- | --- |
| **Phase/Task** | **Start Date** | **End Date** | **Resource Assigned** |
| Requirement Gathering | Month 1 | Month 2 | BA |
| Requirement Analysis | Month 3 | Month 4 | BA |
| Design | Month 5 | Month 7 | Developers, PM |
| Development (D1) | Month 8 | Month 9 | Developers, DB Admin |
| Testing (T1) | Month 10 | Month 11 | Testers, PM |
| Development (D2) | Month 12 | Month 13 | Developers, DB Admin |
| Testing (T2) | Month 14 | Month 15 | Testers, PM |
| UAT | Month 17 | Month 18 | Testers, PM, NW Admin |

**Question 14**

1. **Design Timesheet of a BA**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | **Daily Time Sheet** |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Employee Name | Akshay Shukla |  |  |  |  |
| Manager Name | XYZ |  |  | Week | 01-04-2025 |
| Project Phase | Design Phase |  |  |  |  |
|  |  |  |  |  |  |
| **Date** | **Day** | **Activity** | **Time In** | **Time Out** | **Total Hours** |
| XXX | XXX | Email | 09:00 | 09:30 | 0.5 |
|  |  | Process / Technical Flow Preparation | 09:30 | 11:30 | 2 |
|  |  | Call | 11:30 | 12:00 | 0.5 |
|  |  | Break | 12:00 | 12:30 | 0.5 |
|  |  | Meeting with Tech Team | 12:30 | 01:30 | 1 |
|  |  | Lunch | 01:30 | 02:00 | 0.5 |
|  |  | Process / Technical Flow Preparation | 02:00 | 04:00 | 2 |
|  |  | Break | 04:00 | 04:30 | 0.5 |
|  |  | HLD / LLD Preparation | 04:30 | 06:00 | 1.5 |
|  |  |  | **Total Hours** | | **9** |

1. **Development Timesheet of a BA**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | **Daily Time Sheet** |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Employee Name | Akshay Shukla |  |  |  |  |
| Manager Name | XYZ |  |  | Week | 28-04-2025 |
| Project Phase | Development Phase |  |  |  |  |
|  |  |  |  |  |  |
| **Date** | **Day** | **Activity** | **Time In** | **Time Out** | **Total Hours** |
| XXX | XXX | Email | 09:00 | 09:30 | 0.5 |
|  |  | Requirement Clarification Meet | 09:30 | 11:30 | 2 |
|  |  | Call | 11:30 | 12:00 | 0.5 |
|  |  | Break | 12:00 | 12:30 | 0.5 |
|  |  | Meeting with Tech Team | 12:30 | 01:30 | 1 |
|  |  | Lunch | 01:30 | 02:00 | 0.5 |
|  |  | Report Prep | 02:00 | 04:00 | 2 |
|  |  | Break | 04:00 | 04:30 | 0.5 |
|  |  | Status Tracking Call | 04:30 | 06:00 | 1.5 |
|  |  |  | **Total Hours** | | **9** |

1. **Testing Timesheet of a BA**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | **Daily Time Sheet** |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Employee Name | Akshay Shukla |  |  |  |  |
| Manager Name | XYZ |  |  | Week | 09-06-2025 |
| Project Phase | Testing Phase |  |  |  |  |
|  |  |  |  |  |  |
| **Date** | **Day** | **Activity** | **Time In** | **Time Out** | **Total Hours** |
| XXX | XXX | Email | 09:00 | 09:30 | 0.5 |
|  |  | System Integration Testing | 09:30 | 11:30 | 2 |
|  |  | Call | 11:30 | 12:00 | 0.5 |
|  |  | Break | 12:00 | 12:30 | 0.5 |
|  |  | Meeting with Tech Team | 12:30 | 01:30 | 1 |
|  |  | Lunch | 01:30 | 02:00 | 0.5 |
|  |  | Test Case Preparation | 02:00 | 04:00 | 2 |
|  |  | Break | 04:00 | 04:30 | 0.5 |
|  |  | Status Tracking Call | 04:30 | 06:00 | 1.5 |
|  |  |  | **Total Hours** | | **9** |

1. **UAT Timesheet of a BA**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | **Daily Time Sheet** |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Employee Name | Akshay Shukla |  |  |  |  |
| Manager Name | XYZ |  |  | Week | 30-06-2025 |
| Project Phase | UAT |  |  |  |  |
|  |  |  |  |  |  |
| **Date** | **Day** | **Activity** | **Time In** | **Time Out** | **Total Hours** |
| XXX | XXX | Email | 09:00 | 09:30 | 0.5 |
|  |  | System Integration Testing | 09:30 | 11:30 | 2 |
|  |  | Call | 11:30 | 12:00 | 0.5 |
|  |  | Break | 12:00 | 12:30 | 0.5 |
|  |  | Meeting with Tech Team | 12:30 | 01:30 | 1 |
|  |  | Lunch | 01:30 | 02:00 | 0.5 |
|  |  | Test Case Prepration | 02:00 | 04:00 | 2 |
|  |  | Break | 04:00 | 04:30 | 0.5 |
|  |  | Status Tracking Call | 04:30 | 06:00 | 1.5 |
|  |  |  | **Total Hours** | | **9** |