**Capstone Project 1 Case Study Answers**

1. Identify business process model for online agricultural store – (Goal, Inputs, Resources, Outputs, Activities, Value created to the end customer)
2. **Goal**- To bridge the gap between farmers and product manufacturers, providing accessibility to essential resources for farming. The Main goal is to make it easier for farmers in rural areas to efficiently, affordably and user-friendly manner to buy agricultural products directly from manufacturers.

**Inputs**- User requirements, Customer data, Supplier data, Product information, Technology infrastructure and payment details.

**Resources**- Customer support team, Delivery network, Payment gateway, web and mobile app and product database.

**Outputs**- Product deliveries, order confirmation, Supplier analytics, sales report and feedback.

**Activities**- Registration & login, Product listing, Product search & selection, Order placement, Payment processing, Order confirmation, Customer support, Delivery and feedback.

**Value**- Cost effectiveness, Easy payment options, Timely delivery, Wide product selection, Improved farming outcomes.

1. Mr Karthik is doing SWOT analysis before he accepts this project. What accepts he should consider as Strengths, as Weakness, as Opportunity and as Threats.

 A)

**Strengths**- Experienced team, High demand in agriculture, social responsibility and innovation and marker differentiation.

**Weakness-** Logistics and delivery challenges**,** Limited technological literacy in rural areas, Internet connectivity issues, Investment and budget concerns.

**Opportunities-** Expansion into new product categories or regions, Untapped market in rural areas and growing e-commerce adoption.

**Threats-** Technological challenges and regulatory changes, Competition from other platforms or local vendors.

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.
2.
* **Hardware**- Servers (Web and Database), Cloud infrastructure and backup solutions.
* **Software**- Java (Spring boot, Hibernate), Development tools, Testing tools.
* **Resources**- Java developers, Frontend developers, Database administrators, Network administrators, Testers and Business analysts.
* **Budget-** Various costs involved such as Development costs, Cloud/Infrastructure costs, Testing costs and Licensing fees**.**
* **Time Frame-** 18 months.

 4. What is Gap Analysis for this project?

 **A) Current State:**

* Limited product variety, local access only.
* Purchasing process is manual, offline, with middlemen.
* Cost effectiveness is higher prices due to middlemen and travel costs.
* Travel required to purchase products, especially in remote areas.

**Desired State:**

* Wide range of products from multiple suppliers online.
* Purchasing process is automated, online purchasing directly from suppliers.
* Lower prices, direct access to manufacturers.
* Products delivered directly to farmers location.

5. List down Risk Factors that may be involved (BA Risks and Process/Project Risks)?

 **A) BA Risks**

* Incomplete or misunderstood requirements.
* Conflicting requirements.
* Changing requirements.
* Documentation and knowledge transfer risks.
* Lack of clear prioritization.

**Process/Project Risks**

* Technical Risks.
* Project management risks.
* Data security risks.
* Resource shortages.
* Deployment failures.
* Timeline delays
* Quality assurance issues.
* Compliance risks.

6. Stakeholder Analysis (RACI Matrix)?

 Answer:

|  |  |  |
| --- | --- | --- |
| R/A/C/I | Name of the Resources | Designation |
| Responsible | Mr. Henry | Project Sponsor |
| Mr. Pandu | Financial Head |
| Farmers (Peter, Kevin, Ben) | Stakeholders |
| Mr. John | Database Admin |
| Mr. Jason & Ms. Alekhya | Testers |
| Ms. Juhi, Mr.Teyson, Ms. Lucie, Mr. Tucker, Mr. Bravo | Java Developers |
| Mr.Vandanam | Project Manager |
| Mr. Mike | Network Admin |
| Accountable | Mr. Henry | Project Sponsor |
| Mr. Karthik | Delivery Head |
| Mr. Vandanam | Project Manager |
| Mr. Pandu | Financial Head |
| Consulted | Mr. Dooku | Project Coordinator |
| Mr. Karthik | Delivery Head |
| Mr. Vandanam | Project Manager |
| Mr. Juhi | Senior Java Developer |
| Mr. Mike | Network Admin |
| Informed | Mr. Henry | Project Sponsor |
| Mr. Pandu | Financial Head |
| Farmers | Stakeholders |
| Mr. Karthik & Mr. Vandanam | Delivery Head & Project Manager |

7. Prepare Business case document?

Answer:

* Why is this project initiated?

 This project is initiated because there is a clear and urgent need for farmers in remote areas to have direct access to agricultural products at fair prices. The project will empower farmers, improve agricultural productivity and promote economic development in rural areas. By building an online platform that connects manufacturers and farmers.

* What are the current problems?

1. Difficulties in accessing essential farming products.
2. High costs due to middlemen.
3. Technological and logistical challenges.
4. Lack of transparency and product information.
5. Environmental and sustainability concerns.
* With this project, how many problems could be solved?
1. Improved access to essential agricultural products.
2. Reduction in product costs.
3. Overcoming technological barriers by designing an easy-to-use platform.
4. Fast delivery of products through integrated logistics solutions.
5. Transparency in product in product information.
6. Training and customer support to assist farmers in using agricultural products effectively and making better decisions.
* What are the resources required?
1. **Human Resources**: Developers, Designers, Project Managers, Testers, Customer Support, Business Analysts, Marketing Experts.
2. **Technological Resources**: Development Tools, cloud Hosting, databases, payment systems, security tools and analytics software.
3. Financial Resources: Budget for development, infrastructure, marketing, training and support.
4. **Partnerships**: Collaboration with manufacturers, delivery partners and government agencies.
* What is the time frame to recover ROI?

The estimated time frame for recovering ROI for the online agricultural product store project is between 18 months to 3 years, depending on the adoption rate, marketing effectiveness and operational efficiencies.

8. Four SDLC Methodologies?

Answer:

* **Sequential Methodology (Waterfall)**: The sequential methodology often referred to as the waterfall model, is the most traditional approach to software development. It follows a linear, step by step process where each phase must be completed before moving to the next. This is a very structured model with little room for changes once a phase is completed. This is best for projects with well-defined and stable requirements such as small applications or systems with little chance of change.
* **Iterative Methodology:** The iterative methodology involves breaking down the project into smaller and manageable parts. Each iteration involves revisiting and improving the previous phase. This methodology is best for medium to large projects where requirements may evolve over time or are unclear at the outset.
* **Evolutionary Methodology:** The evolutionary methodology is a form of iterative development, where the system is built and evolved based on continuous feedback from users. It focuses on rapid prototyping and is highly adaptive to changes. This methodology is best for where the exact requirements are unclear at the beginning or where user preferences and needs are expected to evolve.
* **Agile Methodology:** The agile methodology is a highly iterative, flexible, and collaborative approach to software development. It focuses on delivery small, incremental releases of the product that provide value to the customer, while constantly adapting to change. Agile methods focus on frequent communication, collaboration and customer feedback. This methodology is best for projects where requirements are likely to change frequently, or when quick changes and adaptability are necessary.

9. Waterfall RUP spiral and scrum models?

Answer:

 **Waterfall Model**: The waterfall model is one of the most traditional, linear and sequential development processes. Each phase of the project is completed in order, with little room for revisiting earlier stages. The advantage of this model is clear structure and easy to understand. This model is best for projects with well-defined, fixed requirements. The disadvantage of this model is inflexible to changes once a phase is completed.

**Rational Unified Process**: RUP is an iterative and incremental methodology that provides a framework for software development based on four phases inception, elaboration, construction and transition. Each phase consists of several iterations or cycles, where development evolves based on feedback and continuous improvements. The advantage of this model is, it allows for early detection of risks and issues. This model is best for large, complex projects with unclear or evolving requirements that require ongoing refinement, like enterprise level systems.

**Spiral Model**: The spiral model is an iterative development methodology that focuses on risk management. It breaks down the project into multiple cycles, where each cycle involves, planning, designing, building and testing. Each cycle revisits these phases, allowing for continuous refinement and feedback. This model is best for large-scale, high-risk projects where requirements are uncertain, and risks need to be mitigated continuously.

**Scrum Model**: Scrum is a popular agile framework that emphasizes incremental development through iterative cycles called sprints. It focuses on collaboration, flexibility, and continuous delivery of a functional product. Scrum incorporates roles like product owner, scrum master and development team. The advantage of this model is highly flexible and responsive to changes and evolving requirements. This model is best for medium to large projects where requirements are likely to change frequently, and flexibility and quick adaptation are needed.

**My Recommendation**: Based on the characteristics of the agricultural store project, I recommend agile. The agile methodology allows for frequent iteration and feedback, making it ideal for project where requirements can change based on user needs.

10. Waterfall vs V-Model?

Answer:

|  |  |
| --- | --- |
| **Waterfall Model** | **V- Model** |
| Testing starts after the development is completed. | Testing occurs concurrently with development. |
| Focuses on development stages. | Focuses on validation and verification at every stage of development. |
| Less customer involvement | More customer involvement |
| Move in linear way | Don't move in linear way |
| Limited feedback and iteration during the process | Continuous verification and validation. |
| Risks are typically identified and dealt with later, during the test phase | Risks are mitigated earlier because testing happens alongside development |

11. Justify your choice?

 Answer:

 For this online agricultural product store project, I recommend the V-Model because of its strong emphasis on early and continuous testing, validation of requirements and structured development. This methodology offers a clear roadmap to ensure that the system meets the required functionality, quality, and performance standards before moving to the next phase.

12. Prepare a Gantt Chart for this project?

Answer:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Phase | Resources | Week 1-4 | Week 5-8 | Week 9-12 | Week 13-16 | Week 17-18 |
| Requirements gathering | PM, BA |  |  |  |  |  |
| Requirements analysis | PM, BA |  |  |  |  |  |
| Design | PM, BA, Java Dev, DB admin |  |  |  |  |  |
| D1 (Detailed design) | Java devs, DB admin |  |  |  |  |  |
| T1 (Unit testing) | Java devs, Testers |  |  |  |  |  |
| D2(Integration design) | Java devs |  |  |  |  |  |
| T2(Integration testing) | Testers |  |  |  |  |  |
| D3(System design) | PM, Java devs, DB admin, NW admin |  |  |  |  |  |
| T3(System testing) | Testers |  |  |  |  |  |
| D4(Deployment design) | PM, Java devs, NW admin |  |  |  |  |  |
| T4(UAT testing) | BA, testers  |  |  |  |  |  |
| UAT (User acceptance test) | PM, BA, Testers, Java dev |  |  |  |  |  |

13. Fixed Bid vs Billing?

 Answer:

|  |  |
| --- | --- |
| Fixed Bid | Billing |
| Budget predictability high for the client | Budget predictability low for the client |
| Pricing fixed upfront cost agreed at the start | Pricing Based on actual time spent  |
| Risk is on the service provider | Risk is shared or on the client depending on the work efficiency |
| Less flexible, changes to the scope are costly | More flexible, scope can evolve throught the project |
| Payments are made based on milestones or completion | Regular billing based on time or resources used |

14. Prepare timesheets of BA in various stages of SDLC?

 Answer:

1. Design timesheet of BA?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Date | Task | Actionable Items | Start Time | End Time | Duration |
| 05-03-2025 | Requirements gathering | Meet with stakeholders to gather product requirements | 09:00AM | 11:00 AM | 2 Hours |
| 05-03-2025 | Requirements analysis | Analyze and document functional requirements | 11:15AM | 01:15 PM | 2 Hours |
| 05-03-2025 | Documentation review | Review existing project document | 02:30 PM | 03:30 PM | 1 Hour |
| 05-03-2025 | Design | Define user stories and use cases for new features | 03:45PM | 05:45PM | 2 Hours |
| 05-03-2025 | Requirements Gathering | Team collaboration meeting to clarify requirements | 06:00PM | 07:00PM | 1 Hour |
|  |  |  |  | Total hours worked | 8 Hours |

 2. Development timesheet of BA?

 Answer:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Date | Task | Actionable Items | Start Time | End Time | Duration |
| 06-03-2025 | Requirements clarification | Clarify user requirements | 09:00AM | 11:00 AM | 2 Hours |
| 06-03-2025 | Design review | Review design documents and align with requirements  | 11:15AM | 12:45 PM | 1.5 Hours |
| 06-03-2025 | UAT testing | Conduct UAT for feature Y | 01:30 PM | 03:30 PM | 2 Hours |
| 06-03-2025 | Requirements documentation | Write detailed user stories and refine requirements | 03:45PM | 05:15PM | 1.5 Hours |
| 06-03-2025 | Sprint planning | Sprint planning meeting with team | 05:30PM | 06:30PM | 1 Hour |
|  |  |  |  | Total hours worked | 8 Hours |

 3. Testing timesheet of a BA?

 Answer:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Date | Task | Actionable Items | Start Time | End Time | Duration |
| 07-03-2025 | Testing preparation | Review and validate test cases for feature | 09:00AM | 10:30 AM | 1.5 Hours |
| 07-03-2025 | UAT testing | Participate in UAT for feature and log defects | 10:45AM | 12:45 PM | 2 Hours |
| 07-03-2025 | Test collaboration | Collaborate with team to review testing results | 01:30 PM | 02:30 PM | 1 Hour |
| 07-03-2025 | Documentation review | Review and update the test document | 02:45PM | 04:15PM | 1.5 Hours |
| 07-03-2025 | Re-Testing | Conduct Re-Testing after fixes and log results | 04:30PM | 06:30PM | 2 Hour |
|  |  |  |  | Total hours worked | 8 Hours |

 4. UAT timesheet of BA?

 Answer:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Date | Task | Actionable Items | Start Time | End Time | Duration |
| 08-03-2025 | UAT preparation | Review UAT plan and prepare test cases for feature | 09:00AM | 10:30 AM | 1.5 Hours |
| 08-03-2025 | UAT testing | Conduct UAT for feature and log defects | 10:45AM | 12:45 PM | 2 Hours |
| 08-03-2025 | Defect review | To discuss defects found in UAT | 01:30 PM | 02:30 PM | 1 Hour |
| 08-03-2025 | Documentation review | Update UAT documentation with defect details and testing plans | 02:45PM | 03:45PM | 1 Hour |
| 08-03-2025 | Re-testing | Re-testing after defect fixes. | 04:00PM | 06:00PM | 2 Hours |
|  |  |  |  | Total hours worked | 7.5 Hours |

 5. Deployment and implementation timesheet of a BA?

 Answer:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Date | Task | Actionable Items | Start Time | End Time | Duration |
| 09-03-2025 | Deployment preparation | Review and update deployment documentation | 09:00AM | 11:00 AM | 2 Hours |
| 09-03-2025 | Deployment coordination | Assist in deployment coordination with IT team | 11:15AM | 12:45 PM | 1.5 Hours |
| 09-03-2025 | Post deployment validation | Participate in post deployment validation and checks | 01:30 PM | 03:30 PM | 2 Hours |
| 09-03-2025 | Post implementation support | Communicate with users for feedback | 03:45PM | 04:45PM | 1 Hour |
| 09-03-2025 | End-user training | Conduct training sessions for end users on new features | 05:00PM | 07:00PM | 2 Hours |
|  |  |  |  | Total | 8.5 Hours |