**CAPSTONE PROJECT 1 PART 1**

**Question 1** – BPM - 5 Marks

1. **Identify Business Process Model for Online Agriculture Store – (Goal, Inputs, Resources, Outputs,Activities, Value created to the end Customer)**
* **GOALS:** To provide a convenient online agricultural store that connects remote farmers and suppliers by allowing farmers to buy agricultural supplies (such as seeds, fertilizers, and pesticides) straight from suppliers. Leading to bridge the gap between remote farmers and suppliers.
* **INPUTS:** Customer Data (Farmers details), Vendors / Supplier detail, Product details, Trained IT employee, Marketing team, Logistic Department, Payment mode
* **RESOURCES:** Online Agriculture product store/ Mobile applications, Internet, Server applications at Online application store, Office space, warehouse, Outsourcing APT IT Solutions, Logistic department
* **OUTPUTS:** Profit in sales revenue , Efficiency , Delivering the ordered product on time to the selected location
* **ACTIVITIES:** Order placed by customer, Dispatching the order after successful payment from the customer, Tracking the delivery, Providing the customer service to the customer for there on convenience, Saving the data into DB.

**VALUE:** Easy to use online store for the farmers making it more convenient , accessible, availability of the product at desire location, best deals and time saving

**Question 2 –** SWOT - 5 Marks

|  |  |
| --- | --- |
| **STRENGTH** | **WEAKNESSES** |
| * Project funded for 2 CRORE INR BY MR.HENRY
* Availability of a talent pool with highly skilled developers
* Adaptation of corporate social responsibility (CSR) initiative.
* Clear project scope with well-defined objectives.
 | * Internet connectivity issues in remote areas.
* Tight 18-month project timeline
* Not every farmer would be educated or literate enough to use the application.
 |
| **OPPORTUNITIES** | **THREATS** |
| * Creating a new trend for the farmer making it more easier and convenient way for purchasing goods
* Expanding the business through use of social media platform and digital marketing advertisement
* Provide training to farmers on how to use the application.
* Offer multilingual support for better accessibility.
* Expanding into other agricultural sector
* Building the community channel among the supplier and farmers
 | * Farmers may be reluctant to embrace new technology because they are unfamiliar with it or don't trust it.
* Quality check from the genuine product for authentic distributor
* Risk of scope creep from frequent changes request
* Competitor
* Availability created by the supplier on time for big 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.

Question 3 –** Feasibility study - 5 Marks
2. **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.**

**-Hardware (HW)**

* Ensure adequate server capacity (cloud hosting for scalability).
* Optimize for low-cost devices (smartphones, tablets).

**-Software (SW)**

* BALSAMIQ
* **Java**
* Databases MySQL/PostgreSQL.
* Integrate APIs for payment and logistics services.

**-Resources**

* Skilled Java developers , Experienced UX/UI developer , DB administrator, Tester, Logistic department, Customer service support, Market research, Quality control , Payment processing department, Operations

**-Budget**

* Include costs for resources, software tools, hosting, and licenses.
* Allocate funds for post-launch maintenance.

**-Time Frame**

* Break the 18 months into key phases of SDLC.
* Ensure time for UAT and stakeholder feedback.

 **Question 4** – Gap Analysis - 5 Marks
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**

**AS IS**

* The absence of local providers makes it difficult for farmers in isolated locations to obtain pesticides, seeds, and fertilizers.
* Higher expenses and delays result from relying on middlemen.
* There is little to no direct communication between manufacturers and farmers.
* In order to obtain products, farmers must travel great distances, squandering time and money. No single location or platform to compare goods or costs.
* Limited product accessibility in isolated locations.
* Farmers frequently depend on regional vendors with limited selection.
* The high cost of goods because of shipping and middlemen.
* Farmers in isolated locations are not as familiar with procurement technology. Manual procedures take a lot of time.
* Current procedures are not scalable enough to serve a large number of farms or meet the increasing demand.

**TO BE**

* Through this online application, farmers may place direct orders with manufacturers, guaranteeing availability and cost-effectiveness.
* The technology facilitates direct communication between farmers and manufacturers, enhancing demand forecasts and transparency.
* Farmers can save time and effort by browsing and buying products online from the comfort of their location.
* The portal offers a large selection of herbicides, seeds, and fertilizers that are directly sourced from several producers.
* Farmers are introduced to digital procurement through an intuitive platform, which speeds up and simplifies the process.
* A larger agricultural community will gain from the platform's scalability, which can handle more users and areas.

**Question 5** – Risk Analysis - 10 Marks
1. **List down different risk factors that may be involved (BA Risks And process/Project Risks)
BA Risks**
* Insufficient knowledge in the domain of agriculture may lead to a poor understanding of the requirements of stakeholders.
* Insufficient expertise in managing CSR or farmer-focused initiatives could result in deficiencies in requirement management.
* Inadequate experience of BA while handling the project
* Failure to document requirements properly could cause confusion and rework during development.
* Inadequate requirements documentation may result in misunderstandings and rework during development.
* Inaccuracies in the creation of process flows or UML diagrams might result in defective designs.
* Risk of ineffectively communicating requirements to the appropriate stakeholders, testers, and developers.
* Poor coordination between teams may cause delays or misalignment in deliverables.
* Extended timeframes and scope creep might result from frequent requirement changes.
* Inefficient tracking of requirements could result in project lacking within the time frame planned.

**Project Risks**

* Technical problems or platform outages could interfere with user transactions.
* Logistical difficulties in guaranteeing prompt product delivery to isolated locations.
* If there are delays in the requirements collecting, development, or testing stages, the 18-month timetable might not be enough.
* The budget of 2 crore Indian rupees might not be enough because of scope creep, unanticipated expenses, or rework.
* The supplier won't be able to provide enough merchandise for the delivery
* Issue with payment transaction as done by customer but not visible in the server

**Question 6 –** Stakeholder Analysis (RACI Matrix) - 8 Marks

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

| **Phase** | **Mr. Henry (Sponsor)** | **You (BA)** | **Mr. Karthik (Delivery Head)** | **Mr. Pandu (Financial Head)** | **Mr. Dooku (Project Coordinator)** | **APT IT SOLUTIONS Team** | **Peter, Kevin, Ben (STAKEHOLDER)** | **Manufacturers /supplier** | **Mr. Jason, Ms. Alekya (Testers)** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pre-Project** | A | C | R | C | C | I | I | I | I |
| **Planning, Estimation, and Assessment** | A | C | R | C | C | I | I | I | I |
| **Requirement Gathering** | C | A | R | I | C | C | A | C | I |
| **Requirement Analysis** | C | A | R | I | C | C | C | C | I |
| **Design** | I | R  | R | I | C | R | I | C | I |
| **Coding** | I | C | C | I | I | R | I | I | I |
| **Testing** | I | R  | C | I | I | C | I | C | R |
| **Deployment and Implementation** | A | C | R | I | C | C | A | C | I |

**-Key stakeholder of the project**

* **Mr. Henry (Sponsor):** Provides project funding and approval.
* **Mr. Karthik (Delivery Head):** Manages the project delivery and ensures adherence to timelines.
* **Business Analyst (You):** Manages requirements gathering, analysis, and validation.
* **Farmers (Peter, Kevin, Ben):** Key end-users providing feedback and requirements.
1. **Manufacturers:** Supply the products and provide inventory data. **RACI MATRIX NOTATION**
2. R (Responsible): The person or group in charge of carrying out the assignment. They have direct responsibility for finishing the task at hand. (SPOC)
3. A (Accountable): The one who bears ultimate responsibility for the assignment or choice. They are accountable for the result and make sure the assignment is finished. Each duty should be assigned to a single person. (PROCESS EXPERT)
4. C (contacted): Before a task is finished or a decision is taken, stakeholders or experts are Contacted for their suggestions, or comments. (AMBASSOR USER)
5. I (Informed): People or organizations that are not directly involved in the work but are kept updated on decisions, progress, or results. (END USER)
6. **Help Mr Karthik to prepare a business case document**
* **What is the purpose of this project?**

The project's goal is to develop a marketplace on the web or application that enables farmers in remote areas to buy pesticides, seeds, and fertilizers straight from supplier, cutting out middlemen and increasing accessibility while also saving money.

1. **What problem does this project solve?**

It might be challenging for farmers in isolated locations to obtain necessary agricultural supplies like pesticides, seeds, and fertilizer. Because local intermediaries are used, this results in inefficiencies, lower crop yields, and greater expenses. By offering a user-friendly web platform for direct manufacturer procurement, the project tackles this issue.

1. **Which opportunity does this plan makes use of?**

The idea gives farmers the chance to communicate directly with manufacturers through a digital platform, which facilitates efficient procurement, affordable prices, and on-time delivery. This enhances farming methods and output in remote areas.

1. **What is the scope of this project?**

Developing a mobile and online application for perusing and purchasing agricultural goods. Enabling order tracking and delivery management. Making it more efficient convenient and affordable for the farmer and creating a sale for the suppliers

1. **What is the estimated cost and budget for the project?**

Total Budget: 2 Crores INR

1. **What is the estimated timeline for the project?**

Project Duration: 18 months

1. **What are the resources required?**

Project Manager, Business Analyst, Development Team, Quality Assurance (QA) Team, Database Administrators (DBA), Customer Support Team, Marketing team

1. **How to identify stakeholder?**

**Internal Stakeholders:** Mr. Henry (Sponsor), Mr. Karthik (Project Manager), Business Analyst (You), Developers, Testers, Designers.

**External Stakeholders**: Farmers (users), Manufacturers (suppliers), Logistics Partners, Government bodies.

1. **What is the approach for executing the project?**

We will be using sdlc approach with 7 step involved planning, system design, development, testing, deployment, maintenance and support

 **Question 8 –** Four SDLC Methodologies - 8 Marks

**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 IterativeEvolutionary and Agile. Please share your thoughts and clarity on Methodologies**

**In his discussion with Mr. Henry, Mr. Karthik described the four main development approaches—Waterfall Sequential, Iterative, Evolutionary, and Agile—as well as the Software Development Life Cycle (SDLC). Each of these approaches has pros and cons and provides a variety of ways to design software.**

1. **Sequential (or Waterfall) Methodology: This technique ensures that every project phase is finished before going on to the next. Usually, it has the following structure: Analyzing requirements, designing the system, implementing it, testing it, deploying it, and maintaining it.**

**PROS:**

1. **Clear Structure: The process is simple to manage because each phase has clear objectives.**
2. **Predictable: Time and cost estimation may be simpler if requirements are clearly stated from the start.**

**CONS:**

1. **Limited Flexibility: It's challenging to go back and make adjustments once a phase is finished.**
2. **Slow to Adjust: Unsuitable for projects whose needs are changing or unclear.**
3. **Iterative Methodology : This approach divides the project into smaller parts, or iterations. Every iteration produces a functional version of the system that is improved with each cycle after going through all phases of design, development, and testing.**

**PROS:**

1. **Flexibility to Improve: Following each iteration, features can be reviewed and enhanced.**
2. **Risk Mitigation: Issues are found early and fixed at every stage.**

**CONS:**

1. **Possible Scope Creep: New features may be added as iterations go on, which could result in scope creep.**
2. **Close Monitoring: To make sure iterations stay within scope, rigorous management is needed.**
3. **Evolutionary Methodology: The evolutionary approach emphasizes steady progress. It enables ongoing product development and feedback, with new features added at each stage. It is comparable to iterative, but instead of finishing iterations with a clear end goal, it focuses more on the project's gradual evolution.**

**PROS:**

1. **Adaptability: As new needs arise, the project can change.**
2. **Customer-Centric: Ongoing feedback can be used to add or modify features.**

**CONS:**

1. **Uncertain schedule: It may be challenging to forecast the project's ultimate schedule due to ongoing modifications.**
2. **Complexity of Management: Needs close monitoring of modifications to prevent misunderstandings or discrepancies.**
3. **Agile Methodology: The goal of agile is to produce functional software in brief, iterative cycles known as sprints, which last between two and four weeks on average. A fresh, functional version of the product is made available at the conclusion of every sprint, enabling ongoing stakeholder input and modifications.**

 **PROS:**

1. **Flexibility and Adaptability: Agile is perfect for projects with changing demands since it adapts easily to requirements changes.**
2. **Quick Delivery: Facilitates a quick supply of functional capabilities, allowing for the platform to be launched and enhanced gradually.**
3. **Enables quick delivery of working features, making it possible to launch and improve the platform simultaneously**
4. **Constant Feedback: To guarantee alignment with user needs, stakeholder feedback is obtained on a frequent basis.**

 **CONS:**

1. **Active Stakeholder Participation Is Necessary: Agile requires regular stakeholder input, which can be challenging to sustain.**
2. **Possibility of Scope Creep: New features may be added on a regular basis as a result of changes.**

**Agile would probably be the best methodology given the nature of the agriculture product store project because:**

1. **The project must adapt to stakeholder (farmer) input and shifting user needs.**
2. **The platform will remain current and user-friendly if new features can be added on a regular basis.**
3. **The platform's success depends on the input and participation of numerous stakeholders, including farmers, manufacturers, and suppliers.**

**Question 9** – Waterfall RUP Spiral and Scrum Models – 8 Marks

**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?**

There are a number of software development life cycle (SDLC) models that can be used to direct the process. Waterfall, RUP (Rational Unified Process), Spiral, Scrum, and V-Model are some of these models. Every model has unique qualities and works well for various kinds of projects. A synopsis of each is given below:

* **Waterfall Mode**

The Waterfall model is a sequential and linear strategy that requires that all project phases—requirement collection, design, programming, testing, deployment, and maintenance—be finished before going on to the next. It's a methodical strategy that works well for tasks with clear specifications.
 **PROS** :
Clearly defined deliverables and milestones.
easier to oversee with a set budget and schedule.

**CONS:**
Changes are hard to make after the process starts.
Unsuitable for projects with changing or evolving requirements.

* **V-Model** The V-Model is a Waterfall model extension in which every stage of development has a direct correlation with a testing phase. The validation and verification process is represented by the "V" shape, which makes sure that every step is checked and validated before going on to the next.

**PROS**:a focus on thorough testing to make sure the system satisfies specifications at every turn.
traceability and clear documentation.
**CONS**: rigid framework that isn't very adaptable. Testing is delayed, and correcting errors can be expensive.
* **RUP (Rational Unified Process)**The project is broken down into four phases using the iterative RUP development process: Inception, Elaboration, Construction, and Transition. It stresses ongoing improvement and feedback and focuses on iterative releases.

**PROS:**
the ability to adjust to shifting needs.
Roles, activities, and responsibilities are clearly specified in a clear organization.
**CONS**:
demands more time and resources with every iteration.
Implementation can be challenging, particularly for smaller teams.
* **Spiral Model:** The Spiral Model incorporates aspects of both the iterative and waterfall approaches. It emphasizes risk assessment and breaks the development process down into spirals or cycles, with planning, risk analysis, engineering, testing, and evaluation all included in each cycle.

**PROS:**
emphasizes risk management.
allows for changes in requirements with flexibility.
**CONS:**
can be costly since it requires a lot of preparation and risk analysis.
Complex and difficult to oversee for smaller enterprises.
* **SCRUM**The Agile framework Scrum is centered on producing product features in brief, time-boxed cycles known as sprints. Because Scrum is predicated on ongoing stakeholder feedback, the development team can swiftly adjust to evolving requirements.
**PROS**
Highly flexible and adaptable to changing requirements. Focuses on frequent collaboration and delivering working software.
**CONS**

Requires a high level of discipline and commitment from the team.

Can be difficult to manage if the project is not well-defined.

Based on the nature of the project, **a hybrid approach combining Waterfall and Agile/Iterative methodologies** would be the most effective for the **Agricultural Product Store** project. The **Waterfall model** can be used during the early stages for structured requirement gathering and system design, while **Agile** methodologies can take over for continuous development, feedback, and iteration once the core features are in place. This approach balances **predictability** with the **flexibility** needed to accommodate evolving user needs and market changes.

**Question 10** – Waterfall Vs V-Model - 5 Marks

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

|  |  |
| --- | --- |
| **Waterfall Model** | **V Model** |
| 1. **This technique ensures that every project phase is finished before going on to the next. Usually, it has the following structure: Analyzing requirements, designing the system, implementing it, testing it, deploying it, and maintaining it.**
 | **The V-Model is a Waterfall model extension in which every stage of development has a direct correlation with a testing phase. The validation and verification process is represented by the "V" shape, which makes sure that every step is checked and validated before going on to the next.** |
| **Testing at later stages reduces initial costs but may increase costs if defects are found late.** | **Early testing increases upfront costs but reduces defect-related expenses later.** |
| **Testing begins only after development is complete, leading to potential delays in finding defects.** | **Testing begins as early as the requirements phase, ensuring defects are detected early.** |
| **Follows a linear and sequential flow from one phase to another.** | **Corresponding testing phases are linked to each development phase in a "V" formation.** |
| **Customer involvement is limited to the initial and final phases.** | **Customers are involved throughout the development and testing process.** |

**Question 11** – Justify your choice - 3 Marks

**As a BA, state your reason for choosing one model for this project**
I suggest the Agile methodology for the Online Agricultural Product Store project as a business analyst because:
**Flexibility**: Since farmers' needs often change, agile's ability to adjust to changing requirements is essential.
**Iterative Feedback**: Regular input from interested parties guarantees that the platform fulfills user requirements.
**Faster Launch**: Agile makes it possible to offer essential features more quickly, which benefits farmers sooner.
**Risk management**: By identifying and addressing risks early on, iterations contribute to a more efficient development process.

**Questions 12-** Gantt Chart - 5 Marks


Question 13 – Fixed Bid Vs Billing - 5 Mark

**Fixed Bid Projects**:

* **Definition**: Total cost is agreed upfront; fixed price for the entire project.
* **Risk**: Service provider bears the risk if the project exceeds the estimated time or cost.
* **Payments**: Paid in milestones or upon completion.
* **Best for**: Projects with a well-defined scope and timeline.

**Billing Projects** (Time & Materials):

* **Definition**: Client is charged based on actual time and resources used.
* **Risk**: Client bears more risk due to variable costs.
* **Payments**: Paid based on hours worked or materials used.
* **Best for**: Projects with evolving or unclear requirements

**Question 14** – Preparer Timesheets of a BA in various stages of SDLC - 20 marks

**Design Timesheet of a BA**

| **Sr No** | **Task** | **Actionable Item** | **Start Time** | **End Time** | **Duration** |
| --- | --- | --- | --- | --- | --- |
| 1 | Requirement Understanding | Analyzing functional and non-functional requirements | 9:00 AM | 10:30 AM | 1.5 hours |
| 2 | Design Documentation | Documenting use cases, user stories, workflows | 10:30 AM | 1:00 PM | 2.5 hours |
| 3 | Collaboration with Design Team | Working with the design team to ensure alignment with requirements | 1:30 PM | 4:00 PM | 2.5 hours |
| **Total** |  |  |  |  | **6.5 hours** |

 **Development Timesheet of a BA**

| **Sr No** | **Task** | **Actionable Item** | **Start Time** | **End Time** | **Duration** |
| --- | --- | --- | --- | --- | --- |
| 1 | Requirement Clarification | Clarifying requirements with developers | 9:00 AM | 11:00 AM | 2 hours |
| 2 | Collaboration with Development Team | Ensuring features are developed as per requirements | 11:00 AM | 1:00 PM | 2 hours |
| 3 | Documentation Updates | Updating requirements documentation based on development changes | 1:30 PM | 3:00 PM | 1.5 hours |
| 4 | Progress Tracking | Monitoring development progress and ensuring requirements are being met | 3:30 PM | 5:00 PM | 1.5 hours |
| **Total** |  |  |  |  | **7 hours** |

**Testing Timesheet of a BA**

| **Sr No** | **Task** | **Actionable Item** | **Start Time** | **End Time** | **Duration** |
| --- | --- | --- | --- | --- | --- |
| 1 | Test Plan Review | Reviewing test plans to ensure they align with requirements | 9:00 AM | 10:30 AM | 1.5 hours |
| 2 | Test Case Validation | Ensuring all test cases are mapped to business requirements | 10:30 AM | 1:00 PM | 2.5 hours |
| 3 | Defect Management | Tracking, managing, and ensuring resolution of defects | 1:30 PM | 3:00 PM | 1.5 hours |
| 4 | Collaboration with QA Team | Working with QA to ensure defect resolution and requirements alignment | 3:30 PM | 5:00 PM | 1.5 hours |
| **Total** |  |  |  |  | **7 hours** |

**UAT Timesheet of a BA**

| **Sr No** | **Task** | **Actionable Item** | **Start Time** | **End Time** | **Duration** |
| --- | --- | --- | --- | --- | --- |
| 1 | UAT Preparation | Preparing UAT test cases based on final requirements | 9:00 AM | 10:30 AM | 1.5 hours |
| 2 | Feedback Collection | Facilitating UAT with users, gathering feedback | 10:30 AM | 2:00 PM | 3.5 hours |
| 3 | Issue Resolution | Resolving issues raised during UAT | 2:30 PM | 5:00 PM | 2.5 hours |
| **Total** |  |  |  |  | **7.5 hours** |

 **Deployment n Implementation Timesheet of a BA**

| **Sr No** | **Task** | **Actionable Item** | **Start Time** | **End Time** | **Duration** |
| --- | --- | --- | --- | --- | --- |
| 1 | Deployment Coordination | Coordinating deployment schedules and communicating with deployment team | 9:00 AM | 10:30 AM | 1.5 hours |
| 2 | Post-Deployment Support | Assisting users with post-deployment issues and clarifications | 10:30 AM | 1:00 PM | 2.5 hours |
| 3 | Documentation Finalization | Finalizing deployment documentation and training materials | 1:30 PM | 3:00 PM | 1.5 hours |
| 4 | Stakeholder Communication | Communicating deployment status and outcomes to stakeholders | 3:30 PM | 5:00 PM | 1.5 hours |
| **Total** |  |  |  |  | **7 hours** |