CAPSTONE PROJECT 1

ONLINE AGRICULTURAL STORE:-

Online Agriculture Products Store Mr. Henry, after being successful as a businessman and has become one of the wealthiest persons in the city. Now, Mr. Henry wants to help others to fulfil their dreams. One day, Mr. Henry went to meet his childhood friends Peter, Kevin and Ben. They live in a remote village and do farming. Mr. Henry asked his friends if they are facing any difficulties in their day-to-day work. Peter told Mr. Henry that he is facing difficulties in procuring fertilizers which are very important for farm. Kevin said that he is also facing the same problem in-case of buying seeds for farming certain crops. Ben raised his concern on lack of pesticides which could help in greatly reducing pests in crops. After listening to all his friends’ problems, Mr. Henry thought that this is a crucial problem faced not only by his friends but also by so many other farmers. So, Mr. Henry decided to make an online agriculture product store to facilitate remote area farmers to buy agriculture products. Through this Online Web / mobile Application, Farmers and Companies (Fertilizers, seeds and pesticides manufacturing Companies) can communicate directly with each other. The main purpose to build this online store is to facilitate farmers to buy seeds, pesticides, and fertilizers from anywhere through internet connectivity. Since new users are involved, Application should be user friendly. This new application should be able to accept the product (fertilizers, seeds, pesticides) details from the manufacturers and should be able to display them to the Farmers. Farmers will browse through these products and select the products what they need and request to buy them and deliver them to farmers location. Mr. Henry has given this project through his Company SOONY. In SOONY Company, Mr Pandu is Financial Head and Mr Dooku is Project Coordinator. Mr. Henry , Mr Pandu , and Mr Dooku formed one Committee and gave this project to APT IT SOLUTIONS company for Budget 2 Crores INR and 18 months Duration under CSR initiative. Peter, Kevin and Ben are helping the Committee and can be considered as Stakeholders share requirements for the Project.

Mr Karthik is the Delivery Head in APT IT SOLUTIONS company and he reached out to Mr Henry through his connects and Bagged this project. APT IT SOLUTIONS company have Talent pool Available for this Project. Mr Vandanam is project Manager, Ms. Juhi is Senior Java Developer, Mr Teyson, Ms Lucie, Mr Tucker, Mr Bravo are Java Developers. Network Admin is Mr Mike and DB Admin is John. Mr Jason and Ms Alekya are the Tester. And you joined this team as a BA.

Q1)BUSINESS PROCESS MODEL -BPM-------5 MARKS

GOALS:-To bridge gap between Buyers and sellers.(farmers and suppliers(manufacturing companies)

INPUTS:-customer data,marketing campaigns,Trained employees

RESOURCES:-warehouse,software,office space

OUTPUT:-sales and revenue,efficiency

ACTIVITIES:-excellent customer service,partner with leading brands.

VALUE CREATED BY END CUSTOMER:-wide range,customer satisfaction

**Q2)SWOT ANALYSIS:-**

Strengths: weakness:-

**S**trong brand recognition Dependency on external vendors

Skilled workforce supply chain discruptions

Efficient process Inventory management Issues

Social Impact New in business

Opportunities:- Threats:-

Emerging new market Adapting new methologies

Expansion into new products Economic downturns

 Training new people Increased competition

Technological advancement Quality Issues

 Loss in business

 Change in customer spending habits

Q3)Feasibility Study

Technology:JAVA based on DB Server(MySQL,Oracle,API’s,payment gateway(stripe,paypal)

HW :-cloud storage,backup system on server,network Infrastructure:Good Airtel connectivity

SW:-based on shopping cart software(Product advertising API,Add to cart form),JAVA,Content management and payment gateway software:-Stripe,Paypal

 Trained Resources:-

Project Management Team:-

MR DOOKU (From SOONY )

Mr Pandu

Kevin,peter,Ben

Mr HENRY

Mr Vandanam (Project Manager)

Mr Karthik(Delivery head)

Business Analysts:-

Ritika Pandey

Software Developers:-

Teyson,Lucy,Tucker,Bravo

Ms Juhi

Budget:-2 Crore

Development Costs:-30 Lakhs

Hardware costs:-50 lakhs

Time frame:-18 months

No of resources:10

Features:10

**Q4)Gap Analysis:-**

Current State(As Is):-

Established Online Agriculture Product Store Named AgriFarm

Seamless shopping experience buy easily,add to cart check out

Wide range of products from fertilizer,seeds ,pesticides

Depending upon Quantity,quality and price and home delivery

Dependence on external vendors

Limited control over quality

High operating expenses on Technology and marketing

Desired state(To be):-

Increased control over product quality by partnerships with brands

Improved profitiability using user’s feedback and rating

On time delivery

Reduction in costs

Investment in new technology

Making it a national market connecting remote villlages

Discounted prices and buy one get one

**Q5)RISK ANALYIS**

Internal Risks:-

Dependence on external vendors for product supply and inventory management

High operating expenses due to Investment in Technology and marketing

Technical Issues and system down time

External Risks:-

Competition from other local online stores in the Agricultural Domain

Changes in govt regulations and policies that may affect the site

BA risks:-

Incomplete requirements

Domain

Changing Requirements

Project Risks:-

Scope Risks

Stakeholder Risks

**Q6)Stakeholder Analysis**

RACI MATRIX

|  |  |  |  |
| --- | --- | --- | --- |
| RACI MATRIX | Name | Designation | Details |
| Responsible | Mr Dooku  Ms JuhieTeysenTuckerBravoLucie | Manager operationsTechnical SMESoftware Developers | Name:-DookuEmail:-Dooku@gmail.com Contact number:-88000000Name:-JuhieEmail:-juhie@gmail.com Contact number:-8600000Name:-TeysenEmail:-teysen@gmail.com Contact number:-8700000Name:-TukcerEmail:-Tukcer@gmail.com Contact number:-890000Name:-LucieEmail:-lucie@gmail.comContact number:-8100000Name:-Bravobravo@gmail.comEmail:- Contact number:-8500000 |
| Accountable | Mr VadnamMiss Ritika PandeyMr Dooku | Project ManagerBusiness AnalystClient SPOC | Name:-VadnamEmail :-Vadnam@gmail.comContact number:-8400000Name:RitikaEmail:-ritika@gmail.comContact number:-8200000Name :-DookuEmail:-Dooku@gmail.comContact number:-830000 |
| Consulted | Mr XMr KarthikMr Mike | HR HeadProcess ManagerNetwork Admin | Name:-XEmail :-x@gmail.comContact number:-8220000Name :-MikeEmail:-mike@gmail.comContact number:-84400000 |
| Informed | Mr HENRYMr YMr Dooku | SponsorClient BAProject Head | Name:-Mr henryEmail :-henry@gmail.comContact number:-900000Name :-YEmail:-Y@gmail.comContact number:-1100000Name :-DookuEmail :-dooku@gmail.comContact number:-100000 |

**Q7)Business Case Document**

Project Intitation:-

To provide a seamless shopping experience to farmers from Agrifarm online product Agriculture store.

To provide good quality feritilisers,seeds,pesticides to customer at cheaper rates.

Vision, Goals and Objectives

The vision is what the company ultimately seeks to achieve by executing the project in the long term, while goals are broad achievements that are accomplished by completing more specific objectives.
Vision: To become the industry leader in production capacity and efficiency.

**Goals:**

* Increase production capacity by 30 percent within 24 months.
* Reduce production costs by 10 percent through improved efficiency.

**Objectives:**

* Complete facility construction within 18 months.
* Ensure the facility requires less energy consumption than older facilities owned by the company.

Current Problem:-

Current manufacturing capacity is insufficient to meet growing local demand, resulting in production delays, increased costs and missed market opportunities. Existing facilities are also operating at maximum capacity, limiting the ability to introduce new product lines.

2. Background Information

The company has experienced a 20 percent increase in product demand . Current facilities have reached 95 percent capacity, leading to production bottlenecks and increased lead times. Competitors are expanding, highlighting the need for increased [production efficiency](https://www.projectmanager.com/blog/production-efficiency) and capacity.

3. problems can be solved:-

Here are some of the options that were considered to solve the problem.

* Option 1: Expand existing facilities – Limited by space and zoning restrictions, expensive to retrofit.
* Option 2: Outsource production – Loss of control over [quality](https://www.projectmanager.com/blog/quality-control-manufacturing) and supply chain complexity.
* Option 3: Build a new manufacturing facility – Higher initial cost but increased capacity, improved efficiency and long-term scalability. (Recommended)

3. Resources required:-

The project involves the construction of a new 500,000 sq. ft. manufacturing facility to increase production capacity by 30 percent and improve operational efficiency. The facility will be equipped with state-of-the-art automated production lines and sustainable energy systems to reduce operating costs and meet environmental standards.

The [project](https://www.projectmanager.com/blog/project-definition) includes site selection, permitting, construction, equipment installation, staff recruitment and operational launch within a 24-month timeframe. The new facility will enable the company to meet growing customer demand, introduce new product lines and strengthen its market position.

6. Organizational change is required to adapt this Technology:-

We need skill manpower to New Technologies and train them on company software .

Inventory management,supply chain management.

This section explains why this project aligns with the business goal and the organization’s [strategic objectives](https://www.projectmanager.com/blog/strategic-planning-models).

* Corporate Strategy: Supports the company’s growth and market leadership objectives.
* Market Position: Enhances ability to meet growing customer demand.
* Sustainability: Designed to meet environmental standards and reduce carbon footprint.

7. Benefit Analysis

This section explains the expected [benefits](https://www.projectmanager.com/blog/benefits-management) from this project, which in this case are related to operational efficiency, as financial benefits are described separately.

**Tangible Benefits:**

* 30 percent increase in production capacity.
* 15 percent reduction in lead times.
* 10 percent decrease in production costs.

**Intangible Benefits:**

* Improved brand reputation for reliability and innovation.
* Enhanced employee morale through improved working conditions.

8.Time frame to recover ROI:-

The [project financial appraisal](https://www.projectmanager.com/blog/project-financial-management) of a project allows decision-makers to better understand the return on investment.

* Estimated Cost: $15 million
* Projected Annual Savings: $5 million
* Net Present Value (NPV): $50 million over 10 years
* Payback Period: 5 years

9. Identify stakeholders:-

The [project scope](https://www.projectmanager.com/blog/project-scope) section defines what will and won’t be executed as part of the project to avoid misunderstandings or unrealistic stakeholder expectations.

**In Scope:**

* Construction of a 500,000 sq. ft. facility.
* Installation of production lines and automation systems.
* Recruitment and training of 500 new employees.

**Out of Scope:**

* Distribution and logistics network updates.
* Product line changes.

10. Success Criteria and Stakeholder Requirements

The [project success criteria](https://www.projectmanager.com/blog/understanding-project-management-success-criteria) and stakeholder requirements set the parameters and metrics to deem a project successful.

**Success Criteria:**

* Facility completed on time and within budget.
* Production capacity increase by 30 percent.
* Achieve targeted cost savings within 12 months of operation.

**Stakeholder Requirements:**

* Compliance with environmental and labor regulations.
* No disruption to current production during construction.

11. Implementation Plan

As stated above, this is a simplified version of the [project management plan](https://www.projectmanager.com/guides/project-planning), which offers a high-level view of the timeline and budget needed to complete the project.

**Q8)Four SDLC Methodolgies:-**

Sequential:-Waterfall

Iterative:-RUP

Evolutionary:-Spiral

Agile:Scrum

SDLC Models:-

Waterfall model

V model

Spiral

Scrum

RUP

Project Development Approach:-

Sequential:-Waterfall

The Waterfall Model is a classical software development methodology. It was first introduced by Winston W. Royce in 1970. It is a linear and sequential approach to software development that consists of several phases. It must be completed in a specific order. This classical waterfall model is simple and idealistic.

The waterfall model is a [software development model](https://www.geeksforgeeks.org/top-8-software-development-models-used-in-industry/) used in the context of large, complex projects, typically in the field of information technology. It is characterized by a structured, sequential approach to [project management](https://www.geeksforgeeks.org/software-engineering-software-project-management-plan-spmp/) and [software development](https://www.geeksforgeeks.org/software-development/).

The waterfall model is useful in situations where the project requirements are well-defined and the project goals are clear. It is often used for large-scale projects with long timelines, where there is little room for error and the project stakeholders need to have a high level of confidence in the outcome.

**Features of Waterfall Model**

Following are the features of the waterfall model:

1. **Sequential Approach**: The waterfall model involves a sequential approach to software development, where each phase of the project is completed before moving on to the next one.
2. **Document-Driven:**The waterfall model depended on documentation to ensure that the project is well-defined and the project team is working towards a clear set of goals.
3. **Quality Control:** The waterfall model places a high emphasis on quality control and testing at each phase of the project, to ensure that the final product meets the requirements and expectations of the stakeholders.
4. **Rigorous Planning**: The waterfall model involves a careful planning process, where the project scope, timelines, and deliverables are carefully defined and monitored throughout the project lifecycle.

Overall, the waterfall model is used in situations where there is a need for a highly structured and systematic approach to software development. It can be effective in ensuring that large, complex projects are completed on time and within budget, with a high level of quality and customer satisfaction.

**Phases of Waterfall Model**

The Waterfall Model has six phases which are:

1. **Requirements:** The first phase involves gathering requirements from stakeholders and analyzing them to understand the scope and objectives of the project.
2. **Design:** Once the requirements are understood, the design phase begins. This involves creating a detailed design document that outlines the software architecture, user interface, and system components.
3. **Development:** The Development phase include implementation involves coding the software based on the design specifications. This phase also includes unit testing to ensure that each component of the software is working as expected.
4. **Testing:** In the testing phase, the software is tested as a whole to ensure that it meets the requirements and is free from defects.
5. **Deployment:** Once the software has been tested and approved, it is deployed to the production environment.
6. **Maintenance:** The final phase of the Waterfall Model is maintenance, which involves fixing any issues that arise after the software has been deployed and ensuring that it continues to meet the requirements over time.

The classical waterfall model divides the life cycle into a set of phases. This model considers that one phase can be started after the completion of the previous phase. That is the output of one phase will be the input to the next phase. Thus the development process can be considered as a sequential flow in the waterfall. Here the phases do not overlap with each other.

**Disadvantages of Waterfall Model**

The Classical Waterfall Model suffers from various shortcomings we can’t use it in real projects, but we use other software development lifecycle models which are based on the classical waterfall model. Below are some major drawbacks of this model.

* **No Feedback Path:** In the classical waterfall model evolution of software from one phase to another phase is like a waterfall. It assumes that no error is ever committed by developers during any phase. Therefore, it does not incorporate any mechanism for error correction.
* **Difficult to accommodate Change Requests:** This model assumes that all the customer requirements can be completely and correctly defined at the beginning of the project, but the customer’s requirements keep on changing with time. It is difficult to accommodate any change requests after the requirements specification phase is complete.
* **No Overlapping of Phases:** This model recommends that a new phase can start only after the completion of the previous phase. But in real projects, this can’t be maintained. To increase efficiency and reduce cost, phases may overlap.
* **Limited Flexibility:** The Waterfall Model is a rigid and linear approach to software development, which means that it is not well-suited for projects with changing or uncertain requirements. Once a phase has been completed, it is difficult to make changes or go back to a previous phase.
* **Limited Stakeholder Involvement:** The Waterfall Model is a structured and sequential approach, which means that stakeholders are typically involved in the early phases of the project (requirements gathering and analysis) but may not be involved in the later phases [(implementation, testing, and deployment).](https://www.geeksforgeeks.org/post-deployment-testing-in-software-testing/)
* **Late Defect Detection:** In the Waterfall Model, testing is typically done toward the end of the development process. This means that defects may not be discovered until late in the development process, which can be expensive and time-consuming to fix.
* **Lengthy Development Cycle:**The Waterfall Model can result in a lengthy development cycle, as each phase must be completed before moving on to the next. This can result in delays and increased costs if requirements change or new issues arise.

The Waterfall approach involves less user interaction in the product development process. The product can only be shown to end user when it is ready.

It is not suitable in this case.

**Iterative:-RUP**

The Rational Unified Process (RUP) is an iterative software development framework that breaks projects into phases (Inception, Elaboration, Construction, Transition) and further into iterations, focusing on delivering executable software increments and adapting to changing requirements.

Here's a more detailed explanation of the iterative RUP model:

Key Characteristics of RUP:

* **Iterative and Incremental:**

RUP emphasizes iterative development, meaning projects are broken down into smaller, manageable iterations, each resulting in a deliverable increment of the software.

* **Phased Approach:**

RUP divides the project lifecycle into four phases:

* + **Inception:** Focuses on understanding the project scope, feasibility, and requirements.
	+ **Elaboration:** Deepens the understanding of the requirements and designs the system architecture.
	+ **Construction:** Builds the core functionality of the software.
	+ **Transition:** Delivers the software to the end-users and provides ongoing support.
* **Risk-Driven:**

RUP is designed to proactively identify and mitigate risks throughout the development process.

* **Use-Case Driven:**

RUP emphasizes the importance of understanding and addressing user needs through use cases.

* **Architecture-Centric:**

RUP stresses the importance of designing a robust and scalable architecture early in the development process.

* **Collaborative:**

RUP encourages collaboration and communication among team members and stakeholders.

* **Adaptable:**

RUP is not a rigid process, but rather a framework that can be tailored to the specific needs of a project and organization.

How Iterations Work in RUP:

* Each iteration within a phase results in an executable and testable increment of the software.
* Iterations can be time-boxed, meaning they have a fixed duration.
* Feedback from users and stakeholders is incorporated into subsequent iterations.
* The goal of each iteration is to deliver a working version of the software, even if it's a subset of the final product.
* As the project progresses through iterations, the software incrementally builds up to become the final system.

Benefits of using RUP:

* **Improved Risk Management:**

By identifying and addressing risks early, RUP helps to reduce the likelihood of project failure.

* **Enhanced Collaboration:**

RUP encourages communication and collaboration among team members and stakeholders.

* **Increased Flexibility:**

RUP's iterative nature allows for better adaptation to changing requirements and priorities.

* **Improved Quality:**

By focusing on delivering executable software increments, RUP helps to ensure that the final product is of high quality.

* **Reduced Development Time:**

RUP's iterative approach can lead to faster development cycles and quicker time to market.

RUP can be suitable in this Case.

The iterative nature of the Rational Unified Process (RUP) model, while beneficial for flexibility, can also lead to disadvantages like increased complexity, resource requirements, and potential for design issues if requirements aren't fully defined upfront.

Evolutionary:-Spiral

**The Spiral Model** is one of the most important [Software Development Life Cycle models](https://www.geeksforgeeks.org/top-8-software-development-models-used-in-industry/). The Spiral Model is a combination of the waterfall model and the iterative model. It provides support for **Risk Handling**. The Spiral Model was first proposed by **Barry Boehm**. This article focuses on discussing the Spiral Model in detail.

**What is the Spiral Model?**

The Spiral Model is a [**Software Development Life Cycle (SDLC)**](https://www.geeksforgeeks.org/software-development-life-cycle-sdlc/) model that provides a systematic and iterative approach to software development. In its diagrammatic representation, looks like a spiral with many loops. The exact number of loops of the spiral is unknown and can vary from project to project. Each loop of the spiral is called a **phase**of the software development process.

Some Key Points regarding the phase of a Spiral Model:

1. The exact number of phases needed to develop the product can be varied by the project manager depending upon the project risks.
2. As the project manager dynamically determines the number of phases, the project manager has an important role in developing a product using the spiral model.
3. It is based on the idea of a spiral, with each iteration of the spiral representing a complete software development cycle, from [requirements gathering](https://www.geeksforgeeks.org/requirements-gathering-introduction-processes-benefits-and-tools/) and analysis to design, implementation, testing, and maintenance.

The Spiral Model is a risk-driven model, meaning that the focus is on managing risk through multiple iterations of the software development process. It consists of the following phases:

1. **Objectives Defined: I**n first phase of the spiral model we clarify what the project aims to achieve, including functional and non-functional requirements.
2. **Risk Analysis:** In the risk analysis phase, the risks associated with the project are identified and evaluated.
3. **Engineering:** In the engineering phase, the software is developed based on the requirements gathered in the previous iteration.
4. **Evaluation:** In the evaluation phase, the software is evaluated to determine if it meets the customer’s requirements and if it is of high quality.
5. **Planning:** The next iteration of the spiral begins with a new planning phase, based on the results of the evaluation.

The Spiral Model is often used for complex and large software development projects, as it allows for a more flexible and adaptable approach to [software development](https://www.geeksforgeeks.org/software-development/?ref=lbp). It is also well-suited to projects with significant uncertainty or high levels of risk.

*Spiral Model*

**Each phase of the Spiral Model is divided into four quadrants as shown in the above figure. The functions of these four quadrants are discussed below:**

1. **Objectives determination and identify alternative solutions:** Requirements are gathered from the customers and the objectives are identified, elaborated, and analyzed at the start of every phase. Then alternative solutions possible for the phase are proposed in this quadrant.
2. **Identify and resolve Risks:** During the second quadrant, all the possible solutions are evaluated to select the best possible solution. Then the risks associated with that solution are identified and the risks are resolved using the best possible strategy. At the end of this quadrant, the Prototype is built for the best possible solution.
3. **Develop the next version of the Product:** During the third quadrant, the identified features are developed and verified through testing. At the end of the third quadrant, the next version of the software is available.
4. **Review and plan for the next Phase:** In the fourth quadrant, the Customers evaluate the so-far developed version of the software. In the end, planning for the next phase is started.

The most serious issue we face in the cascade model is that taking a long length to finish the item, and the product became obsolete. To tackle this issue, we have another methodology, which is known as the Winding model or spiral model. The winding model is otherwise called the cyclic model.

**When To Use the Spiral Model?**

1. When a project is vast a spiral model is utilized.
2. A spiral approach is utilized when frequent releases are necessary.
3. When it is appropriate to create a prototype
4. When evaluating risks and costs is crucial
5. The spiral approach is beneficial for projects with moderate to high risk.
6. The SDLC’s spiral model is helpful when requirements are complicated and ambiguous.
7. If modifications are possible at any moment
8. When committing to a long-term project is impractical owing to shifting economic priorities.

**Conclusion**

Spiral Model is a valuable choice for software development projects where risk management is on high priority. Spiral Model deliver high-quality software by promoting risk identification, iterative development and continuous client feedback. When a project is vast in software engineering, a spiral model is utilized.

**Spiral Model is not suitable for this case as it is more risk driven and suitable for large projects.**

**Agile:Scrum**

Scrum is a popular agile framework that helps teams structure and manage their work through short, iterative cycles called sprints, focusing on delivering value incrementally and adapting to change.

Here's a more detailed explanation:

* **What is Scrum?**

Scrum is a framework for developing, delivering, and sustaining complex products, often used in software development but applicable to other industries.

* **Agile vs. Scrum:**

Agile is a broader philosophy that emphasizes flexibility, collaboration, and continuous improvement, while Scrum is a specific agile framework that provides a structured approach to implementing those principles.

* **Key Elements of Scrum:**
	+ **Sprints:** Short, time-boxed periods (typically 2-4 weeks) during which a team works to complete a specific goal.
	+ **Scrum Team:** A self-organizing team consisting of a Product Owner, Scrum Master, and Developers.
	+ **Product Backlog:** A prioritized list of features or tasks that the team needs to work on.
	+ **Sprint Backlog:** A subset of the Product Backlog that the team selects for a particular sprint.
	+ **Daily Scrum:** A short, daily meeting where the team discusses progress and identifies any impediments.
	+ **Sprint Review:** A meeting at the end of a sprint where the team demonstrates the completed work to stakeholders.
	+ **Sprint Retrospective:** A meeting where the team reflects on the sprint and identifies areas for improvement.
* **Benefits of Scrum:**
	+ **Increased Flexibility:** Scrum allows teams to adapt to changing requirements and priorities.
	+ **Improved Collaboration:** Scrum encourages collaboration and communication within the team and with stakeholders.
	+ **Faster Delivery:** Scrum enables teams to deliver working software or products in shorter cycles.
	+ **Continuous Improvement:** Scrum promotes continuous feedback and reflection, leading to ongoing improvement.

**Conclusion:-**

**Scrum Agile model is suitable for this Project as it is a smaller project,faster delivery of products to customers and continuous improvement and Increased Flexibility.**

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

The Waterfall model is a sequential, structured approach, while RUP (Rational Unified Process) is a process model for large projects, and the Spiral model is iterative and risk-focused. Scrum is an agile framework for iterative development with a focus on collaboration and adaptation to change.

1. Waterfall Model

* **Sequential:**

The Waterfall model follows a linear, sequential approach, where each phase (requirements, design, implementation, testing, deployment, maintenance) must be completed before the next begins.

* **Upfront Planning:**

It emphasizes thorough upfront planning and documentation, with minimal room for changes once the project is underway.

* **Suitable for:**

Projects with well-defined requirements and minimal risk of change.

* **Disadvantage:**

Can be inflexible and time-consuming, making it difficult to adapt to changing requirements.

2. Rational Unified Process (RUP)

* **Iterative and Incremental:**

RUP is an iterative and incremental approach to software development, allowing for flexibility and adaptation to changing requirements.

* **Large Projects:**

It's designed for large, complex projects, focusing on managing complexity and delivering high-quality software.

* **Phases:**

RUP uses phases like "Elicitation," "Analysis," "Design," "Implementation," and "Testing," which are iterative and incremental.

* **Risk Management:**

RUP emphasizes risk management throughout the project lifecycle.

3. Spiral Model

* **Iterative and Risk-Focused:**

The Spiral model is an iterative approach that focuses on risk management at each stage of the development process.

* **Phases:**

Each "spiral" (iteration) involves planning, risk analysis, engineering, and evaluation.

* **Suitable for:**

Projects with high levels of risk and uncertainty, where requirements are not fully defined upfront.

* **Disadvantage:**

Can be complex and time-consuming, requiring a high level of expertise in risk management.

4. Scrum

* **Agile Framework:**

Scrum is an agile framework for managing software development projects in sprints (short time periods).

* **Iterative and Incremental:**

It's iterative and incremental, focusing on delivering working software in each sprint.

* **Empiricism:**

Scrum is based on empiricism, meaning knowledge is gained through experience and observation.

* **Collaboration:**

It emphasizes collaboration and communication between the development team and stakeholders.

* **Suitable for:**

Projects where flexibility and adaptation to changing requirements are crucial.

* **Disadvantage:**

Can be challenging to manage without a strong team and clear roles.

The V-model is a software development lifecycle (SDLC) model that's an extension of the Waterfall model, emphasizing testing at each stage, while the Waterfall model is a sequential, linear approach where testing occurs after development.

Here's a more detailed comparison:

Waterfall Model:

* **Sequential and Linear:**

The Waterfall model follows a linear, sequential approach, where each phase (requirements, design, implementation, testing, deployment, and maintenance) must be completed before the next one begins.

* **Testing After Development:**

Testing is typically performed after the development phase is complete.

* **Suitable for:**

Projects with well-defined and stable requirements, where changes are unlikely.

* **Drawbacks:**

It can be inflexible and less adaptable to changes in requirements during the project lifecycle.

V-Model:

* **Extension of Waterfall:**

The V-model builds upon the Waterfall model by incorporating a testing phase for each development stage.

* **Verification and Validation:**

The V-model is also known as the Verification and Validation model, emphasizing the importance of verifying that the development process meets requirements and validating that the final product meets user needs.

* **Testing Throughout:**

Testing is integrated into each phase of the development process, allowing for early detection and correction of defects.

* **Suitable for:**

Projects where testing is critical, requirements may evolve during the project, and early defect detection is crucial.

* **Advantages:**

The V-model can lead to improved quality, reduced rework, and better project outcomes compared to the Waterfall model.

Conclusion:-

V model is more suitable as compared to waterfall model.

**Question 10 – Waterfall Vs V-Model - 5 Marks 20Write down the differences between waterfall model and V model.**

|  |  |  |
| --- | --- | --- |
| **Feature** | **Waterfall Model** | **V-Model** |
| Approach | Sequential, linear | Sequential with testing at each stage |
| Testing | After development | Integrated into each development stage |
| Adaptability | Less adaptable to changes | More adaptable to changes |
| Focus | Development | Verification and Validation |
| Suitable for | Projects with well-defined requirements | Projects where testing is critical and requirements may evolve |

**Question 11 – Justify your choice - 3 Marks As a BA, state your reason for choosing one model for this project**

The V-model is used in software development and systems engineering to ensure quality and traceability by aligning each development phase with a corresponding testing phase, promoting early defect detection and a structured approach to project management.

Here's a more detailed breakdown:

Key Reasons for Using the V-Model:

* **Early Defect Detection:**

The V-model facilitates early identification and correction of defects by aligning testing activities with each development phase.

* **Improved Quality:**

By focusing on verification and validation throughout the project lifecycle, the V-model helps ensure a higher quality product.

* **Enhanced Traceability:**

The V-model promotes traceability, ensuring that each requirement, design decision, and test case is documented and linked back to the original project goals.

* **Structured Approach:**

The V-model provides a clear, structured framework for project planning and execution, making it easier to manage and track progress.

* **Effective Communication:**

The V-model promotes better communication and collaboration between development and testing teams by establishing a clear understanding of responsibilities and deliverables at each stage.

* **Cost Reduction:**

Identifying and fixing defects early in the development process reduces the cost of fixing them later.

* **Regulatory Compliance:**

The V-model can help organizations meet strict regulatory standards by aligning development and validation phases.

* **Adaptability:**

The V-model is more adaptable to changes compared to traditional Waterfall due to its focus on testing and verification.

Question 12 – Gantt Chart - 5 Marks 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.

**Question 13 – Fixed Bid Vs Billing - 5 Marks Explain the difference between Fixed Bid and Billing**

In project billing, "fixed billing" refers to a set price for the entire project, regardless of the time or resources used, while "billing" (in general) encompasses the process of creating and sending invoices for goods or services.

Here's a more detailed explanation:

Fixed Billing (or Fixed Fee):

* **Definition:**

Fixed billing, also known as fixed-price billing or flat fee billing, involves agreeing on a specific amount of money for a defined scope of work, regardless of the time or resources required to complete the project.

* **Key Characteristics:**
	+ **Predictability:** Clients know the total cost upfront, offering budget certainty.
	+ **Clear Scope:** Fixed billing typically relies on a well-defined scope of work and deliverables.
	+ **Milestones:** Payments may be made at agreed-upon milestones or upon project completion.
	+ **Risk Sharing:** Both the service provider and client share some level of risk, as changes outside the initial scope may require additional agreements.
* **Examples:**
	+ A web designer charging a fixed fee for creating a website, regardless of the actual hours spent.
	+ A consultant agreeing to a fixed price for a specific project, even if the project takes longer than initially anticipated.
	+ A software development company offering a fixed price for creating a piece of software.

Billing (General):

* **Definition:**

Billing is the process of creating and sending invoices to customers or clients for goods or services rendered.

* **Key Characteristics:**
	+ **Invoicing:** Generating and sending invoices to customers.
	+ **Payment Tracking:** Monitoring and tracking payments received.
	+ **Overdue Account Management:** Following up on overdue accounts.
* **Examples:**
	+ A utility company sending monthly bills to customers for electricity or water usage.
	+ A retailer sending invoices to customers for purchases made on credit.
	+ A freelancer sending an invoice to a client for services rendered.

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

Design Timesheet for a BA

Requirment Gathering phase

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sno | Tasks | Actionable Items | Start Time | End time | Duration |
| 1 | Identify stakeholders meeting them | Meeting with stakeholders | 10 am | 11 am | 1 hour |
| 2 | Client Interaction | A zoom call to update client on MOM | 12 pm | 2 pm | 2 hour |
| 3 | Finetuning Inputs for BRD document | SME discussion In person call | 3pm  | 4 pm | 1 hour |
| 4 | Requirments sorting | Working on the template | 5pm | 6 :30 pm | 1:30 hour |
| 5 | Team Meeting  | Discussion on the day Inputs | 7 pm | 8pm | 1 hour |

Design Timesheet of a BA

As a business analyst, design activities involve understanding business needs, analyzing processes and data, and translating requirements into actionable plans, often using data analysis and modeling techniques to ensure solutions align with strategic goals.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sno | Tasks | Actionable Items | Start Time | End time | Duration |
| 1 | Understand User needs | Meeting with stakeholders | 10 am | 11 am | 1 hour |
| 2 | Discussion on approach | Discussing suitable design  | 11am | 12pm | 1 hour |
| 2 | Client Interaction | A zoom call to update client on MOM | 12 pm | 2 pm | 2 hour |
| 3 | Call with Managers | SME discussion In person call | 3pm  | 4 pm | 1 hour |
| 4 | Finalising the Design and actionable plan | Working on the template and modelling techniques | 5pm | 6 :30 pm | 1:30 hour |
| 5 | Team Meeting  | Discussion on the day Inputs | 7 pm | 8pm | 1 hour |

Development Timesheet of a BA

A business analyst's development activities involve gathering and analyzing business requirements, collaborating with stakeholders, documenting functional specifications, and ensuring solutions meet business needs, often through data analysis and problem-solving.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sno | Tasks | Actionable Items | Start Time | End time | Duration |
| 1 | Create mockups | Meeting with Project Team | 10 am | 11 am | 1 hour |
| 2 | Client Interaction and stakeholders meet | A zoom call to update client on MOM | 12 pm | 2 pm | 2 hour |
| 3 | Development of prototype | SME discussion In person call | 3pm  | 4 pm | 1 hour |
| 4 | Test and Iterate and documenting functional requriements | Working on the template | 5pm | 6 :30 pm | 1:30 hour |
| 5 | Team Meeting Ensuring solution meets business needs | Discussion on the day Inputs | 7 pm | 8pm | 1 hour |

Testing Timesheet of a BA

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sno | Tasks | Actionable Items | Start Time | End time | Duration |
| 1 | Conduct user testing  | Conducting Testing  | 10 am | 11 am | 1 hour |
| 2 | Client Interaction | A zoom call to update client on MOM | 12 pm | 2 pm | 2 hour |
| 3 | Analyze and feedback | SME discussion In person call | 3pm  | 4 pm | 1 hour |
| 4 | Iterate and feedback | Working on the template | 5pm | 6 :30 pm | 1:30 hour |
| 5 | Team Meeting  | Discussion on the day Inputs | 7 pm | 8pm | 1 hour |

UAT Timesheet of a BA

During User Acceptance Testing (UAT), a Business Analyst's key activities include supporting the testing team in creating acceptance test plans, identifying users for testing, reviewing the plan with stakeholders, providing clarifications on requirements, and obtaining sign-off on system acceptance.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sno | Tasks | Actionable Items | Start Time | End time | Duration |
| 1 | Creating acceptance test plans | Creating the plans | 10 am | 11 am | 1 hour |
| 2 | Identifying users of testing  | A zoom call to update client on MOM | 12 pm | 2 pm | 2 hour |
| 3 | Reviewing the plan with stakeholders | SME discussion In person call | 3pm  | 4 pm | 1 hour |
| 4 | Providing feedback and clarification on requirements | Working on the template | 5pm | 6 :30 pm | 1:30 hour |
| 5 | Obtaining sign off on system acceptance | Discussion on the day InputsAnd sign off with client | 7 pm | 8pm | 1 hour |

 Deployment n Implementation Timesheet of a BA

1. Preparing for Implementation:

* **Develop an Implementation Plan:**

Business analysts work with the project team to create a detailed plan, including timelines, resources, and potential risks.

* **Identify Risks and Issues:**

They proactively identify potential problems that could arise during implementation and develop mitigation strategies.

* **Create Transition Documentation:**

Business analysts prepare documentation to help users and technical teams understand the new solution's functionality.

2. Implementing the Solution:

* **Collaborate with IT and Operations:**

They work closely with IT and operations teams to ensure a smooth transition from development to production.

* **Address Last-Minute Requirements:**

Business analysts address any last-minute requirements or issues that may arise during deployment.

* **Facilitate User Acceptance Testing (UAT):**

They ensure that end-users are involved in testing the solution to verify that it meets their needs and expectations.

* **Provide Ongoing Support:**

Business analysts provide ongoing support to development teams, addressing questions and ensuring alignment with project requirements.

3. Deployment:

* **Ensure a Seamless Transition:**

Business analysts assist in ensuring a seamless transition from development to production.

* **Communicate with Stakeholders:**

They keep stakeholders informed about the deployment process and address any concerns.

* **Monitor and Track Performance:**

They monitor the performance of the solution after deployment and identify any issues or problems.

* **Gather Feedback:**

They gather feedback from users and stakeholders to assess the success of the deployment and identify areas for improvement.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sno | Tasks | Actionable Items | Start Time | End time | Duration |
| 1 | Create implementation plan | Conducting Testing  | 10 am | 11 am | 1 hour |
| 2 | Create transition documentAnd collaborate with IT Team | A zoom call to update client on MOM and creating a document | 12 pm | 2 pm | 2 hour |
| 3 | Analyze and feedback | SME discussion In person call | 3pm  | 4 pm | 1 hour |
| 4 | Monitor and track performance | Working on the templateAnd KPIs | 5pm | 6 :30 pm | 1:30 hour |
| 5 | Team Meeting to gather feedback | Discussion on the day Inputs | 7 pm | 8pm | 1 hour |

**THANK YOU**