Question 1: → Waterfall Model

You have been appointed a project manager within an information systems organization. Your job is to build an application that is quite similar to others your team has built, although this one is larger and more complex. Requirements have been thoroughly documented by the customer. What software model(s) would you choose and why? Explain in detail.

Solution:

Stated Facts:

1. Similar project is already made by my team.
2. Project is large and complex than previous one.
3. Well-defined requirements.

Assumptions:

1. There is no short time limit.
2. As similar project has been made by my team, so it will be not that much difficult to engineer it.
3. Team resources are available sufficiently.

Selected Process Model:

"Incremental Model"

Reasons for selecting this model:

1. Project is complex and large. So, incremental approach will help us to do our work more efficiently. As project is broken into smaller increments. So, it will help us to do work better.

2. Risk can be managed more effectively. Each increment is a mini-project with its own planning, design, and other phases. So, we can identify and address issues early.

3. As similar project is already made by my team. So, the

structure is ready. We can easily understand the already done work.

4. In case where requirements may change or evolve over time, the cremental model allows to adapt and incarporate new requirements into ubsequent increments.

5. Requirements are clearly described by the customer. There is customer involvement. Incremental model encourages ongoing customer feedback and involvement throughout the development process.

Project Working:

1. The project will be divided into logical increments based on the functionality or features. Different tasks might be divided to different teams.

2. We can use some of our pre-made models by making some changes in it.

3. First the most critical features will be focused on. Work with the customer to prioritize the increments that should be developed first.

4. Start with the first increment and follow the required process. Then after designing, developing and testing; deliver that increment to the customer.

5. After getting feedback from customer and stakeholders, use the feedback to refine requirements for subsequent increments.

6. Continue developing and delivering the increments, gathering feedbacks and making adjustments as necessary until the full application is complete. Then integrate all the models/increments.

uestion 2: → Incremental model.

You have been appointed a project manager for a small software roducts company. Your job is to build a breakthrough product that combines virtual reality hardware with state-of-art software. Because competition for the home entertainment market is intense, there is significant pressure to get the job done. What software model(s) would you choose and why? Explain in detail.

Solution:

Stated Facts:

1. We need to build a breakthrough product that combines virtual reality hardware with state-of-art software for home entertainment market.
2. Competition is intense for home entertainment market.
3. There is significant pressure to get the job done.
4. Project involves cutting-edge technology making it challenging to define all requirements upfront.

Assumptions:

1. Assume that virtual reality hardware is well established and wont change significantly during the project.
2. We expect to get feedback from users regularly to make product better.
3. There might be unexpected challenges, both technically and in the market. We plan to use Spiral model's risk management approach.
4. There will be continuous uncertainties and changes in technology and market conditions.

Selected process Model:

Spiral Model

Reasons:

1. In this project, cutting-edge technology makes it challenging to define all requirements upfront as there might be unknown challenges. Spiral model's iterative and risk-driven approach is well-suited for these evolving

ements and uncertainties.

2. There is intense competition in home entertainment market. Spiral model's iative nature facilitates for quick adaptations based on market trends and feedback.

3. Given the high risks, stakes or market risks in this project, Spiral model's risk-driven approach is beneficial.

4. Obtaining feedback from users and stakeholders is essential when a product is aimed to be breakthrough in market. Spiral model encourages the collection of user feedback and market responses enabling improvement.

Project Working:

1. First requirements and constraints are gathered.

2. High-risk areas are identified and a baseline plan for the project is established.

3. Virtual reality hardware components and essential software features are developed. Core functionality is implemented first, then the entire product.

4. Product increment is reviewed after each iteration. This evaluation includes testing hardware and software.

5. Feedback is gathered from users and stakeholders.

6. If risks are identified (by seeing evaluation results), risk mitigation strategies are implemented. Each iteration builds on previous one, improving the product.

7. Increments are then released to market as project goes through multiple iterations. These releases allow company to gain competitive edge.

8. There is continuous feedback loop throughout the project which informs the direction of subsequent iterations making sure project remains competitive and aligned with user expectations.

Question 3:

You have been appointed a project manager for a major software products company. Your job is to maintain/manage the development of the next generation version of its widely used word-processing software. Because competition is intense, tight deadlines have been established and announced. What software process model(s) would you chose and why?

Solution:

Stated Facts:

1. Project manager for a major software products company.
2. Managing development of next generation version of word-processing software is the task.
3. Competition is intense
4. Tight deadlines have been established.

Assumptions:

1. Clear understanding of software requirements.
2. Sufficient or adequate resources are available (human resources, financial resources and technological resources)
3. Experienced team
4. Skilled project team in software development.

Selected Process Model:

"Hybrid Model: RAD-Incremental Hybrid"

Reasons:

1. RAD (Rapid Application Development)

1. Tight deadlines have been established. We have limited time. When time is less and requirements are clear, we use RAD model.
2. It encourages user involvement. (Resources are increased) User involvement ensures that software meets user expectations.
3. It emphasizes iterative development, making it suitable for quickly producing functional versions of software.

4. We need to modify the previous version of word-processing software. It is to focus on user interface design & experience which is critical for word-processing software.

2. Incremental Model:

1. We need to maintain development of next generation versions. So, incremental model is suited for a project when we need to manage other versions.

2. Competition is intense. Incremental model provides opportunities for early releases of functional portions of software to gain a competetive edge.

3. It reduces risks and allows improvements and ongoing feedback.

4. It helps to manage as software is developed in smaller, mangeable increments in incremental model.

Project Working:

1. Start by gathering requirements like user needs and preferences.

2. To present prototypes of user interface elements & functionality quickly, use RAD technique.

3. Gain feedback and refine prototypes iteratively.

4. Break the project into increments where each increment will focus on specific features sets or functionality.

5. Apply RAD principles for developing & refining user interface and experience rapidly, within each increment

6. Test increments and gather feedback on developed increments.

7. Make improvements based on feedback.

8. Integrate all increments into existing software base making sure that overall project is functional and coherent.

9. Keep iterating through RAD and incremental phases

10. Release the final product when all increments have been developed, integrated, & thoroughly tested.

Question 4:

You have been asked to develop a small application that analyzes each course offered by a university and reports the average grade obtained in the course (for a given term). What software model(s) would you chose and why? Explain in detail?

Solution:

Stated Facts:

1. Need to build small application to analyze and report average grade obtained in the course (for a given term).

2. Calculation of average grade is well understood method.

3. The project assumes that necessary data (course information, student grades, etc) is readily available for analysis.

4.

Assumptions:

1. Assume that project requirements are well-defined, stable and unlikely to change significantly during development.

2. Project can be divided into distinct phases which then can be implemented sequentially.

3. With limited involvement during development, client perfers a clear and well-documented development process.

4. Requirements and method of calculation are well understood.

Selected Process Model:

"Linear Sequential Model / Water Fall Model"

Reasons:

1. As application requirement, design and implementation is well understood. Project can be divided into sequential phases. such as requirement gathering, design, implementation, testing and deployment. Linear and sequential approach fits well with this project structure.

2. This project assumes well-defined, clear and stable requirements. We need to change any requirements, design and implementation. We have to follow ain sequence. Waterfall Model is best suited for projects with fixed and lear requirements. Model ensures that each phase is completed before moving on to next, minimizing changes.

3. This model requires less active client involvement during development. This alligns with the assumption that client prefers a more hands-off approach.

Project Working:

Requirement Gathering

1. First detailed requirements are gathered from client and stake holders. Document is created of requirements, specifying all functionality and features of the application.

2. Design: Based on requirements, design is created. Detailed design documents including database schemas and flowcharts are developed.

3. Implementation: According to design specifications, actual development of application takes place

4. Developers do coding and implement features as outlined in design.

5. Testing: Testing is performed to make sure that application functions correctly and meets specified requirements.

6. When application is approved, it is deployed to production environment Users can access application to analyze course grades for specified term.

7. To address any post-deployment issues and updates, ongoing maintenance and support is provided.