Mark Shinozaki
11672355

CptS 322 Software Engineering Principles I

Spring 2023

Homework 2

(Due February 21, 2023 on Canvas)

1. (10 points) For each of the following software projects, what you think would be the best process model for managing the development process? Justify your answer for each project as well.

- A system to control anti-lock braking in a car

- The best process model for managing the development process of this project would most likely be the waterfall model. The reason being that this project requires a sequential and linear approach where each phase is completed before moving onto the next. A development process for anti-locking brakes would require a lot of testing and validation. A more structured approach like waterfall ensures that each stage is worked through and planned before proceeding to the next part.

- A virtual reality system to support software maintenance

- I think for this example the best process would be an agile model, an agile model emphasizes flexibility, collaboration, and frequent iterations. This approach is best suited for software projects where the purpose or flow of the project is constantly changing. This sort of normal is normal for new emerging technologies like virtual reality. Also, agile is a good model for this project because is emphasizes continuous integration and testing.

- A university accounting system that replaces an existing system

- The best model for this process would be a spiral model. The spiral model combines the two models of agile and waterfall by emphasizing risk management and flexibility. A universities accounting system is complex and is very important to an institution,

The spiral model iterative approach allows developers to identify and address potential risks early in the process, while the system's complexity and scale requires flexibility in a development approach.

- An interactive travel planning system that helps users plan journeys with the lowest environmental impact.
- The best process model for this project would be an agile model. An agile model is for projects with ever-changing requirements which is essentially the scope of this project, where a users preferences and needs change throughout the course of the application. Another good reason to use agile for this project is that it has frequent releases and user feedback which is good for the development and updating process of this application.

2. (10 points) Provide three examples of software projects that would be amenable to the waterfall model. Be specific.

- Development of a banking system
    - Replacing an existing banking system that requires a systematic approach to avoid errors and financial losses. The waterfalls model can work step-by-step to ensure that the new system is fully functional, safe, and meets the banks requirements.
- A medical device
    - A medical device requires multiple layers of testing and validation before it is released to the market. The waterfall model's linear and sequential approach allows for thorough planning and execution of each phase, the device needs to meet regulatory and safety standards which makes this a great process.
- A bridge
    - A software that designs bridges, The waterfall model requires a certain linear or sequential process including collecting data, designing and testing which can ensure the accuracy of the software's accuracy and effectiveness, which is why.

Mark Shinozaki
11672355

3. (10 points) Provide three examples of software projects that would be amenable to the prototyping model. Be specific.

- Development of a mobile app
    - A mobile app requires a user-centered design, with a focus on ease of use and functionality. The prototyping models iterative approach calls for frequent feedback from users which will then be incorporated into the products design and development.

- Creation of a new website for ecommerce
    - An e-commerce store/website needs to constantly be engaging and user friendly. By prototyping models quick feedback loop enables developers to test different designs, features and functions.

- Development of a new video game
    - Creating a video game requires a lot of experimentation with game physics, controls and graphics. The prototyping model allows game designers to create multiple versions of a game, test them with focused groups or beta testers and then receive feedback on what works and what needs improvement.

4. (10 points) Spiral model and incremental model are two software process models. Explain how these two models are different and related.

- The main difference between the spiral and incremental model is that the spiral model focuses on risk management while the incremental process focuses on delivering products incrementally. Both models share a very similar iterative process but in this case each phase builds on one another which results in an improved product. Both models allow for changes to be incorporated into the development process. This in turns makes them flexible and adaptable to changing requirements.

Mark Shinozaki
11672355

*Note: submit your solution as a single PDF[1].

[1] For instance, you may do so by creating a Word document, copy the questions from here, write your answers, and then save the finished document as PDF.