School of Computer Science Engineering and Information Systems
(SCORE)

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1. Giving reasons for your answers based on the type of system being developed, Suggest the most appropriate generic Software process model that might be used as a basis for manging the development of the following - systems.

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

Model: Waterfall Model

Reasoning:

- Safety-critical: Anti-lock braking systems directly impact safety, requiring rigorous testing and adherence to strict requirements Waterfall's sequential stage-gate approach ensures all the phases are completed before moving to the next minimizing risks and ensuring thorough testing.

- Stable-requirements: the core functionalities of anti-lock braking are well-defined and Unlikely to change significantly, making Waterfall's upfront planning and documentation efficient.
- Limited User feedback: this system focuses on functionality rather than user interface making iterative development less necessary.

b. A Virtual reality system to support Software development.

Model: Agile Model (eg. Scrum)

Reasoning:

- Emerging technology: VR maintenance systems are evolving rapidly, requiring flexibility to adapt to new features and user feedback Agile's iterative approach allows for rapid prototyping, continuous improvement and quick adaptation to changing needs.

- Uncertain requirements: The specific needs and functionalities of VR maintenance might change based on user feedback and industry advancements.

- User-centric focus: VR experiences rely heavily on user feedback for optimal design. Agile's frequent releases and user testing cycles enable continuous improvement based on user input.

C. University accounting system that replaces an existing system.

Model: Incremental Model

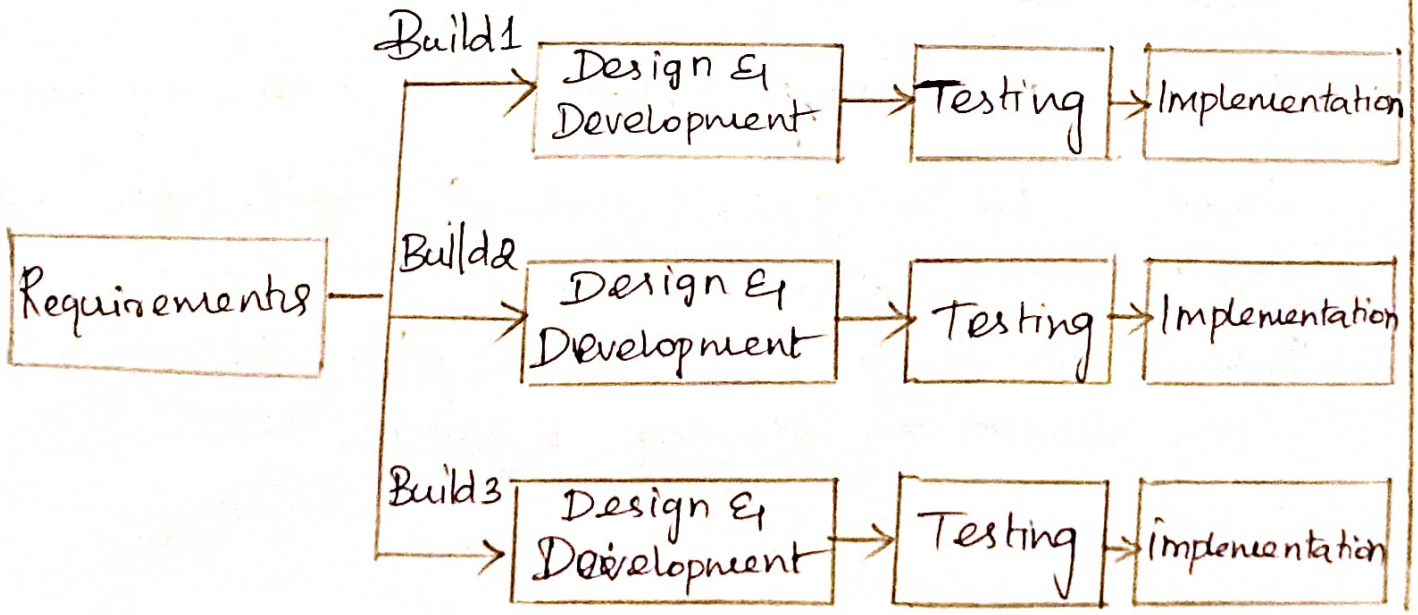
Reasoning:

Leveraging existing system: The new system needs to integrate with and potentially reuse components from the existing system. this model focus on identifying, selecting and adapting existing systems.

Minimizing distribution: Replacing an existing System requires careful planning and minimal downtime.

Stable requirements: University accounting System have well-defined and relatively stable requirements, making this model's upfront planning and configuration effective.

Example: Imagine upgrading a University existing accounting system. this model would help identify compatiable components from existing system, integrate them with new functionalities, and ensure a smooth transition with minimal disruption to financial operations.



d). An interactive travel planning system that helps users plan journeys with the lowest environmental impact.

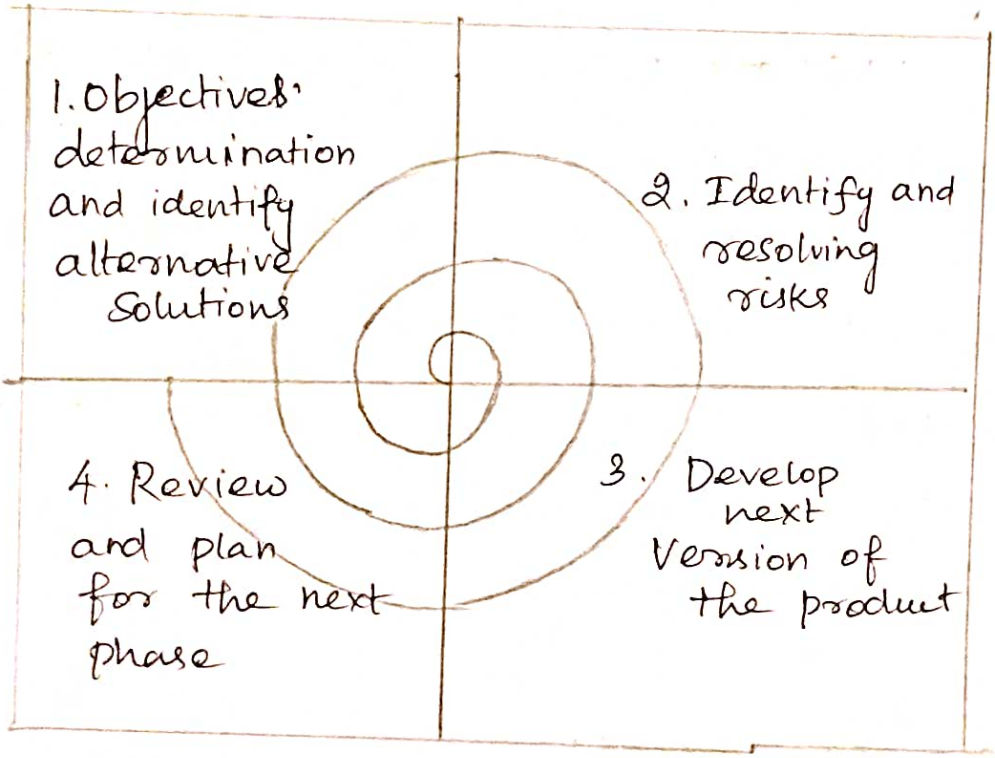
Model: Spiral model

Reasoning:

- Complex calculations. the system involves complex routing and environment impact Calculations, requiring multiple iterations of design and testing to refine the algorithms Spiral model's cyclical approach allows for incremental development and testing, ensuring optimal performance.

- Evolving user needs: User preference and Environment factors can change over time this models risk-mitigation and prototyping phases allow for adapting to changing needs and incorporating new data sources.
- Uncertain User adoptation: the success of such a system depends on the user adoptation and acceptance.

Example: the Spiral model would allow for iterative development and testing of routing algorithms, incorping user feedback and new environment data sources, ultimately leading to a user friendly and impactful app.



2. When would you recommend against the use of an agile method for developing a Software system?

1. Highly regulated and safety-Critical systems:

Reasoning: System like medical devices, aircraft control systems or financial trading platforms demand rigorous adherence to

regulations and strict quality control Agile's flexibility can sometimes conflict with these ~~gorid~~ rigid requirements.

2. Projects with fixed scope and well defined requirements.

Reasoning: Agile thrives on iterative development and adapting to changing needs. If the project scope and requirements are firmly set, a more efficient as changes introduce complexity in Agile.

3. Geographically dispersed teams with limited

Reasoning: Agile relies heavily on close Collaboration and frequent communication If ~~them~~ team members are spread across different locations and time zones, Coordinating effectively and maintaining transparency becomes challenging.

4. Strong resistence to change from stakeholders or users:

Reasoning: Agile thrives on feedback and adapting to evolving needs. If stakeholders or users are resistent to change or have unrealistic expectations about the development process, frequent iterations and potential changes in direction might create friction.

5. Lack of skilled personnel or experience with agile.

Reasoning: Implementing Agile effectively requires trained personnel familiar with its principles and practices. If the team lacks the necessary skills or experience, the benefits agile minght hot be fully realized, and the project could suffer from confusion or) mismanagement.