Green University of Bangladesh

Department of Computer Science and Engineering
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Lab Report #04

Course Title: Integrated Design Project I
Course Code: CSE 324
Section: 213 D7

Experiment Name:
Advanced AI-driven Vehicle Tracking System for Efficient Customer Services using Machine Learning, and IoT Integration.

Students Details

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Lab Project Status	
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Introduction:

Software Development Life Cycle (SDLC) models serve as the foundational framework for organizing the phases of software development. They help guide development teams in building systems effectively by specifying a structured approach to system design, implementation, testing, and deployment. This report compares several SDLC models – **Waterfall**, **V-shape**, **Iterative**, **Spiral**, **Agile**, and **Prototype** – to determine the best fit for the development of an **AI-driven Vehicle Tracking System**. The system incorporates machine learning and IoT technologies, requiring careful consideration of adaptability, efficiency, and risk analysis in the development process.

Table 1: comparison matrix with different models

Priority	Criteria	Waterfall	V-shape	Iterative	Spiral	Agile	Prototype
5	Well known requirement	Yes	Yes	No	No	No	No
3	Technological knowledge	Yes	Yes	Yes	Yes	Yes	Yes
6	Efficiency	No	Yes	Yes	Yes	Yes	Yes
5	Risk analysis	No	No	No	Yes	Yes	No
5	User testing ability	No	No	Yes	Yes	Yes	Yes
6	Dependability and Security	Yes	Yes	No	Yes	Yes	No
4	Time consuming	Yes	Yes	Yes	Yes	No	Yes
Total=34	Over all	11	21	17	25	28	18

Conclusion

For the **AI-driven Vehicle Tracking System**, the **Agile model** is the most suitable due to its adaptability, support for continuous feedback, and alignment with the evolving nature of AI and IoT technologies. The **Spiral model** could also be a strong contender if we anticipate heavy risk management and iterative testing needs, especially in terms of security and performance. **Prototyping** could be useful early on but may not support the full development process, limiting its overall effectiveness for this particular project.

Discussion

The **AI-driven Vehicle Tracking System** is a complex software solution that requires careful consideration of both technological aspects and user needs. As outlined in the comparison matrix, each SDLC model offers a different set of strengths and weaknesses. To make an informed decision, we evaluate the models based on seven key criteria: known requirements, technological knowledge, efficiency, risk analysis, user testing ability, dependability and security, and time consumption.

The **Agile** model emerges as the most suitable approach for this project due to its adaptability and iterative nature, allowing for continuous feedback and realignment with the evolving nature of AI and IoT technologies. **Agile** supports fast iterations and encourages collaborative input from users, which is essential for the dynamic and changing requirements of vehicle tracking systems. Furthermore, **Agile** excels in efficiency and user testing, both crucial for maintaining system performance and enhancing user experience.

The **Spiral** model also ranks high in terms of risk analysis and dependability, making it a strong contender, particularly for projects with significant security and performance concerns. **Spiral** focuses on early identification and mitigation of risks, which is beneficial for ensuring the security and reliability of the tracking system. However, it can be more time-consuming compared to Agile.

Lastly, **Prototyping** offers benefits in the early stages of development by providing tangible models for user feedback but lacks the long-term support necessary for complex systems like the AI-driven Vehicle Tracking System. While **Prototype** supports early-stage testing, it falls short in handling continuous changes and iterations required in advanced AI and IoT integration.