Green University of Bangladesh

Department of Computer Science and Engineering (CSE)
Semester: (Fall, Year: 2024), B.Sc. in CSE (Day)

Course Title: Integrated Design Project I
Course Code: CSE 324
Section: 221 D1

Students Details

Name	**ID**
Jahid Hasan Jitu	221002248
Jakaria Ahmed	221002631
Rana Miah	221002217

Submission Date: 21/10/2024
Course Teacher's Name: Sagufta Sabah Nakshi

[For teachers use only: redDon't write anything inside this box]

Lab Project Status	
Marks: **Comments:**	**Signature:** **Date:**

1. Select the best model of a School Management System by creating a model matrix

A School Management System (SMS) requires the selection of an appropriate Software Development Life Cycle (SDLC) model to ensure successful development. Different SDLC models offer distinct advantages based on project needs such as flexibility, documentation, risk management, customer involvement, and security. This report evaluates five popular SDLC models: Waterfall, Agile, V-Model, Spiral, and Iterative, using a set of evaluation criteria relevant to an SMS project.

The goal is to determine the best SDLC model that meets the unique needs of a school management system, which often requires handling student enrollment, grading, attendance tracking, communication and data privacy.

Step 1: Identify SDLC Models

Common SDLC models include:

- Waterfall
- Agile
- V-Model
- Spiral
- Iterative

Based on the project's objectives, priorities were assigned to each criterion, with a range from 1 to 5 . Each software model was evaluated against the selected criteria. If a model fulfilled a criterion, it received a score equal to the criterion's priority. If it did not, it received a score of 0. For each model, the total score was calculated by summing up the individual scores across all criteria.

Step 2: Define Evaluation Criteria

Criteria that are important for our School Management System project. Here are some suggested criteria:

1. **Flexibility**: .....Educational requirements often change based on curriculum updates, regulations, or stakeholder feedback. The model should allow for easy incorporation of changes.
2. **Documentation**: Schools often require detailed documentation for compliance, training, and reference. The level of documentation produced by the model should align with these needs.
3. **User Involvement**: .....Regular input from teachers, administrators, and students can help ensure the system meets diverse needs. By this customer involvement we can know about our project pros and cons.
4. **Risk Management**: .....Implementing a system in an educational environment comes with risks such as data privacy concerns. A fast approach to risk management can help to solve the potential issues.
5. **Change Management**: Requirements may change throughout the project. The chosen model should facilitate effective management of these changes to avoid disruptions.
6. **Time to Market**: .....Timely delivery is critical, especially if the system is needed for an upcoming school year. A model that supports quick releases can provide a competitive advantage.
7. **Development Speed**: .....Quick development cycles can be important for responding to immediate needs, such as enrollment periods or regulatory changes.
8. **Testing Approach**: .....The model should incorporate thorough testing phases to ensure reliability, especially for features like grading systems or attendance tracking that directly impact students.
9. **Complexity Handling**: A school management system often involves various functionalities (e.g.scheduling, reporting, communication). The model should be capable of managing this complexity without irresistible the development team.
10. **Security**: The model's ability to incorporate and manage security features to protect sensitive student and school data.

Model Matrix

The table below represents the comparison matrix for the five SDLC models based on the defined evaluation criteria, including security:

Criteria	Waterfall	Agile	V-Model	Spiral	Iterative
Flexibility	Low	High	Medium	High	Medium
Documentation	High	Low	High	Medium	Medium
Customer Involvement	Low	High	Medium	Medium	Medium
Risk Management	Low	Medium	Medium	High	Medium
Change Management	Difficult	Easy	Medium	Easy	Medium
Project Size Suitability	Small to Medium	All Sizes	Medium	Large	Medium
Time to Market	Long	Short	Medium	Medium	Medium
Development Speed	Slow	Fast	Medium	Medium	Medium
Testing Approach	After Development	Continuous	Concurrent	After Each Phase	After Each Iteration
Complexity Handling	Low	Medium	High	High	Medium
Security	Medium	Medium	High	High	Medium
Total Score	17	46	40	**53**	36

Table 1: Comparison of SDLC Models for School Management System

Analysis Result

Criteria	Waterfall	Agile	V-Model	Spiral	Iterative
Flexibility	1	5	3	5	3
Documentation	5	2	5	3	3
Customer Involvement	1	5	3	4	4
Risk Management	1	3	3	5	3
Change Management	0	5	3	5	3
Project Size Suitability	2	5	3	5	3
Time to Market	1	5	3	3	3
Development Speed	1	5	3	4	3
Testing Approach	1	5	4	4	5
Complexity Handling	1	3	5	5	3
Security	3	3	5	5	3
Total Score	17	46	40	**53**	36

Table 1: Model Evaluation Matrix for School Management System

Based on the evaluation, the Spiral Model has the highest score, with a total of 53 out of 55 points. This makes it the most suitable model for the development of the School Management System. The Spiral Model's strengths lie in its high flexibility, strong risk management, and ease of handling complex requirements. Additionally, its high score in security ensures that the sensitive data in the school management system is well-protected.

Make Decision

While Agile and V-Model also performed well, the Spiral Model is the best fit due to its ability to handle risks, flexibility, and its iterative approach to development, which suits the requirements of this project.

Conclusion

Based on the comparison matrix and the evaluation of criteria Spiral is the most suitable SDLC model for a School Management System. It offers high flexibility, strong risk management, and robust security

features. Its iterative nature ensures that the system can evolve based on user feedback, while its focus on risk management and security makes it ideal for handling sensitive data such as student grades and personal information. By selecting Spiral, the project will benefit from continuous assessment and risk mitigation, ensuring a secure and adaptable system that meets the school's dynamic needs.