information systems - Assessment Task 1 – Report

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# Introduction

# Information systems

An Information System (IS) is a structured setup of resources like hardware, software, and data used to meet business needs (Gantz & Philpott, 2013).

## Types of Information Systems:

Executive Support Systems (ESS):  
Designed for top management, ESS provides easy access to internal and external information. It uses tools like dashboards and data visualization to help executives track performance, identify trends, and support strategic decisions (DevX, 2024).

Management Information Systems (MIS):  
MIS delivers managers the data they need to run a business effectively. It gathers and processes data to produce actionable insights, enabling managers to monitor metrics, identify trends, and allocate resources efficiently (Proquest.com, 2024).

### Decision support systems

used in a business or organisation to support judgements, choices, concepts, and plans of action. A DSS will sift through vast volumes of data to extract high-quality information that may be used to decision-making (Segal, 2024).

### Transaction processing system

TPS tracks and records automated or semi-automated transactions, such as between departments, employees and suppliers, or customers and employees. It validates, processes, and updates transactional data to generate reports for decision-making (Jameslopresti, 2023).

Example:  
Airline reservation systems generate tickets, send confirmations, validate payments, and check seat availability (Igor Tomych & Co., 2024).

### Process Control systems

These systems monitor and manage processes in industries like manufacturing, oil and gas, power generation, and food production. They’re also widely used in biotechnology and pharmaceuticals (Fiix, 2024).

## Importance of information systems

Leaf Village Training Ltd currently relies on unstructured documents and spreadsheets. Shifting to an IS would improve efficiency, compliance, and adaptability to changing regulations (Nibusinessinfo.co.uk, 2024).

* **ESS**: Helps executives make faster, data-driven decisions with real-time visual insights (DevX, 2024).
* **TPS**: Tracks and flags unpaid fees for quicker resolution (Malyshev, 2024).
* **MIS**: Streamlines class and course management for easier adjustments.
* **Process Control Systems**: Supports managers in implementing operational changes, such as assigning students to classes.

# System development Lifecycle (SDLC)

## Development Stages

A 2023 Gartner study found SDLC methods used in 78% of successful IT projects, reducing failures by 35% (Full Scale, 2024).The seven stages are;

### Planning

Defines project requirements, scope, risks, and impacts, including legal considerations (D’Agostino, 2024).

### Analysis

Refines requirements and uses feasibility studies to ensure the project aligns with budget and timeline (Itexus, 2024).

### Design

Architects and developers create prototypes and flowcharts, incorporating feedback to minimize risks (Siften Halwai, 2021).

### Development

Developers build the project based on the design and perform user acceptance testing and security checks (Michigan Technological University, 2024).

### Testing

The program is tested to meet client specifications. Errors are revised before moving forward (Renju Thampy, 2019).

### Implementation

The project is deployed, often staggered for large-scale rollouts to meet stakeholder needs (Team, 2024).

### Maintenance

Fixes are applied for reported issues, and software is updated to meet industry standards and regulations (Talreja, 2023).

## Development Methodologies

### Agile

Agile operates in cycles of four to six weeks and involves collaborative decision-making over several sprints (Ganguly, 2024).This helps with flexibility and client collaboration (Technology & Software Development Blog | Future Processing, 2019). But can be difficult to measure times(Planview, 2022).

### Waterfall



Figure - waterfall model , (Tutorialspoint.com, 2024)

Winston W. Royce created waterfall in 1970, and it was widely utilised because it was straightforward, document-driven, quality-controlled, and helped to define phases and provide stability (GeeksforGeeks, 2018).However, the issues are difficult to resolve since testing must be finished before recoding can start, which delays software delivery (Smartsheet, 2017).

### Spiral

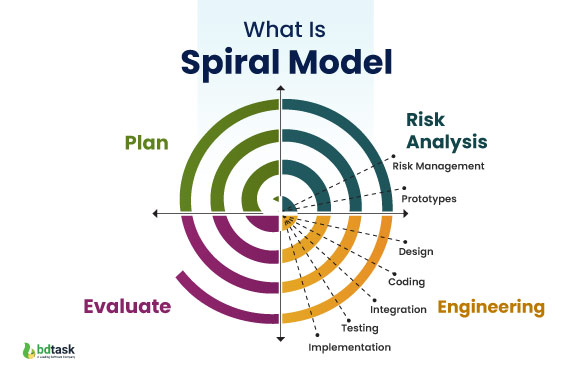


Figure 2 - spiral , (Sumaiya Simran, 2024)

This methodology combines both waterfall and iterative development. It evolves continual refinement also including risk analysis, this advantage of this model is the progressive refinement of the software involved with the customer helping satisfaction (Jackson, 2023).

## Chosen methodology for project

Leaf Village will benefit from an agile approach to the project, the constant changes can help with 75% of businesses cited faster software delivery as the main justification for using agile (Petrova, 2017). However project scope is always changing with demands causing a lack of documentation(Zhezherau, 2024).

# Requirements Analysis

## Stakeholders

Employees and executives will be stakeholders in the Leaf Villages project as their data will be added to the database and they will utilise it to manage and make choices based on requirements and data. Since they will be listed in the training course database, clients will also be considered stakeholders.

## Requirements gathering

### Functional Requirements (FR)

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Description automatically generated

Figure - functional requirements

A white rectangular box with text

Description automatically generated with medium confidence

Figure - functional requirements

### Non-Functional Requirements (NFR)

|  |  |  |
| --- | --- | --- |
| Non-Functional Requirements (NFR) | NFR1.1 | The system shall ensure data security by implementing role-based access controls to restrict unauthorized access to sensitive data. |
|  | NFR2.1 | |  | | --- | |  |  |  | | --- | | The system shall support scalability to accommodate increasing numbers of students, staff, and courses. | |
|  | |  | | --- | |  |  |  | | --- | | NFR3.1 | | The system shall ensure data integrity for student fees and enrolment records to prevent discrepancies. |
|  | |  | | --- | |  |  |  | | --- | | NFR4.1 | | The system shall provide an intuitive interface for staff to access and update data as per their permissions. |
|  | NFR5.1 | The system shall allow for easy updates to course fees and other changing parameters without requiring significant downtime. |
|  | |  | | --- | |  |  |  | | --- | | NFR6.1 | | The system shall be optimized to handle concurrent access by multiple users without performance degradation. |

## Feasibility study

Feasibility study takes into account constraints of the project such as time and budget on weather it can be completed and successful (Martins, 2024).

The feasibility study for Leaf Village would assess the developers' proficiency with the SQL programming language in order to meet the criteria and the system's six-week development, testing, and deployment timeline.

# Conclusion

When developing a new information system, Leaf Village will use an agile methodology, which will improve accuracy and efficiency over the spreadsheets the system now uses (Nibusinessinfo.co.uk, 2024). Courses and classes are among the requirements that this information system will adhere to. Additionally, the agile approach will allow for iterative development, ensuring the system evolves to meet user needs effectively (Rahul Awati, 2023). By incorporating feedback at every stage, the system will maintain high usability and adaptability, ultimately enhancing the management of resources and scheduling (School of Professional Studies at Wake Forest University, 2023).

This approach emphasises stakeholder cooperation and ongoing development, which is in line with SDLC principles (Linkedin.com, 2022). Additionally, given the dynamic nature of Leaf Village's activities, Agile's flexibility allows for quick adaptability to changing requirements, a crucial benefit (Zhezherau, 2023). Additionally, the method promotes openness and consistent communication between developers and stakeholders, which builds confidence and guarantees that the system is provided as expected.

The new system will mitigate the limits of the existing unstructured procedures by providing strong data integrity, scalability, and secure access by attending to both functional and non-functional criteria (Tech Editor, 2021). The organisation will eventually achieve increased operational efficiency and customer satisfaction as a result of the information system's gradual reduction of mistakes, streamlining of workflows, and improvement of decision-making skills.

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