# **Chapter 3:**

# **METHODOLOGY**

### ****3.1 Overview****

This chapter presents a comprehensive analysis of the feasibility and development approach adopted for the proposed Web-Based Complaint Management System at the Islamic Sciences University. It includes an in-depth feasibility study covering technical, operational, and economic aspects, a clear definition of the software development methodology, and a detailed articulation of the system’s functional and non-functional requirements. These elements are critical for ensuring that the project is viable, aligned with institutional objectives, and technically implementable within the given timeframe and resources.

**3.2 Feasibility Study**

The Feasibility Study is a critical document that defines the initial concepts, objectives, requirements, and alternatives for the system. It also forms the framework for the system development project and establishes a baseline for future studies.

Furthermore, it serves as the initial analysis of the proposed plan or project before the commencement of work, including the investment of time and resources. The project manager is responsible for analyzing and assessing the project's efficiency to determine its capacity.

The study identifies the required resources in terms of capabilities, funding, and manpower. Requirements were collected through surveys distributed to key stakeholders, including students, administrative staff, and faculty members, to ensure the system meets the actual needs.

The estimated costs include the necessary expenditures for training sessions, meetings with the supervisor, coordination among team members, and other associated expenses, as outlined in the table below.

Table 3. 1: Feasibility study

|  |  |
| --- | --- |
| Item | Estimated cost |
| Courses | 100 JD |
| Meeting | 50 JD |
| Other expenses | 50 JD |
| Total | 200 JD |

### ****3.3 System Requirements****

The system requirements outline the necessary hardware and software specifications needed to run the **Web-Based Complaint Management System** for the Islamic Sciences University. These requirements define the functionality that the system must have to meet the university's needs for managing student complaints. Below, we present the functional and non-functional requirements of the system.

#### ****• Functional requirements****

* **Admin functions:**
  + Log in with ID and Password.
  + View and manage all complaint records and histories.
  + Add, delete, and modify complaints and responses.
  + Manage users (students, faculty, and staff).
* **User functions (Students and Faculty):**
  + Log in with the ID and password.
  + Register complaints through a web form.
  + View status updates on their complaints.
  + Logout from the website.

#### ****• Non-Functional requirements****

* **Security**: The system will be secured by a login mechanism with unique user credentials (ID and password) for different user roles (students, faculty, admins).
* **Availability**: The website will be accessible 24/7 to all users (students, faculty, and admins) via internet connection.
* **Maintainability**: The system will be built to support future updates and scalability as the university's needs evolve.

### ****3.3.1 Tools****

These are the tools used for the development and management of the **Complaint Management System**:

Table 3. 2: Tools

|  |  |
| --- | --- |
| **Tool** | **Purpose** |
| Visual Studio Code | Code editor for front-end and back-end development |
| XAMPP | Local server environment for development |
| Microsoft SQL Server Management Studio | Database management and query execution |
| Microsoft Office – Word | Documentation of project phases and reporting |
| Draw.io | Diagramming and system flowchart creation |

### ****3.3.2 Programming Languages****

The programming languages used in the development of the **Complaint Management System** are essential to ensuring the system is efficient and scalable:

Table 3. 3: Programming Language

|  |  |
| --- | --- |
| **Component** | **Languages** |
| Front-End | HTML, CSS , JS |
| Back-End | ASP.NET Core |
| Framework | Bootstrap , MVC |

### ****3.4 Methodology Process****

The development of the **Web-Based Complaint Management System** for the Islamic Sciences University followed the **Agile methodology**, specifically the **Scrum framework**, due to its adaptability and effectiveness in managing evolving software requirements.

Scrum divides the work into time-boxed iterations called **Sprints**, each delivering functional system components. Key roles include:

* **Product Owner**: Prioritizes system features based on user and university needs.
* **Scrum Master**: Facilitates the process and removes obstacles.
* **Development Team**: A self-organizing team responsible for implementing features.

Scrum uses core artifacts like the **Product Backlog**, **Sprint Backlog**, and **Increment**, along with structured events such as **Sprint Planning**, **Daily Stand-ups**, **Sprint Reviews**, and **Retrospectives**. These ensure steady progress, continuous feedback, and alignment with project goals.

This methodology enabled the team to build a flexible, user-centered complaint system efficiently and incrementally.

Table 3. 4: Sprint

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Number of sprints** | **Sprint 1** | **Sprint 2** | **Sprint 3** | **Sprint 4** |
| **Planning** | |  | | --- | | Plan    Review | | |  | | --- | | Plan    Review | | |  | | --- | | Plan    Review | | Plan    Review |
| **Time of Sprint** | 4 Week | 4 Week | 4 Week | 4 Week |
| **Requirement item** | * Choosing the idea * Planning * First home page * Start write the documentation | * Second home page * Login/Sign up page * Website Dashboards * Documentation con… | * Design All pages * Database * Testing project * Documentation | * Website Integration * Finish documentation |

### ****Sprint-Based Planning Process for the Complaint Management System Project****

#### ****Data Collection:****

1. **Number of Sprints:**
   * Sprint 1
   * Sprint 2
   * Sprint 3
   * Sprint 4
2. **Sprint Planning Process:**
   * **Plan:** The planning process follows the sequence of Analyze, Design, Code, Test, and Release for each sprint.
3. **Duration of Each Sprint:**
   * 4 weeks per sprint.
4. **Items Required in Each Sprint:**
   * **Sprint 1:**
     + Idea selection and project planning.
     + Development of the first home page (user interface for complaints).
     + Initiation of project documentation.
   * **Sprint 2:**
     + Development of the second home page (admin dashboard for complaint management).
     + Login/Sign-up page for students, faculty, and admin access.
     + Website dashboards for managing complaints and responses.
     + Continuing the project documentation.
   * **Sprint 3:**
     + Design and development of all system pages (user-facing and admin-facing).
     + Database development for storing complaints and user information.
     + Testing the system for bugs and functionality.
     + Continuation of documentation.
   * **Sprint 4:**
     + Integration of all website components.
     + Finalizing and completing project documentation, including user manuals and system documentation.