University Department Information System

A project for understanding Software Engineering fundamentals

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Overview

Creation of an application that helps with overall academic, logistics and financial management of a department in a University through a single source of truth by using fundamental software engineering methods.

Methodology followed

Agile Model

- Iterations of software
    - Small functionalities that were required were added over time to the software till the requirements in the SRS document were satisfied.

Initially,

- Admin view was implemented with read/write access to all databases given.
- Iterations that followed reduced this superuser to a more balanced role and added Teachers roles to access Student Datas

Planning Involved

SRS Document Creation

- The document was created to formalise the notion of how the application is supposed to work
- Several iterations of this document were made before settling on the final version.

UML Diagrams

- An Abstract view of User Classes, was made along with the functions and the required data flows.
- Had to be changed over time due to evolution of the SRS Document.

Problems Faced

Continuous Revision

- Since the document changed a lot due to us adding features over each revision, it involved a lot of work to rewrite components

Non-Fixed Classes

- Non-Fixed nature of our classes introduced a lot of data flow bugs into the software.

Software Development Workflow

Simple Java CMD program

A Java Command line application was developed by integrating the required classes defined in the SRS document in the database server. This version of the software had the functionality of the then SRS document and the interaction with the user was limited. Also, to check the updated values , the only option we had was by manually going over the database.

Java Swing UI Creation

After finalizing the version of the classes that was going to be used, a UI was prototyped that incorporated all the functionalities of the final SRS document. The UI was first designed in Figma and then,it was coded up

CMD and UI Coupling

After finalizing the UI using Java Swing,, the only task that was left was to integrate the frontend with the CMD program. This involved rewriting classes to accommodate the data flow.

Other Methodologies that were followed

- **Basic Testing :** Simple Tests using JTest and Asserts were written as a sanity check
- **Peer Programming:** Two people were involved whenever writing some code. One was assisting with the class definitions and database checks and the other was assigned to code. This methodology was extremely useful and boosted up the development process.