Evaluation: Final Project (Unit 11) vs. Initial Project Proposal (Unit 6)

1. Introduction

This study evaluates the differences between the project report submitted in Unit 6 and the executive summary submitted in Unit 10.

Both projects aimed to manage patient information, medical records, and administrative data efficiently. My main idea was not to change the project completely, but to work on it, improve it, and make it more comprehensive.

To accomplish this goal, I decided to explore certain aspects of the first project in more depth, such as the logical and physical design of the database, the integration of clinical standards, legal compliance, and future perspectives using AI tools.

2. Database modelling

The database proposed in the first project was based on the entity-relationship model, and I decided to use it in the final project, maintaining the same relations and core entities. The first text focused only on the entity-relationship model. It defined all entities and their relationships and then described the data cleaning process. In the final project, I decided to maintain the same cleaning process, adding only the verification of integrity constraints. Furthermore, I defined the aspects that would be designed during the physical database phase, and the monitoring and optimization of the database management system.

In the final text, I also decided to highlight the advantages and disadvantages of choosing a relational database for the Affidea CDC to offer a more in-depth analysis.

In conclusion, my goal in the final project was to place greater emphasis on scalability, the physical design of the database, and maintenance.

3. DBMS Selection

In the first project, the team chose to implement the database on the Microsoft SQL Server; therefore, I decided to maintain this server in the final project. To enhance it, I conducted a detailed analysis of the advantages and disadvantages of using SQL Server. In addition, a comparison of SQL and NoSQL databases is presented to explain why SQL is the right choice in this case.

In the final text, I also proposed the introduction of AI to improve SQL Server performance and the possibility of moving to a cloud-native server in the future because it performs well under increasing data volumes, higher traffic peaks, and evolving queries.

4. Standards, Legal and Compliance Requirements

In the team project, ICD-10, LOINC, and DICOM were mentioned as clinical standards, but it did not delve into one of the major challenges of using them: handling different languages. In the final project, I propose introducing ML to simplify the integration and interpretation of data. In the team project, the OpenEHR model was used to allow interoperability and versioning. In the final project, I also added ISO 13606 to allow the exchange of the EHR extract.

Moreover, the final project mentions ISO 31000:2018 and ISO/IEC 27001:2022 to improve risk management and information security.

The last aspect that was not well defined in terms of legal compliance, considering that the database will be implemented in the Italian CDC clinics, is the protection of data, which must comply with the EU GDPR regarding informed consent and transparency.

In conclusion, in the final project, the Standards, Legal, and Compliance Requirements are the ones to which I add more details, as it is an important aspects that were not sufficiently addressed in the first project.

5. Personal reflection

During the module, through both the team project and the final project, I was able to explore new concepts such as database design, SQL, compliance and standards, and the use of AI. These skills are not only important for completing the exam but will also guide me in making more informed decisions regarding databases in the future. The major challenge was not only learning new topics but also realising that even in topics that I thought I understood, there was still more to learn. As a student, this experience allows me to understand that learning is continuous, and that participating in a new project, even if intimidating at first, always provides valuable insights through collaboration and comparison with others.

Looking back to the initial project, I believe that the choices we made were appropriate for the knowledge that we had at the time. Thanks to the new knowledge gained during the module, however, the final project became more comprehensive and refined.

6. Conclusion

In conclusion, during the final project, I decided to stick with the decision made in the team project and make it more complete.

The database respected the core entities and the relation proposed by the team; however, in the final text, I decided to add the physical project phase and to present the advantages and disadvantages of the entity-relationship model. Then, while maintaining the implementation of the database on SQL Server, in the final text, I decided to present the advantages of using SQL and a comparison with NoSQL, which was not included in the team project. Finally, I propose a plan for future adoption.

The final project concludes with a paragraph on the Standards, Legal, and Compliance Requirements, which I consider an extremely important topic in the context of big data, and which was not explored sufficiently in the team project.

Overall, this experience allows me to gain new knowledge that will be extremely useful in my future experiences.