# The Importance of Effective Management of Academic Activities to Improve Educational and Organizational Performance

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## ABSTRACT

In an ever-changing world, universities need to adopt innovative ways to effectively manage academic activities. A robust and well-designed digital platform can provide students with access to a clear and concise overview of the academic year, including detailed information about the courses they have to attend, their financial situation, exam grades and teaching materials. Such a platform not only enhances students' educational experience, but also allows them to be more organized and have quick access to the information they need to excel in their studies. *StudentHub* is an innovative digital platform that aims to address these needs. Designed to provide a complete solution, *StudentHub* makes it easy to manage academic and administrative activities through an intuitive interface and advanced functionality. It allows students to quickly access course information, financial status and grades, while also providing access to the learning materials they need to study.

**Keywords**: digitization, academic activities, digital platform, education, management of academic and administrative activities

## INTRODUCTION TO THE NEED FOR ACADEMIC DIGITIZATION

### General context of digitization in education

Digital technology has transformed almost every aspect of modern life, and education is no exception, as it is a constantly evolving process [1]. Academic institutions are increasingly adopting IT solutions to manage processes from student enrollment and resource allocation to academic performance monitoring. Students and teachers in the 21st century have been exposed to using various technology-based equipment as aids or tools in teaching, learning and data management in the educational process [2].

Rapid advances in information and communication technologies, coupled with increased access to information and the formation of global communities, have prompted researchers and academics to rethink educational practice. In this context, attention has turned to expanding traditional 'literacy' skills to include new media literacies that reflect the complexities of today's society [3].

The rapid advancements in technology have brought about a transformative shift in the landscape of education, with the process of digitalization playing a pivotal role in shaping the way knowledge is acquired, disseminated, and experienced. This digital revolution has permeated all aspects of life, from social interactions to the professional domain, and education is no exception [4]. The integration of technology in education has been a gradual process, but the pace of technological development and the emergence of

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disruptive innovations have compelled educational institutions to adapt and adopt these tools more swiftly, especially in the wake of the COVID-19 pandemic [5].

In the context of ongoing digitization, the need to implement efficient and effective digital solutions in universities is greater than ever. Digitization is no longer just a temporary trend, but an essential imperative for improving and modernizing education systems [6]. Today's universities are faced with the challenge of managing a considerable volume of academic data and activities, which requires the adoption of digital platforms that facilitate both administrative and educational activities.

The digital transformation in education has ushered in a paradigm shift, where technology is viewed as a complex and interconnected ecosystem that enables digital learning, with a greater emphasis on student experience rather than technology itself [7].

This shift has manifested in various ways, such as the increased use of virtual and independent learning, the decentralization of education, and the growing emphasis on improving the quality and standard of education. Furthermore, the need for lifelong learning has become more pronounced, as the rapid obsolescence of skills in the 21st-century landscape demands a constant acquisition and refinement of knowledge and abilities [8].

Digitization brings significant benefits for teachers, and platforms such as the one presented in this paper - *StudentHub,* facilitate the management of educational activities. It allows teachers to organize their calendars more efficiently, monitor student attendance, distribute teaching materials and record exam grades [9]. Our educational institutions were largely built for a different era, one based on an industrial rather than a digital age [10]. This optimizes teaching and assessment, providing a more organized and accessible environment for both teachers and students. These functionalities significantly reduce time spent on administrative tasks, allowing teachers to focus more on the educational process and direct interaction with students [11].

For university administration, digitization is a crucial step in the efficient management of students, courses, teachers and tuition fees. A centralized digital platform, such as *StudentHub*, developed within the Multidisciplinary Research and Informatics Centre (CCIM) of UTT Romania, allows for fast and accurate information management, facilitating the processes of enrolment, fee management and organization of educational resources. This reduces the risk of errors and improves the transparency and accessibility of administrative information.

The need for digitalization in the university environment stems from the desire to improve the quality and efficiency of educational and administrative processes. In an information age, quick and easy access to data is essential. Students of today's generation are familiar with technology and have high expectations in terms of access to information and educational resources. Professors and administrative staff also require modern tools that simplify their daily activities and allow them to focus on the essentials of education and university management.

**StudentHub - Solution for Digitization**

*StudentHub* is an innovative digital platform that aims to meet these needs. Designed to provide a complete solution, *StudentHub* facilitates the management of academic and administrative activities through an intuitive interface and advanced functionalities. It allows students to quickly access course information, financial status and grades, while giving them access to the learning materials they need to study.

Teachers can use *StudentHub* to manage their timetable, track student attendance, record grades and upload teaching documents. The platform thus ensures efficient communication between teachers and students, enhancing the educational experience.

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For faculty and university administration, *StudentHub* provides a comprehensive suite of tools designed to streamline academic and administrative workflows. The platform facilitates critical processes such as student enrollment, tuition fee management, course organization, and real-time monitoring of academic activities. By automating many routine tasks, *StudentHub* not only saves time and reduces administrative burdens but also ensures accuracy and consistency in managing academic resources.

Moreover, the platform's robust analytics and reporting capabilities empower decision-makers with insights that help optimize resource allocation, identify areas for improvement, and enhance the overall management of academic institutions. Customizable features and user-friendly interfaces make it adaptable to the specific needs of any faculty or university.

The adoption of *StudentHub* not only enhances the quality of education but also sets the foundation for creating a forward-thinking, dynamic academic environment that meets the demands of the digital age. It is a step forward in redefining the future of higher education, making it more accessible, efficient, and impactful.

### Objectives and purpose of StudentHub

*StudentHub* aims to provide an integrated platform that centralizes all academic information in one accessible and user-friendly place. The main objectives of the platform generally include Academic Information Management, Planning and Organization, Efficient Communication, Financial Management, Security and Differentiated Access.

*StudentHub* will contain a centralized database with information about students, teachers, courses, labs and exams, providing quick and efficient access to this data for all authorized users. The application will allow detailed planning of courses, labs and exams, as well as monitoring student attendance and exam results, ensuring optimal organization of academic activities.

The application will integrate a chat system dedicated to each course, facilitating fluid communication between teachers and students and promoting more effective interaction and collaboration.

Functionalities for managing tuition fees are included, allowing students to check the payment status online and facilitating payment tracking for the university administration and will ensure data security through two-step authentication and provide specific access levels and permissions for different roles (admin, teacher, student), thus protecting sensitive information.

## REQUIREMENTS ANALYSIS AND APPLICATION DEVELOPMENT PLANNING

In order to develop an application that would successfully meet users' requirements, preliminary research was carried out, including surveys and interviews with students, teachers and administrative-secretarial staff. These analyses highlighted the need for a centralized, intuitive and adaptable system.

### Technologies used for development

In developing the *StudentHub* web application, a variety of technologies and libraries were used to ensure performance, scalability and ease of use. The following will briefly describe each of these technologies, demonstrating an understanding of them and justifying their choice for this project.

A web application is software that runs on a server and can be accessed through a web browser. Unlike traditional desktop applications, web applications do not require installation on the end-user's device and can be accessed from anywhere as long as there is an internet connection. This type of application is ideal for

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educational platforms such as *StudentHub*, as it allows quick and easy access to educational resources for students and teachers.

*C#* [12] is a programming language developed by Microsoft, which is known for its clear syntax and its power to create robust and scalable applications. C# is an object-oriented language and is widely used in enterprise application development. For StudentHub, C# was chosen because of its excellent integration with the .NET platform and its support for rapid web application development through ASP.NET Core.

*Blazor* [13] is a framework developed by Microsoft for creating interactive web applications using C# instead of JavaScript. Blazor allows developers to use the same programming skills on both the client and server side, providing a unified development experience. The choice of Blazor for StudentHub was motivated by its ability to create dynamic and responsive user interfaces utilizing the advantages of the C# language.

*HTML* [14] (HyperText Markup Language) is the standard language for creating web pages. HTML describes the structure of a web document using tags and elements. In the development of *StudentHub*, HTML was used to create the structure and content of web pages, providing a solid basis for the user interface.

*CSS* [15] Cascading Style Sheets is a styling language used to describe the presentation of an HTML document. CSS controls the visual appearance of web pages, including layout, colors and fonts. The use of CSS in *StudentHub* has made it possible to create an attractive and responsive interface, adapting to different screen sizes and devices.

*JavaScript* [16] is a programming language used to create interactive elements on web pages. It is a client-side scripting language that allows dynamic content updates and complex interactions without the need to reload the page. In *StudentHub*, JavaScript has been used to enhance the interactivity and functionality of the application, complementing the capabilities provided by Blazor.

*CQRS* [17] [18] Command Query Responsibility Segregation is a design pattern that separates read (Query) and write (Command) operations. This pattern helps to scale applications and manage complexity by separating read and write logic.

*SQL* [19] (Structured Query Language) is a standardized programming language for managing and manipulating relational databases. MS SQL Server is a database management system developed by Microsoft, offering high performance and security. In *StudentHub*, MS SQL Server has been used to store and manage application data, ensuring its integrity and accessibility. The use of SQL for queries and database operations enabled efficient and secure manipulation of information.

*Entity Framework Core* [20] (EF Core) is an Object-Relational Mapper (ORM) framework developed by Microsoft, used to manipulate databases in an object-oriented way. EF Core allows developers to work with databases using .NET objects, eliminating the need to write SQL code directly. This framework simplifies CRUD (Create, Read, Update, Delete) operations and provides support for migrations, allowing developers to update the database schema incrementally. The use of EF Core enabled the implementation of a robust and easy to maintain data access layer, contributing to the overall scalability and performance of the platform.

In conclusion, the choice of these technologies for the development of the *StudentHub* application was made to ensure an optimal user experience, high performance and scalability. Each technology played a key role in realizing a robust and efficient application capable of meeting modern academic requirements.

## APPLICATION ARCHITECTURE AND IMPLEMENTATION

The application has been built on a modular architecture, which allows easy addition of new functionality. The data flow will include interaction between the database, backend API and user interface.

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With full integration and Blazor support, Visual Studio provides an integrated environment for all the technologies used, including Blazor, making it easy to develop and test the application in one place.

The architecture offers IntelliSense, advanced debugger and easy package management through NuGet, speeding up code writing, debugging and testing. Integration with Git enables efficient developer collaboration and code version management, essential for a team project.

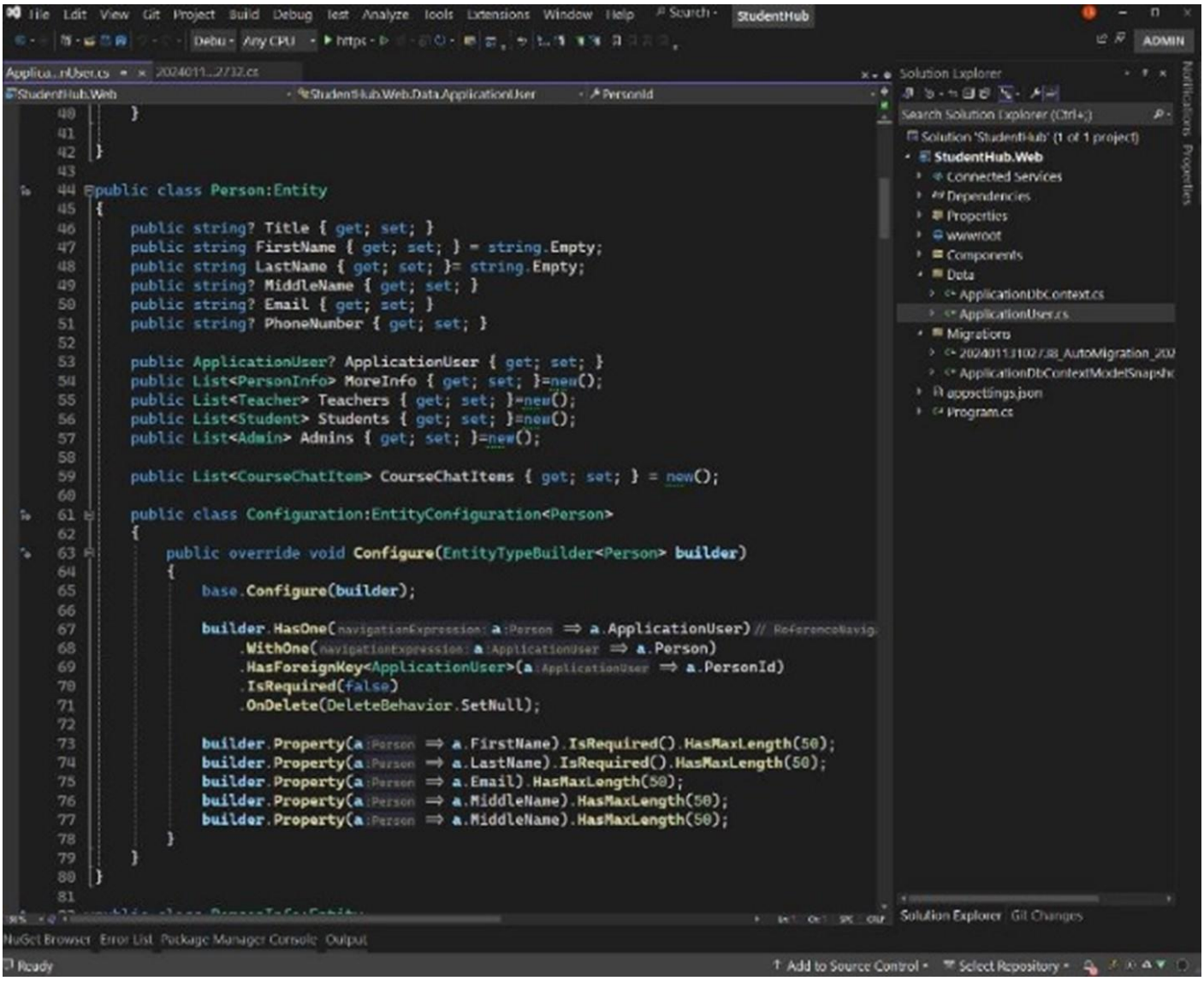


Fig. 1 Realized Technical, Visual Studio

**DataBase**

Entity Framework Core enables direct connection between objects in C# code and tables in an SQL database.

.NET to SQL tables enables easy interaction with the database through simplified and intuitive C# code. Any changes made to the application model are automatically applied to the database. The synchronization between the database structure and the code is seamless and without additional effort, using migrations, changes in the database schema are handled automatically, ensuring continuous synchronization between the application model and the database.

The Code First approach allows automatic database generation from C# classes, providing flexibility and control over the database structure without manually writing SQL code. To configure tables - everything is generated automatically, while providing flexibility and control over the database design.

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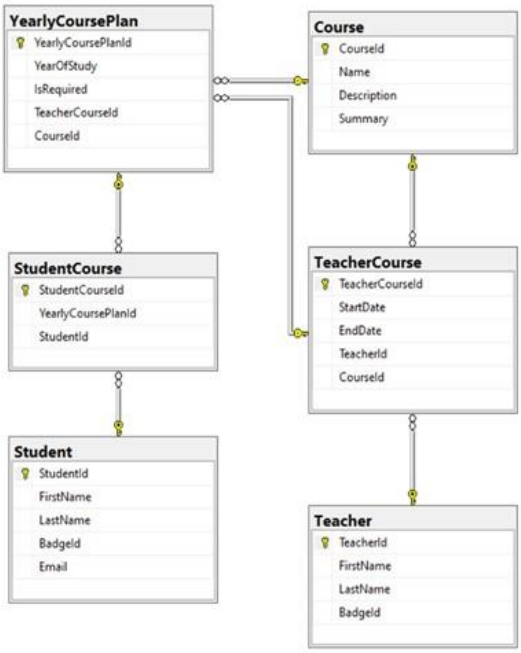


Fig. 2 Database structure

**User interface**

Blazor enables the creation of modular and component reusable interfaces, simplifying the development and maintenance of application UI. Using C# for interface development eliminates the need for JavaScript for client-side logic, providing a unified programming experience.

Blazor uses SignalR to enable real-time UI updates, providing an interactive and dynamic user experience.

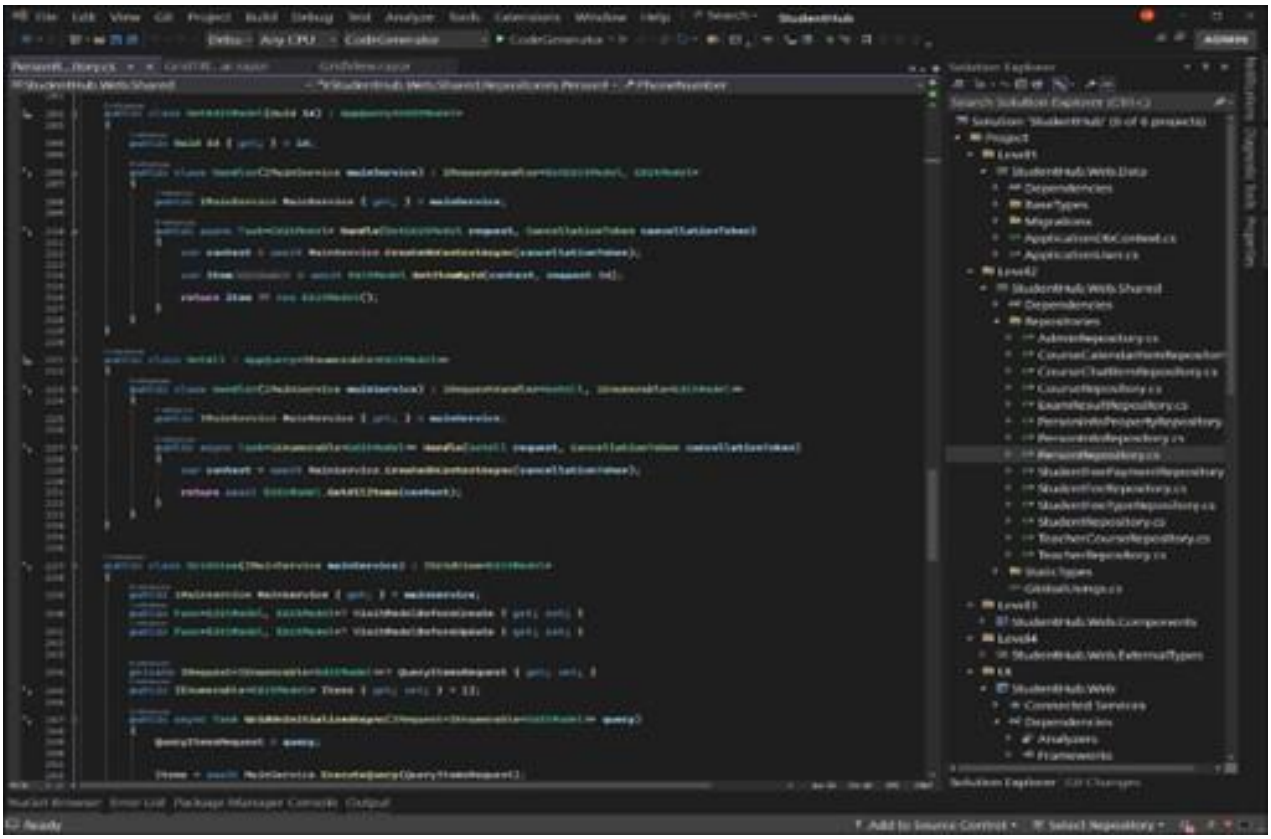

Fig. 3 User interface code - C# front-end


Fig. 4 Web - landing page

The attached image shows the *StudentHub* landing page. It serves as the main entry point for users, providing a clear and accessible interface for students, teachers and administrators.

In the center of the page is the title "Student HUB", written in large and visible type, with a purple background that creates a strong and eye-catching contrast. The *StudentHub* logo, placed next to the title, emphasizes the visual identity of the application and gives it a professional touch.

The student management page is part of the administrative settings section of the *StudentHub* application. It is designed to allow administrators to efficiently manage student information, providing functionality to add, edit and delete records.

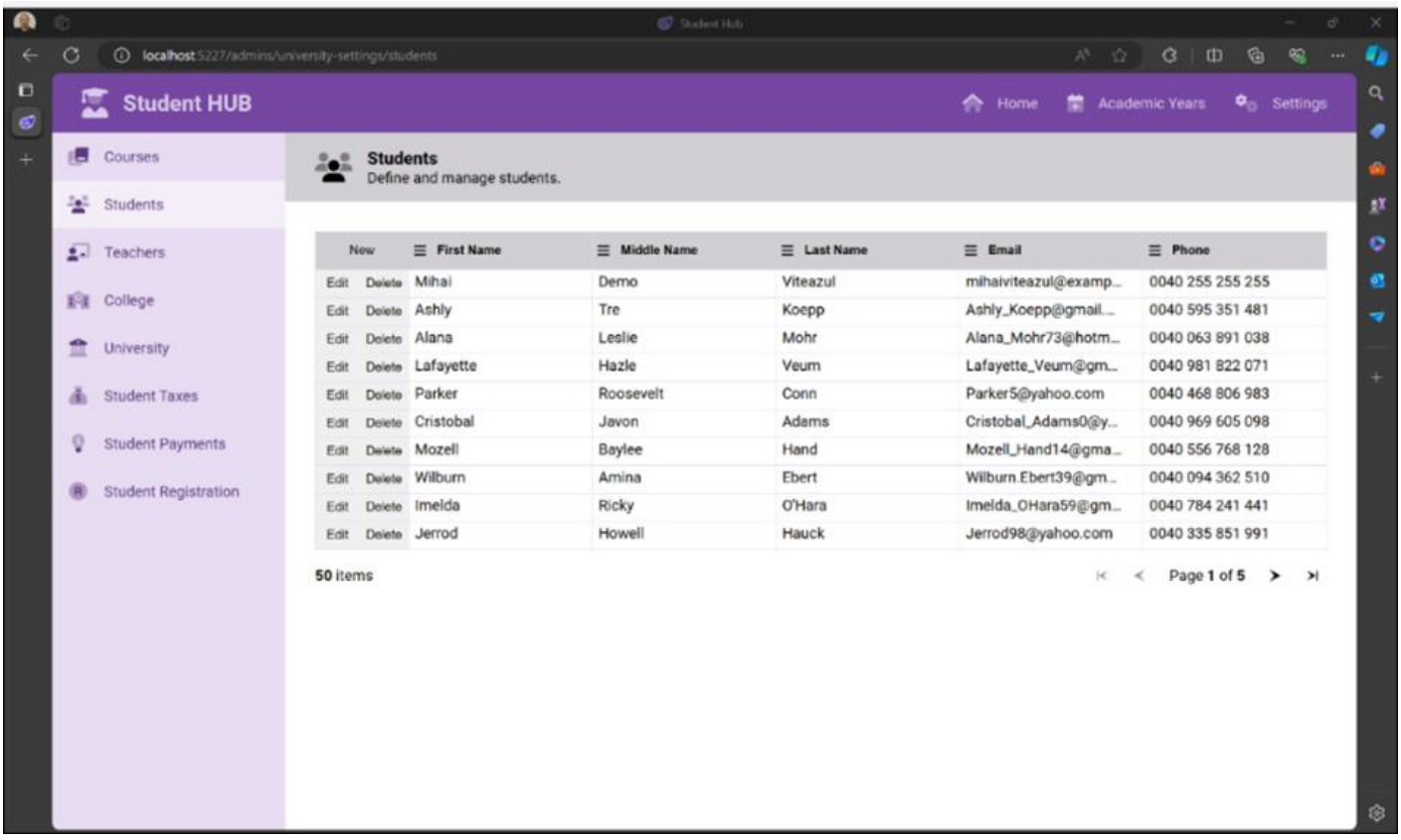


Fig. 5 Web - admin settings page

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# IMPACT OF THE STUDENTHUB APPLICATION

The implementation of the StudentHub application has had a significant impact on the way academic and administrative processes are managed in our faculty, FCIA. The automation and optimization of workflows has led to significant savings in time and resources.

By digitizing administrative and academic processes, repetitive and time-consuming tasks have been automated, allowing administrative staff to focus on more strategic and important activities. For example, processes for student registration, grade management and academic event planning have been streamlined and accelerated. This not only reduced manual workload, but also decreased the risk of human error, thereby increasing the operational efficiency of the university.

Accessibility and transparency have been greatly improved through the use of the StudentHub app. Students and teachers now have quick and easy access to academic and administrative information, which has increased transparency and improved communication. Information about classes, grades, academic events and financial status is available just a few clicks away, eliminating the need for physical travel or paper requests for information. This increased accessibility has contributed to better information and time management for all users.

The modular architecture and use of modern technologies has given the StudentHub application outstanding flexibility and scalability. The modular design allows functionality to be added or changed without affecting the rest of the system, making the application easily adaptable to the changing needs of the university. In addition, the use of modern design patterns, such as CQRS, and the Blazor framework allowed the application to support a large number of users without compromising performance. This ensures that the application can evolve and grow with the university, meeting future user requirements.

The implementation of advanced security measures ensured the protection of sensitive data and guaranteed the privacy of users' personal information. Data security is a critical issue in the context of digitization, and StudentHub has been designed to meet the highest data protection standards. Security measures include data encryption, strict authentication and authorization, and information access auditing. These practices have been implemented to prevent unauthorized access and protect confidential student and faculty information. Confidentiality and data integrity are thus ensured, giving users confidence in using the application to manage academic and administrative information.

Testing of the application has brought significant improvements in the efficiency, accessibility, flexibility and security of university processes. Workflow automation has saved time and resources, allowing administrative staff to focus on strategic tasks. Increased accessibility to information increased transparency and improved communication between students and teachers. The application's flexibility and scalability ensured its adaptability to the changing needs of the university, and strict security measures guaranteed the protection and confidentiality of users' data. These collective benefits demonstrate the positive impact of digitization through StudentHub, contributing to a more efficient and modern management of university processes.

# CONCLUSIONS

The development of the StudentHub application was an ambitious and complex project aimed at transforming the way academic processes are managed in a university. In this final part of the paper, I will detail the facilities of the application, its impact on the digitization of university processes, and my specific contribution to its development.

### StudentHub Application Facilities

*StudentHub* has been designed to meet the needs of students, teachers and administrators by providing an integrated and accessible platform to enhance the educational experience, improve administrative efficiency and streamline workflow.

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The app allows students to access detailed information about the courses they are enrolled in, including syllabi and required course materials. Teachers can upload documents and teaching resources, facilitating quick and centralized access to study materials.

Students and teachers can view and manage academic events through an integrated calendar. This functionality ensures that all stakeholders are up-to-date with the academic program, including exam dates, project deadlines and other relevant activities.

*StudentHub* offers teachers a simple and efficient way to enter and manage student grades. Students can quickly access their academic standing by viewing grades and assessments received, allowing them to track their educational progress.

The app includes functionality for managing tuition fees and other university payments. Students can view their financial statements and make payments online, simplifying the process of managing financial obligations.

Internal messaging functionality allows students, teachers and administrators to communicate effectively within the platform. This facilitates information sharing and collaboration between all parties involved in the educational process.

*StudentHub* allows personalization of the user experience through individual accounts while ensuring a high level of data security. All information is protected by advanced security measures, guaranteeing the confidentiality and integrity of user data.

During the development and testing phase of the application, ongoing user support and application maintenance was provided to ensure that the application was running in optimal conditions. Application performance was monitored and regular enhancements and updates were implemented. Ongoing support included troubleshooting user-reported issues, optimizing performance and adding new functionality based on feedback received. Regular maintenance ensured that the application remained up-to-date and compatible with new technologies while providing a seamless user experience.

In conclusion, the development of the StudentHub application was a complex and ambitious project, which involved the use of modern technologies and the implementation of efficient software development practices, thus responding to today's needs for digitalization and efficiency. By integrating digital solutions, StudentHub supports a more connected and user-oriented educational environment.

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