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MOBILE APPLICATION DEVELOPMENT AND IMPLEMENTATION FOR DIGITALIZING EDUCATION

Mobile applications have rapidly integrated into daily life, offering quick access to information and services available anytime, anywhere. Modern trends in mobile technology development have encouraged the adoption of applications in education, where many institutions are creating mobile platforms to facilitate students' access to academic information [1;2].

Higher education institutions typically offer online portals for students to access academic data. However, these portals are often not optimized for mobile devices, creating challenges for students, particularly in hybrid learning environments. Consequently, developing a user-friendly mobile application for modern educational institutions, such as universities, is crucial to ensure students' continuous access to

academic resources. This approach optimizes the learning process, promotes information mobility, and enhances adaptability in the contemporary educational landscape [3, p.809].

In light of the relevance of this issue, we developed and launched a pilot version of a mobile application, EUni, at the European University this academic year. This application integrates modern digital tools, including digital avatars [4].

The EUni mobile app aims to transform education by integrating advanced digital technologies and artificial intelligence into a single interactive platform. Its data management employs a hybrid approach, combining relational databases like MySQL and PostgreSQL with NoSQL solutions such as MongoDB to ensure efficient access and reliability. Relational databases were selected for their rapid development cycle, ease of customization, and provide a smooth user interface.

Along with efficient data access, the application emphasizes high security and functional autonomy. Secure data transfer protocols and offline access ensure information protection, while machine learning algorithms personalize content and automate various tasks. This approach aims to create an integrated educational ecosystem that optimizes both management and learning processes. Developed for iOS and Android platforms using Flutter and Dart, the app provides stable, uninterrupted access to timetables and other essential resources.

We also analyzed the European University's website using browser developer tools, examining the executed queries to identify required parameters and data received [4]. The EUni mobile application we developed includes four main functions:

1. Convenient access to the schedule.
2. Notifications about changes.
3. Academic life organization.
4. Digital avatar.

The first function of the EUni mobile app is schedule access. Users can select their group and view the current week's timetable. The timetable is saved to the phone's memory, allowing offline access, and automatically updates when connected to the internet. The timetable screen is shown in Fig. 1.

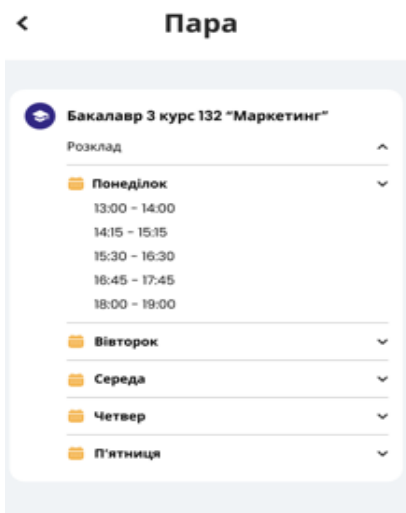


Fig. 1. Class schedule in the EUni mobile application

Another function of the EUni mobile app is to inform users about changes. Through push notifications, users receive real-time updates on any schedule changes, reducing the risk of missing important classes and helping them adapt quickly to the updated timetable, thus improving the efficiency of the educational process.

In addition to the class schedule, EUni allows students to receive important messages from the university, track learning outcomes, and stay informed about deadlines for coursework and exams (Fig. 2).



Fig. 2. Notification of changes in the EUni mobile application

A significant achievement of the developed mobile application is the ability to make online payments for education. Integrated with

payment systems, the app allows students to complete transactions without visiting the educational or banking institutions in person. This simplifies the payment process, particularly for international students or in unstable environments.

The screen displays the user’s ID-passport with their photo, name, and balance information, ensuring personalization and easy tracking of financial transactions. The payment button is highlighted in a bright color to attract attention and enhance usability (Fig. 3).

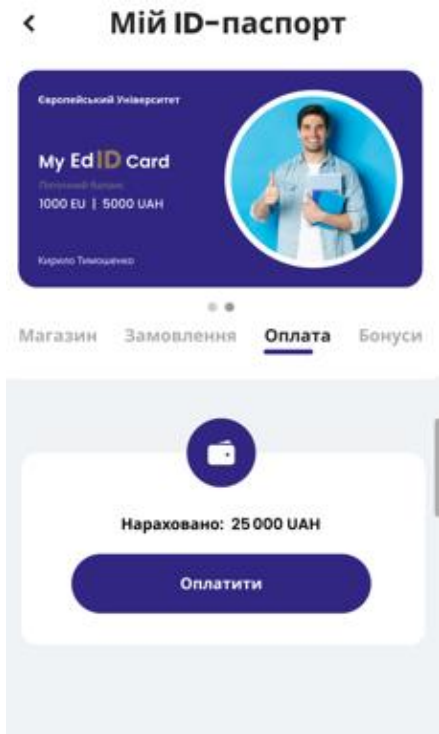


Fig. 3. Tuition payment account in the EUni mobile application

In addition to the user-friendly interface, we have implemented an innovative tool in the educational process: a digital avatar, which is increasingly used by leading educational institutions worldwide.

A digital avatar is more than just a virtual figure; it is a technology that enables teachers to conduct training sessions through university mobile applications, fostering interactivity and a personalized learning experience. A key aspect of this approach is the creation and use of digital teacher avatars, which are fully modeled after real teachers.

The introduction of a mobile application like EUni represents a significant step in the digitalization of universities, aimed at creating a modern and convenient educational environment. These mobile applications offer students and teachers versatile tools to enhance the organization of the educational process, including access to class schedules, online payment systems, reminder functions, and communication chats. Today, mobile applications are essential in the digital transformation of education, providing modern tools for easy access to academic resources and efficient management of the learning process.

References

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