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ІМЕНІ В. Н. КАРАЗІНА

ІТ-ПРОСТІР СЬОГОДЕННЯ: ТЕНДЕНЦІЇ, ІННОВАЦІЇ ТА ПЕРСПЕКТИВИ РОЗВИТКУ

Збірник тез доповідей
III Міжнародної науково-практичної студентської конференції

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IT-SPACE OF TODAY: TRENDS, INNOVATIONS AND DEVELOPMENT PROSPECTS

Collection of abstracts
of the II International Scientific and Practical
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DEVELOPMENT OF A WEB APPLICATION TO SUPPORT THE PROCESS OF LEARNING FOREIGN LANGUAGES

The purpose of the study is to develop a modern web application to support the process of learning foreign languages, which should ensure an interactive passage of the educational process, personalization of the learning process, vocabulary acquisition and tracking of user progress. The method used to design a web application includes such subject areas as structural and functional analysis, component modeling, client-server architecture design, development of web applications using modern technologies. During the work, the following was carried out: analysis of the subject area and research of existing platforms for learning foreign languages, identified their advantages and disadvantages, created the concept of the application and implemented its main functionality. The developed application can be used as an interactive learning platform to support the process of learning English and French.

The analysis proved that in the modern world, knowledge of a foreign language is becoming an important component of education, professional development, and everyday life in society. A significant number of learners use digital platforms for independent or distance learning, as they provide free access to learning materials anytime and from anywhere. It is because of the rather high demand and demand of users that the development of web applications, as well as educational games to support the process of learning foreign languages, is becoming more and more important. The analyzed modern language learning platforms provide users with a significant selection of exercises, tests, and interactive materials that implement AI modules in video or audio tasks. However, a fairly significant part of such services has certain drawbacks, in particular: insufficient personalization of the learning process, difficulty in maintaining user motivation, monotony of exercises, and limited opportunities to repeat complex topics. In addition, many platforms have a rather "overloaded" interface or certain restrictions on free use, which is very disturbing and forces the user to look for a different, simpler approach to learning.

The purpose of the study is to develop a web application "Lingo Jungle" to support the process of learning foreign languages, which can provide students with a fairly convenient tool for learning new words, taking lessons, performing exercises and tracking their own progress in learning. To implement the presented project, a set of modern technology stacks was used, namely: TypeScript, Next.js and Tailwind CSS for the frontend, the Supabase platform for working with the database and user

authorization, as well as Java Spring Boot for checking answers, tips and logic of flash cards. The project includes: analysis of existing language learning platforms in order to determine their advantages and disadvantages, as well as the development and implementation of features that can improve the user's interaction with the system and thereby increase the effectiveness of learning. The main functionalities of the web application include: registration and authentication of users; taking lessons with different types of exercises; saving progress, tracking lessons learned in a weekly goal and daily series; a system for saving user progress; automatic checking of answers, tips and correction of incorrect answer options; flashcards system for learning new vocabulary; choice of language, level on the CEFR scale and learning goals; gamification system with coins, avatars, and an internal store; adaptation of content in accordance with the chosen level and learning goals. Thus, during the study, the Lingo Jungle web application was developed to support the process of learning foreign languages. The system went through the main stages of the software life cycle, namely: domain analysis, design, development, testing, and preparation for further modernization of the functionality. The process of deploying a web application consists of the following steps: preparation of the source code of the client and server parts; creating and configuring database tables in Supabase; launch of the Java Spring Boot backend; deployment of the client part of the web application on the hosting platform; setting up environment variables to connect to Supabase, Google OAuth, and backend APIs; checking the work of authorization, downloading courses, completing lessons and saving progress. Since the web application must work in a certain number of existing browsers, there is no need to install anything on the computer or update the system specifically for the implementation of the software product. That is, the user can access the application by opening the URL of the developed application, clicking the "Login and Start" button, and logging in with their credentials, such as Google. The next important step is to create a learning profile. After that, the user can choose a category to learn a specific language, according to the approximate level of knowledge, in order to gain access to a specific training course. Thanks to this, users can access and use the application on any device, using only any modern browser and the Internet. This should significantly increase the simplicity and usability of the application. The relevance of the implemented software is due to the growing popularity of digital educational platforms, the popularization of distance learning (due to unstable conditions in the world) and the need to create interactive learning systems that provide personalization to the user, increase a certain motivation of users, as well as convenient access to educational materials at any time. In the process of work, the following were analyzed: the main shortcomings and problems of modern educational services, the subject area of distance learning systems, as well as the functional requirements for the software product. Based on the analysis, the following were developed: database structure, UML activity diagrams and the logic of direct user interaction with the system. The implemented web application project provides: authorization of users through a Google account; setting up an individual training profile; a system of internal currency and rewards; work with flashcards to repeat vocabulary; support for the streak system to motivate the user; passing the level test;

automatic calculation of learning progress; change of mentors, design themes and personalization elements; saving Learning Outcomes and User Statistics. In order to implement the developed software product, the following modern web development technologies were used, namely: Next.js, TypeScript, Tailwind CSS, Supabase and Java Spring Boot. The database was built on the basis of PostgreSQL, it provides: storage of user data, courses, lessons, exercises, completion results and educational progress. As part of the study, functional testing of the developed software product was carried out. The test results confirmed the full correctness of the main functions of the web application and the compliance of the implemented software product with the specified functional requirements. During the inspection, no critical errors were found that would make it impossible to use the software product. The practical value of the developed software product lies in the possibility of using it to organize the process of independent learning of foreign languages, as well as in further expanding the functionality of the learning system. The software product can become a certain basis for creating a full-fledged educational platform that provides: support for additional languages, performance analytics, adaptive learning, and integration of artificial intelligence tools. The developed software product demonstrates: the possibility of certain practical application of modern technologies of web development, database design and server logic in the creation of information systems in the field of online learning.

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Електронне наукове видання
комбінованого використання
Можна використовувати в локальному та мережному режимах

ІТ-ПРОСТІР СЬОГОДЕННЯ: ТЕНДЕНЦІЇ, ІННОВАЦІЇ ТА ПЕРСПЕКТИВИ РОЗВИТКУ

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