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UKRAINIAN CENTER FOR EDUCATIONAL QUALITY ASSESSMENT

Infopulse Saves Nationwide University Admission Campaign

Client: Ukrainian Center for Educational Quality Assessment | **Industry:** Education | **Location:** Ukraine | **Employees:** 120+ | **Website:** testportal.gov.ua

CLIENT BACKGROUND

The Ukrainian Center for Educational Quality Assessment (UCEQA) is a national testing agency established in 2005 to provide development and implementation of the external independent assessment of the high school graduates. The main goal of the agency is to create transparency and equal opportunities for college and university admissions.

External Independent Testing (EIT), conducted by the UCEQA under the supervision of the Ministry of Education of Ukraine, helps to estimate the academic proficiency of all Ukrainian secondary school graduates during their admission to the universities and colleges.

BUSINESS CHALLENGE

A legacy EIT system, developed by a different company, had major performance and security flaws, making it impossible to use it further. Thus, the EIT had to be rebuilt and redesigned. Timeframes were of extreme importance as the entire graduation campaign 2016 could fail. Only a few months were left to launch a modern, secure and productive system to make the graduation and admission campaigns possible.

The EIT project required a comprehensive approach to design, development, implementation, support, and maintenance of the system, as well as the high level of the security and protection against cyberattacks, along with the deep analysis of the legislative and procedural frameworks. The system had to support thousands of simultaneous connections and needed to facilitate the process continuity during admission campaign. One of the most important challenges was to implement, test and launch the system before the start of the admission campaign.

EIT SOLUTION

The updated External Testing system provides the following functions:

- Anonymized registration of the testing participants in the system
- Encrypted processing of application forms filed by school graduates
- Automated generation of the documents for all testing participants and testing centers
- Automated tests processing
- Summary of the testing results across the country, etc.

Some of the aforementioned EIT system functions are accessible online for the graduates or school representatives (Example 1, Example 2), while access to other backend features is available to specific User Groups only (e.g., UCEQA employees, school graduation campaign specialists, etc.).

Some parts of the system were launched only in 1 month after we started our work on the project, to allow graduates to register in the system. A number of other modules and parts of the system were launched right before the start of the testing campaign (just in 3-5 months after we started our work). In total, the EIT system was actively developed for 9 months, with all preparatory and maintenance works taking up to 13 months.

- We suggested to migrate the Database from MS SQL to Oracle DB as it allowed to harmonize the technology stack, review and clean up the entire backend code, and get rid of the unnecessary junk, bringing increased security and performance;
- Infopulse established a high-level protection against DDoS attacks;
- Our approach to system architecture design enabled horizontal scalability of the system, improving its reliability and performance;
- Conducted updates to the network and server architecture;
- Optimized back-office system and website source code.

Currently, the system is able to withstand a significant number of concurrent users.

In 2016, the EIT system was tested to ensure appropriate performance during periods of the sharp increase in the concurrent connections:

- 270,000 frontend users
- Up to 450 backend users
- Up to 20-30,000 requests per day during External Testing registration
- Up to 100-150,000 transactions per day after the publishing of the external testing results.

TECHNOLOGIES

EIT Frontend:

CentOS	Nginx	MVC – Laravel	jQuery	MySQL	PHP

EIT Backend:

MS SQL/Oracle DB	Delphi

"MY ZNO" MOBILE APPLICATION

Our next step to support UCEQA was to develop an official EIT mobile app for the testing participants.

"MY ZNO" mobile app brings a simplified anytime, anywhere access to personalized testing schedule and results on handheld devices to the testing participants.
The app offers a number of features as listed below:

- Exams schedule in selected subjects and addresses of the External Testing Centers.

- Personalized results of External Testing.

- Reminders, push notifications and synchronization of the exams schedule with the system calendar.

- Option to view the previous year's testing results.

Due to a specific nature of the data, a personal certificate number and a PIN-code are required to access the above-listed app features. The app connects to the UCEQA database and requires an internet connection. At the same time, neither Infopulse nor any third parties have access to the personal data of the testing participants. Upon establishing the connection with the server, user's personal data is stored on a user's device and is accessible offline.

TECHNOLOGIES

Android Frontend:

Dagger2	Butterknife	Retrofit2	RxJava/RxAndroid/RxBinding	JWT

iOS Frontend:

Swift	MVVM	Moya	RESTful	QuickLook

Backend:

PHP & Laravel	MySQL database	GCM	Nginx web server	Google Cloud Messages

"My ZNO" app is available to all testing participants as a free download via Google Play Market and iOS App Store.

BUSINESS VALUE

Infopulse saved the nationwide admission campaign in Ukraine, by meeting all regulatory requirements.

UCEQA has successfully conducted the External Testing Campaign without a hitch. The 300 thousands of external testing participants (school graduates and future students) were able to my register for the external testing and complete all graduation exams on time. This allowed the students to receive and submit the results of their exams for the admission to colleges and universities.

Infopulse ensured the stability, performance, and durability of the system during peak loads, improving personal data protection, and fully maintaining all cybersecurity aspects. The EIT system has been certified to comply with modern information security requirements as Infopulse and their partners implemented multiple layers of cybersecurity protection and improved personal data protection, fully maintaining all cybersecurity aspects. This allowed to encrypt and isolate executable code data, which ensures the highest levels of data security.

We provided all required actions and operations, meeting tight deadlines determined by the government regulations and a strict due date of the admission campaign.

UCEQA IS SATISFIED WITH THE PRODUCTIVE COOPERATION ESTABLISHED WITH INFOPULSE, QUOTING:

The results of the UCEQA and Infopulse collaboration in development and implementation of the External Independent Testing 2016 are very productive.In 2016 for the first time ever, the certificates with the results of the state final academic assessment were sent to the educational institutions in pure digital form only. The certificates' data integrity and consistency were confirmed with the digital signature.We strongly believe that ET Campaign 2016 was our mutual success. For us, Infopulse has become a truly reliable and professional partner.

Vadym Karandiy, Director at the Ukrainian Center for Educational Quality Assessment

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ABOUT INFOPULSE

Infopulse, part of the leading Nordic digital services company TietoEVRY, is an international vendor of services in the areas of Software R&D, Application Management, Cloud & IT Operations, and Cybersecurity to SMEs and Fortune 100 companies across the globe. Founded in 1991, the company has a team of over 2,000 professionals and is represented in 11 countries across Europe and North America. Infopulse is trusted by many established brands, such as BICS, Bosch, British American Tobacco, Citrix, Credit Agricole, ING Bank, Gorenje, METRO Cash & Carry, Microsoft, Mondelēz, OTP Bank, Raiffeisen Bank Aval, SAP, UkrSibbank BNP Paribas Group, VEON, Vodafone, and others.

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