

# Web application for organizing bilingual presentations

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**Abstract**—The importance of creating new hardware and software tools for teaching English is *substantiated*. A corresponding web application for management and edit the presentations is proposed. This can contribute to more effective bilingual education. The structure of the web application, the corresponding technology stack, the data schema are described, and the principles of working with the site are explained in general.

**Keywords**—ASP.NET Core, MVC, multilingual presentations, Blazor.

## I. INTRODUCTION

It is difficult to overestimate the importance of English language proficiency in the modern world. This is evidenced, e.g., by various official documents of many authorities, organizations and institutions (see, e.g., the concept of foreign language education development at the National University of Water and Environmental Engineering [1]). This state of affairs is especially pronounced, e.g., among specialists in the IT sector, which brings a high level of income to the state budget. Therefore, the development of new effective methods and approaches to teaching English is a very urgent task, the delay in solving which significantly increases the level of unreceived financial benefits by the state.

The level of English teaching in higher education institutions can be significantly improved by encouraging teachers to learn the language. However, noticeable results will only be seen in the long run. An effective way to get results “here and now” is to introduce hardware and software tools for conducting classes in a foreign language. The use of English-language presentations, but with Ukrainian-language dubbing of the educational material, has become quite widespread. This allows students with different levels of foreign language proficiency to navigate the content of the lesson. However, it should be borne in mind that students who do not speak foreign languages will understand less material than others. Thus, the teacher should use 2 presentations when conducting classes: in the native language and in the foreign language. But in this case, screen demonstration becomes more complicated. Therefore, the authors of this paper have developed a web application that can be used to

duplicate the presentation given by the teacher in a fairly convenient way (Fig. 1).

## II. ARCHITECTURE AND TECHNOLOGY STACK

The developed website provides opportunities, e.g., to implement the ability to conduct presentations in more languages simultaneously. Extensibility is primarily ensured by using a clean architecture [2]. In this case, the web application consists of 4 projects: UI, Core, Infrastructure, BlazorPresentation.

### A. UI (User Interface) project

This project contains the entry point to the program. It also contains all the controllers, views, Bootstrap v5.1.0 files, the Identity system, etc. that are needed to interact with the site user.

### B. Project Core

To ensure the use of the dependency inversion principle [2], the application core contains interfaces, as well as: models, DTOs, services, specification files, mapping settings, all interfaces available in the program, etc.

### C. Project Infrastructure

In order to separate the settings for communication with the “outside world” from the rest of the logic, this project contains migration files and implements the Repository pattern [3].

### D. BlazorPresentation project

The Syncfusion.Presentation package [4] is connected to the Blazor server, which allows you to build and customize tools for developing your own presentations, editing and presenting them quite efficiently. In addition, there are several JavaScript files to implement functionality that is not available in the Syncfusion.Presentation package.

### E. Database

One of the most popular databases, Microsoft SQL Server 2019, was chosen to store and manage the data [5, 6]. The data schema consists of 7 main tables (Fig. 2) and 6 automatically created by the Identity system [6].

### III. HOW TO WORK WITH THE SITE

When the teacher clicks on the button to add a new presentation, a dialog box appears to select a \*.ppt or \*.pptx file from the local disk. After successful uploading to the database, you can add a presentation in

another language. The translation can be done, e.g., automatically, using the deepL website [7]. The teacher can then select the desired presentation from the drop-down list and correct any errors that appeared during the upload of both files. All changes made are automatically entered into the database.

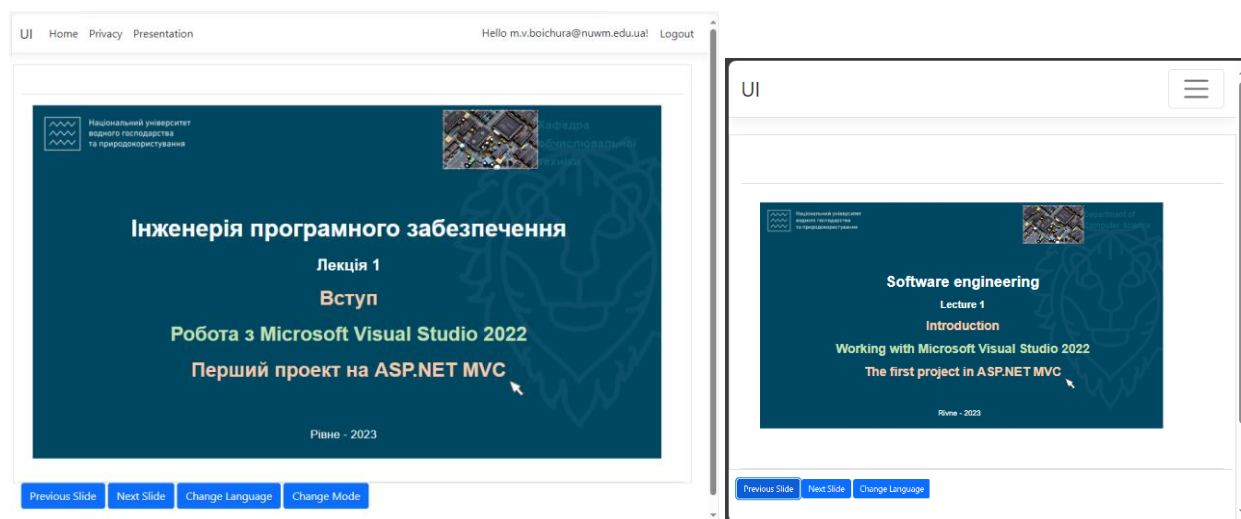


Figure 1. Teacher (a) and student (b) interfaces in a web-based bilingual presentation application

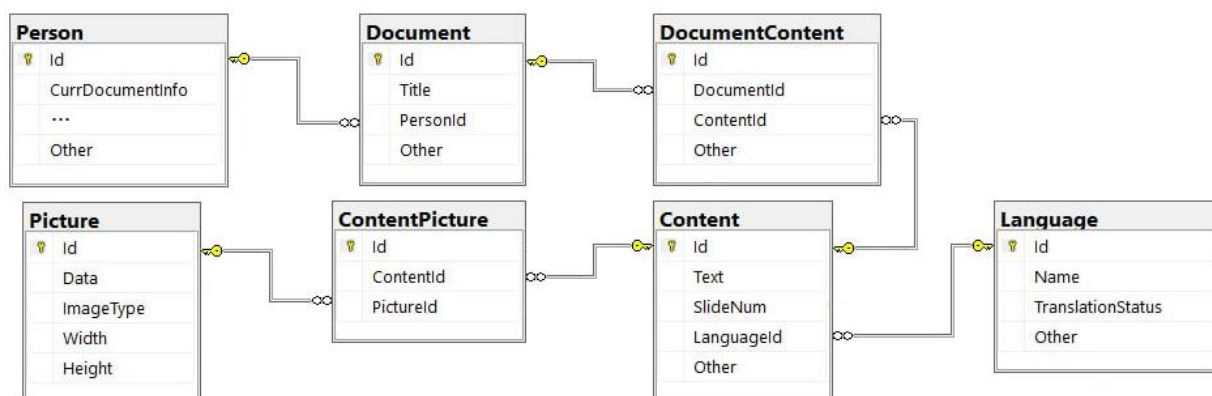


Figure 2. Data schema (data generated by Identity is not shown here)

On the webpage, the teacher can scroll through slides, change the language or modes (editing/presentation). In the presentation mode, all mouse movements or slide scrolling performed by the teacher can be seen by other users of the site. They can also independently scroll through the slides or change the viewing language.

Information about the current mouse cursor position, slide number, and current document ID is placed in the CurrDocumentInfo of the Person table.

When adding the first (of a pair) document, it adds data to all the main database tables. Whereas adding the second (of the pair) document only fills the Content and Language tables.

### IV. CONCLUSIONS

A website for bilingual presentations was developed. The basic functionality of the presentation editor has been implemented. The web application is developed using modern technologies and is extensible with an adaptive design.

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