

## The iMSi - a modern e-learning platform

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**ABSTRACT:** Virtual teaching is becoming more and more popular. There are many e-learning systems and methods but all of them have some disadvantages. Current e-learning platforms are distance-learning systems without the necessity for contact with the teacher. The modern e-learning platform (iMSi), based on the most recent technologies, that exhibits rich and complex functionality, is presented in this article. One of the important features is that every student can take an active part in a lecture in real time. Students can also participate in off-line lectures that can be downloaded from the system. It is not important where the students are, all they really need is a computer with an Internet connection to undertake the e-lecture.

### INTRODUCTION

Nowadays, e-learning means the existence of on-line options for acquiring knowledge. What is more, students do not need to come to school, so they can save their time for other things. Flexibility is the main reason why e-learning systems are becoming more and more popular. Although it is a modern system in education, its role is becoming increasingly important. More and more frequently classical teaching methods are being replaced by e-learning and on-line systems.

E-learning systems are supported by Information and Communication Technology (ICT), which is used by Universities to build virtual learning environments, etc. Many universities have been involved in creating and developing on-line tools [1]. Further, the number of institutions, where e-learning systems are successfully applied, is constantly growing [2][3]. The Internet society is also developing steadily, and it provides new opportunities to use the Internet in on-line systems. Web technologies are more popular and are being used in distance learning. The number of Virtual Learning Environments (VLEs) has increased during the past decade [4][5].

Even if a large group of universities and other institutions successfully exploit new e-learning models and tools, there is a lack of a standardised way of planning, comparing and evaluating e-learning projects, their outcomes, and their effectiveness, as is stated and discussed in the literature [6][7]. Very often students prefer education via e-learning methods than via the traditional way of teaching. What is more, some parts of our society are not able to take part in traditional courses. Modern on-line systems give them possibilities to develop their knowledge and, finally, their career.

In the future, traditional university will eventually offer complete courses in virtual form.

### USAGE CASES

There is no system or platform covering the wide range of interests of either universities or commercial institutions [8][9]. The modern e-learning platform (iMSi) handles the problem of distance learning. There are many reasons for its use as the level of local education, the geographical or political situation, or personal disability limit access to knowledge for many people. The iMSi platform solves these problems in a modern, complex way as outlined below:

- Due to the availability of this platform, people are able to learn (attending on-line courses) at home whenever they need to. Moreover, they are able to take part in lectures in real-time, as well as being able to take exams, to put questions to the teacher, etc;
- The system makes it possible for students to communicate all the time with each other;
- Qualified disabled teachers can provide lectures from home using the iMSi platform;

- Disabled people have unlimited access to knowledge. This application gives them opportunity to graduate;
- Some groups of students have a problem with going to school (not enough time, not enough money, young children, remote location, etc). This system is the best solution for them to start or continue their education by attending e-classes;
- To prepare training for employees in another city it is necessary to provide accommodation and transport. It also creates additional costs for the companies. A lot of them can reduce it by using this system;
- Students could continue their university courses at foreign universities without the necessity of being there in person.

## FUNCTIONALITY

The iMSi platform has many important functions which make it atypical. Among these are:

### Accessibility

The iMSi platform is user-friendly for people with poor eyesight. The iMSi platform was enhanced with special features as:

- A virtual keyboard (Figure 1);
- Over-sized GUI elements;
- A magnifier to zoom into lectures in 3D mode;
- Automated voice, which reads notes and lectures.

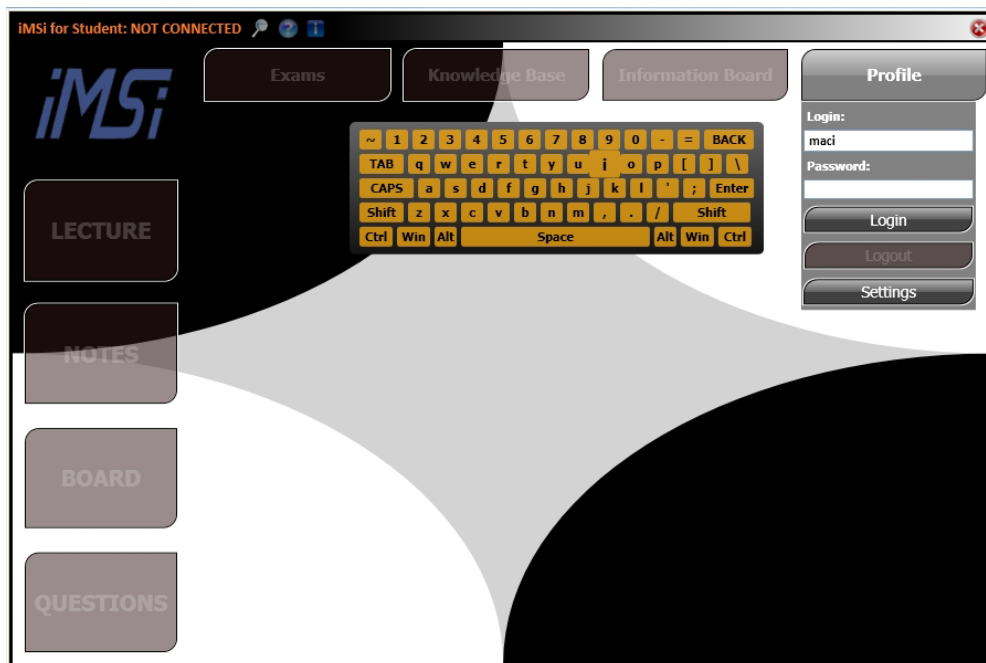


Figure 1: The iMSi platform - virtual keyboard.

### Voice Control

There is no need to use a mouse or the keyboard to enjoy lectures. Students can use voice recognition to write notes and take part in classes.

### Comfort

Teachers can draw something on the *virtual whiteboard* that will appear in the student's application.

### Notes

Students can quickly and easily write notes. There are two ways of adding student notes to the lectures, as follows:

- Students are able to highlight a part of the text and to add a text note directly to the lecture file. This feature is shown in Figure 2;
- The special notes tab includes virtual sheets of paper where students can easily draw or write. This function is illustrated in Figure 3.

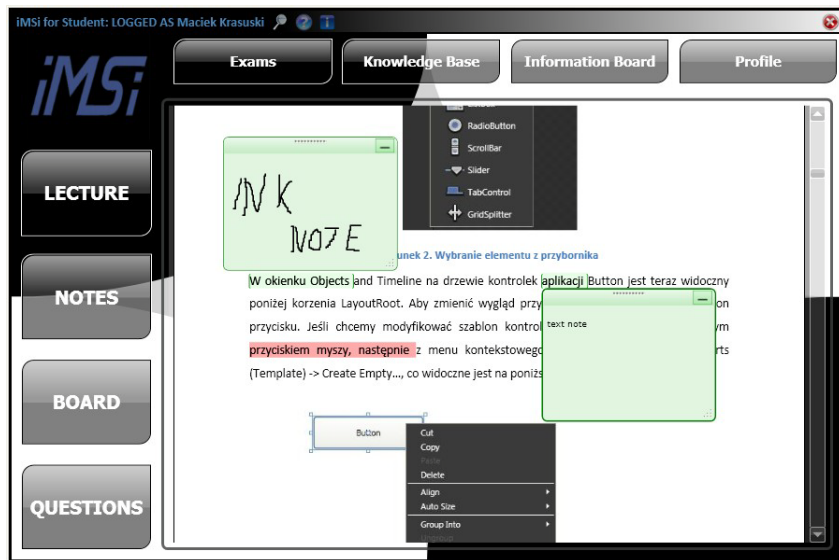


Figure 2: The feature of the iMSi platform - notes.

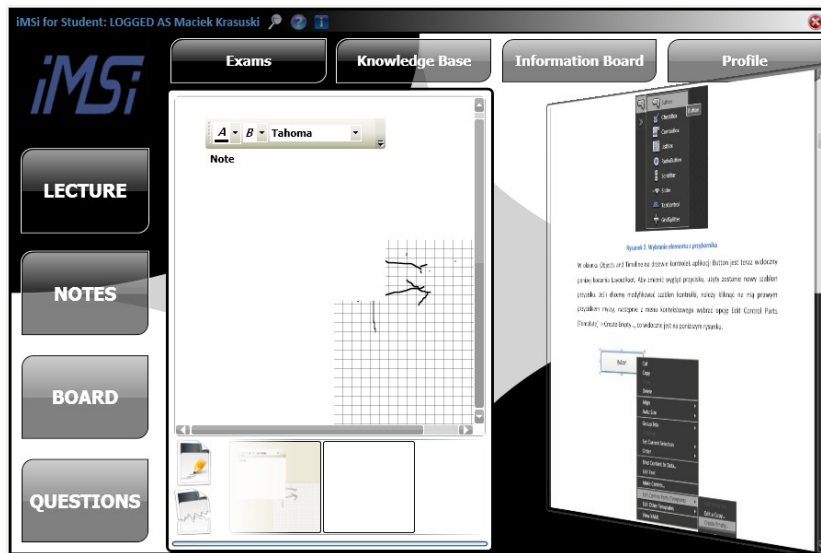


Figure 3: The feature of the iMSi platform - virtual sheet of paper.

### User-Friendly Interface

The magnifier can zoom into some part of the lecture and the live video streaming feature makes it easier to learn (Figure 4).



Figure 4: The iMSi platform - general view of a virtual whiteboard.

## Communication

The other features, which improve communication and interaction between teachers and students, include the following:

- Audio/video streaming - students are able to see and hear the teacher during the lecture (Figure 5).
- Chat, which enables the asking the teacher questions directly (Figure 5).
- Access to a recording of the lecture with optional subtitles.

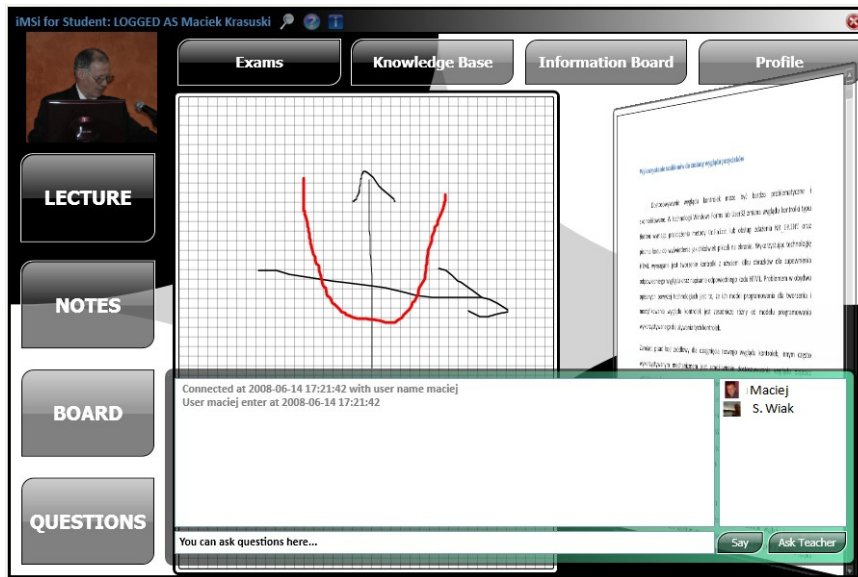


Figure 5: The iMSi platform - interaction with the teacher.

## TECHNOLOGIES

In designing the iMSi platform, the following hardware, technologies and software platforms were implemented.

### Software

- NET 3.5 - logic of application;
- SQL Server 2008 R2 - database server;
- WPF - presentation layer of student and teacher applications;
- WCF - used for communication;
- Direct Show and Media Format - used to capture, code and transmit video/audio stream;
- Sapi Ver. 5.3 - speech API - used for voice synthesiser and voice recognition (recognition only in Windows Vista or Windows 7);
- XPS - format of documents used by our application.



Figure 6: The iMSi platform - teacher application.

#### Hardware:

- 3 IBM HS22 Servers
- Digital camera - used to capture the lecture;
- Microphone - used to capture the lecture, voice control and to record notes.
- Tablet (optional - can be used with *notes* and *board*);

#### CONCLUSIONS

The results of the development of the iMSi platform, as well as its functions and features have been presented and discussed in this article. This development was carried out with the objective of improving teaching effectiveness, student comfort, as well as to increase learning features and possibilities. The inventors and authors of the platform built a lot of functionality into it, and made it modern and user-friendly.

It should be noted that current e-learning platforms are distance-learning systems without the necessity of continuous contact with the teacher. The iMSi system offers more than just the capacity for students to download lecture files. Students can feel as if they are actually present in the classroom.

Modern methods of teaching, with the use of e-learning platforms, are nowadays more popular not only for application in the school environment but also for use by business companies and other institutions all over the world.

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