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THE USE OF MOBILE APPLICATIONS IN THE FIELD OF BIOTECHNOLOGIES

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Abstract

The number of mobile users today is greater than the number of desktop users. Mobile applications have the advantage of utilizing features of a mobile device like camera, contact list, GPS, phone calls, accelerometer, compass, and so on. Such device features, when used within an app, can make the user experience interactive and fun.
The aim of the paper is to describe the making of the first electronic Romanian - language dictionary with biotech terms, ***being the first mobile application of its kind*** *and to highlighting the importance of using mobile applications in biotechnology both educational and industrial field.*
Mobile applications like dictionaries are useful for both researchers and students in various domains for a facile access to the necessary information directly from mobile phone so they can work or study wherever they are.

Key words: *biotechnology, education, e-learning, internet, mobile, mobile application.*

INTRODUCTION

Spectacular discoveries in the fields of biology, biochemistry, microbiology, genetics, enzymology, and the need to apply this knowledge in practice have led to the emergence of a new science called generic Biotechnology.
According to the European Federation of Biotechnology: *The integrated use of biochemistry, microbiology and engineering sciences in order to achieve technological application of the capabilities of microorganisms, cultured tissue, cells* is the definition of Biotechnology (The European Federation of Biotechnology-EFB, 1981).
In the field of biotechnological education, in recent years, there has been notable progress in terms of teaching and learning techniques. Using the Internet and modern technology in education have resulted in changes of substance (Toma, 2013; Toma, Pomohaci, 2005).
Computer and electronic (digital)/ multimedia materials are used as support in teaching, learning, assessment, or as a means of communication (Toma et al., 2016; Mărgărit et al., 2016)
The number of mobile users today is greater than the number of desktop users.
Mobile applications have the advantage of utilizing features of a mobile device like camera, contact list, GPS, phone calls, accelerometer, compass, and so on. Such device features, when used within an app, can make the user experience interactive.
Mobile applications like dictionaries are useful for both researchers and students in various domains for a facile access to the necessary information directly from mobile phone so they can work or study wherever they are (Toma, 2016).

MATERIALS AND METHODS

The huge part of the mobile devices' software uses the Android system.
Android is a mobile operating system based on a modified version of Linux (for hardware, process and memory management) and Java libraries (for telephony, connectivity, graphics, user interface programming).
As mobile applications are the ones that bring competitive advantage, the benefit of Android is the unified approach to application development. In other words, an application developed under the Android API will be able to run on multiple mobile devices where the operating system is installed.
The Linux kernel (with some modifications) contains drivers for various hardware (screen, camera, keyboard, Wi-Fi antenna, flash

memory, audio devices), responsible for process, memory, peripherals (audio / video GPS, WiFi), input / output devices, network and power consumption.
The application level contains both the products with which the mobile device is delivered (Browser, computer, Camera, Contacts, Clock, FM Radio, Launcher, Music player, Phone, S Note, s planner, Video Player, Voice Recorder) and the products installed from the Play Store or those developed by programmers (Figure 1).

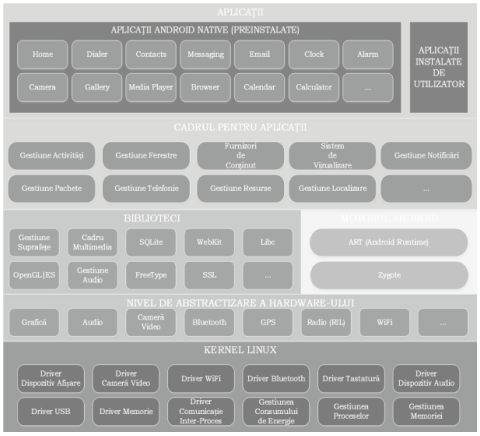

Figure 1. Android structure

The application presented is a hybrid application. Hybrid mobile applications are applications that are typically developed using WEB technologies (JavaScript, HTML, CSS).
The software is an electronic Romanian - language dictionary with biotech terms, being the first mobile application of its kind. The application is designed to help biotechnology workers ease their work if they need a dictionary with terms used in biotechnology. One can enter a word into the application, and he is given the definition of that word.
The Android mobile software described in this paper is built with the Unity engine with C # and Java programming elements.
Unity is a powerful engine and an extremely user-friendly interactive application development environment. It has the advantage of being very easy to use, both by the people who do not have the solid knowledge of programming as well as experienced ones.
The engine uses three programming languages: C #, Boo and Unity JavaScript and can be used to develop applications for most operating systems, even mobile ones (Figure 2).

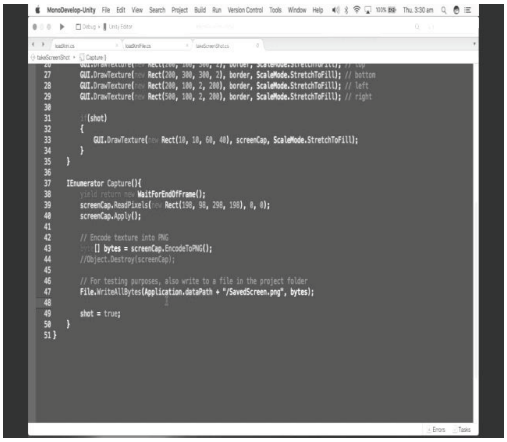

Figure 2. Unity screenshot

Unity can publish the output in Windows, OS X, and through the Web Player plug-in. Web Player is a browser plug-in that works with all known browsers and offers the same performance as the stand-alone desktop application.

RESULTS AND DISCUSSIONS

The definitions have been translated from an online English Dictionary. The dictionary contains about 300 words with their definitions. The action was repeated for each word, that is, a definition in part (Figure 3).

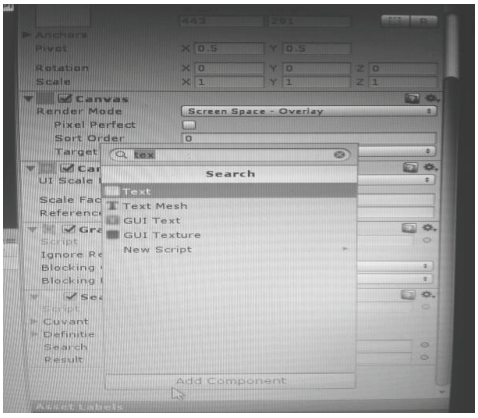

Figure 3. Unity screenshot

The next step was to create the Search button. After this step was created the Text field where

the definitions will appear after the Search action.
The following stage is the scene layout of the actions (Button, Text field, Field Search). The Scene page is shown in the following image (Figure 4):

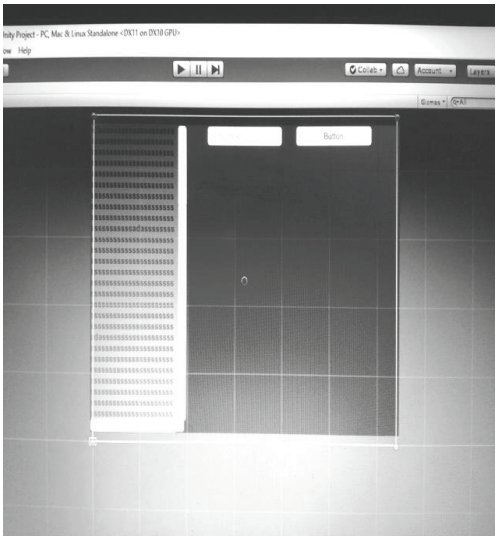

Figure 4. Scene screenshot (Unity screenshot)

When the app is started on the device a page with the name of the app is launched (Figure 5).

Figure 5. Open screen of application

The application is designed to help students ease their work if they need a dictionary with terms used in biotechnology. One can enter the word into the application, and the definition of that word is given as the result. Some examples of such definitions are given in the pictures below (Figures 6, 7).

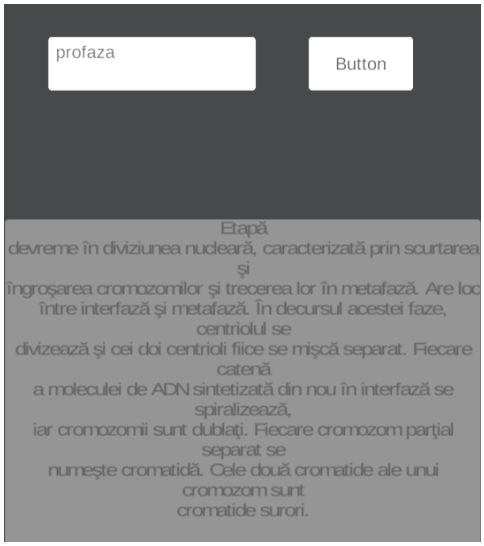

Figure 6. Screenshot of application

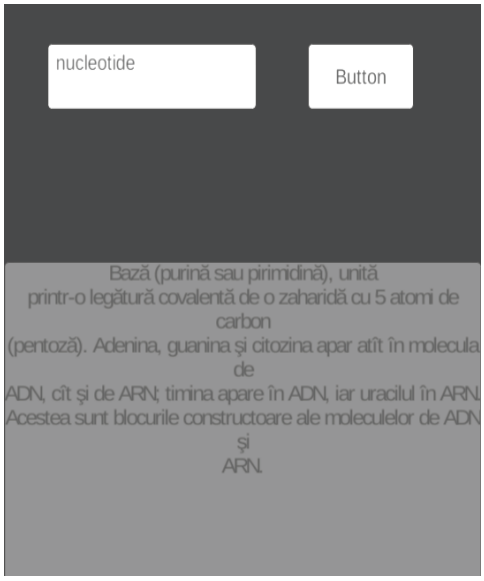

Figure 7. Screenshot of application

The font of the text is Arrial and its size is 18. The keyboard used is the Querty that Android uses (Figure 8).

Figure 8. Screenshot of application

The final result is a mobile application for Android smartphones (APK) of a dictionary of biotechnology terms, with about 300 terms.

CONCLUSIONS

Creating such a dictionary-based application is beneficial to biotechnology researchers as it facilitates access to the necessary information.
At the same time, the application is also useful for biotechnology students, or related fields, providing them with a modern, perfectly portable educational tool to quickly access information of interest as computer and electronic (digital)/ multimedia materials are used as support in teaching, learning, assessment, or as a means of information.
The application presented is a hybrid application. Hybrid mobile applications are applications that are typically developed using WEB technologies (JavaScript, HTML, CSS). Nowadays, hybrid applications are starting to grow stronger because many development environments are becoming more stable and provide access to more and more hardware features. Developing hybrid mobile applications can bring the following **benefits** to those who create them:
- Low development time for a wide range of operating systems;
- Faster learning of development technologies, being in principle WEB technologists;
- The app has a higher visibility on the platform where it is launched because it is distributed through the application markets used by most mobile users;
- Free development tools.
Hybrid applications also have **negative** points as follows:
- Dependence on tool developers, which may delay the launch of an application running on a new version of an operating system or delays in repairing technical issues that may occur especially with new versions of mobile operating systems;
- Lower performance in some places;
- Low reputation among loyal users of a particular mobile platform;
- Loss of time to fix the problems found by not running on all platforms as well.

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