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CREATION OF HARDWARE AND SOFTWARE COMPLEX FOR IDENTIFICATION BY PHOTOS AND CLASSIFICATION OF ARTIFICIALLY GROWN PLANTS

Abstract*: the long-term strategic program of development of the country until 2030, the Address of the President of the Republic of Kazakhstan to the people of Kazakhstan «stability and security of the country in the new century» defines the scientific support of agricultural production.*

With the creation of a hardware and software complex designed for photo recognition and classification of artificially grown plants, it is possible to determine the type and physiological state of plants, external and internal factors. It is the most necessary hardware and software complex for solving problems of phenotypic plants and other biological systems. Artificial plants are considered in Northern Kazakhstan. The research is effective and relevant for the development of this programming language. We cannot achieve great results without developing the agricultural sector with the help of digital technologies. For example, developed countries increase economic growth by 80–85% using digital systems. The introduction of IT technologies in production will reduce costs by 20%. Kazakhstan farmers should make extensive use of digital technologies such as GPS systems, mobile applications, high-tech sensors, algorithms, and satellite monitoring.

Keywords*: grain crops, sorting of grain crops, automation of agriculture, mobile applications, Java, Html.*

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***Аннотация**: долгосрочная стратегическая программа развития страны до 2030 года, Послание Президента Республики Казахстан народу Казахстана «стабильность и безопасность страны в новом столетии» определяет научное обеспечение сельскохозяйственного производства.*

С помощью создания аппаратно-программного комплекса, предназначенного для идентификации по фотографиям и классификации искусственно выращенных растений, можно определить тип и физиологическое состояние растений, внешние и внутренние факторы. Это необходимый аппаратно-программный комплекс для решения задач фенотипических растений и других биологических систем. Принимаются во внимание искусственно выращенные растения в Северном Казахстане. Исследование является эффективным и актуальным для разработки данного языка программирования. Достижение значительных результатов невозможно без развития аграрного сектора, где прибегают к помощи цифровых технологий. Например, развитые страны увеличивают экономический рост на 80-85%, применяя цифровые технологии. Внедрение IT-технологий в производство позволит снизить затраты на 20%. Казахстанских фермерам следует найти широкое применение цифровым технология, такие как системам GPS, мобильным приложениям, высокотехнологичным датчикам, алгоритмам и спутниковому мониторингу.

***Ключевые слова**: зерновые культуры, сортировка зерновых культур, автоматизация сельского хозяйства, мобильные приложения, Java, Html.*

Introduction. The essence of the choice of this topic currently in Northern Kazakhstan there is little information about artificially grown plants, photos and hardware and software systems designed for recognition by classification are not developed. This question prompted the choice of the topic.

The significance of this work: the results of scientific research allow you to create and develop a web site and mobile application for photo recognition and classification of plants grown manually.

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Mobile applications for photo recognition and classification of artificially grown plants are not yet used in Kazakhstan and even many works are presented for automatic identification of plants, there are very few applications for plant identification on the market. However, this program is intended for iOS users and works with identifying trees in the northeastern United States.

As for the pros and cons of working, there are more advantages than disadvantages. For example:

– the main thing is that we can use this work at any time and in any place;

– use the work of tourists from abroad;

– can be used by any person;

– the number of effective programs in the country will increase;

– access to the common population;

– information about hand-grown plants can be obtained from photos and classification.

There are many advantages. As for the drawback, of course, he will need the first Internet network and a pocket phone.

Main part. Crop production is the largest branch of the agricultural sector in Kazakhstan, which in 1997 produced about 70% of the gross agricultural output. Among agricultural crops, the first place is occupied by cereals, which account for 66% of the sown areas of the Republic with soil.

In the Northern economic region, the most developed agricultural sector in Kazakhstan is located. Northern Kazakhstan is the largest grain region of the country. The abundance of ground land has a positive effect on the development of agriculture. The main specialization (80% of the acreage) is the cultivation of spring wheat. The largest areas of grain crops are located in North Kazakhstan, Kostanay and Akmola regions (more than 3 million hectares).

In addition, oats, barley, winter wheat and buckwheat are grown here. The economic region occupies a leading position in Kazakhstan from the gross grain harvest (67%), while the predominant element is Akmola, North Kazakhstan and Kostanay regions. Share of technical crops (sunflower, flax, itch.b) not much, but the

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production obtained from sunflower is quite high-11% of the gross harvest in the Republic.

Vegetable, potato and melon Daks are grown in the vicinity of the city and in the river valleys.

In the city of Pavlodar, the region's crop production is 2 types, it is the cultivation of cereals, forage crops and vegetables, as well as potatoes, sunflower, rapeseed and flax. The predominant agricultural crops are: spring wheat, winter rye, buckwheat, millet, barley, oats, oilseeds, potatoes, vegetables and melons, fodder, perennial legumes, vegetables of closed soil.

Currently, the mobile market is dominated by three companies in popularity among their users, in the first place-Apple, the IOS platform (iTunesAppStore), the second Google, the Android platform (AndroidMarket), the third Microsoft, the Windows Phone platform (Windows marketplace). In addition, there are platforms Symbian, BlackBerry, OS.

Foreign experts have predicted the dynamic development of mobile applications for mobile devices. Already in 2009, the marketing and analytical Agency IDC said that by 2013, more than 1.19 billion professionals (34.9% of the total workforce) use mobile technology. The development of mobile technologies in Kazakhstan is below the above-mentioned global development rates. In Kazakhstan, there are many companies engaged in the creation and implementation of mobile applications. Many mobile app developers work on their own. The reason is the lack of demand. Mobile apps have little demand due to high prices.

Now in Kazakhstan, mobile applications have only a few large banks, Internet platforms and media. As a result of KazNet monitoring, a list of popular mobile applications was formed.

For example, the MobileCreators team created «People o'clock», «DialerOne», «Kinosaurus» and «GQ BarLab» apps for iOS and Android. Glatis Studio with its own iDrive.kz the site has developed an application «iDrive: traffic rules and penalties of the Republic of Kazakhstan» on the Android platform. And so Homebank.kz created the diesel iPhone app and the Alliance Bank iOS app. With the

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Kaznetmedia «NewsBox» team for iOS and Android and Apple devices «Bnews.kz», «channel 7 (Kazakhstan)», «Focus», «Vesti» and «PM.kz» applications have been compiled. Among the Android applications, you can find works written in the Kazakh language. But these applications are collections of works by one or more authors and do not allow you to read other works.

Currently, the creation of Android mobile applications is one of the most dynamically developing programs.The Android operating system is installed on several smartphones.These include: Sony, Samsung, Lenovo and others, as well as the actual problem is the rapid development of Internet programs. In this regard, at the request of Internet users, the program is updated. Among them, the leading positions are occupied by the Android and IOS platforms.

The purpose of the research is to create a mobile program based on the Android operating system. According to the study, programs related to this topic can not be found much on the Internet. In this regard, the main issue is to find more users who are trusted on the Internet. The Android operating system is installed on smartphones, tablets, digital players, netbooks, on the Linux kernel. One of the main programming languages is the Java processing library. To create an application, we use the Android Studio environment, the Android SDK device will be implemented using the SDK emulator.

The current state of Affairs in this area in the North Kazakhstan region, a study was conducted to identify diseases of artificially grown plants. An observation project has been developed to detect diseases of these plants via satellite. This project was put into operation. But up to now, mobile applications designed for photo recognition and classification of artificially grown plants have not been used in Northern Kazakhstan. And abroad is developing intensively. For example, several species.

Thailand has developed a mobile application for instant identification of plants «PictureThis-Flower & Plant Identification». This mobile app is able to identify with accuracy 10,000 + plant species photos with 98% accuracy.User reviews of this program are good.

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In Germany, Ilmenov technical University created a mobile application «Flora Incognita-automatic identification of plant species». On the website of our project (www.floraincognita.com/de) or Facebook (https://de-de.facebook.com/Flora. Incognita/) we keep you informed of the latest developments. User reviews have left the opinion that they are good, but do not identify home plants. Such mobile applications are also used in other countries.

A brief statement of the mobile application is compiled with the Java programming language.

Java programs are mapped by a program to guide the Java bytecode executed by the Java virtual machine (JVM)-to process the bytecode and pass the hardware as an interpreter.

You see beautiful and interesting cultures, but you don't know what it's called, or you don't remember it. To identify these cultures, we are launching a mobile app. To do this, you need to download Osim tanu – program. This program also exists for Android and IOS. Registration is not required, it is necessary in order to upload search results to the database. We are creating a mobile app as shown in figure 1.

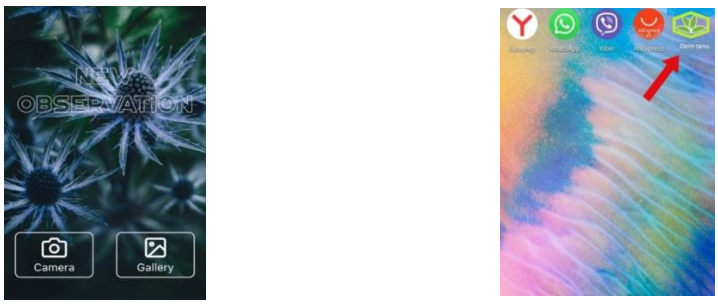

Fig. 1. Home page of the mobile app

Research on mobile applications was conducted on the topic of the work. The development of a mobile program for the Android operating system is one of the dynamically developing areas. The Android operating system is installed on many smartphones, such smartphones include: Samsung, iPhone, Sony, LG, Lenovo, etc. in this regard, the Internet has started to rise and at the request of users, programs are constantly updated. Among the platforms, the leading positions are occupied by the Android and IOS platforms.

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To create an application, the Eclipse environment is used, and The androidsdk mobile design is implemented by the SDK emulator. A language based on a Java object has many internal libraries of its own. In the first place, it demonstrates easy user interaction.

In order to create an app for Android OS, you need to install the item. For this task, the classic version is suitable. The hardware can be downloaded from the Android SDK developer site developer.android.com. when installing and required SDK platforms, you can select items. In the center of the ADT plugin, substances provide access to Android SDK tools. To install the plugin, CLICK «help – > install new software «through me in the» work with «field» dl-ssl.google.com/android/ eclipse /» enter the plugin download address. Each time in the table below, select the «development tool» and click on the «Next» button.

To build, you need the Java Runtime Environment (JRE), the Java Development Kit (JDK) compiler. They can be downloaded from the official Oracle website (oracle.com).

When performing the work, it is known that modern mobile technologies are rapidly penetrating into various areas of human life, and the use of mobile applications is quite profitable. It is established that at present most mobile phone and tablet manufacturers produce for the Android operating system, consumer prices are affordable and convenient for consumers. In order to work, the requirements were met. In domestic and foreign literature studied photos and literature for recognition by classification of plants of artificial origin. Was considered the analog of a program designed for recognition and classification of plants cultivated manually. As a result of the research, a hardware – software complex will be created, designed to recognize photos and classify artificially grown plants that are widely used in technology. The obtained result is compared with the known experimental results. The main achievements of the program, formed as a result of scientific work, are to increase the importance of mobile applications, providing users with reference information.

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