

For the implementation of UWB communication system optimal type of pulse modulation will be PPM modulation, considering analysis results of noise immunity of a signal and a condition of simplicity of a technical implementation of system. The use of modern PLDs allows creating a flexible structure of the modulator / demodulator. To achieve optimum sensitivity of the receiver can be varied the number of pulses accumulation while adhering to the specified data rate. The classical approach of coding logical "0" and logical "1" different pulse delay can be replaced with coding single delay directly a certain bit pattern, which will increase the capacity of the channel.

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**THE DEVELOPMENT OF THE INFORMATIONAL AND EDUCATIONAL ENVIRONMENT
BASED ON GOOGLE APPS FOR EDUCATION**

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The article is devoted to the establishment of educational environment based on the platform Google Apps for Education, which would facilitate the work of students and teachers in higher education institutions, as well as enhance study progress control.

High-quality training at university is not possible without study progress control throughout each semester. An effective system of study progress control allows assessing not only each student's implementation of the curriculum at university, but also helps to evaluate the quality of ongoing educational programs, to draw attention to the difficulties students encounter in their studies, and to obtain certain indicators of effective teaching.

If we consider the fact that the 21st century is a century of information technology, it becomes clear that modern information technology can be reasonably used for study progress control at university. For example, you can use cloud services to store electronic registers that can be accessed and searched in an easier way in comparison with paper registers and numerous archives.

Thus, an idea to develop a system that would help to facilitate lecturer's work in relation to study progress control has appeared.

The modern system of university education is gradually adapting the rating system of academic progress assessment. **The rating system of academic progress assessment** is a set of organizational, educational and control measures, based on all sorts of didactic resources available for this or that subject.

Taking into account what has been said above, the establishment of the electronic environment able to control the learning process of students becomes of current importance. Moreover, it can be helpful in final evaluation of students' academic progress together with the rating system.

Since March 2012, Polotsk State University has been developing informational and educational environment based on Google Apps for Education. Since August 2014, this medium was supplemented with a new service – **Goggle Classroom**.

Google class helps teachers save time by organize classes quickly and easily and communicating effectively with students. It allows teachers to create and maintain a task quickly, assign grades, leave comments and communicate with students. In turn, students can keep a job to Google Drive and take the work performed in the classroom and to communicate directly with each other and with teachers.

Creation and submission of assignments

In class, you can work with Google Docs, Google Turn and Gmail. Because of this, teachers can assign tasks and collect works, forgetting about piles of notebooks. They will also be able to see at a glance who has submitted or delayed the assignment and comment on the work individually in real time.

Effective communication

Teachers can make announcements, ask questions and comment in real time. Communication with students during class and after class has never been so effective.

Convenient organization of work

A class is automatically created on the disk folder for each assignment and each student, and students can always see what tasks they need to perform on the following page [5].

The aim of our work is the refinement of Google Classroom functions and adding the following new features to them:

- uploading the results of students' work on the server;
- development of a universal system of settings to work with Google Classroom;
- development of a system of students' knowledge testing.

One of the main tasks of the developed system will be the storing of students' academic progress, so the system is a kind of data storage. Naturally, the system is primarily designed to facilitate the work of the teacher. Google provides the possibility of using their cloud services and applications.

Cloud storage is a kind of online storage where data is stored on multiple servers distributed on the network provided for the use of customers, mainly by a third party. In contrast to another kind of data storage based on its own servers, purchased or leased specifically for such purposes, the number or any internal structure of the servers is not generally visible to a client. The data is stored and processed in a so-called cloud that represents, from the point of view of a client, one large virtual server. Physically, these servers can be located remotely from each other geographically, even on different continents [3].

Naturally, the question of creating such information environment rests on the development of a web application, which is an important issue, since in this case it will be necessary to use third-party libraries from Google and adjust to their standard building web applications.

Web Application Development is the process of creating web pages or sites. Web pages are created using HTML, CSS and JavaScript, they can contain simple text and graphics, recalling a static document. Pages can be interactive or static. Creating interactive pages is a little more complicated, but they allow you to create websites with rich contents. Today, most of the pages are interactive and provide advanced interactive services, such as dynamic visualization or display of difficult structure data [4].

Web application development is carried out using specialized programming languages.

The most common programming languages for writing Web applications are:

- PHP.
- C #.
- Python.
- Java.
- JavaScript [1].

JavaScript is commonly used as an embedded language for programming access to the application sites. Is is most widely used in web browsers as a scripting language to make interactive web pages [2].

It should be noted that libraries that Google has opened for individual completion of their applications require the use of Javascript precisely, so based on that fact and on our own experience and knowledge, Javascript will be used as the task language.

Thus, the modification of the service Google Classroom and the use of Google cloud storage will allow us:

- to improve the quality of education due to the intensification of the educational process, the revitalization of the faculty members and students to maintain and improve the content and teaching methods;
- to strengthen regular monitoring of students' work during the development of the basic educational program in the specialty (direction);
- to increase the motivation of students to the development of educational programs;
- to strengthen the discipline of students;
- to improve student attendance of classes;
- to strengthen independent and individual work of students.

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SCHEMATIC ASPECTS OF PROCESSING BLOCKS OF INFORMATION IN THE ALARM SYSTEM

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The operation principle of a standard alarm system is considered. The block diagram of the alarm system is defined A6-04. The schematics analysis of the main components of this system is given. The ways to improve modern alarm systems are shown.

Now automatic systems of protection are gaining an increasing popularity. The development of automatic protection systems is connected with the fact that every year the requirements of mankind grow and the cost of property increases. In addition, everyone wants to protect their property. The first systems of protection were invented in Ancient Egypt and Japan and had nothing in common with present security systems. Let's consider some outstanding inventions which laid the foundation of modern alarm systems. The first and most important invention was electric current and devices related to it. Thanks to electricity people got an opportunity to transfer information to considerable distances in seconds. Another invention was the creation of a photo cell which could distinguish violators in a zone of protection and switch on the alarm. Then sensors of various physical quantities were invented. They were incorporated in alarm systems improving their functionality. A standard security system includes the following set of sensors:

- motion sensors (IR sensors detect the infrared radiation emitted or reflected from an object, if no motion is being detected, the relay contact is closed, if motion is detected, the relay opens, triggering the alarm; ultrasonic sensors generate high frequency sound waves and evaluate the echo which is received back by the sensor, measuring the time interval between sending the signal and receiving the echo to determine the distance to an object; microwave sensors);
- glass break sensors (acoustic sensors);
- automatic door open/close sensors (such sensors use galvanomagnetic converters or magnetically operated sealed switches);
- smoke detectors;

Modern security systems can also include sets of other sensors if needed. Modern protection systems differ in the quantity of protected zones, system control flexibility, ergonomics. Security systems use wireless data channels, for example GSM, GPRS, radio link, Wi-Fi. However Wi-Fi channel is used only in home security systems as it allows to manage the security system by means of the smartphone. Thus, alarm systems are widely used in industrial enterprises, offices, shops, public institutions and organizations, and also in private houses – “smart home” systems. Let's analyze the block diagram (figure 1) that shows A6-04 alarm system and schematics features of the data processing block.

A signal from sensors goes to the sensing control block from which it is transferred to the information processing block. The information processing block makes calculations and forms output signals which go to the block of the formation of the notification. The information processing block also arm and disarm the security system, activate light and sound signals in case of intrusion. The block of the formation of the notification generates signals of various levels, both analog, and digital, as these signals go on various devices (for example