

21. IMPLEMENTATION OF CLOUD TECHNOLOGIES IN THE EDUCATION PROCESS OF HIGHER EDUCATION INSTITUTIONS IN UKRAINE

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Introduction. We are living in a very dynamic time. Scientific and technological progress and production do not stand still, they are developing, changing, growing, which means that new technologies, management strategies, methods of work, etc. appear in the world every day. Improvements in modern education are currently associated with the introduction of new information technologies in the educational process. This approach is based on high requirements for the level of information and educational training of modern specialists. Currently, the use of modern information technologies is essential to ensure the qualitative education. The introduction of modern information technologies makes it possible to improve the quality of education, ensure the level of students' motivation, organize independent work more effectively, and use an individual approach to learning. The use of information technology allows to realize such developmental goals of learning as the development of thinking (spatial, algorithmic, intuitive, creative, theoretical types of thinking), the development of skills to make optimal decisions from possible options, the development of skills to carry out experimental research activities (for example, through opportunities computer modelling), the development of information culture, and the ability to process information.

This accelerates the pace of learning, frees up time, and therefore intensifies the learning process. The development of new information technologies in education stimulates the development of software and applications that implement methodological ideas related to semi-automatic or automatic access to educational

information, verification of the results, and evaluation of initial and current training and so on.

In its turn, the dynamics of information technology stimulates the development of the education system in higher education institutions (HEI), in particular, distance and on-line learning systems, which are characterized by a high level of interactivity and allow people who are in different countries to participate in the learning process and have access to the Internet in a convenient for human rhythm of cognitive activity at any convenient time. Experienced users use them more and more often in everyday work with information flows due to the convenience and time savings provided there is constant access to the Internet.

The number of individual services and comprehensive solutions from commercial companies that can be used to implement training projects is constantly increasing. In particular, cloud technologies from such leading companies as Google and Microsoft open great opportunities for support and organization of educational work including the independent work of students [3,8]. The issue of what services from these companies to use in the educational process in the organization of independent work of students and under what conditions is on the agenda of many teachers-innovators. Therefore, our task is to compare these services in the context of the organization of students' project work and draw conclusions about the feasibility of their use for this purpose.

Literature review. Many works by domestic and foreign authors are devoted to the use of the Internet social services in education. They include works on the use of the elements of distance learning in the classroom and in the individual work of students, such as by B.Ye. Roman, R.P. Kukharchuk [2], S.S. Shtohrin [9]; features of the use of cloud services in education are considered in the work by Z.S. Saidametov, S.N. Seitveliev [4]; the issues of the use of ICT in education are revealed in the study of I.V. Savytska [6]; the use of social network services in education is considered by I.V. Krechetnikova, K.H. Krechetnikov features of the use of the Internet as an educational technology in the system of higher education and recommendations for their use are given in the work of Grandon Gill [9]; the effectiveness of cloud computing in the process of teaching and training students is described in [11,12]; complex use of cloud services in the e-learning course is described in the work of I.V. Herasymenko, K.I. Zhuravel, and O.S. Palamarchuk [10].

The analysis of publications shows that the use of cloud technologies is described rather superficially in most works, there are no examples of their application in the educational process. It is necessary to analyse the functionality of the most famous modern cloud services, to determine the possibility of their

application in the educational process, in the process of independent students' training.

Results. The purpose of this article is to perform a comparative analysis of Microsoft and Google cloud services to organize the work of a modern teacher, independent work of students and convenient storage and exchange of information to gain professional skills and experience of users of modern cloud technologies.

The following methods were used during the study: analysis of theoretical sources on the development of the educational environment and the use of cloud technologies in higher education, generalization and evaluation of the results.

Cloud technologies, as well as all technologies that are actively developing due to their obvious advantages, penetrate into all spheres of human life. Of course, their implementation is happening at different speeds in different areas. Unfortunately, for example, distance learning systems and self-study systems do not yet actively use their potential.

Cloud technology is a field of information systems, which is actively developing and has a number of advantages. The main advantages include:

- Access to materials from anywhere in the world where there is the Internet;
- All information is available from any device (PC, tablet, smartphone, etc.) connected to the Internet.
- The user is not tied to a specific workplace.
- A wide range of on-line tools for teamwork on various materials; the necessary tools for work are usually provided automatically by the web service.
- Minimum technical requirements for hardware;
- No need to install and configure software on users' computers;
- Cloud technologies are simple and require minimal support;
- The high level of manufacturability of computing power, which is provided to the user, allows you to store, analyse and process data.

The main disadvantages of cloud technologies are the following:

- To work with the "cloud" requires a constant connection to the Internet.
- To create your own "cloud" requires large costs, which HIE do not always have.
- The user may not always be able to customize the software used.

Continuous strengthening of information protection requirements: large data sets that require a high level of security and management to meet both privacy and intellectual property requirements.

In the practice of individual work of the teacher and collective cooperation with students it is quite convenient to use cloud services, among which are the electronic wall Padlet [15], electronic disks eDisk [16], cloud storage with support

for MS Office Web Apps: Microsoft Office 365 [17], Microsoft OneDrive [20], Google [19], Yandex [21], Dropbox [18], etc.

In today's pace of life, cloud storage solves the problem of convenient and fast synchronization of information on all devices of one or more users. Whether it is a smartphone, home or work computer, you always have access to the information you need: textbooks, assignments, lecture material, photos, projects and any other files are always at hand. Cloud services allow you to synchronize not only "traditional" files, but also notes, calendars, contacts, mail, turning your gadgets into one bundle with all the necessary information available from anywhere on the planet (where there is the Internet).

Let us consider the most famous cloud services for storing information: 1) Dropbox is a file sharer and file synchronizer from Dropbox Inc. through which users can upload files to the Dropbox server. You can make your own files on Dropbox available to other users or anyone. MIT students Drew Houston and Erish Ferdowzi, receiving the first funding from the Y Combinator business incubator, created Dropbox as a start-up in 2007.

Dropbox initially positioned itself as a file sharer (uploaded, sent and deleted) and it handles these functions perfectly. Now the service offers free 2 GB of cloud storage with the ability to expand it to 16 GB, inviting friends or performing tasks, such as installing its official application. 1 TB per year costs 2800 hryvnias [18].

Dropbox does not have its own cloud suite for working with office documents, but it does offer Microsoft Office Online. Nevertheless, it has a Facebook add-on that allows you to transfer Dropbox files via Messenger without leaving the program.

Pros: add-on for Facebook, synchronisation with PC.

Cons: small disk space in free version.

2) OneDrive is a cloud storage, the main task of which is to ensure the exchange of files between different devices, as well as additional space for storing important information. The rapid development of cloud technologies could not fail to attract the attention of such an IT giant as Microsoft. As a result, after several years of development, the world saw the OneDrive service. Initially, the cloud service was called SkyDrive and was available to a small number of users who participated in narrow testing. Over the years, the platform has developed significantly, received many options for programs and programs for different operating systems.

OneDrive allows you to view documents in Portable Document Format (PDF), and in Open Document Format (ODF), an XML file format supported by many word processing programs, including Microsoft Office, LibreOffice,

OpenOffice.org, and Corel's WordPerfect. The OneDrive search function does not support searching in PDF documents [20].

OneDrive includes an on-line text editor that allows users to view and edit text files, such as text and batch files. Syntax highlighting and code completion are available for a number of programming and mark-up languages, including C #, Visual Basic, JavaScript, Windows PowerShell, CSS, HTML, XML, PHP, and Java. This on-line editor includes a search and replace feature, as well as a way to manage file merge conflicts.

In addition, OneDrive provides the ability to: store text documents, spreadsheets, presentations, PDF files, photos, video and audio files for an unlimited period of time; create: folders by topics, groups or disciplines, store various files (documents) in them; Word documents, Excel spreadsheets, PowerPoint presentations, OneNote notebooks, and Excel surveys; provide access to individual files or entire folders (for viewing or editing) to a certain group of people or an unlimited number (colleagues, students); joint work with documents; download selected files; copy and move items within the OneDrive workspace; delete and rename files and folders; create html-code to embed the selected file or folder in the blog or web-page, while readers (blog, web-site) can view the selected item without logging in; for files created by MS Office or Office Online, there is a Version Log, which contains a list of changes, modifications of the file with the date, time and author of the changes.

The service from Microsoft offers its users 5 GB of free disk space, with support for the cloud office and applications for Windows, Android and IOS. The main advantage of OneDrive over competitors is cheap premium plans of 66 hryvnias/month for 50 GB and 1,400 hryvnias/year for 1 TB. The program for synchronization in Windows 10 is already installed; users of other operating systems will have to install it yourself.

In addition to the terabyte plan, Microsoft is giving away a licensed office suite for the PC. The service also supports temporary links to shared files, which partially protects them in case the link is made public.

Pros: best price for 1 TB of storage, integrated office suite, temporary links to shared files

Cons: little free storage.

3) MEGA is Kim Dotcom's file sharer. It was opened on January 19, 2013, exactly one year after the closure of the Megaupload service. Mega encrypts all content directly in the browser using the AES algorithm. The service encrypts all data with a key that cannot be changed or restored, so if it is lost, all data will also be lost. Users can transfer files to each other in encrypted form, while all data is stored in the "cloud". File access keys are not published in the public domain, but

are distributed on a Friend-to-Friend basis, between trusted users. As of July 2018, it is in the top 200 most popular web sites in the world.

This is a cloud service with a huge, compared to the above competitors, free storage – as much as 50 GB. MEGA has mobile applications for Android, iOS and a program for synchronizing folders with a PC.

The service has restrictions on data transfer, which is quite difficult to exhaust and easy to increase after performing several tasks (install a mobile application, invite a friend).

Pros: large free memory of 50 GB, synchronization with a PC.

Cons: traffic restrictions, no office suite.

4) Google Drive (<https://drive.google.com/drive/u/1/my-drive>) is one of the most reliable and convenient services for storing information in the cloud. In the free version, the user has access to 15 GB of disk and convenient applications for Android and IOS. If you have a Google account, additional registration on the service is not required. Google Drive has a convenient search, a field “quick access” with the latest added or changed files, a field with folders and files [19].

The biggest advantage of Google Drive is its compatibility with other services of the company: documents (they can be edited, even by several users at once), calendars, mail, and photos. By the way, Google provides unlimited storage for photos, if you store them in medium quality, which is a very profitable compromise for a smartphone. If 15 GB is not enough for you, you can buy more; 100 GB will cost 460 hryvnias per year, and 1 TB 2300 hryvnias per year.

In addition, the advantage of Google services and tools over their competitors is, first of all, the presence of a single login and authorization system, as well as a centralized cloud storage. Once you create a Google Account, you can use many products and services, such as iGoogle, Gmail (gmail.com), Google Groups (groups.google.com), Picasa (picasa.google.com), and AdWords (adwords.google.com), Google Docs (docs.google.com), Google Drive (drive.google.com), Web History (history.google.com), and more.

Google also has services specifically designed for education, such as Classroom (classroom.google.com). However, to use it, you need to connect your school to the system “Google Apps for Education”, and this already creates additional organizational problems. However, Google has many more open and widely available services. It has recently opened its own social network Google+ (plus.google.com).

Google Drive can easily completely replace all paper textbooks, workbooks and notes of teachers and students, which will allow both students and teachers to access their materials anywhere and from any device.

Therefore, Google Drive allows you to:

- create files and work together on them;

- protect files and provide access to them from anywhere;
- find the right files easily.

However, there are some drawbacks. For example, P. Sipiska [5] rightly points out that it is always better to create documents in Google first than to upload already created ones, as Google Docs can bring down even a simple formatting created in another program.

When working with Google Drive, you have complete control over who and how can use files, folders, and documents.

Google Drive sharing allows you to:

- work in real time with colleagues and friends;
- eliminate the use of endless sending of files by e-mail;
- choose who can view and edit files, using settings and access levels;
- share the results of working with other people.

There are the following availability parameters:

- publicly available on the Internet – everyone has access to the file. Public files can be included in search results, and can be opened by anyone who finds their address. This access option is recommended when you need to disseminate any information.
- users who have the link – only users who know its exact URL can access the file. This access option is recommended in cases where access to information needs to be provided to a large group of people, and the content of the document is not confidential.
- personal access – only the current user has access to the file. The “Private” access option is recommended for personal documents, as well as if you need to share the file with a small group of people.

K. Khodakovskiy [7] makes a clear comparison of Google Drive with major competitors in their key characteristics, which shows that as a cloud storage Google Drive is largely superior to the services of other companies. This applies to compatibility with mobile operating systems, and the price per gigabyte of data, and the amount provided free of charge.

Pros of Google Drive: free, unlimited photo storage, integration with other Google services, the ability to share disk resources with different access rights, eliminate document loss, reduce material costs for storage and exchange of information, save time.

Cons: there is no complete trust in data storage and confidentiality, limited compatibility (does not support all formats), stability of data access (powerful Internet access should be available at all times), no application for synchronization with a PC, not all users are psychologically willing to give up simple and fairly clear physical media and local area network drives and move to cloud storage, which has its own interface you need to get used to.

Based on the conducted research and the analysis of modern cloud services it is possible to speak about expediency of their use in educational process of HEI. Over the recent few years:

- Google Drive service is used in the educational process by the Department of Management and Public Administration, in particular when teaching the discipline “Production Management” to students of all fields of training;
- MS OneDrive service in preparation for classes in the discipline “Operational Management” for students of all fields.

Where and how cloud services are used in the educational process depends on the experience and desire of the teacher to use modern technologies. However, the authors recommend using these services, for example, in the systematization of their own information. As practice shows, people engaged in science have a lot of unsystematised information about the discipline. Over time,, the amount of this information only increases with the development of the specialist and the development of the field of knowledge in general and not always the teacher is able to find what is needed at a given moment, a student may not always have their own computer or a drive with data. If you store and organize your data in cloud services, this problem is solved by itself. This will allow the teacher to be mobile, relevant in time, fast in their search and incredibly systematic. Google Drive allows you to store files and materials on the discipline under study and have constant access to them.

From the point of view of communication, cloud services are not a means of communication as such, but this does not mean that they do not provide such an opportunity within their concept. Google Drive has built-in chat functionality that allows you to communicate. This wonderful little thing will allow the teacher to communicate directly with the student on the topic of their work, keeping it in front of them; you can also arrange group chats to explain on the example of one work how to solve it, common mistakes and more.

Obviously, to store course information, such as lectures, practical and laboratory tasks is best in one place, so it is advisable to use services such as Google Drive and Dropbox. It is enough for the teacher to upload the necessary data to the server once and give access to students, and again all changes, additions or deletions of materials will be synchronized and shown to all participants. It is also enough to give students access to their notes and they will always have additional information on the course approved by their teacher.

On the other hand, providing the result of the student’s work and checking it by the teacher is also simplified when using cloud services. Quite often, the report on laboratory work is either a text file or a presentation, these files are convenient to create in Google Drive, and here the problem of compatibility of operating systems is solved at once, and it is very important because high schools use

Windows family products, and the share of application of free alternative products, including Linux operating systems, grows everywhere, and the compatibility of files created on different systems is unfortunately poor. Using Google capabilities, it is enough to complete the task and give access to it to a teacher or a methodologist who monitors the performance of the work. After reviewing, using the commenting mechanism, which is well implemented in Google Drive, the reviewer can leave comments, point out shortcomings and inaccuracies, all this data will be permanently stored, and you can always contact them for the following tasks. At the same time, the teacher and the student see the work done, in the same document there is communication about the results and errors, the history of corrections and corrections of the document provides information about the intensity of the student's work, and so on.

Using a similar cloud resource MS OneDrive in preparation for classes, the teacher has the opportunity [20]:

- create the necessary materials (text files, spreadsheets and presentations);
- download bulk files (manuals (in various formats), videos and software, the size of which often does not allow you to download directly to the system of distant learning);

- using Skype, Facebook, Google, Twitter and LinkedIn to create contact lists of students who will be provided with the access to work materials; – create user groups for further access.

The teacher places the material prepared for the lesson (lectures, presentations, theoretical and methodological literature, audio and video files, test tasks) in the MS OneDrive and sends students an invitation with a link to view by placing it in the appropriate section of the System of distant learning. In this way, students have access to all the information necessary to master the material, which they can download to their computer or media or use on-line.

The biggest problem is that when using cloud services there is no protection of consumer rights, i.e. there is no protection of intellectual property; to establish the real location of the database is impossible due to the automatic migration of servers depending on the download. Similarly, it is impossible (guided by their definition in the Law) to identify “third parties” who have the owner's personal data during their migration, or, even more, to provide information on cross-border transfer.

It should be noted that the legal framework lags far behind the pace of development of the IT sector (and in particular cloud computing) not only in Ukraine but also around the world. However, the EU has already begun intensive work on its modernization, and it is planned to cancel not only the registration of databases, but also any mandatory warnings about their collection and processing.

It is definitely expedient for Ukraine to focus on this experience in order to harmonize domestic legislation with European ones.

Another regulatory problem that arises along with the development of the cloud market in Ukraine is the complete lack of relevant national standards that would establish appropriate requirements for the quality and reliability of cloud technologies and services in Ukraine. In the future, it will obviously be necessary to harmonize them with ISO and EU standards.

The urgency of these issues is because there are already projects for the transition to cloud technologies of IT infrastructures of government agencies in Ukraine (for example, the National Bank of Ukraine).

Conclusions. The most suitable and multifunctional and those that can be used to implement various elements of the learning process are Google Drive and MS OneDrive. Thus, students in cloud services can perform:

- essays, individual tasks (independent, creative, scientific works) and send the teacher links for editing and verification;
- team projects, giving the project team permission to edit the team work;
- tests, term papers, dissertations, sending the teacher a link with permission to edit for verification, which will significantly reduce the number of printed versions of documents.

As directions of further researches of cloud services application, it is possible to allocate the following:

- to form and divide the workload between teachers of the department;
- to form the schedule of classes for students of HEI;
- in work with the dean's office and the educational part of HEI;
- to form an individual work plan of teachers of the department and control over its implementation;
- to ensure the document flow of the department.

Thus, modern cloud technologies (cloud computing) are a progressive and promising solution, one of the elements of the revolutionary “third IT platform”. Their rapid spread is now one of the key trends that will significantly affect global development in the next 5–8 years. Strategic decisions and action plans for the systematic and integrated development of cloud services have already been adopted in the most developed regions of the world (USA, EU), and relevant work has been launched. The use of cloud technologies is associated with not only huge cost reductions and intensification, but with significant consumer risks (especially the risks of data storage and transmission). On the other hand, (a) cloud solutions are constantly being improved, and (b) the cloud provider today can achieve an acceptable level of security by carefully adhering to a number of conditions. The Ukrainian cloud market, in contrast to the US or EU markets, is currently in a

“latent phase” of development: the formation of demand and accumulation of initial experience of consuming cloud solutions. Nevertheless, according to unanimous expert forecasts from next year until 2015-2016, it will demonstrate exponential growth typical of cloud markets in the developed countries. Multiple market growth in the coming years will lead to the emergence of a new specific and significant sector of the Ukrainian economy and infrastructure. Such development prospects highlight the need for the state to develop an effective regulatory policy. At this stage, the priorities are the following:

1. Further modernization of the relevant regulatory framework (including taking into account the prospects for the development of cloud technologies in Ukraine and the world when making changes to the “Strategy for the development of the information society in Ukraine”).
2. Development of national standards that would establish appropriate requirements for the quality and reliability of cloud technologies and services in Ukraine. In the future, it will obviously be necessary to harmonize them with ISO and EU standards.
3. It is advisable to conduct a comprehensive analysis and assessment of the state, trends and prospects of the cloud services market in Ukraine at the state level, as well as opportunities for their use in public administration (including within the framework of the currently implementing “System of electronic interaction of public authorities”). Such an analysis should be carried out in particular in the annual “Report on the state of informatization and development of the information society in Ukraine” (executor: the State Agency for Science, Innovation and Informatization of Ukraine), as well as the annual Report on the National Commission for State Regulation in the field of communication and informatization.

REFERENCES

1. Krechetnikov K.H. (01 July 2011) Sotsialnye setevye servisy v obrazovanii. Retrieved from [http://ido.tsu.ru/other_res/pdf/3\(39\)_45.pdf](http://ido.tsu.ru/other_res/pdf/3(39)_45.pdf) (Last accessed: 26.01.2021)

2. Kukharchuk R.P. (25 February 2018) Zastosuvannia elementiv dystantsiinoho navchannia v individualnii roboti studentiv. Retrieved from: <https://int-konf.org/ru/2014/aktualni-problemi-suchasnoji-nauki-21-23-10-2014-r/908-kandidat-pedagogichnikh-nauk-kukharchuk-r-p-zastosuvannya-elementiv-distsijnogo-navchannya-v-individualnij-roboti-studentiv> (Last accessed: 26.01.2021)

3. Nevmerzhytska S.M., Tsalko T. R. (5 October 2018) Suchasni natsionalni yevropeiski systemy vyshchoi osvity: zahalnyi ohliad ta porivnialna kharakterystyka. *Proceedings of the VIII International Scientific-Practical*

Conference [The effectiveness of the organizational and economic mechanism of innovative development of higher education in Ukraine] (Kyiv). Publisher: Kyiv National University of Technologies and Design. P. 363-371. Retrieved from: https://er.knutd.edu.ua/bitstream/123456789/10309/1/EOEMIR2018_P363-371.pdf (Last accessed: 01.02.2021)

4. Seidametova, Z., Seytveliyeva, S., & Temnenko, V. (2012). ONLINE LEARNING SYSTEMS: CLASSIFICATION, COMPONENTS, SUCCESSFUL PROJECTS. *Journal of Information Technologies in Education (ITE)*, (13). <https://doi.org/10.14308/ite000345> (Last accessed: 01.02.2021)

5. Sirisko P. (2017) Google Docs as a collaborative space: the pros and cons Retrieved from: <http://propheris.com/web-development/collaboration/google-docs-as-a-collaborative-space/> (Last accessed: 01.02.2021).

6. Stavytska I.V. (2012) *Informatsiino-komunikatsiini tekhnolohii v osviti Proceedings of the X International Scientific-Practical Conference* [Modern methods of teaching specialized foreign language in higher education]. Retrieved from: <http://confesp.fl.kpi.ua/ru/node/1103> (Last accessed: 22.01.2021)

7. Khodakovskiy K. (2012) Srovneniie Goodle Drive s konkurentami: Besplatnye predlozheniia, osobennosti Retrieved from: <http://www.3dnews.ru/software-news/628306> (Last accessed: 01.02.2021).

8. Tsalko T.R., Nevmerzhytska S.M. (10 November 2020) *Problemy formuvannia munitsypalnoho upravlinnia osvitoiu. Proceedings of the II International Conference* [Problems of integration of education, science and business in the conditions of globalization] (Kyiv). Publisher: KNUTD. P. 76–77. Retrieved from: https://er.knutd.edu.ua/bitstream/123456789/16871/1/PIONBUG_2020_P076-077.pdf (Last accessed: 22.01.2021)

9. Shtohrin S.S., Roman B.Ye. (2018) Zastosuvannia elementiv dystantsiinoho navchannia pry provedenni zaniat zi studentamy dennoi formy navchannia Retrieved from: <http://elibrary.nubip.edu.ua/5505/1/10css.pdf> (Last accessed: 01.02.2021)

10. Gerasimenko I.V., Zhuravel K.I., & Palamarchuk O.S. (2005) Integrate use of cloud services in e-learning course *Science and Education a New Dimension Pedagogy and Psychology*, III(37), 75. P. 29–32.

11. Sarathy V., Narayan P., & Mikkilineni R. (2010) Next generation Cloud Computing Architecture. Enabling real-time dynamism for shared distributed physical infrastructure Retrieved from: <http://www.kawaobjects.com/resources/PID1258479.pdf> (Last accessed: 22.01.2021)

12. Rayport J., Heyward A. (2009) Envision the cloud: the next computing paradigm Retrieved from: <http://marketspacenext.files.wordpress.com/2011/01/envisioning-the-cloud.pdf> (Last accessed: 22.01.2021)

13. Tsalko, T. and Nevmerzhytska, S. (2020), “Executive discipline in public administration in conditions of transformation and digitalization”, *Ekonomika ta derzhava*, vol. 12, pp. 114–120. DOI: 10.32702/2306-6806.2020.12.114 (Last accessed: 01.02.2021)
14. Start work with OneDrive Retrieved from: <http://windows.microsoft.com/ukua/windows-8/getting-started-onedrive-tutorial> (Last accessed: 01.02.2021)
15. Electronic wall Padlet Retrieved from: <https://padlet.com/> (Last accessed: 26.01.2021)
16. File storage e-Disk Retrieved from: <http://edisk.ukr.net/> (Last accessed: 26.01.2021)
17. Cloud Internet-service Microsoft Office 365 Retrieved from: <https://login.microsoftonline.com/> (Last accessed: 01.02.2021)
18. Cloud environment for data storage Dropbox Retrieved from: <https://www.dropbox.com/> (Last accessed: 01.02.2021)
19. Cloud data storage Google Retrieved from: <https://www.google.com/drive/> (Last accessed: 01.02.2021)
20. Cloud environment for data storage OneDrive Retrieved from: <https://onedrive.live.com/> (Last accessed: 01.02.2021)
21. Cloud data storage Yandex Retrieved from: <https://disk.yandex.ua/> (Last accessed: 01.02.2021)