

**DIGITAL DISTRIBUTION. INFLUENCE OF ONLINE SERVICES FOR USERS AND DEVELOPERS.
EXTERNAL PAYMENT SYSTEM AND ITS INFLUENCE ON SERVICE SECURITY**

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This paper presents digital distribution and its importance for the distribution of software products. Also online services, and their impact on business and the ability of users to manage the purchased goods are considered. Additionally, it also presents an external payment system for an online service and its impact on the overall reliability of online service in general. Various systems will also be considered and the comparison of them will be made.

Distribution of goods occupies an important part of the history since the founding of trade. It allows you to effectively find new customers and sell the right goods, regardless of location. One of the methods of distribution is digital distribution. The importance of digital distribution has played an important role since the development of the Internet: it allows you to quickly and safely distribute software or distribute advertising of it. In fact, everybody uses it nowadays: from simple users to experienced businessmen and distributors. This means that in addition to digital software, it is possible to distribute other products, ranging from ordinary items to very rare things. So now there are many online shops where you can buy absolutely everything. To better understand the problem of product distribution on the Internet, we will research the concept of digital distribution and the way it affects the trade via the Internet.

Digital distribution is a method for distributing digital content without using a tangible medium, usually consisting of downloading via the Internet to a user's terminal device [1]. The advantage of digital distribution is easy, quick search and purchase of copies of the necessary software.

There are several options for distributing software over the Internet.

The main protocols used in digital distribution are HTTP, P2P and FTP. Systems that distribute proprietary software usually contain technical means of copyright protection that prevent the buyer from selling/distributing his copy of the software (programs).

There are several options for purchasing software rights:

1. PayPlay - products will be available only after their purchase.
2. Try before you buy - user downloads the program and gets the opportunity to use it for some time. In case the user wants to continue using the full version of the program, he must pay. After that (as a rule) a special serial number is provided, by entering which the user gets the opportunity to use the program for an unlimited time.
3. Advertising - in this case, the program is absolutely free, but the user is shown advertising in the program, on display of which the software owner earns.
4. Subscription - monthly payment for the right to use the program or programs from a specific set provided by a digital distributor. There are also single subscriptions for one specific program and for a different period (including unlimited) [1].

For the implementation of digital distribution is used online service, where you can get all the necessary goods for the mentioned methods.

The main products of digital distribution are:

Books - electronic books are the most popular and the main difference from a traditional purchase is the storage in an indefinite amount in an electronic book reader or any electronic device supporting the book format.

Music - the main representatives are online buying or streaming. In the first case, the artist's album or several of his songs are purchased for the specified amount, and in the second case, free access to listening to the songs of the specified artist is provided for subscription or under the specified conditions. The main difference from the traditional purchase of physical media is easy access to music files and the ability to store in unlimited quantities on a certain device.

Films - the main representatives are also online purchase or subscription. In the first case, for the specified amount of money unlimited access to a particular film or series is given, and in the second case for a specified period of time an access to viewing through the service where the subscription was made is given.

he main difference from the traditional form is easy access to the video and the ability to store in unlimited quantities on a certain device.

Video Games - the main representatives are also online purchase or subscription. In the first case, for a specified amount of money unlimited access is given to a certain film or series, and in the second case, access to viewing through the service where the subscription was made is given for a certain amount of time. The difference from the traditional form is also easy access to video and the ability to store in unlimited quantities on a certain device.

In addition to online services, a launcher may be included. Launchers are the programs that allow you to install, to launch and play purchased or activated software. These are programs such as iTunes, Spotify, Steam, Netflix, etc. The main advantage is storage of all purchased software under your account, the automated process of downloading application from the server and installing it on user's machine.

The main impact of digital distribution over traditional retailing can be seen in areas such as:

Books – some companies like Bookmasters Distribution have spent \$4.5 million on hardware upgrades to work with more users. In addition, the vice president of Perseus Books Group noted a 68 percent increase with the transition to e-books and the Independent Publishers Group announced sales growth of 23 percent in the first quarter of 2012 [2].

Music - the growth of digital distribution has led to a 2-fold drop in CD sales over the course of the 2000s. The development of systems such as iTunes and later Spotify contributed to the independent distribution of music. In addition, since the beginning of digital sales, the increase from 160 million in 2004 to 795 million in 2006 was noted, with remittances ranging from \$397 million to US\$2 billion [2].

Films - due to digital distribution, there has been a sharp transition of films and series to platforms such as YouTube, Netflix, Amazon Prime, etc. In addition, due to the services, one can note the growing popularity of views on Smart-TV, computers, smartphones, game consoles and tablets [2].

Video games - the main development of digital distribution began in 2004 with the release of the Steam platform, which, instead of selling games gives rights to store game by accepting an agreement (result of rules violation store has a full right to withdraw product or user profile). Since the late 2000s, digital distribution of games has been reached an increasingly broad audience, with major game publishers and retailers have focusing more on digital sales - including Steam, PlayStation Store, Amazon.com, GAME, GameStop and the others. And as a result, the sale of physical media fell from \$5.03 billion in 2007 to \$2.15 billion. According to a Superdata Research, revenue from games sold in this way worldwide reached around \$6.2 billion per month during February 2016. In early 2019, services such as Epic Games, Rockstar Games Launcher, battle.net and Bethesda Game Launcher were developed, which led to competition, as it's profitable for companies to use their own service. For example, Ubisoft with the release of Tom Clancy's Division 2 under the Uplay service received 4.5 times more income than other services, which led to the decision to release their products only under their own service.

Thus, one can point out a noticeable increase in digital distribution and its replacement by the traditional sale of physical media.

In addition any digital distribution should have a good and reliable payment system.

A payment system is an essential part of any online service where payments are necessary, because without it there cannot be any possibility of trading. The payment itself can occur both in the internal system and through external systems, where the system we specified will execute the transaction. But first, we have to understand the concept of e-commerce, internal and external payment systems and their features.

E-commerce is a sphere of the economy that includes all financial and trading transactions carried out using computer networks, and business processes associated with such transactions. To e-commerce include:

1. Electronic information interchange (Electronic Data Interchange, EDI),
2. Electronic Funds Transfer (EFT),
3. Electronic commerce (e-trade),
4. Electronic money (e-cash),
5. Electronic marketing (e-marketing),
6. Electronic banking (e-banking),
7. Electronic insurance services (e-insurance) [1].

Electronic payment system - a system of payments between financial institutions, business organizations and Internet users when buying and selling goods and for various services via the Internet. Such systems are electronic versions of traditional payment systems and are divided into:

1. Debit (working with electronic checks and digital cash);
2. Credit (working with credit cards) [2].

Figure 1 will show the purchase scheme of payment system.

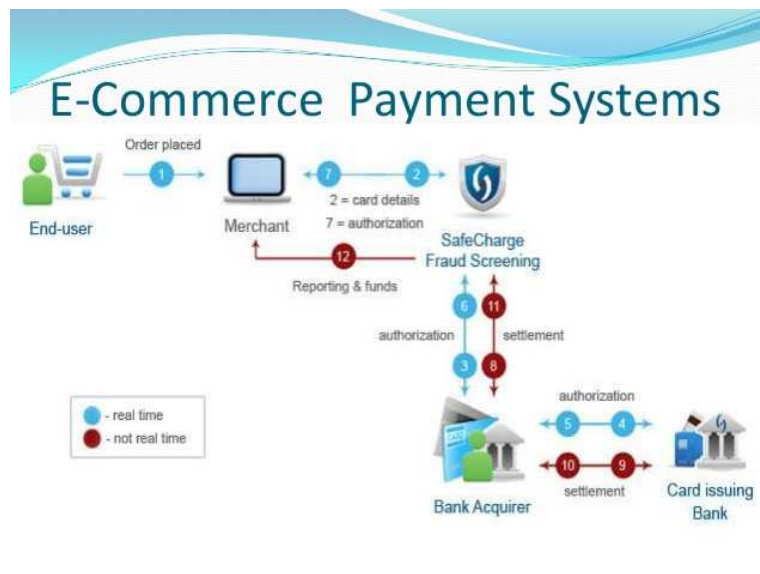


Figure 1. – The process of payment through the payment system

The payment system in services can be divided into two types:

Internal (or integrated) is a payment system which is built into an online service and conducts a transaction to a bank through a bank card. The only thing the buyer needs is his own payment card information. The pros are full control of the transaction and the absence of the user having additional data on other services, and the cons are increased load due to the personal conduct of the necessary transactions and the vulnerability of leakage of important data in case hacking.

External (or third-party) is a system that receives data from an online service and then independently conducts the necessary transaction. For payment, data from service and/or customer data is used. The pros are reduced service load and protection against hacking due to transfer of responsibility to a third-party service, and cons are possible additional payment for use, requirement of additional data from the buyer and possibility of a third-party system refusing to work in case of a load.

The main payment systems are:

PayPal is a payment system founded in 1998 and gained popularity in 2002 with the purchase of an online auction site Ebay. It is the most popular (450 million people) in the world and has a guaranteed transaction for both the user and the buyer. There is also a sandbox version for developers that, when integrated into an online service, can safely check the operation of a payment and transaction.

Amazon Payments is a payment system developed by Amazon and is the most popular mobile payment service. It also has a library for integration into its own service for sale.

WebMoney is a system founded in 1997 and is the most popular system in the post-Soviet space. And one of the most reliable because of the multi-level identification. It differs from the others by the presence of opening an unlimited number of wallets in different currencies (WMZ - dollar, WMR - rubles, WME - euro, etc.) for convenience of use combining into special storages (keeper), where a unique WMID holder number is assigned.

QIWI is a payment system founded in 2007 and being the most popular system in Russia due to the availability of terminals for creating an account and replenishing funds.

Figure 2 will show the rest of the systems that were not indicated above.

As a result of the study, the main directions of digital distribution were investigated, and as a result of the development of recent trends, the development of online services for the distribution of video games was deduced. Since users, after obligatory registration on the service and purchase/activation, are given the right to keep the product under their account, which gives the necessary control and allows developers to distribute and release their project without a deal with the publisher, which leads to additional sales. You can also add a solution to the problem of archaic storage of purchased applications by creating a system which allows you to purchase, download and install everything you need. Additionally, a comparison was made among several types of payment systems, their features, pros and cons in comparison to each other. And third-party payment systems were listed and their features indicated.

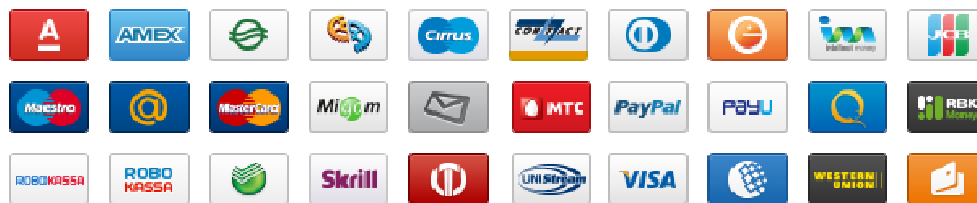


Figure 2. – Basic payment systems

Based on the analysis, it's planned to develop a project whose main task is to provide conditions for the distribution of non-gaming software with the ability to launch purchased applications using a special launcher. In addition, it was decided to use the external PayPal payment system for the implementation of the project because of satisfaction with security indicators, ease of payment through the service and libraries available for different programming languages.

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