

Saint-Petersburg State University
Graduate School of Management
Master in Management Program

**DIGITAL COMPETENCES OF CONSUMERS IN BUYING DIGITAL
PRODUCTS VIA TECH-ENABLED COMMERCE**

Master's Thesis by the 2nd year student
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St. Petersburg

2020

ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

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Год	2020
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Описание цели, задач и основных результатов	<p>Целью диссертации является исследование цифровых компетенций потребителей при покупке цифровых товаров через каналы электронной коммерции.</p> <p>Задачами диссертации являются: анализ существующей литературы, посвященной цифровым продуктам, электронным платформам продажи, цифровым компетенциям и поведению потребителей и выявление пробелов в существующих исследованиях; выявление и анализ значимых компетенций потребителей при покупке цифровых товаров через каналы электронной коммерции, а также сравнение выявленных компетенций для разных категорий цифровых товаров; описание портретов потребителей цифровых товаров на основе их цифровых компетенций.</p> <p>Основными результатами работы являются: определение перечня значимых компетенций потребителей при покупке цифровых продуктов их разных категорий, формирование логически обоснованной типологии потребителей на основе их цифровых компетенций, а также рекомендации для дальнейших исследований и практического использования результатов.</p>
Ключевые слова:	Цифровые компетенции, цифровые товары, электронная коммерция, поведение потребителей

ABSTRACT

Master Student's Name	Anastasia Sheremeeva
Master Thesis Title	Digital competences of consumers in buying digital products via tech-enabled commerce
Faculty	Graduate School of Management
Main field of study	Management, concentration – Marketing
Year	2020
Academic Advisor's Name	PhD, Associate Professor Maria M. Smirnova

Description of the goal, tasks and main results	<p>The main goal of the Master Thesis is to investigate consumer digital competences during the process of digital goods purchasing via tech-enabled commerce.</p> <p>The objectives of the thesis include: analysis of existing literature on digital goods, e-Commerce, digital competences, consumer behavior and identification of gaps in existing papers; identification and analysis of significant consumer digital competencies when purchasing digital goods through e-Commerce, as well as comparison of identified competences for different categories of digital goods; description of portraits of digital goods consumers based on their digital competences.</p> <p>The main results of the work are: determining the list of significant consumer digital competences when purchasing digital goods of different categories, forming a viable typology of consumers based on their digital competences, as well as recommendations for further research and practical use of the results.</p>
Key words	Digital competences, digital products, e-Commerce, consumer behavior

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INTRODUCTION

Today, the digital world is a part of every aspect of our lives, from how we spend our time to how we manage our money. It changes the usual way of communication, entertainment and getting new information. We become digital consumers who search for products and services not in yellow page catalogs, but in search engines. During recent years, digital technologies have become strongly integrated across all sectors of our society and economy. Not only it became possible to create new types of goods and services but also the whole way various product categories are created, distributed, sold and consumed has undergone dramatic changes. All these provoke online retail market to increase its competitiveness, online sellers create new approaches and models of communication with their customers and, as a consequence, more and more new digital channels continue to appear in order to satisfy modernized needs of the customers.

Despite the fact that digitalization encouraged creating great possibilities for the overall economic growth and evolution of the whole process of retail functioning it also influenced significantly the final consumer. Consumer spending on digital goods has increased dramatically within recent years. Today people not only want to be aware of what goods and services are available for them in the marketplace, their expectations about information available, conditions, quality and format of on-line buying process have been also seriously transformed. All these changes inevitably lead to significant changes of the whole consumption patterns, particularly within such stages as obtaining information, negotiating of specific terms of transactions, making the purchase decision itself, making payments and so on.

However, while there is a lot of literature attempting to answer the question how e-commerce influences the market prices, companies' business models and their functioning in the new environment in general, much less works tried to go deeper with understanding of the customers itself. In fact, companies are faced with complex radical changes in the implementation of their business, trying to meet all the requirements of online retail, to have time to adopt the best technological trends and so on. Nevertheless, few people take into account the fact that modern consumers also continually face with new conditions on the Internet, with rapidly changing trends and what even more significant with a huge amount of information that is also updating at a breakneck speed. Thus, it cannot be ignored that consumers also need certain skills and knowledge, or even sets of skills and knowledge that would allow them to satisfy their needs in the Internet environment. Why should it be important to companies and online retailers? The extent of utility extracted from consumption different goods and services can directly depend on the level of knowledge base and skill base of consumers and also on efficient usage of all these skills and knowledge. On the other hand, because of the lack of certain sufficient skills, consumers

themselves may suffer from their experience in the digital environment, facing negative consequences at different stages of their consumer journey. Since these statements directly relate to the success or failure of the process of consumption in the E-commerce realities, it is difficult to overestimate the relevance and importance of this topic.

Moreover, most of existing papers in this field devoted to studying the online purchasing in the context of ordinary offline goods. However, according to recent report describing the consumption trends of online purchasing prepared by Fiserv in 2019 almost three quarters of all online purchases in the world are for digital goods and services. And not only this segment differs from physical one by inability to touch them but it also entails a number of distinctive characteristics, advantages, and disadvantages that directly affect the process of their consumption online. That is why the study of competencies in the context of this segment of products requires special attention, which this work will try to cover.

Nevertheless, going deeper into the study of digital competencies required for online consumption of digital goods, this work also tries to consider the competencies in the context of various categories of digital goods, which may also imply the presence of different significant competencies.

CHAPTER 1. LITERATURE REVIEW

This chapter is devoted to an overview of the main theoretical concepts regarding the topic of this research work. The main purpose of the literature review is to analyze existing scientific papers and researches, systematize the information they contain, and identify the main aspects of consumer digital competencies, depending on various factors, and also to analyze the existing models of customer buying behaviour. All discovered features, regularities, and findings at this stage will be used to form a reasonable practical part of this study. Thus, first of all, the nature and the types of the digital goods themselves are crucial as these goods implies having different approaches and behavior in general from the customers. Secondly, equally important the consideration of e-commerce itself, since it does not involve offline interaction of the consumer with the product, it is directly related to the consumer's journey, and therefore to the skills and competencies the customer should have to get a successful experience. Thirdly, the very concept of digital competencies will be considered, its definitions, types and dimensions that were already identified by existing studies, so that they could be analyzed and customized further for the practical part of this research. And finally, the customer buying behavior will be analyzed as there are a lot of concepts exist, even regarding the customer journey types, what directly influences the competences' set we are interested in. All in all, this chapter will allow to formulate precise research gap that will be adequately filled in the end of the research.

1.1 DIGITAL PRODUCTS

The digitalization process has not only changed the stages of the consumer buying process but has also had a direct impact on the transformation of the types of goods offered. (Rha, Oh, Park, & Shin, 2009). Technically, the digital goods can be related to the absolutely new consumption category.

In attempt to give the definition of electronic goods there are often a lot of really controversial thoughts arise about its definition. Moreover, sometimes it is possible to meet some doubts whether digital goods should be related to goods or services (Hojnik J., 2017). For example, the 2011 EU Consumer Rights Directive prefer using the term “digital content”, particularly defining it as “data which are produced and supplied in digital form, such as computer programs, applications, games, music, videos or texts, irrespective of whether they are accessed through downloading or streaming, from a tangible medium or through any other means”. At the same time Quah (2002,) also does not specify the relation of digital goods to strict type (goods or services) considering digital goods as “bit strings, sequences of binary digits, 0s and 1s that have economic

value”. Molesworth and Denegri-Knott (2013) also underline that digital goods are rather about “transformation into files that can be transmitted without physical object” and that are able to improve consumers’ life and welfare (Goldfarb, Greenstein, and Tucker, 2015).

However, there are some attempts were made in terms of classification that are worth consideration. Despite the fact that most of the digital goods do not have any corresponding physical nature and have “no physical bounds in production and use”, they can be still classified in several categories. One of the ways to classify them was presented in the following way (Choi, Stahl & Whinston, 2003) (Table 1):

Table 1 - Examples of digital products by Choi, Stahl & Whinston (2003)

Category	Examples of digital goods
Information and entertainment products	<u>Paper-based information products</u> : newspapers, magazines, journals, books <u>Product information</u> : product specifications, user manuals, sales training manuals <u>Graphics</u> : photographs, postcards, calendars, maps, posters <u>Audio</u> : music recordings, speeches <u>Video</u> : movies, television programs
Symbols, tokens and concepts	<u>Tickets and reservations</u> : airline, hotels, concerts, sport events <u>Financial instruments</u> : checks, electronic currencies, credit cards, securities
Processes and services	<u>Government services</u> : forms, welfare payments <u>Electronic messaging</u> : letters, faxes, telephone calls <u>Business value creation processes</u> : ordering, bookkeeping, inventorying, contracting <u>Auctions and electronic markets</u> <u>Remote education, telemedicine, and other interactive services</u> <u>Cybercafes and interactive entertainment</u>

This classification is quite broad and covers the most popular types of digital goods. So, there is also another version of digital goods’ differentiation with more detailed specification of general categories (Loebbecke, 2002) (Table 2):

Table 2 - Kinds of Digital goods by Loebbecke, 2002

Kinds of digital goods	Illustrations
Searchable databases	Restaurant guides, phone books
Dynamic information	Financial quotes, news
On-line magazines and newspapers	International, national, regional; general and special interest publications
Reports and documents	Easy multiplication and indexing
Multimedia objects	Music, video files, texts, and photos

Information services	Offerings by travel agencies, ticket agencies, stock brokerages
Software	Off-the-shelf products, customized products
Interactive services	On-line forums, chat rooms, telephone calls, games

There are not so many variations in proper digital goods' classification. The classifications presented above cannot be seen neither wrong nor right. They both have all the rights for existence, however, we need to keep in mind that digital goods is a very fast developing type of goods in general hence these options of categorization are not fully relevant as there are a lot of changes occurred for the last years.

There are lots of advantages related to digital goods: the purchase of digital goods assumes the possibility of immediate consumption; it eliminates the fact of digital goods' loss or damage; all the purchased digital goods do not need any significant costs for their storage (Goldfarb, Greenstein, and Tucker, 2015). Nevertheless, despite all the existing advantages of digital goods' consumption and the ease of the whole process of digital goods' buying it was discovered that physical goods tend to have greater demand and retain greater value in comparison with digital goods (Pew Research Center, 2016). The great example of such phenomenon is presented with printed books and e-books, when there is no any upward trend within market share related to e-book versions. Also, within several experiments Atasoy O. (2018) established that even though digital goods own some really strong advantages the comparable versions of the same physical goods are valued several times higher.

Now the key characteristics of digital goods should be considered. So, Rayna (2008) highlighted the fact that in order to eliminate all the challenges that arise with the appearance of digital economy and, as a consequence, digital products the features related to economic nature should be examined. Among such economic characteristics were mentioned the following ones: the fact that digital goods are public, durable and that some can be related to experience goods. The last feature covers that digital goods which actual value can be seen only after finishing the consumption process. Below there is the derived by the author relationship between the core features of digital goods and their interaction with technologies, characteristics and behavior (Figure 1):

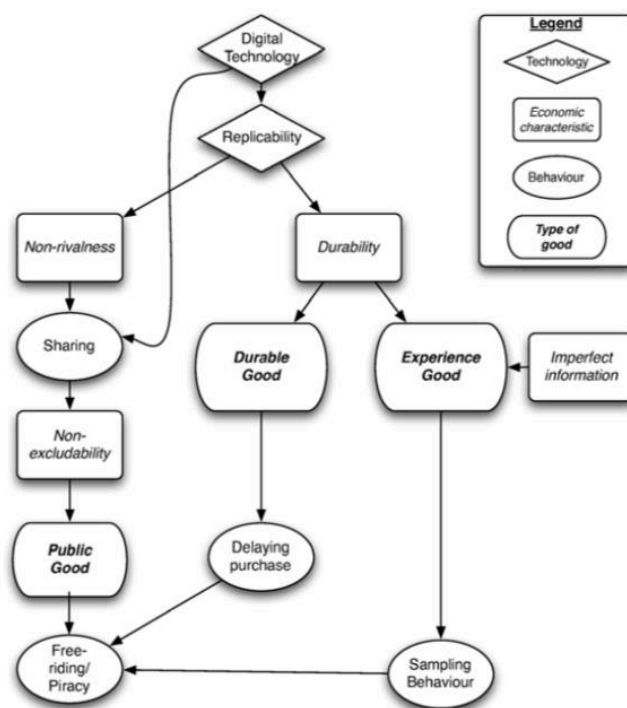


Figure 1 - The economic nature of digital good: how technology, characteristics and behavior interact (Rayna, 2008)

Quite interesting list of qualities has been proposed by Quah, 2002 as five core digital goods' characteristics were outlined. Some of the features fully correlate to those three features that were mentioned by Ryana (2008), and the rest expand the meaning of such goods.

The first intrinsic characteristic is nonrivalry, meaning that the fact that the digital good is used by one particular customer does not reduce the value and significance of this product for other potential users. Here the author gives a good example with the attitude to media channels and digital goods. Thus, the struggle and competition really exist in the vast media market specifically among those who are responsible for the spread of digitalized products, but the digital goods themselves according to their properties can be easily copied and what is important without losing their original qualities.

Infinite expandability is a characteristic assuming that the number of digital units can be increased objectively in a very short time, with almost minimal costs. The reason is that if you look at the costs required to produce a new unit of digital product, you may find a strong imbalance between the ratio of fixed costs (which are very high) and almost near-zero marginal costs (Varian, 1998). The consequence of this characteristic is also a change in the very nature of the consumption of such goods, leading to a more serious consideration of a special approach to the protection of intellectual property, etc.

One of the most important features of digital products is the fact that they are both everywhere and nowhere, in other words they are aspatial. However, despite the fact that such goods do not have a physical interpretation and cannot literally have a physical contact with the consumer. Nevertheless, digital goods do not lose their value, on the contrary, becoming a unique representative of a new type of goods on the market.

Perhaps one of the most important qualities is the nontransparency of digital goods. This is what makes the consumption of such goods quite challenging. What product can be seen as transparent one? Transparency occurs when we can get the most complete information about the product before making a purchase decision, that is, it should happen at one of the first stages of the entire consumer buying process. It is also worth paying special attention to the fact that all the same digital goods is more about the usage rather than about the process of ownership, which also explains the difficulty in obtaining all the desired information before the purchase (Sun, 2010).

The final feature in this list is recombincancy. What is good about such feature is the fact that after modifying the existing product (by changing something, adding or removing), it turns out that you get a completely new unit of digital goods. At the same time, Quah (2002) emphasizes that the resulting new product may retain many of the qualities of the original product. Here again it is necessary to mention the issue of intellectual property, since with such goods there may be various misunderstandings between different producers and suppliers.

It is curious and really worth mentioning that one of the latest studies on digital products raises the issue of consumer control. It is of great interest, both in the context of consumer psychology and in relation to communication technologies. The thing is that consumers need to have a feeling of owning a good, but it cannot be fully realized with digital goods and in the end on the contrast of physical goods the value of digital ones becomes less for some people. Thus, despite all the “beneficial” features of digital goods there are still some points that make them look less attractive for some users, for example, because they are “unstable, ephemeral, quick and spontaneous and incapable of fully representing individual and personal aspects of memories” (Linwan W., 2020). Moreover, according to the results of another research it was found out on the basis of focus group that the reason for reduced sense of control in relation to digital goods was the presence of “restrictions in legal ownership” and “dispositional control achieved through selling, donating, lending, and sharing the possessions of products to others is restricted with digital formats” (Helm et al., 2018). This, of course, is true only in case the consumer is aware of all these legal aspects regarding all the actions that are allowed to be done with the digital products.

Nevertheless, Linwan Wu argues that despite the fact of reducing customer sense control relating to digital products, still “the process of consuming digital products may conversely grant

consumers increased perceptions of control due to the various technological affordances of digital media (e.g., customization, interactivity, and navigability)”. Here customization, for example, “equalizes” the situation and “satisfies people’s desire for autonomy, defined as the ability to control the outcome of his/her own endeavors in the digital environment” (Sundar, 2015). We can see how important actually the whole process and the ways people have to consume digital products.

1.2 THE OVERVIEW OF TECH-ENABLED COMMERCE

The appearance of the internet gave birth to the new terminology – “internet commerce” also known as e-commerce – that brought absolutely new touch to the world of transactions. E-commerce has fully changed the way businesses are carried out today, the way marketplaces are organized and also the way consumers behave within their buying processes.

Today it is possible to meet absolutely different kinds of definitions given to the e-commerce. One of the shortest versions of this term was given by Harris L. (2003) that includes just the process of “trading of goods and services online”. So, most of the definitions are really similar to this one, thus other option considers electronic commerce being interpreted as “transaction processing, such as buying and selling products and services through computer networks like the Internet” (Chintagunta, 2012, Bamfield, 2013).

However, the most detailed version of the e-Commerce definition can be seen from United Kingdom’s department of trade and Industry: “the use of electronic network to simplify and speed up all stages of the business process, from design and making to buying, selling and delivery, e-commerce is the exchange of information across electronic networks, at any stage in the supply chain, whether within an organization, between businesses, between businesses and consumers, or between the public and private sectors, whether paid or unpaid”. This comprehensive definition clearly better reflects the essence of e-Commerce, emphasizing the exchange of electronic information rather than merely the fact of trade facilitation. It immediately mentions both the strengths of e-Commerce and also its types. However, it is worth dwelling on these nuances in more detail, as well as talking separately about the disadvantages and risks that arise from appealing to the electronic type of Commerce.

Online shopping is often considered as a fully new type, model or even as a new shopping experience in general. With the advent of e-Commerce businesses have to invent and implement completely new strategies and approaches for effective interaction with consumers who have also undergone changes in different planes. Andrey Fradkin (2017) mentions the following characteristics that are peculiar to electronic commerce marketplaces:

1. **Digital Matching:** it is related to the fact that the process of searching and matching between the seller and the buyer is occurring in a digital form, for example, within browser or app.
2. **Low Entry Cost:** more than one seller is able to exist in the platform having in the result quite low entry barriers for realizing its activities.
3. **Ex-post Screening:** most of the screening is occurring ex-post, involving “explicit or implicit feedback given by users regarding transaction quality”.
4. **Non-exclusive and Short-run Contracts:** this point relates mostly to the sellers as they do not have any obligation to use only one platform and they also do not establish long-run employment relationships.
5. **Direct Transactions:** the sum of money paid by the customer at least partly is forwarded to the seller.

The features of e-Commerce influence a lot not only business side but also the customers. If you think about it, the consumers have to adapt to the fully new environment (digital one). The presence of big number of sellers makes the market very saturated that as a consequence creates much larger choice for the customers, when some of them can be not even prepared for it. There are also totally new ways of communications with companies and even new approaches for proceeding payments.

The e-Commerce got a list of advantages in comparison to traditional offline stores, among which can be mentioned higher “flexibility, enhanced market outreach, lower cost structures, faster transactions, broader product lines, greater convenience and customization” (Brynjolfsson et al., 2009). Sameer S Paradkar (2014) also adds to the already mentioned benefits of e-Commerce the following advantages for consumers: the ability to shop and make transactions without any time and geographical limitations, ability to communicate within various electronic communities in order to share their experience and exchange with ideas.

Moreover, the e-Commerce created several important effects that led to some changes in internet transactions’ specifics. The first one is the communication effect reflecting the fact of increasing the amount of information that can be transmitted within the same unit of time. The second effect is electronic integration effect which means the creation of connection between buyer and seller. The third type is electronic brokerage effect that relates to the possibility of buyers and sellers to compare existing offerings from different kind of resources. And the last electronic strategic networking effect speaks about the fact that IT gives to firms the opportunity to join the common achievements to gain competitive advantages (Pauwels et al., 2011).

However, considering these advantages and effects it is hard to speak about consumer's benefit, most of mentioned advantages are related rather to business side. That is why in order to get the positive sides of e-Commerce for consumers it is better to consider opportunities that were created for them. According to Robin L. (2005) among such opportunities can be mentioned the following ones: the ability of consumers to search for, gather and compare all types of existing information about commercial goods and services; the ability to save time making orders online via computer; the opportunity to be free of time limits in relation to purchasing process and the ability to compare and create unlimited number of sellers and vendors; the possibility to obtain sufficient amount of information in order to evaluate the quality of the good or service before buying.

Nevertheless, despite such a wide list of advantages and features created by e-Commerce for seemingly more effective interaction of all trade participants there are also a number of complex issues that arise for consumers who are used to traditional forms of purchasing goods. E-Commerce assuming the usage of Internet technology what is actually can turn out in challenging step for some users, especially for the older generations. Moreover, in order to proceed the online purchases, the consumers need to be able to make online payments in a proper way. And from this point arises another important nuance – the consumer's trust. Some consumers can also not to suspect how the actions they make online and how the information they leave on the platforms can be used. Thus, with the risk of losing money there is also another risk of privacy intervention (Brynjolfsson et al., 2009).

To sum up, the emergence of e-Commerce has significantly increased the level of purchases by buyers, but at the same time the requirements for both buyers and sellers. At the same time, it is really difficult to compete with this type of shopping, when the modern world only increases the requirements for saving time, efforts simultaneously with the ever-increasing variety of goods and services (Isha S., 2007).

1.3 CONSUMER DIGITAL COMPETENCE

Digital competence is a relatively new term that doesn't really have a certain definition and common understanding even among the researches. Even the name of this term varies from work to work. Moreover, at present time there is no fully formulated and checked digital competence framework and as a consequence there are problems with their practical implications. Thus, in this section an attempt will be made to gather the most relevant existed definitions and framework in order to analyze and use them further in the paper.

1.3.1 DEFINITION OF DIGITAL COMPETENCE

The concept of digital competence is one of the latest concepts covering the consideration of technology-related skills. However, digital competence is the term that can be often met in different formulations: digital literacy, digital skills, technology skills, ICT skills and so on (Ilomäki, et al, 2011). And in most of the cases all these term variations are considered to be synonyms even despite the fact that sometimes the definitions given are too different in scope and accents. For example, Jenkins, Clinton, Purushotma, Robinson, and Weigel (2009) considered the skills in scope of literacy of the 21st century, making an accent rather at social skills than individual skills. The ways of digital competence interpretations have been changing simultaneously with the development of the whole technological environment, in the society and culture in general (Ilomäki, et al, 2011).

Nevertheless, the whole concept of digital competence, the introduction of the terminology, which is now used everywhere was introduced for the first time by Paul Glistter in 1997 (Glistter, 1997). At that time, he did not seek to analyze the term in detail and build the entire list of competencies and skills, on the contrary, he gave a General description of the concept and formulated it as “an ability to understand and to use information from a variety of digital sources” and formulated it just as literacy in the digital age.

Today the consideration of digital competence became truly more complicated. Thus, Soby (2016) also emphasizes the complexity of this term because of increased speed of ICT development, and moreover, points out that digital competence even became a key concept in educational policy and in research. Rhee, Yang, Cheon, Kim, and Kwon (2007) defined the consumer competence as “the capability needed by consumers to function effectively and rationally in the marketplace”. Each author came up with different accents in order to find proper definition for “digital competence” term and its synonyms, so, some other examples of such attempts are presented in the table below (Table 3):

Table 3 -The examples of definitions of “digital competence” term and its synonyms

Author	Year	Definition
Eshet-Alkakai	2004	“Digital literacy involves more than the ability to use software or operate a digital device, it also includes a large variety of complex cognitive, sociological, and emotional skills that end-users need in order to function effectively in a digitally driven environment”.
Emma K. Macdonald Mark D. Uncles	2007	“Consumer savvy is a more contemporary term that applies to the competency of consumers across the array of

		practical skills and knowledge to respond to a constantly changing, networked environment. “
Balanskat & Gerthsch	2010	Definition of digital competence as “the application of acquired knowledge, skills and attitudes through the use of ICT to perform a task satisfactorily in a particular context”
Goodfellow	2011	“Digital literacy must also refer to the awareness, attitude and the ability of an individual to use digital tools for communication, expression and social action in specific life situations”.
European Commission	2011	“Consumer digital competence is defined here as the competence consumers need to function actively, safely and assertively in the digital marketplace”.
Petersson	2017	“Generally speaking, digital competence often refers to the skills and literacies needed for the average citizen to be able to learn and navigate in digitalized knowledge society”.
United Nations Educational, Scientific and Cultural Organization (UNESCO)	2018	“Digital literacy is the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies for employment, decent jobs and entrepreneurship. It includes competences that are variously referred to as computer literacy, ICT literacy, information literacy and media literacy”.

Despite the fact that all the presented definitions are quite different, almost all of them argue that digital competence (digital literacy, digital savvy) is something that is crucial for individuals who tend to get confident in fast-changing digital society and to perform confidently and safely in the digital environment in general. However, as it can be expected the definitions from such organizations as European Commission and UNESCO bring some stronger practical accent of digital competence referring to applying them in the digital marketplace and for such purposes as searching for job and entrepreneurship.

1.3.2 DIGITAL COMPETENCE FRAMEWORKS

As there were a number of attempts to find the most appropriate definition to “digital competence” at the same time some researcher tried to propose their versions of digital competence frameworks or indexes.

Analyzing various research papers it can be summarized that most of the authors consider the digital competences as a multi-disciplinary concept. The study of Krish is based on the identification of five core disciplines like information literacy, computer literacy, media literacy, communication literacy and technology literacy where each of them is considered under three perspectives. Finally, it is performed in the following framework (Table 4):

Table 4 - Framework to access components of digital literacy (Krish Chetty et al., 2018)

Type of literacy	Perspective		
	Technical	Cognitive	Ethical
Information (Digital Content)	Access, Usage	Synthesis, Evaluation, Create	Appropriate Usage
Computer (Hardware and software)	Usage	Evaluate, Problem solving	Appropriate Usage
Media (Text, sound, image, video, social)	Navigation	Critique, Create	Assess truthfulness
Communication (non-linear interaction)	Develop and use content	Critique, Apply	Appropriate Usage
Technology (Tools for life situations)	Usage	Invent, evaluate tools	Appropriate usage

The research of Marco Gui et al. (2015) was based on the Van Dijk's model of digital skills (2005) and in the end distinguishes three core areas of skills: theoretical knowledge/awareness, operational skills, evaluation skills. The first dimension relates to some general knowledge about operating online. The second dimension fully corresponds to the Dijk's model and assumes considering "operational" and "formal information skills". It is directed to study the level of "ability to use the computer applications" and at the same time the ability "to recognize specific web environments and to navigate efficiently". And the part about evaluation skills is devoted to again Dijk's "substantial information skills" that covers the "level of awareness and the actual skills in information evaluation practices".

Another paper studying the consumer savvy (Macdonald, 2010) after synthesizing a number of similar papers in e-marketing and e-management spheres comes up with the two core constitutes of "consumer savvy":

1. Areas of competency: technological sophistication, interpersonal network competency, online network competency, marketing/advertising literacy.
2. Aspects of empowerment: self-efficacy, expectations of firms.

The whole conceptual model looks the following way (Figure 2):

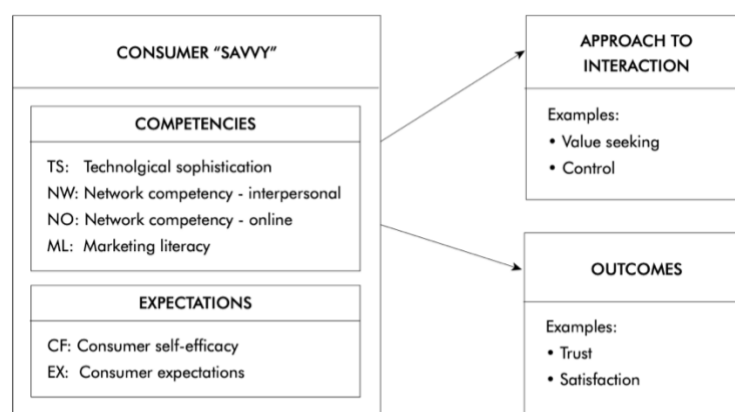


Figure 2 - Conceptual model of "consumer savvy" (Macdonald et al., 2010)

There are couple of works that deserve some special attention. They were made by Joint Research Centre (JRC) on behalf of DG Education and Culture and tend to figure out and to study the core digital competencies that are crucial for citizens in general. The earliest work "Digital Competence Reference Framework for Consumers" was published in 2016 and have rather descriptive than prescriptive nature. It proposes 14 core competencies that are divided into three main areas corresponding to three core stages of consumer buying process. Thus, the final version of the framework is presented below (Table 5):

Table 5 - The list of DigCompConsumers competencies (Brečko and Ferrari, 2016)

Competence area	Competences
1. Pre-purchase	1.1 Browsing, searching and filtering information on goods and services 1.2 Evaluating and comparing information on goods and services 1.3 Recognising and evaluating commercial communication and advertisement 1.4 Managing digital identity and profile in the digital marketplace 1.5 Considering responsible and sustainable consumption in digital markets
2. Purchase	2.1 Interacting in the digital marketplace to buy and sell 2.2 Participating in collaborative economy platforms 2.3 Managing payments and finances through digital means 2.4 Understanding copyrights, licences, and contracts of digital goods and services 2.5 Managing personal data and privacy 2.6 Protecting health and safety
3. Post-purchase	3.1 Sharing information with other consumers in the digital marketplace 3.2 Asserting consumer rights in the digital marketplace 3.3 Identifying digital consumer competence gaps and limits

The important notice to these proposed competencies is that the legislation nuances were not fully taken into consideration and the same with the consumer rights as they were partly taken

into consideration. Moreover, it is still impossible to speak about universality of the application of these competencies (particularly, not all the countries can consider this list.)

Another paper of global JRC research is “The Digital Competence Framework for Citizens” that at present time have two version. Here the second version will be discussed which in its short version sounds as DigComp 2.1 The core difference from the initial version is that the proposed list of competencies was extended with corresponding eight proficiency levels and some examples for use. Thus, the overall model is presented in the table below (Table 6):

Table 6 - The Conceptual Reference Model (DigComp 2.1)

Competence areas (dimension 1)	Competences (dimension 2)	Proficiency levels (dimension 3)	Examples of use (dimension 4)
Information and data literacy	1.1 Browsing, searching and filtering data, information and digital content	Foundation (2 levels)	Employment Scenario
	1.2 Evaluating data, information and digital content 1.3 Managing data, information and digital content	Intermediate (2 levels)	Learning Scenario
Communication and collaboration	2.1 Interacting through digital technologies	Advanced (2 levels)	
	2.2 Sharing through digital technologies 2.3 Engaging in citizenship through digital technologies 2.4 Collaborating through digital technologies 2.5 Netiquette 2.6 Managing digital identity	Highly specialised (2 levels)	
Digital content creation	3.1 Developing digital content 3.2 Integrating and re-elaborating digital content 3.3 Copyright and licences 3.4 Programming		
Safety	4.1 Protecting devices 4.2 Protecting personal data and privacy 4.3 Protecting health and well-being 4.4 Protecting the environment		
Problem solving	5.1 Solving technical problems		
	5.2 Identifying needs and technological responses 5.3 Creatively using digital technologies 5.4 Identifying digital competence gaps		

All in all, there are 8 proficiency levels stated in the paper that classify on the basis of complexity of tasks, autonomy and cognitive domain. And there are two different scenarios were

considered in order to provide the examples that correspond to certain competence area at the certain proficiency level.

In 2018 United Nations Educational, Scientific and Cultural Organization (UNESCO) proposed a really global framework adopted in 20 countries. Not only the educational function this paper have but it also offers real practical actions of applying their theory in real life. The core objective of the paper was to propose a methodology that can become a basis for “Sustainable Development Goal (SDG) thematic Indicator 4.4.2: “Percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skills”. In fact, the whole project was based on the first version of DigComp (2.0) framework as it was considered as the most relevant. However, there was one core limitation about using the sources solely in English language, that is why there could be some informational gap in terms of specifics of some countries. Thus, the overall number of mentioned countries in the paper is equal to 47.

One of the latest literature studies identified three core groups of components together influencing the consumer’s decision process in the digital context: consumer knowledge, consumer attitude and consumer skills (Fielder, Anna, et al, 2016). In the result of applying these three components the digital competencies index was conducted by Park, Rha, Widdows in 2011. These three components were reformulated as digital goods consumption knowledge, digital goods consumption attitude and digital goods consumption skills and the following framework was created (Table 7):

Table 7 - Framework for Digital Goods Consumption Competence (Park, Rha, Widdows, 2011)

	Definition	Content
Digital goods consumption knowledge	Declarative procedural knowledge in digital goods consumption	<ul style="list-style-type: none"> • General knowledge of hardware, software application, networks and elements of digital goods • Legal knowledge about the fair use and rights in the use of digital goods
Digital goods consumption attitude	Consistent beliefs about egocentric and ecological consequences of digital goods consumption	<ul style="list-style-type: none"> • Beliefs about consumer rights in digital goods consumption • Beliefs about consumer responsibilities in digital goods consumption
Digital goods consumption skills	Skills that are required for efficient and rational choice and for utilizing and maintaining digital goods	<ul style="list-style-type: none"> • Accessing and searching for information about digital goods online • Purchasing digital goods online • Obtaining and maintaining digital goods

One of the latest frameworks regarding to digital competences topic was proposed by international organization DQ Institute (DQI) that has a mission to make certain global standards

in scope of education and also to set some concrete policies on digital intelligence. Their recent work published in 2019 is called “DQ Global Standards Report 2019. Common Framework for Digital Literacy, Skills and Readiness”. This report was actually the collaboration with OECD Education 2030 Framework and also combines top global approaches in digital competencies.

In this framework in the center of the concept lies the “digital intelligence” (DQ) term that is defines as “comprehensive set of technical, cognitive, meta-cognitive, and socio-emotional competencies grounded in universal moral values that enable individuals to face the challenges of digital life and adapt to its demands”. However, it is presented that the DQ here has a function of “organizing “digital skills,” “digital literacy,” and “digital readiness” across all sectors and demographic groups”. The whole structure of the concept is divided in pointing out 8 areas of Digital Life, 3 levels of Maturity and 3 Components of Competency. Thus, this framework sates the following list of competencies (Figure 3):



Figure 3 - DQ Competencies (DQ Global Standards Report, 2019)

Moreover, the OECD Education 2030 implies that the development of needed competencies is possible in terms of three directions: knowledge, skills and attitudes and values. It is assumed that only with the mobilization of these three components it is possible for digital citizen to “build and manage healthy identity” (Park, 2019).

1.4 CONSUMER BEHAVIOR

Understanding consumer behaviour is extremely important as all the efforts of all the marketers are directed on influencing the behavior of their customers in a way they need. However, consumer behaviour is very complicated and vast subject especially today, when the customers continue to be exposed to constant changes of external environment. As a consequence, there are various

attempts to interpret this term and to create aggregate models reflecting the peculiarities of consumer behaviour in the purchasing process.

1.4.1 DEFINITION OF CONSUMER BEHAVIOR

Due to its complexity and versatility “the consumer behavior” term owns a lot of definitions. A lot of attempts were made in order to give a proper one, however it is rather normal phenomenon that there are so many options as each time period had each own characteristics. Thus, one of the earliest attempts of creating a hierarchy of periods in consumer behavior by distinguishing and systemizing the existing types of decision makers was made by Zaichowsky in 1991. Below there is a table with her version of all types of decision makers in according to a certain decade (Table 8):

Table 8 - Historical periods in Consumer Behaviour (Zaichowsky, 1991)

Decade	Type of decision maker
1940s	Economic man
1950s	Irrational man
1960s	Transition to problem solver
1970s	Problem solver
1980s	Cognitive miser
1990s	Collective decision maker

From the table we can see that even from the first echoes of modern marketing to the end of the previous century the complexity of viewing the decision-making process changed significantly. Literally, from the primitive “maximizing of economic well-being approach” to more complex “problem solving” type and even to the “collective decision making” in the end.

Thus, Walters and Paul (1970) wrote that “consumer behavior is the process whereby individuals decide whether, what, when, where, how, and from whom to purchase goods and services. Consumer behavior includes both the mental and physical activity necessary for making decisions in the marketplace”. Kotler (1972) also gives pretty similar definition: “consumer behaviour is the study of how people buy, what they buy, when they buy and why they buy.” Clearly, this is one of the most general known and at first glanced simplified way of defining “consumer behavior”, however it cannot be seen as incorrect but rather incomplete in present conditions.

Leon G. Schiffman and Leslie Lazar Kanuk, (2002) defined consumer behavior “as the behavior that consumers display in searching for, purchasing, using, evaluating and disposing of products, services and ideas which they expect will satisfy their needs”. Noel H. (2009) interprets the consumer behaviour as “the study that examines the products and services consumers buy and

use and how these purchases influence their daily lives”. The definition of Shiffman and Kanuk is wider and touches the core stages of buying process. Noel makes an accent on post-purchase activities connected with the acquired good or service. Here we can see that together these definitions mentioned above focus more on the actions directed by the consumer in relation to products and services participating in the buying process. If we look at later version of consumer behavior’s definition we will meet the definition of Wayne D. Hoyer et al (2012) that reflects to “the totality of consumers’ decisions with respect to the acquisition, consumption, and disposition of goods, services, activities, experiences, people, and ideas by decision-making units over time”. However, the closest to the most up-to-date versions belongs to Bamossy, G. J., & Solomon, M.R. (2016). First of all, they emphasized that previously the term of consumer behaviour was referred to buying behavior where an accent was made on interaction between consumers and producers at the moment of purchase itself. On the contrary, today they highlight that the accent has changed and now consumer behaviour is rather about ongoing process, so that they assume that the field of consumer behaviour covers “the study of process involved when individuals or groups select, purchase, use or dispose of products, services, ideas or experiences to satisfy needs and desires”. The newest versions of definitions changed their vector to ongoing process, particularly decision-making process that all the customers are involved each time they make purchases. Such shift of accents can be explained by the fact that the whole consumption journey has become several times more difficult at each stage, changing not only within the goods and platforms available for the sale, but also changing the whole way people think, make decisions and deal with a huge amount of information they get.

1.4.2 CONSUMER DECISION-MAKING MODELS (CDM)

With the tremendous changes in consumer behavior in general we can observe relatively active emergence of Customer Decision-Making (CDM) models. The overall buying and consumer decision-making processes are quite complicated that is why there are quite a lot of CDM models were offered in scientific circles. It is explained by specifying various sets of factors influencing on consumer’s decisions, and both internal and external, and there are also different stages are pointed out within different models. It is necessary to be very critical of all existing models, since there is no the right one. Now some models are already outdated and cannot be seen as fully relevant at all, but this does not mean that it is not possible to draw some valuable ideas from them that will help explain the phenomena that are happening now in the consumer decision-making process. In general, all existing models can be divided into two approximate groups: models that are close to “traditional” ones and more recent versions models. It is impossible not

to refer to the first group of models at all. Thus, the most general and valuable information will be aggregated, and useful points will be indicated that can be referenced further. Then some "deviating" models from the usual "traditional" ones will also be analyzed for the highest relevance and useful features.

As it was already mentioned there is a quite large number of so-called traditional models. However, we do not need to consider in detail each of them. That is why, first of all, the most famous and important ones will be aggregated in the table below (Table 9):

Table 9 - Core (chosen) traditional CDM models

Name of the model	Authors	Year	Key ideas
Nicosia model	Nicosia F.M	1966	This model describes the decision-making process separated in three stages of activities: intelligence activity, design activity, and choice activity. The core statement of the author is about seeing the decision-making as a cognitive process that can be separated into several simple and sequential steps.
EKB model	Engel J.F., Kollat D.T., and Blackwell R.D.,	1968	The core elements of this model are input, information processing, decision process, and variables influencing the decision process. There are also five basic stages - need recognition, search, alternative evaluation, purchase, and outcomes.
Keeney's four-stage decision-making model	Keeney R.L.	1982	There are four key stages in the model: structure the decision problem, assess possible impacts of each alternative, determine preferences of decision makers, and evaluate and compare alternatives.
Kotler's Five Stage Model of Consumer Buying Process	Kotler, P.	1997	Presented as a number of sequential steps the consumer follows to arrive at the final buying decisions, where not all the steps are obligatory for each purchase action.
Shiffman & Kanuk model	Shiffman, Kanuk	2004	Defined consumer decision making as "the process of making purchase decision based on cognitive and emotional influences such as impulse, family, friends, advertisers, role models, moods, and situation that influences a purchase".
Sheth, Newman & Gross model	Sheth J.N., Newman B.I. & Gross B.L.,	1991	This model states five consumption values influencing the consumer behaviour: functional, social, conditional, emotional, and epistemic values.

Within the consumer buying process traditionally most of the researchers highlighted several similar stages, each of which corresponds to particular steps and where each has its own set of factors that affect the consumer decisions. In general, most often it is customary to distinguish three main stages: pre-purchase stage, purchase stage and post-purchase stage

(Frambach, Krishnan and Roest, 2007). Pre-purchase stage is assumed to be about gathering all the information available about all the meaningful offerings. The central stage of purchase implies the decision about making purchase decision itself and transaction completion. And, finally, the post-purchase stage when the moment of decision making about the continued use of offering is happening and also repeating of purchase take place.

A kind of "extended version" of the generalization above presents as a slightly detailed consideration of buying process' stages. Kotler (1997) proposed the five-stage model of buying process which is shown in the figure below (Figure 4):



Figure 4 - Five-stage model of the consumer buying process (Kotler, 1997)

However, Kotler underlines that the consumer does not necessarily pass through all these stages with his every next purchase. It depends on the circumstances of the purchase, for example, if the consumer makes a purchase item of his “regular” brand, he will escape such stages as information search and evaluation of alternatives.

Over time the approaches of considering the consumer decision-making process have been evolving and became more complicated. So, for example, Schiffman, Kanuk (2015) considered the behavior of consumers at the junction of four disciplines, which they claim are directly involved in different stages of the buying process (Figure 5). Among such disciplines psychology, sociology, anthropology and communication were mentioned.

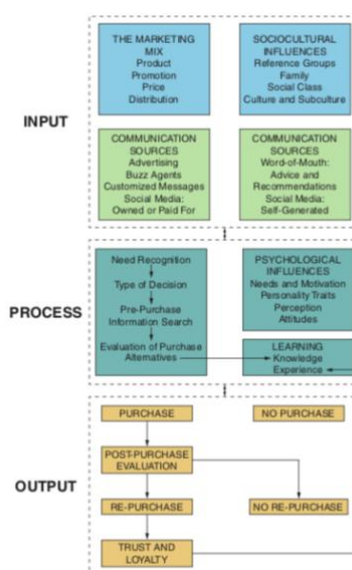


Figure 5 - A model of consumer decision-making (Shiffman, Kanuk, 2015)

The first stage includes two core types of influencing factors which related to the firm's marketing efforts and various sociocultural aspects. The authors also include different types of communicational sources with the help of which the information from the firms and sociocultural subjects is translated to customers. The second stage named as "process" pays attention to how the consumer makes his decisions. It is assumed that psychological pack of factors participate within the influence of external inputs on consumer's recognition of need, identification of type of decision, information search and alternatives' comparison. The last stage is related to the two basic post-decision activities: purchase itself and the evaluation of this purchase.

Another famous model of decision-making process of consumers is EKB model (Engel et al., 1978). This model is based on some consumer psychology theories, for example, Nicosia's theory (Nicosia, 1976). The key distinguishing feature of this model is the consideration of external environmental factors in the entire decision-making process. It still states five core stages, where the first stage assumes initial recognition of need and a problem, then it flows into search of alternative options basing the search on external and internal environment, on the third step we assume evaluation process of previously chosen options using a certain personal criterion of the consumer. After that there is a step of purchase itself and in the end the post-purchase evaluation of final outcome. It is important to highlight that in this model Engel also makes the greatest accent on figuring out by the consumer his unfilled needs.

Later the initial version of EKB was extended and became Engel, Blackwell and Miniard Model (Figure 6). It was shortened till four core stages: information input, information processing, decision process and external variables that influence the whole decision process. The core drawback of this model was seen as unclear influence of stated variables the consumer decision-making process.

Despite all the importance and well-deserved recognition these versions of consumer decision-making models may not be considered fully relevant today. Some researches made attempt and came to the consideration of the decision-making process of consumers from another angles.

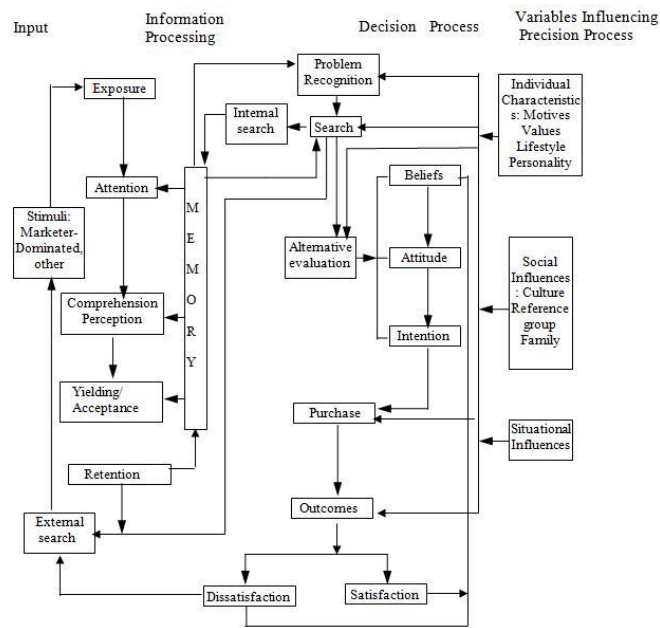


Figure 6 - Engel, Blackwell and Miniard Model (Engel, J.F., 1968)

Thus, Solomon (2006) decided to think about decision-making process in terms of continuum assuming that there are two extreme stages like “habitual decision-making” and by extended problem-solving. And there is also some intermediate state that is defined as “limited problem-solving”. The difference between these options is quite simple and logical and depends on the degree of information search and reflection the consumer activates during the consumer buying process (Figure 7).

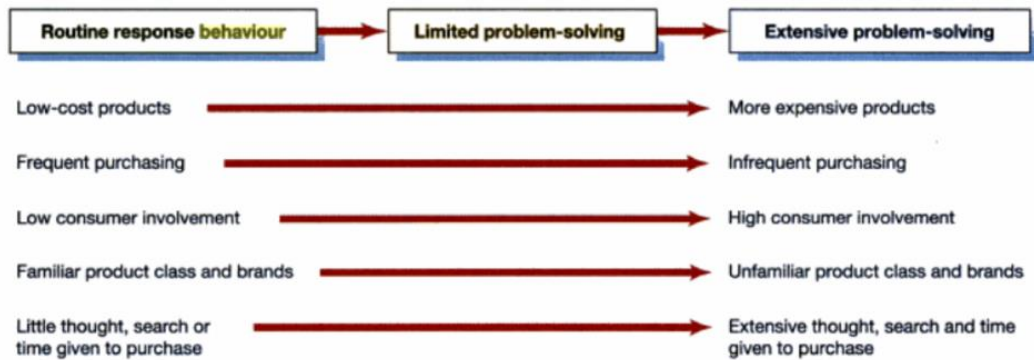


Figure 7 - A continuum of buying decision behavior (Solomon, 2006)

Another existing concept is called “The Marketing Spiral” (Armano, 2007). This approach distinguishes with its non-linear view on the consumer’s decision-making process. “Spiral” approach assumes the mechanism when the more consumer is engaged the more spiral amplifies. Thus, the process of one cycle can repeat adding further even more cycles (Figure 8).

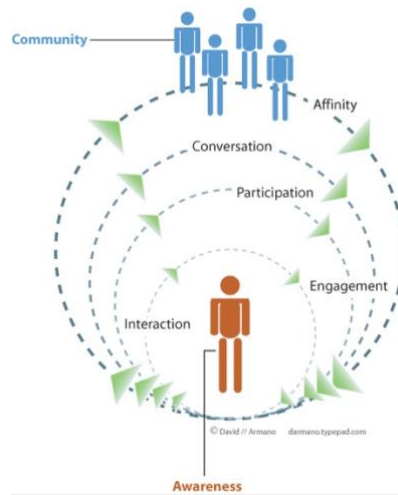


Figure 8 - “The Marketing Spiral” model (Armano, 2007)

Pretty similar concept of decision-making process to EKB’s model was presented in 2014 and was defined as “a five-step process used by consumers when buying goods or services” (Lamb, Hair, and McDaniel, 2014). The authors also highlighted the fact that not all the stages are needed to be passed by the consumer during each purchase and that each stage during consumer’s journey is influenced by combination of such factors as cultural, social, individual and psychological (Figure 9).

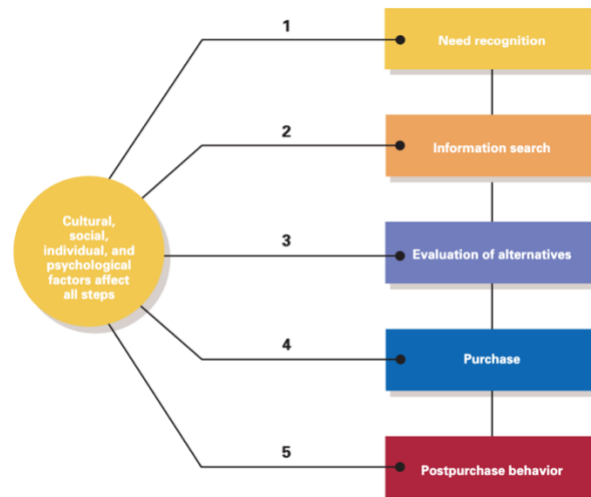


Figure 9 - Consumer Decision-Making Process (Lamb, Hair, and McDaniel, 2014)

McKinsey (2009) proposed a completely new approach of perception the consumer buying process even introducing the new name to the model calling it as “consumer decision journey” (Figure 10).

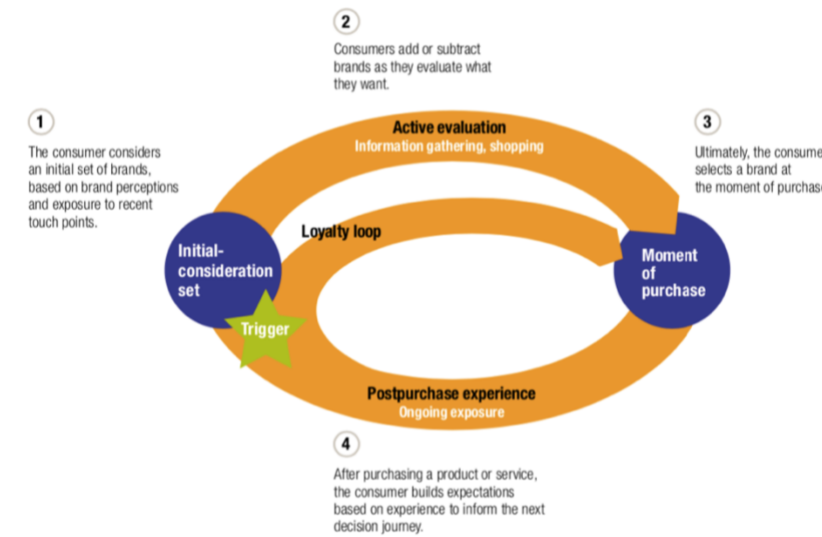


Figure 10 - The consumer decision journey

The reason for implementing this new concept lies in the obsolescence of the “funnel” metaphor (Figure 11) that assumed the following process of consumer consideration: starting the buying process consumer has a certain number of potential brands (which is related to the widest part of the funnel); then with the external influence of marketing forces the initial number of considered brands start to decrease (similar to the process of moving through the tunnel) coming up in the end with the one brand to purchase. McKinsey enhances that here the “funnel” concept is failing to catch all the moments where the consumer could be influenced implying that the whole process is not that simple and linear.

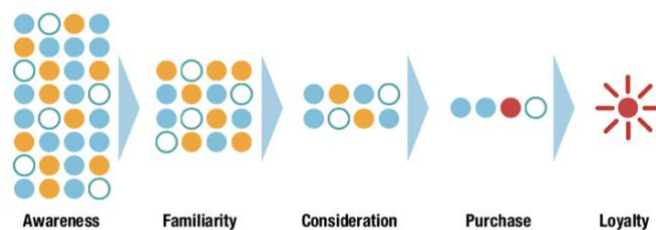


Figure 11 - The traditional funnel (McKinsey, 2009)

After conducting the study McKinsey came up with conclusions that increasing variability of media and products the brands have to look for new possibilities to embed in the process of initially considered set of brands. Moreover, conceptually, the “funnel” model involves the consequent narrowing the number of brands considering in the beginning coming up with the one option in the end flowing then in the post-purchase stage. In this case marketers tried to influence their customers during each stage of the “funnel” concept. However, the main point of the new approach is that the whole decision-making process rather looks like the circular one, not like the

funnel. In this model the marketers have four basic stages for undertaking any kind of action: initial consideration, active evaluation, moment of purchase and post-purchase experience.

Nevertheless, the above version of the customer buying process is not the latest one. In 2015 McKinsey decided about the update need due to increasing in brands fight for their customers' attention and possibility to influence their decisions. Today companies take the most from the journey use for both their customers and their brand. The ones who are successful with this experience are able to compress the consideration and evaluation phases and sometimes even eliminate them (Edelman, 2015). So, today the customer has two starting points to begin his journey (Figure 12). So, one of the assumptions that can be made here is that the customers with the higher level of digital competences are tend to stay within the "shorter" loop as they could be more proficient within the "consideration" and "evaluate" stages, when the customers with lower levels of digital competence could go back to the longer version of journey more often or even during each purchasing experience.



Figure 12 – New journey, Edelman, D (2015)

CHAPTER 2. RESEARCH METHODOLOGY

In this chapter the methodological framework of the research will be described and explained. So, it will include the research approach, data collection and its processing and analysis description.

2.1 RESEARCH APPROACH

The literature review conducted in the previous chapter, first of all, allowed to delve into the nature of digital products and electronic platforms in order to identify the necessary features, strong and weak sides related to them that can be relevant in the current research. Second of all, the main models related to consumer behavior in general as well as existing frameworks for consumer competencies were mentioned and analyzed.

The “competence” term in general is discussed across a variety of literatures under various angles. However, existing researches related to the main line of the current paper’s theme – digital competences of consumer – cover too broad directions in this topic. Thus, most of indexes and models were created in order to formulate the range of competences needed for the typical citizens in general to exist confidently and safely in the digital surface. For example, they included the competences that are necessary to operate a computer, to use computer applications and manage internet access that are called as “operational internet skills” (Van Deursen and Van Dijk, 2010). Some papers distinguished separate “domain part” that related to “computer, ICT, internet, multimedia” (Hatlevik, Ottestad & Throndsen, 2015). Moreover, most studies have been conducted at a more global level, examining cross-country differences, or identifying types of competencies at the national level (DigComp 2.1). And some papers look at digital competences in scope of quite narrow spheres (Marco Gui, et al., 2011) that implies the presence of its own specifics and makes it difficult to extrapolate such findings on other spheres or online users in general. Also, the term “digital competence” can be often met in some research papers uncovered from the point of view of business and tend to figure out the ways to reveal the SME’s ability to innovate to bring the most value for business side, not for customer’s one (Dragos Vieru, 2015).

Nevertheless, speaking about the research gap, existing concepts and models did not explain the full potential of customers digital competence needed to operate effectively via tech-enabled commerce and especially during digital goods’ consumption. Why there is an accent on online shopping via eCommerce and, particularly, digital goods’ consumption? According to recent statistics about 63% of shopping occasions begin online (Thinkwithgoogle, 2018) and about 62% of online buyers shop at least monthly (Episerver, 2019). The demand for online shopping is huge, and the way the experience of customer’s online consumption has changed is very

significant. However, none of the studies analyzes consumers for whether they have a sufficient set and variety of skills to successfully experience online consumption of digital goods. The importance of considering digital goods can be explained by tremendously growing tendency in its consumption. Thus, Russia, for example, is now one of the ten countries where the use of digital goods and services is very active – every second resident of the country are accessed at least once a week to digital goods consumption, according to the BCG research. Such type of goods was also considered in the first chapter for unique features, pros and cons of their consumption, so that they need special attention from the customer's side in terms of online purchases.

On the basis of described research gap the following research questions can be formulated:

RQ1: What digital consumer competencies and socio-demographic factors influence the purchase frequency of digital goods on electronic platforms?

RQ2: Does different digital goods categories require the presence of different digital competences and socio-demographic factors and what these differences are?

RQ3: What viable typology of consumers can be made according to their digital competence?

The answers for these formulated research questions will let to get deeper understanding of consumer's competence nature in terms of digital goods' online consumption and will help to figure out some insights regarding the relationship between consumer's self-evaluation and socio-demographic traits and their actual online buying behavior.

After determining the research questions of this research paper the specific approach of research organizing was chosen. As the essence of this work is about collecting and analyzing the data to further general knowledge it can be attributed to the basic research type. The topic under study is very raw in terms of the number of existing works. There are some works and indexes on digital competencies in general that were described in the previous chapter, but no one has narrowed this topic and has not dealt with digital consumer competencies in the context of purchasing digital goods through tech-enabled commerce yet. So, as the chosen topic of this research was not sufficiently studied by previous studies and also because of the reasons stated above this research is exploratory in its nature. This paper aims to explore and formulate some insights about consumer digital competence when the level of digitalization is as high as ever, especially when due to coronavirus consequences the customers started to change their buying behavior online and they have also become forced to adapt to the active online consumption of digital goods. Moreover, based on the results of this work it will be possible to formulate many directions for further development and deepening of the topic in order to obtain new important insights.

2.2 DATA COLLECTION METHODS AND PROCEDURES

Due to all the specifics of this research survey type was chosen as the most appropriate research method and, obviously, human-centered approach as the most suitable data collection approach.

In order to get the survey as accurate as possible and do not overload it with superfluous questions, a preliminary brainstorming session was first conducted regarding the structure of the survey, its logic, and the scale of the topics covered. Second, a pre-test interview was conducted on a limited number of people in order to be able to correct the questions before conducting a real survey.

During the brainstorming session, several main focuses were chosen, on the basis of which the entire survey was formed. The idea was to take into account all the important aspects for the survey as much as possible. The main features of digital products and e-Commerce platforms were considered, and the competences' list from latest frameworks "Digital Competence Reference Framework for Consumers" (2016) and "A Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2" (2018) were used as a basis for creating questions for questionnaire. However, in order not to focus on unnecessary competencies within the topic that were connected with solving technical problems or creating digital content, the final list from the considered framework has been adjusted and reduced. The original lists of competencies were analyzed and reduced to 10 most relevant to the digital goods consumption, which were later assigned to the four core areas of competencies (Table 10). These competences served as a basis and reference point for creating a survey and conducting an analysis of the key competencies that are necessary for purchasing digital goods. Also, each of the competences' areas were differentiated by a selection of knowledge, skills, and attitudes (Park, 2019).

Table 10 – List of selected competences from Global Framework of Reference on Digital Literacy Skills assigned to the particular areas

Digital Competences Areas	Competences
Digital security	Managing digital identity and profile in the digital marketplace Managing payments and finances through digital means Managing personal data and privacy
Digital communication	Interacting in digital marketplace with other parties with intention to buy Sharing information with other consumers in the digital marketplace
Digital literacy	Browsing and searching the information on digital goods Filtering information on digital goods Recognizing, evaluation and processing of advertisements

Digital rights	Understanding copyrights, licences, and contracts of digital goods Knowing consumer rights in the digital marketplace
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The next step was to create the first version of the survey based on the filtered and sorted list of competences mentioned above and test it on a small focus group of 10 respondents – undergraduate students of the Saint Petersburg State University. Also, the interview respondents were asked some additional questions regarding digital goods and self-evaluation criteria, answers for which will be analyzed further in the paper. Undergraduate students were selected as suitable sample group for survey pretest because the pretest needed a category of people who definitely had and continue to have an experience in making online purchases of digital goods. After pretest study all the feedbacks were taken into account so that the final version of survey was adjusted and upgraded. In addition to reducing the number of questions and adjusting the wording of the remaining ones, the most important changes were the including the parts about consumers’ self-assessment of their competencies, as well as a section with questions about consumption and attitudes to different types.

All the data for the final study was collected via Internet online survey, particularly through the special survey platform - Google Sheets. The survey was created for free because of the low-cost availability, in the Russian language and the whole process was fully anonymous for all the respondents in order to collect as much answers as possible and get the highest possible response rate. The link to the survey itself was distributed online via various social networks assuming that online communities are the most appropriate way and, of course, with the help of word of mouth. In the beginning of the survey there was a notification about the expected time to be spent on it - around seven minutes.

As for the target audience of the survey, it was limited to the citizens of the North-Western region of Russia. The choice was based on the results of a research project implemented in 2015 by the non-profit organization ROCIT (Golubovskaya, T., 2015). The main goal of the study was to develop a methodology for calculating the Digital Literacy Index in the regions of Russia. The North-Western region is the leader in the Digital Literacy Index, with a 34% higher value than the average one. Separate blocks show that the highest values are digital consumption and digital competencies, as well as the level of consumption of social networks, the competence of using mobile communication tools. Thus, this audience was considered as the most suitable one for conducting the survey in scope of selected topic for this research paper. For most of the questions in the survey 5-point Likert-type scales (1 = strongly disagree, 5 = strongly agree) was adopted for further analysis of consumer digital competences.

2.3 DATA PROCESSING AND ANALYSIS

Since the data collected by the survey relates to quantitative type, the most relevant method of analysis is statistical analysis. First of all, it was necessary to analyze the data itself and get a complete picture, structure and filter it. Secondly, it was necessary to identify significant cause-and-effect relationships that allow us to answer the research questions posed in the work. The interview was conducted in the period from the 23rd of March to the 1st of April. Speaking of the interview sample, which, as mentioned above, included 10 participants who were undergraduate students as they related to category of customers who had and continue to have an experience in making online purchases of digital goods. If we speak about the personal characteristics of the interview participants the following was stated about them (Table 11):

Table 11 – Core characteristics of interview respondents

№	Sex	Age	Education	Occupation	Income
1	Male	23	Master’s Degree	Getting a higher education	< 30,000 rub
2	Male	26	Postgraduate Degree	Work (part-time, combine with my studies)	31,000 rub – 60,000 rub
3	Female	24	Master’s Degree	Getting a higher education	< 30,000 rub
4	Male	23	Master’s Degree	Work (part-time, combine with my studies)	31,000 rub – 60,000 rub
5	Female	22	Master’s Degree	Work (part-time, combine with my studies)	< 30,000 rub
6	Female	24	Master’s Degree	Work (part-time, combine with my studies)	31,000 rub – 60,000 rub
7	Female	23	Master’s Degree	Getting a higher education	< 30,000 rub
8	Female	26	Postgraduate Degree	Work (part-time, combine with my studies)	61,000 rub – 90,000 rub
9	Female	24	Master’s Degree	Getting a higher education	< 30,000 rub
10	Male	24	Master’s Degree	Work (part-time, combine with my studies)	31,000 rub – 60,000 rub

As it can be seen from the table above (Table 12) women make up 60% of the respondents and men 40%. Almost all of the respondent obviously are getting their Master Degree, however there are two representatives of students who are getting their Postgraduate Degree. At the same time despite the fact that all of the respondent are students 60% of them already work part-time, thus as a consequence the average income of these respondents lies in the range of 31,000 rub – 60,000 rub.

The survey was conducted between the 1st of April and the 15th of April, and finally 345 responses were collected from respondents who purchased digital goods via tech-enabled commerce. In order to be sure that the respondents are aware about all the terminology and the

overall concept of the customer digital competence special examples and definitions were placed in the beginning of the survey.

For proceeding all the practical steps the SPSS and RStudio softwares were used. So, after all the data was structured and brought to the needed form the following statistical methods were applied:

- Descriptive statistics was in order to get some general basic features of the data in a manageable form. It includes summaries, means, medians and some other general indicators about the sample. Along with several simple graphics on the basis of such statistics the overall and complete picture about the data was formed.
- Cronbach's alpha was performed in order to measure the internal consistency of the survey results. In most of the researches it is assumed that a minimum alpha coefficient can lie between 0.65 and 0.8 and if it less than 0.5 it is usually considered as unacceptable.
- Factor analysis was chosen for densifying the data from many variables to the limited number. This analysis helps to figure out whether the questions in the survey have similar patterns in terms of responses.
- Cluster analysis was chosen for proceeding classification or in other words segmentation of the data, when it separated into groups on the basis of some similar patterns. The whole process of analysis involves selecting a distance measure, a clustering procedure, choosing the number of clusters, interpreting the profile clusters. So, in the end we got so-called homogenous groups.
- Cross-tabulation analysis conducted for finding the relation between socio-demographic respondents' characteristics and consumer digital competence.
- Finally, the regression analysis helped to describe the relationships between chosen independent and dependent variables.

CHAPTER 3. EMPIRICAL RESULTS

To get the answers on the stated research questions a number of statistical methods were used in the practical part of this research. Thus, the logic of this chapter will be structured in the following way: firstly, general descriptive statistics will be presented in order to analyze the responses received from the conducted survey, secondly; separate part will be devoted to the description of all the manipulations with consumer competencies, namely, their analysis and unification with factor analysis and determining the significant competences influencing on purchase frequency with the help of regression analysis; finally, the respondents' clustering on the basis of their competencies will be presented and analyzed.

3.1 RESEARCH SAMPLE

In the launched survey 345 respondents from the North-Western Federal district took part. After processing the survey results 31 responses were considered as irrelevant and eliminated as 28 respondents answered that they do not have a digital goods purchase experience via tech-enabled commerce and 3 responses duplicated existing ones by technical mistake. So, after deleting irrelevant responses, 314 observations on 70 variables were left for applying in subsequent research. In order to have a better understanding about the audience which responses are analyzed in the further parts, some general characteristics of our sample are presented below (Table 12).

Table 12 - General sociodemographic variables statistics of respondents

Characteristics	Frequency	Percentage
Sex		
Male	177	56.4%
Female	137	43.6%
Age		
< 18 years old	23	7.3%
18 – 25 years old	147	46.8%
26 – 35 years old	65	20.7%
36 – 45 years old	57	18.2%
46 – 55 years old	22	7.0%
Education		
Secondary education	29	9.2%
Specialized secondary education	27	8.6%
Bachelor's Degree	116	36.9%
Master's Degree	132	42.0%
Postgraduate study	10	3.2%
Occupation		
I am getting a secondary education	28	8.9%

I am getting a higher education	52	16.6%
I work (part-time, combine with my studies)	55	17.5%
I work (full-time, do not combine with my studies)	143	45.5%
I own business	11	3.5%
Freelancer / self-employed	7	5.4%
Unemployed	8	2.5%

The table above contains the information about 314 respondents regarding the following characteristics – gender, age, education level and income level. Speaking about gender, men and women are represented almost equally: 137 men and 177 women. However, the number of women is slightly more prevalent, which can be explained by the fact that in general women are slightly more likely to make any online purchases.

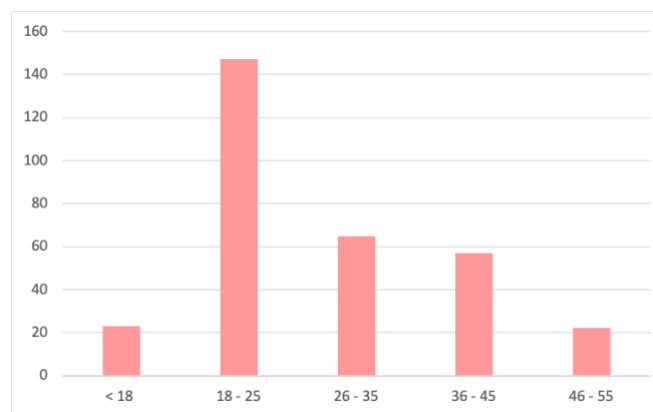


Figure 13 – Respondents' age distribution

Further, based on the graphs above (Figure 13), can be seen that the entire sample is represented by buyers of five age categories. However, as it was expected the sample results differ from the normal distribution and are skewed towards the predominant second category of buyers aged 18 to 25 years old. This happened due to the following reasons: firstly, this group of respondents correlates with the age of the researcher, which influenced a larger number of survey participants from this category, and secondly, this group of respondents is the most active in terms of digital space in general. At the same time, the categories “26-35 years” and “36-45 years” are represented almost equally by about 21% and 18%, respectively and categories “below 18” and “46-55 years” are also represented by the same percentage – 7%.

As for education, the skewness of the sample by age parameter also explains the large percentage of those who have already received or are still in the process of obtaining a bachelor's or master's degree what is equal to 37% and 42% respectively. However, the remaining categories representing secondary and specialized secondary education have a relatively small percentage,

which allows to suggest that this study will deal with consumers with a fairly high level of education.

Despite the fact that the sample is represented by a fairly young age group, almost half of the sample works on a permanent basis, not combining with studies and makes up 46% of the sample. Taking into account that a significant proportion of people may not have completed their education yet, but are in the process of getting it, then in the second place logically follows that a significant number of those who work on part-time basis, combining with their studies.

If we look at the geographical location of respondents, all of them represent the North-Western Federal district, as it was stated and explained above. The distribution of the respondents to the federal subjects is presented in the table below (Table 13):

Table 13 – Respondents’ geographical distribution

Federal subject	Frequency	Percentage
Saint – Petersburg	213	67.8%
Leningrad region	45	14.3%
Novgorod region	28	8.9%
Pskov region	15	4.8%
Arkhangelsk region	13	4.1%

As it was expected most of the respondents are from Saint-Petersburg that represents almost 68% of all respondents. The rest share of respondents was distributed in descending order in the Leningrad (14,3%), Novgorod (8,9%), Pskov (4,8%) and Arkhangelsk (4,1%) regions.

Since the subject of the study is focused on making purchases in relation to digital goods, the level of average monthly income of respondents deserves the special attention. As we are studying the respondents from particular geographic area, according to the latest data from Rosstat, as of 2019, the average salary in the North-Western Federal district was about 52,000 rubles. Taking into account that almost 68% of respondents present Saint-Petersburg and 14,3% are from Leningrad region, it is worth to specify that according to the latest data dating 2019 year Rosstat states that the average salary in St. Petersburg was about 64,000 rub and in the Leningrad region was 45,000 rub. Analyzing the distribution of the average monthly income of respondents, it can be easily seen that the income of a third of all buyers does not exceed 90,000 rub, namely, 26% of consumers have an income less than 30,000 rub, and in the same proportion (24%) are respondents with an income in the ranges of 31,000 rub - 60,000 rub and 61,000 rub - 90,000 rub. However, the average income of 16% of the respondents lies in the range of 91,000 rub – 120,000 rub, which is significantly higher than the average income of the whole North-Western district, however, we should not forget about a certain percentage of business owners and freelancers who usually earn

above the market, and also that those consumers who work full time, without combining with their studies, can occupy quite high-ranking positions that provide a higher-than-average level of income.

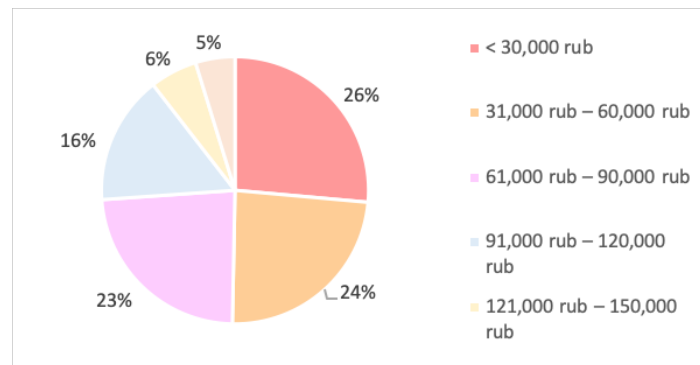


Figure 14 – Respondents' average monthly income level

Thus, although the sample has slight skewness tendency by age and geographical characteristics, the number of respondents and the variety of their general characteristics make up a fairly representative sample for further research.

3.2 DIGITAL GOODS CATEGORIES ANALYSIS

Next, to move on to the next part of the analysis, we need to mention a few more details about the digital goods categories. The selection of the final list of categories considered in the work began with an analysis of the literature review of papers covered in the first chapter regarding digital goods, especially focusing on the already described categorization options.

It is worth saying that there are actually not too many options exist for categorizing digital goods. Moreover, as it was stated by Whinston, 2003 “the list of digital products is bounded only by human imagination. Still, they share a number of common traits.”. The classifications that were discussed in the first chapter covered quite diverse range of existing digital goods. Despite taking into account already existing categorization options of digital goods another thing was also considered. Previous researches distinguished two types of customer’s uncertainty: first is about product quality and the second is about product fit with a consumer’s taste. So, here we get the risk when the digital product’s condition will not relate to the expected and also the vendors may fail to communicate needed product information to consumers (Hong, Pavlou, 2014). All these consequences are especially suitable for so-called “experience goods” that create a quite level of uncertainty as the quality of experience goods is realized only after use. So, such types of digital goods are of high interest in terms of required consumer competence as they potentially more “complicated” for consumers. However, when differentiating the types of digital products, it was decided to focus on the type of content that underlies the category. In other words, it was taken

into account whether digital products were based on audio content, or video content, or graphic content, and so on in order to create broad categories and cover as much digital goods as possible.

Thus, the final list digital goods categories are presented in the table below (Table 14).

Table 14 - Final list of the digital goods categories

CATEGORIES	EXAMPLES
Text-based digital goods	eBooks, online reports, online magazines, online newspapers, templates (email, business document etc.), online guides, phone books etc.
Audio-based digital goods	Audio books, podcasts, music, sound effects etc.
Video-based digital goods	Films, video tutorials, paid webinars etc.
Image-based digital goods	Photos, fonts, logos, icons etc.
Tools and software	Apps, plugins, website templates etc.
Tickets and reservations	E-ticket for a plane, hotel reservation etc.
Online courses and training	Online course with video/audio materials, paid online training etc.

Respondents were also asked to evaluate the categories presented in accordance with the frequency of purchasing digital goods from each of them.



Figure 15 – Pie charts of “Text-based” (left) and “Image-based” (right) digital goods category purchase frequency

Consumer purchases in categories «Text-based” and “Image-based” (Figure 15) are not popular, so more than 60% of consumers do not buy these categories at all, and about 20% made only one-time purchases. The remaining part of respondents who make relatively frequent purchases is very small and their regularity of purchases can be explained, for example, by the specifics of their employment or some existing subscriptions.

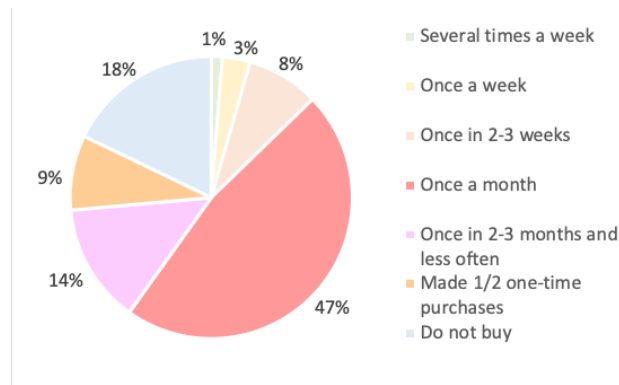


Figure 16 – Pie charts of “Audio-based” digital goods category purchase frequency

Speaking about the “Audio-based” digital goods (Figure 16) the majority of consumers (47.1%) buy digital products with relative regularity - once a month. This can be explained by the tendency of many respondents to use subscriptions for any audio content consumption. Also more than 8% of the respondents are tend to make more frequent purchases – once in 2-3 weeks – so here it is possible to make assumptions that some people can prefer to buy audio content separately, not using the subscription options, also these people could be true fans of some audio-based content makers and to consume all the updated content, or they could also have several subscriptions for various content in general.

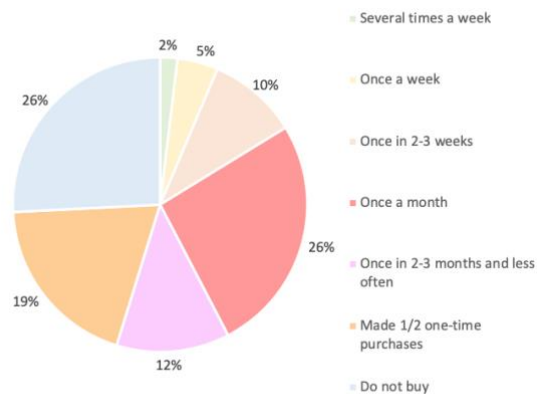


Figure 17 - Pie charts of “Video-based” digital goods categories purchase frequency

Frequency consumption of “Video-based” digital goods category (Figure 17) is quite diverse. The same proportion of people (26%) both buy them regularly once a month, and do not buy at all, and 19% of respondents made only 1-2 one-time purchases at all. The rest of the respondents, on the contrary, tend to buy such content quite often.

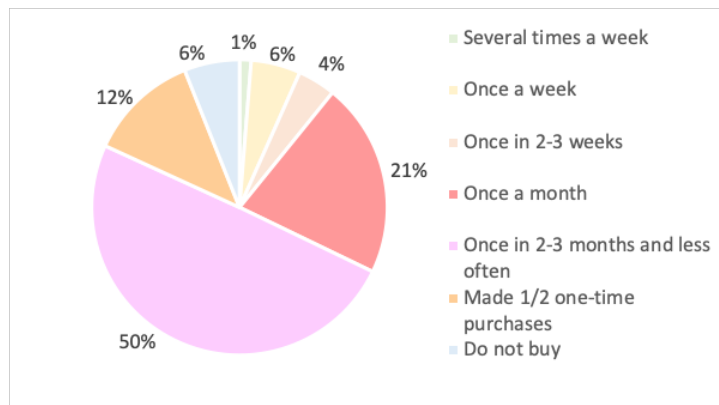


Figure 18 - Pie charts of “Tickets and reservations” digital goods categories purchase frequency

A slightly different behavior is shown in relation to the consumption of digital goods of the "Tickets and reservations" category. An interesting fact is that only 6.1% of all respondents do not purchase products from the first category (Figure 18). At the same time, more than half of the respondents make purchases every 2-3 months or even less often, where 12.1% of them made only 1-2 one-time purchases at all.

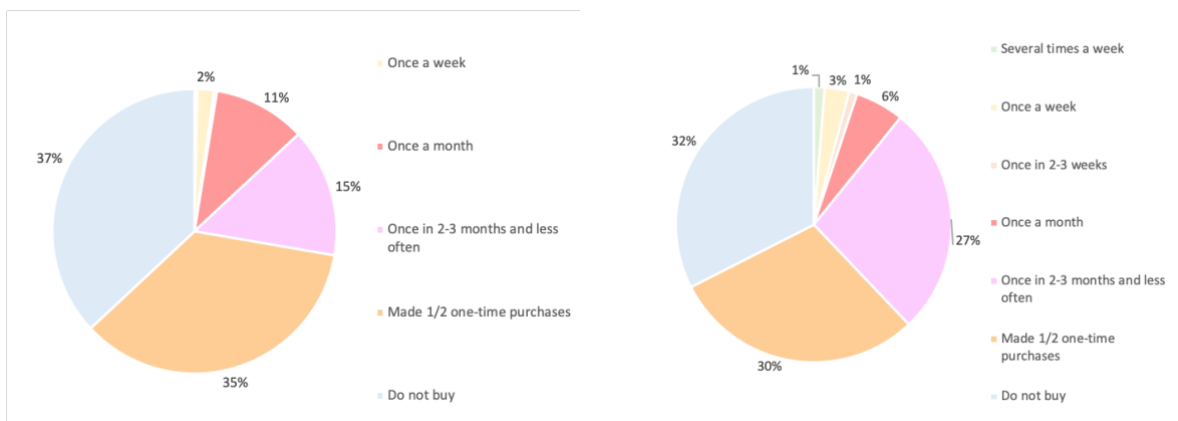


Figure 19 - Pie charts of “Software and Tools” (left) and “Online Courses and Trainings” (right) digital goods categories purchase frequency

The next two categories (“Software and Tools” and “Online Courses and Trainings”) have slightly similar patterns of consumption (Figure 19). Most people do not consume digital products from these categories at all (more than 30%) or have made only 1-2 one-time purchases (also more than 30%). Also, in category 1, there are 27% of consumers who buy digital products every 2-3 months or less. A possible explanation for this behavior may be the relative high cost of products from these categories. Also, it should be mentioned that as the survey of the respondents were conducted during the quarantine period implemented in Russia due to Covid-19 influence there was an assumption that the consumers could face the habit changes of their digital goods’ consumption. Thus, the following question was asked: “Have your habits regarding buying digital goods online changed during the quarantine compared to the period before it?”. However, more

than the half responses regarded to the answers “No, my habits didn’t change” and “No, but given a longer quarantine, I assume they might change” (Figure 20). So, in this particular research all the data was considered without Covid-19 effect influence.

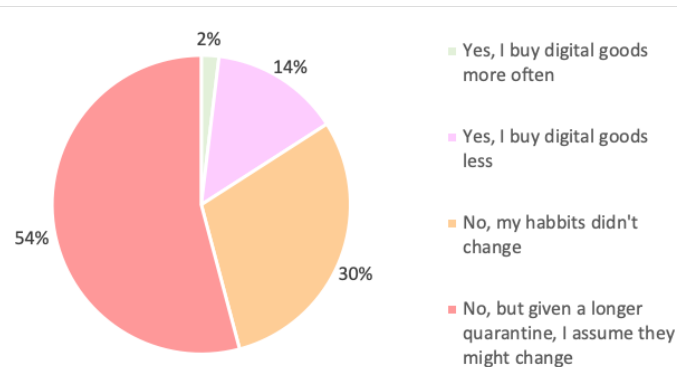


Figure 20 – The respondents answers’ statistics to Covid-19 influence on their purchase habits

3.3 FACTOR ANALYSIS RESULTS

Taking into account all the features of both digital goods themselves and electronic platforms described in the first chapter, the main consequence is that a new type of products, a complex and constantly updated format of electronic platforms create not only advantages, but also difficulties for consumers, and will also impose certain requirements on their competencies, if they want to successfully implement their purchases. Further analysis will make an attempt to investigate which digital competence can potentially help consumers to make successful purchases.

According to the results of the survey, 27 questions related to the competence of consumers and using 5-point Likert-type scales (1 = strongly disagree, 5 = strongly agree) were answered. In fact, they were taken as 27 variables, that at the first stage required classifying and their possible reducing, for which factor analysis was chosen as an ideal method for achieving these goals.

The very first step prior to factor analysis is checking the questionnaire scales for reliability and internal consistency, for which purposes the Cronbach’s Alpha was chosen to be calculated. It is the most common form of internal consistency reliability coefficient. Thus, Alpha is equal to 0 when the true score is not measured at all, and the observed score contains only the error component, and alpha is 1.0 when all points measure only the true score and there is no error component in the observed score. By agreement of the researchers, “soft” cut-off 0.60 is accepted for exploratory research; alpha which is 0.70 or higher considered as "satisfactory" scale; and most researchers require a cutoff 0.80 for a "good" scale.

So, all the 27 questions related to the digital competences of consumers were tested. The resulting Cronbach's alfa coefficient resulted in 0.804 (Table 15), that is as alpha is higher than 0.08 it says about considering it as a "good" scale and about the high level of reliability and internal consistency in scope of the current sample. Additionally, the items statistics was calculated (Appendix 2) that also demonstrated the variables' consistency.

Table 15 - Reliability statistics results, SPSS output

Reliability Statistics	
Cronbach's Alpha	N of Items
0,804	27

Moreover, another step prior to realizing the factor analysis was checking the data for the normality with the help of Shapiro Wilk's test. All the tests results had the Significance level (p-value) lower than 0,05, so that we couldn't speak about the data normality (Appendix 2). As all the data is not normally distributed the extraction method that will be chosen for factor analysis is principal axis factoring (PAF), as it does not require the data normality condition. So, after these steps for each DQ Areas' questions the factor analysis was applied.

Initially, the data was checked for suitability to conduct the factor analysis. Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's test of sphericity were calculated for this purpose. For all the dimensions KMO's indicator was quite high (> 0.6) and the p-values of Bartlett's test are less than 0.05 so that all the data can be seen as suitable for the factor analysis (Appendix 2).

During the initial stage of factor analysis we determined the minimum number of factors that adequately reproduce the observed correlations for each dimension, and the Parallel Analysis Scree Plots were built for this purpose. The line of the plot demonstrates eigenvalues of actual data, here we needed to look at the significant drops in the actual data and particularly take the point where it levels off to the right. According to the Parallel Analysis the recommended number of factors for Digital Security group of variables - 2 factors (two factors with Eigenvalue > 1 were generated, accounting for 55.967% of variance), 1 factor for Digital Communication group (one factor with Eigenvalue > 1 and cumulatively explaining over 61% of the variance), 2 factors for Digital Literacy group (two factors with Eigenvalue > 1 , accounting for 58% of variance) and 2 factors for Digital Rights group (two factors with Eigenvalue > 1 , accounting for 61% of variance) (Table 16).

Table 16 - Total variance explained, Factor analysis output from SPSS

Dimension	Component	Initial eigenvalues		
		Total	% of variance	Cumulative %
Digital Security	1	2,280	38,004	38,004
	2	1,078	17,964	55,967
Digital Communication	1	1,833	61,106	61,106
Digital Literacy	1	2,857	40,812	40,812
	2	1,205	17,216	58,029
Digital Rights	1	1,890	37,799	37,799
	2	1,143	22,852	60,651

As the next step, in order to formulate the interpretation of stated number of factors the factor loadings were analyzed. The rotated matrix tables allowed to make the process of the factors' interpretation much easier in comparison to matrix with unrotated solution. The final SPSS outputs of rotated component matrix with factors' loadings exceeding the 0.4 value are presented in the Appendix 2 (variables with factor loadings that are lower than 0.4 were eliminated from the final tables).

Keeping in mind the fact that factor analysis is only an additional tool for identifying the final factors, then based on the semantic load of the analysis results, it was decided to form 7 final factors, which interpretation is given below.

Thus, the first factor of Digital Security group corresponds to the consumer's ability to operate, create and manage the data related to online accounts within various e-commerce platforms and related to the payment information. And the second factor of this group is about consumer safety feelings during making online purchases that require performing personal information and payment information and also in terms of online account creation.

The Digital Communication dimension got only one factor that reflected the knowledge of the consumer about how communication organized on online trading platforms and his skills to implement communication with relevant persons when necessary.

The Digital Literacy got two factors. The first factor presents the consumer's skills to search and filter the information he finds about the digital goods and channels online and knowledge level about the search engines mechanisms and general understanding of existence the add content among the search results. And the second factor reflects customer's values and attitudes towards evaluating information very critically and towards very active finding and collecting information about digital goods.

Finally, speaking about the Digital Rights dimension we got again 2 factors in the end, where the first one is about consumer's knowledge of the legal framework with regards to publishing, commenting or selling online and the skills to identify and differentiate illegal and

inappropriate for consumption types of digital goods and platforms where it is possible to purchase them. And the other factor reflects the attitude of consumer towards illegally published or downloaded content.

The aggregated and simplified names of the final factors are shown in the table below (Table 17):

Table 17 – Interpretation of final list of factors

Factor	Name
Factor 1	Digital Security skills
Factor 2	Digital Security attitude
Factor 3	Digital Communication knowledge & skills
Factor 4	Digital Literacy knowledge & skills
Factor 5	Digital Literacy attitude
Factor 6	Digital Rights knowledge & skills
Factor 7	Digital Rights attitudes

In the result of the factor analysis we got 7 well-interpreted factors. Also, in order to be able to interpret these factors adequately in the further analysis the factor scores were compound as means.

3.4 REGRESSION ANALYSIS OF COMPETENCES INFLUENCING BUYING FREQUENCY

It was mentioned previously that the process of online consumption of digital goods cannot be easy for everyone and can require certain competences from the consumers. As a consequence, it can also influence the way they do their purchase, particularly how successful they do it. In this research the measure of success of the customer experience will be considered as the frequency of purchases they made. In order to test the existence of the influence of consumers' digital competencies on the frequency of purchases of digital products, multiple linear regressions were constructed.

To be more specific, the ordinal linear regression was applied, an extension of the generalized multiple linear regression model in which the dependent variable is measured on an ordinal scale and independent variables can be categorical or quantitative. In our case we have purchase frequency in different digital goods categories as the dependent variable on an ordinal scale. As independent variable we take all the variables regarding digital competences (defined previously with the help of factor analysis) and sociodemographic characteristics (sex, age,

education, income). Before the analysis the data was checked for missing variables as the result might suffer from the impact and thus become invalid. So, data did not have any missing values. Setting the alpha equal to 0.05 the following hypothesis were formulated:

H0: there is no statistically significant digital competences that influence the purchase frequency of digital goods

H1: there is at least one statistically significant factor among the variables that influence the purchase frequency of digital goods

It is needed to mention that it is planned to build 7 models, where the frequency of purchases of digital goods from different 7 categories will be considered as dependent variables. These categories are: “Text-based”, “Audio-based”, “Video-based”, “Photo-based”, “Software and Tools”, “Tickets and reservations”, “Online courses and trainings”. All variables belong to the type of ordinal variables, and are represented by a seven-point scale: 1 - "do not buy", 2 - "made 1-2 one-time purchases", 3 - "once in 2-3 months and less often", 4 - "once a month", 5 - "once in 2-3 weeks", 6 - "once a week", 7- "several times a week".

So, the full step by step actions for regression analysis will be presented on the example of first regression model with the purchase frequency of “Audio-based” digital goods category as dependent variable (all the rest key outputs for the models are presented in the Appendix 3).

Basically, there are four key assumptions that have to be met for performing ordinal linear regression:

1. The dependent variable is ordered.
2. One or more of the independent variables are either continuous, categorical or ordinal.
3. There is no multicollinearity within independent variables.
4. Proportional odds assumption.

Compliance with the first two assumptions about dependent and independent variables was supported by above explanation. In order to check one of the regression’s assumption about multicollinearity, particularly that variables are independent of each other the Variable Inflation Factor was calculated. All the VIFs values did not exceed the 2.5 (for this research this value was taken as the critical one) that is why it was concluded that the multicollinearity was absent (Table 18). And the most important assumption for this model – about proportional odds – is discussed further.

Table 18 – VIF results for variables included in regression model

Independent variables	VIFs
Sex	1.066921
Age	2.104366
Education	1.196102

Income	1.448640
Digital Security skills	1.193828
Digital Security attitude	1.229792
Digital Communication knowledge and skills	2.003937
Digital Literacy knowledge and skills	1.494227
Digital Literacy attitude	1.680218
Digital Rights knowledge and skills	1.326034
Digital Rights attitude	1.106633

So, after building the first model, we first evaluate whether there is a significant improvement in fit of the Final model relative to the Intercept only model. The negative value of 2LL (Double value of the logarithm of the likelihood function) is used as an estimate of the significance of the contribution of individual independent variables to the improvement of forecasts obtained using the model. In our case we got a significant improvement in fit of the Final model as there is a statistically significant chi-square statistic (Table 19). The same result was for the Model 2 fitting information (Appendix 3).

Table 19 - Model Fitting Information, Model 1

Model Fitting Information				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	949,831			
Final	851,538	98,293	39	0,000

In order to test whether a model exhibits good fit to the data the Deviance and Pearson chi-square tests were counted. Here the Pearson chi-square test and the deviance test are both non – significant, so that these results suggest good model fit (Table 20).

Table 20 - Goodness-of-Fit, Model 1

Goodness-of-Fit			
	Chi-Square	df	Sig.
Pearson	1877,039	1779	0,052
Deviance	848,765	1779	1,000

For ordinal linear regression the R-square metric does not equal to the one that we used to see on OLS regression. So, in the table shown the pseudo-R-square values found for the Model 1 (Table 21). Although, there are no strict rules in the existing literature on how these values should

be interpreted in appropriate way (Pituch & Stevens, 2016), sometimes, most often, Nagelkerke value is used with the same meaning of R-square. In this case we can speak about almost 38% explained variation between customer's purchase frequency of digital goods of "Audio-based" category and taking into account the specific of research and data this value could be seen as a good one. However, in this research we would rather refrain from such a direct interpretation of these coefficients.

Table 21 - Pseudo R-Square, Model 1

Pseudo R-Square	
Cox and Snell	0,369
Nagelkerke	0,382
McFadden	0,103

One more way to verify the ordinal linear logistics regression model fitting is to look at the results of likelihood ratio test (Table 22). It can be concluded that the final model statistically significant predicted the dependent variable: Likelihood Ratio Chi-Square equal to 98,293, p-value < 0,05.

Table 22 – Omnibus test

Omnibus Test^a		
Likelihood Ratio Chi-Square	df	Sig.
98,293	39	0,000

As the next step the regression coefficients and the significance test for each of the independent variable were found. However, in order to get the Odd Ratio's (OR's) coefficients reflecting the changing odds of a case falling at a next higher level of the dependent variable the exp(Estimate) was found. The final model is presented in the Appendix 3, and the significant variables for Model 1 are presented in the table below (Table 23).

Table 23 - Parameter Estimates with significant independent variables, Model 1

Parameter Estimates											
Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test			Exp(B)	95% Wald Confidence Interval for Exp(B)	
				Lower	Upper	Wald Chi-Square	df	Sig.		Lower	Upper
Threshold	[Freq_sound=0]	1,386	1,3799	-1,318	4,091	1,010	1	0,315	4,001	0,268	59,802

	[Freq_sound=1]	1,956	1,3818	-0,752	4,665	2,004	1	0,157	7,074	0,471	106,138
	[Freq_sound=2]	2,685	1,3875	-0,034	5,405	3,746	1	0,053	14,663	0,966	222,490
	[Freq_sound=3]	5,344	1,4116	2,577	8,111	14,332	1	0,000	209,386	13,163	3330,662
	[Freq_sound=4]	6,545	1,4271	3,748	9,342	21,032	1	0,000	695,620	42,425	11405,615
	[Freq_sound=5]	7,849	1,4883	4,932	10,766	27,812	1	0,000	2562,185	138,612	47360,877
	[Sex=female]	-0,657	0,2266	-1,101	-0,213	8,407	1	0,054	0,518	0,333	0,808
	[Sex=male]	0 _a							1		
	[Age=<18]	0,662	0,8304	-0,966	2,289	0,635	1	0,425	1,938	0,381	9,869
	[Age=18-25]	0,300	0,4627	-0,607	1,206	0,419	1	0,517	1,349	0,545	3,342
	[Age=26-35]	0,248	0,4521	-0,638	1,134	0,301	1	0,583	1,282	0,528	3,109
	[Age=36-45]	0,200	0,4552	-0,692	1,092	0,194	1	0,660	1,222	0,501	2,981
	[Age=46-55]	0 _a							1		
	[Education=bachelor's degree]	0,185	0,4060	-0,611	0,981	0,208	1	0,649	1,203	0,543	2,667
	[Education=master's Degree]	0,346	0,4145	-0,467	1,158	0,695	1	0,404	1,413	0,627	3,184
	[Education=postgraduate study]	0,961	0,8243	-0,654	2,577	1,361	1	0,243	2,616	0,520	13,158
	[Education=secondary education]	1,212	0,6732	-0,107	2,531	3,242	1	0,072	3,360	0,898	12,572
	[Education=specialized secondary education]	0 _a							1		
	[Income=<<30,000]	-0,521	0,4334	-1,370	0,329	1,444	1	0,229	0,594	0,254	1,389
	[Income=>151,000]	-1,215	0,5314	-2,257	-0,174	5,232	1	0,022	0,297	0,105	0,840
	[Income=121,000-150,000]	-1,151	0,5350	-2,200	-0,103	4,631	1	0,031	0,316	0,111	0,902
	[Income=30,000-60,000]	0,006	0,3911	-0,761	0,772	0,000	1	0,989	1,006	0,467	2,164
	[Income=61,000-90,000]	-0,730	0,3678	-1,451	-0,009	3,943	1	0,047	0,482	0,234	0,991
	[Income=91,000-120,000]	0 _a							1		
	Digital Security skills	0,518	0,2418	0,044	0,991	4,582	1	0,032	1,678	1,045	2,695
	Digital Security attitude	0,259	0,1403	-0,016	0,534	3,414	1	0,065	1,296	0,984	1,706
	Digital Communication knowledge & skills	-0,024	0,1630	-0,343	0,296	0,021	1	0,884	0,976	0,709	1,344
	Digital Literacy knowledge and skills	-0,281	0,1596	-0,594	0,032	3,106	1	0,078	0,755	0,552	1,032
	Digital Literacy attitude	-0,153	0,1317	-0,411	0,105	1,343	1	0,247	0,858	0,663	1,111
	Digital Rights knowledge and skills	0,253	0,1095	0,039	0,468	5,361	1	0,021	1,288	1,040	1,597
	Digital Rights attitude	0,259	0,1137	0,036	0,482	5,174	1	0,023	1,295	1,036	1,619
	(Scale)	1 _b									

From the table, it is possible to find out which factors have a significant impact on the dependent variable in general. Such factors are Income, Digital Security skills and Digital Rights competence dimension (knowledge and skills, attitude).

However, it is crucial to highlight that when categorical variables with several levels are used in regression as independent ones, each level of the categorical variable is dummy coded (i.e., coded 1 if the observation falls in that category and 0 otherwise). Hence, an increase of one unit in the ordinal predictor score means a change from 0 to 1. That is equivalent to saying: relating of the observation to particular category leads to change of the probability of being in a higher level of the dependent variable. So, if we look at the Exp(B) column which are actually the mentioned above Odd Ratio's we can interpret this indicator as following: an odd ratio > 1 assumes an increasing probability of being in a higher level on the dependent variable and correspondingly an odd ratio < 1 suggests a decreasing probability. So, relating to the Income categories "61,000 – 90,000", "121,000 – 150,000", ">151,000" does not lead to the increasing probability of falling into the group of those who buy digital goods from "Audio-based" category more often (their exp(B) indicator < 1). And therefore, one unit increase of Digital Security skills, Digital Rights knowledge and skills, Digital Rights attitude leads to increasing odds of being in a higher level on the dependent variable. These results can be interpreted as following: customers whose income lies in the ranges "61,000 – 90,000", "121,000 – 150,000", ">151,000" do not have a higher probability to make purchases from considered category more often. At the same time, if the level of Digital Security skills, Digital Rights knowledge and skills and Digital rights attitudes increases for one unit the odds of making the purchase more often also increases.

Finally, the assumption of proportional odds that suggests that the relationships between the independent variables are the same across all possible comparisons was checked with the Test of Parallel Lines. The result indicates insignificance of the result which confirms that assumption is satisfied (Table 24).

Table 24 – Test of Parallel Lines, Model 1

Test of Parallel Lines^a				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	851,538			
General	698.009 ^b	153.529 ^c	195	0,987

All the same steps were made for all other 6 models, the outputs for which can be found in the Appendix 3. So, all the assumptions were met, and the quality of the model is high enough to

interpret their results. Thus, the significant variables for the rest of models are stated below, however, the full number of accompanying outputs are presented in Appendix 3.

- **Model 1:** dependent variable – purchase frequency of “Text-based” digital goods
Significant variables (exp(B)): Digital Literacy knowledge and skills (1,521).
Interpretation: $1,521 > 1$, then with the increase of Digital Literacy knowledge and skills level the odds of more frequent purchases increase.
- **Model 2:** dependent variable – purchase frequency “Video-based” digital goods
Significant variables (exp(B)): Digital Rights knowledge and skills (1,054), Digital Rights attitude (1,177).
Interpretation: $1,054 > 1$ and $1,177 > 1$, then with the increase of Digital Rights knowledge and skills and Digital Rights attitude level the odds of more frequent purchases increase.
- **Model 3:** dependent variable – purchase frequency “Image-based” digital goods
Significant variables (exp(B)): Digital Communication knowledge and skills (1,123), Digital Rights attitude (1,503).
Interpretation: $1,123 > 1$ and $1,503 > 1$, then with the increase of Digital Communication knowledge and skills and Digital Rights attitude level the odds of more frequent purchases increase.
- **Model 4:** dependent variable – purchase frequency “Tickets and reservations” digital goods
Significant variables (exp(B)): Digital Security skills (1,837), Digital Communication knowledge and skills (1,438).
Interpretation: $1,837 > 1$ and $1,438 > 1$, then with the increase of Digital Security skills and Digital Communication knowledge and skills level the odds of more frequent purchases increase.
- **Model 5:** dependent variable – purchase frequency “Software and Tools” digital goods
Significant variables (exp(B)): Digital Security skills (1,636), Digital Rights knowledge and skills (1,288).

Interpretation: $1,636 > 1$ and $1,288 > 1$, then with the increase of Digital Security skills and Digital Rights knowledge and skills level the odds of more frequent purchases increase.

- **Model 6:** dependent variable – purchase frequency “Online courses and trainings” digital goods

Significant variables (exp(B)): Digital Security skills (1,448)

Interpretation: $1,448 > 1$, then with the increase of Digital Security skills level the odds of more frequent purchases increase.

Thus, to sum up, the null hypothesis for each regression model was rejected as in the result of each model we got at least one significant digital competence variable. Analyzing the final list of significant variables, it can be stated that the increase of competences level from Digital Rights dimension leads to purchase frequency increase within almost all categories (except “Text-based” and “Tickets and reservations”). The same effect demonstrated the competences related to Digital Security Skills for “Tickets and Reservation”, “Software and Tools”, “Online courses and trainings” and “Audio-based” digital goods categories. The level increase of competences related to Digital Communication knowledge and skills has an impact on purchase frequency from “Image-based” and “Tickets and reservations” categories of digital goods, when the purchase frequency increase in “Text-based” category is influenced only by competences related to Digital Literacy knowledge and skills. The more detailed explanation is presented in the fourth chapter.

3.5 CLUSTER ANALYSIS OF CUSTOMERS ON THE BASIS OF THEIR DIGITAL COMPETENCE

Previously, the analysis was conducted that allowed us to identify certain factors related to a certain group of competencies, and significant competencies that affect different categories of digital products were also identified. The goal of the next step is to define whether a viable typology of consumers according to their digital goods consumer competence could be detected.

In order to achieve this goal the cluster analysis was applied. The hierarchical clustering method was used in order to figure out the relevant number of clusters hidden within the dataset. So, as it visualized below on the Cluster Dendrogram we got three clusters in the end (Figure 21).

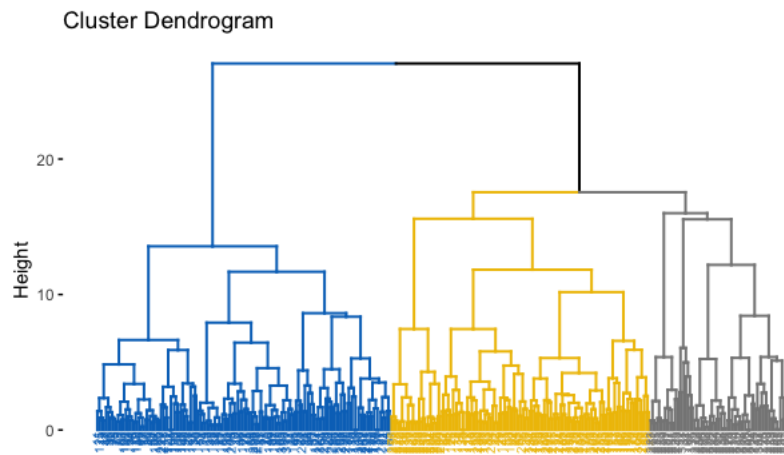


Figure 21 – Cluster Dendrogram

The first cluster included 127 respondents, the second one had 117 respondents and the third one got 70. In order to have more visual representation of cluster differences, the table below (Table 25) shows the results of previously identified factors related to consumer digital competencies.

Table 25 – Results of cluster analyses

Clusters	Number of respondents	Digital Security		Digital Communication	Digital Literacy		Digital Rights	
		Skills	Attitude	Knowledge & Skills	Knowledge Skills	Attitude	Knowledge & Skills	Attitude
1	127	4,73	3,8	4,34	4,3	4,3	3,87	3,9
2	117	4,57	3,5	4,12	3,9	3,8	2,72	2,7
3	70	4,41	3,2	2,94	3,4	2,3	2,8	3,1

So, how can we characterize the resulting clusters? First, the table shows the differentiation of competencies among “stronger” and “weaker” clusters. Thus, the first cluster includes consumers who have a fairly confident level of almost all types of competencies, excluding only the slightly sagging part associated with the “Digital Rights” dimension. The second cluster includes consumers who have a moderate level of Digital Communication competence and Digital Security competence, while maintaining slightly lower indicators for skills and attitude in the context of "Digital Literacy" and “Digital Rights” dimensions. Finally, in the third cluster there are respondents whose competencies are relatively weaker in all the parts, excluding relatively high indicator for skills in the part of "Digital security".

To get an even more detailed picture of the clusters obtained, the purchases frequency of the above-mentioned product categories was analyzed across three groups, the indicator of self-evaluation of competencies by the consumer and some sociodemographic features were compared

and analyzed within the clusters (Appendix 4). The portraits of the consumer from each cluster can be presented in the following way:

a. Cluster №1 (high overall rate of digital competences)

- **High:** all the competences; **Medium:** “Digital Rights attitude”; **Low:** none.
- **Self-evaluation:** most respondents evaluate their competencies as the highest ones
- **General description:** The consumers from this group have a high level of knowledge, skills and attitudes in most of the categories of competencies. In this regard, they are confident in their actions and do not tend to carefully search and evaluate the terms and conditions before making a purchase of digital goods. As they are quite active in purchasing digital goods they also do not support the illegal publishing/using/downloading of the digital goods online. In terms of age, this group is the youngest of all clusters, but with the highest level of education and relatively low income.

b. Cluster №2 (medium overall rate of digital competences)

- **High:** “Digital Security skills”, “Digital Communication knowledge & skills”; **Medium:** “Digital Security attitude”, “Digital Literacy knowledge & skills”, “Digital Literacy attitude”; **Low:** all the rest.
- **Self-evaluation:** most respondents evaluate their competencies as average
- **General description:** They do not feel fully confident across “Digital Rights” dimensions. However, they are pretty sensitive to the add content, they know how to identify it and how the overall search process works. Moreover, they care about the safety of their personal and purchasing information. In terms of age and education, this group of people is represented mostly with the young group (18 – 25 years old), however with quite high level of education and steady income level.

c. Cluster №3 (low overall rate of digital competences)

- **High:** “Digital Security skills”, **Medium:** “Digital Literacy knowledge and skills”, “Digital Security attitude”, “Digital Rights attitude”; **Low:** all the rest.
- **Self-evaluation:** most respondents evaluate their competencies as high and average
- **General description:** Low level of all knowledge and skills in almost all categories of competencies. However, they have some skills and values regarding the security of personal information in accounts and when making payments. Their critical attitude towards illegally published digital goods can be explained by their total uncertainty within online surface. At the same time, they evaluate their competencies at high and average level. However, this group makes frequent purchases from “risky” category. This group is

the oldest of all the clusters, with the highest income indicator, but with the average level of education.

Summing up, we can say that based on digital competencies, we were able to identify three quite distinct clusters of consumers. Each cluster has certain strong and weak areas of competence and relatively correlated socio-demographic characteristics.

CHAPTER 4. RESEARCH FINDINGS AND DISCUSSIONS

This chapter is devoted to analysis of the main results and its interpretations. Also, theoretical and managerial implications are discussed in this part based on the results obtained during research. Finally, the limitations of the research and relevant recommendations for the potential research extensions are described in the last part of the chapter.

4.1 EXPLICIT ANSWERS TO RESEARCH QUESTIONS

Based on the existing research gap stated at the beginning of the work, the following research questions were formulated on this topic:

RQ1: What digital consumer competencies and socio-demographic factors influence the purchase frequency of digital goods on electronic platforms?

RQ2: Does different digital goods categories require the presence of different digital competences and socio-demographic factors and what these differences are?

RQ3: What viable typology of consumers can be made according to their digital competence?

First, the descriptive analysis performed at the beginning helped to better understand the data on which the study was based. So, already at the first steps, some comparisons were made in the characteristics of consumption of certain digital goods categories. Further, factor analysis helped to properly filter out the variables in order to get well-interpreted factors perfectly related to the considered digital competencies dimensions as a result.

Answering the first and the second Research Questions we can conclude about the existing influence of a number of digital competencies on the purchase frequency of the digital goods. So, we can mention the importance of paying attention to the competencies related to:

- Skills related to managing digital identity, online payments and personal data (Digital Security skills)
- Knowledge and ability to find, read, evaluate, synthesize information and understand new technology and services (Digital Literacy knowledge and skills)

- Knowledge and skills about interacting in digital marketplace with other parties properly (Digital Communication knowledge & skills)
- Knowledge related to copyrights licenses, contracts of digital goods and skills to identifying inappropriate and illegal content or actions online (Digital Rights knowledge & skills)
- High concerns about terms, conditions of purchase and use of digital product, and attitude towards illegal publishing/using/downloading digital goods (Digital Rights attitudes).

Additionally, it is possible to say that of all the sociodemographic factors only income level turned out to be significant and only for one digital goods category. Going back to the competence differences among different categories of digital goods it was found out that there are differences in digital competence that influence the purchase frequency of each category. Although, the most importance for almost all categories have the skills related to managing digital identity, online payments and personal data (Digital Security skills), knowledge related to copyrights licenses, contracts of digital goods and skills to identifying inappropriate and illegal content or actions online (Digital Rights knowledge & skills) and high concerns about terms, conditions of purchase and use of digital product, and attitude towards illegal publishing/using/downloading digital goods (Digital Rights attitudes). These results are supported by conclusions from the recent researches about the existing extra risks associated with digital goods because of their intangible nature that creates high uncertainty about its quality and state before the purchase (Linwan Wu, 2020) and also about reduced sense of control associated with digital products because of the restrictions in legal ownership (Helm, 2018). That is why knowing about the influence of such competencies on customer's purchase behavior in respect of some digital goods categories it is possible to take appropriate measures and promote more efficient consumption of digital goods.

Finally, considering Research Question 3 the conducted cluster analysis confirmed that it is actually possible to identify a clear typology of customers based on their digital competencies. Three clearly separated clusters were obtained in the end (if simplify: with "high", "medium" and "low" levels of digital competencies), however, buying behavior of customer in relation to certain digital goods categories and socio-demographic characteristics was not fully obvious and revealed some interesting features.

4.2 THEORETICAL AND MANAGERIAL IMPLICATIONS

The findings presented in this paper make certain contribution to the current understanding of digital competence in the context of digital goods online purchasing. As it was mentioned in the first chapter with literature review there is no any similar researches were made studying

digital competence in the context of digital goods. Since this topic is generally poorly studied and does not have a large number of scientific papers in this direction, the results obtained can be used as a basis for a more detailed study of this topic on more narrowly focused issues.

Nevertheless, this work demonstrates that there is a certain amount of digital competence can be specified as significant ones regarding digital goods online purchasing experience. Moreover, these competences helped to distinguish the customers and formulate three viable clusters that have certain characteristics what can lead to the formation of a potential formalized typology of consumers in accordance with the identified competence and characteristics. And also, this paper provided the understanding of relations between purchase frequency of certain digital goods categories and a number of digital competences. This could be a starting point in the research direction regarding studying and comparison of various digital goods categories specifics.

Speaking about managerial implications, the research can be applied in various formats. The sudden appearance of external factors such as coronavirus has forced society to rapidly adapt to a different format of consumption of goods. The amount of consumption of digital goods online is growing at a huge rate. And it is growing among completely different categories of the population and product categories. Thus, this topic is more relevant than ever in terms of creating relevant material by higher-level structures for quick and comfortable training of citizens and helping to eliminate existing gaps in the consumer's consumption of certain categories of goods. Moreover, it is impossible not to mention the prospects of using this knowledge for marketing purposes of companies. Thus, having strictly formulated clusters and portraits of consumers with pronounced patterns regarding buying behavior, competencies, and demographic factors, it is possible to significantly improve a business's understanding of its consumer, facilitate the process of interaction with them, and raise the level of customer dialog and customer experience in general.

4.3 LIMITATIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

There are some limitations in the study that can be taken into consideration. First of all, the survey audience can be expanded as this particular research was focused on the citizens of the North-Western region only. There can be a probability that the customers from other regions could demonstrate some additional significant digital competences regarding digital goods purchase frequency indicator. Another limitation relates to the statistical approaches used, the whole analysis was based on the factor analysis, cluster analysis and ordinal linear regressions, however, for example, the Structural Equation Modelling (SEM) can be applied as it uses diverse set of

mathematical models and statistical methods that perform mostly confirmatory, rather than exploratory, technique.

There are also several additional actions can be made for continuing and expanding the research on this topic.

Firstly, it is possible to go deeper into the analysis of digital competencies with consumers from different regions and countries, testing hypotheses about certain differences between their competencies, consumer behavior in general, and cluster types.

Secondly, this study has taken relatively basic categories of digital goods, but in order to identify specific requirements for the competence, more narrow categories of goods, or in other words, more expanded specified lists of digital goods categories can be used for checking whether these unobserved categories have their own specifics in relation to consumers clusters and their corresponding digital competences.

Thirdly, also, a separate step can be made to focus on the analysis of competencies in combination with more specific types of digital goods' purchasing platforms. In this study, e-Commerce term was discussed more in order to lay down the relevant characteristics and features of these platforms in the formation of a set of relevant consumer competencies, as well as to simplify the conduct of interviews and surveys.

And finally, promotion can be made if the study includes consideration of such a concept as consumer intentions. For example, in the current study, the "success" of the customer experience was taken as a characteristic of the purchase frequency of various categories of goods. However, together with consumers' intention to purchase certain products, it could be possible to improve the quality of the estimated models and, as a result, the quality of predictions.

CONCLUSION

Widespread use of digital technologies, where the use of artificial intelligence, robotics, virtual reality and other innovations have a powerful impact on the nature of product consumption, directly affecting the requirements set in relation to the knowledge and skills of consumers. Digital goods being a fully separate category of goods have their own characteristics and, as a result, set special requirements for consumers in terms of their effective consumption.

The research goal of this master thesis is to investigate consumer digital competences during the process of digital goods purchasing via tech-enabled commerce. Current study was exploratory in nature aimed at identifying significant digital competence influencing different digital goods categories consumption. In order to achieve this goal the current research was structured in four chapters.

In the first chapter a number of resources – articles, reports, books, statistical data – were studied in order to cover various important aspects. Firstly, the existing definitions and categorizations of digital goods were analyzed and compared, and also specific advantages and disadvantages were covered. Secondly, the electronic platforms for making purchases were also studied in terms of general understanding and special features they imply. Thirdly, special attention was paid to the review of existing references to digital consumer competencies, again comparing different definitions, dimensions, existing frameworks formulated at different levels and with different goals. Finally, the analysis of evolution of the consumer decision-making process was done basing on the existing core models and frameworks.

In the second chapter the identified research gap was stated, on the basis of which the general goal of the study and the corresponding research questions were formulated. Further, the overall logic of the research and the most suitable methods of data collection and data processing were identified and described.

The third chapter of this research focuses on the analyzing the research sample that was formed in the result of conducted survey (the overall core characteristics, descriptive statistics). Then, the certain competence dimensions were identified and specified that were further used in building a model identifying significant competencies for various categories of digital products. In the end the viable typology of the customers on the basis of their competences was presented and corresponding customer portraits were formulated and described.

Finally, the answers to the stated research questions were given where in the result the whole list of digital competences was stated in the end, and the difference among significant competences for different digital goods categories were analyzed and explained. That allowed to provide a certain significant theoretical and managerial implications and to offer a number of options that could help to upgrade and continue the existing research.

The significance of this research is difficult to underestimate, since digital competencies are given objectively low attention, and this was not done previously in the context of digital goods. The results obtained can serve as a real boost for further research in this direction and can also be taken into account by companies in terms of a customized approach to their consumers based on the competencies they possess or do not possess.

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Questionnaire
(In English, original language – Russian)

Table 1 - Questionnaire: Consumer digital competence research

PART 1. EXPERIENCE OF BUYING DIGITAL PRODUCTS ONLINE	
How often do you buy digital products from the following categories?	
<p>List of categories:</p> <p>Text-based (online books, reports, manuals, etc.)</p> <p>Audio-based (music, audiobooks, podcasts, etc.)</p> <p>Video-based (video courses, movies, paid webinars, etc.)</p> <p>Image-based (photos, fonts, icons, etc.)</p> <p>Tools and software (applications, plugins, web templates for websites, etc.)</p> <p>Tickets and reservations (e-tickets, hotel reservations, etc.)</p> <p>Online courses and training (any paid online courses and trainings)</p>	<p>Answer options:</p> <p>Several times a week</p> <p>Once a week</p> <p>Once in 2-3 weeks</p> <p>Once a month</p> <p>Once in 2-3 months and less often</p> <p>Made 1/2 one-time purchases</p> <p>Do not buy</p>
Evaluate your level of digital competence regarding making purchases online. Choose the answer that suits you the most.	
<p>I can perform simple and routine actions online</p> <p>I can perform routine tasks and solve specific problems online</p> <p>I can perform tasks of various levels of complexity</p> <p>Sometimes I need third-party help while doing online purchases.</p> <p>I can do all the actions and solve all arising problems by myself.</p> <p>I perform all actions independently and can help/teach other people if necessary.</p> <p>It usually takes me a significant amount of time to complete the necessary actions online.</p> <p>It usually takes me a certain amount of time to complete the necessary actions.</p> <p>I usually perform all the necessary actions quickly and know exactly how long it will take.</p>	
PART 2. DIGITAL GOODS CATEGORIES	
Evaluate digital product categories basing on the following criteria:	
<p>List of categories:</p> <p>Text-based (online books, reports, manuals, etc.)</p> <p>Audio-based (music, audiobooks, podcasts, etc.)</p> <p>Video-based (video courses, movies, paid webinars, etc.)</p> <p>Image-based (photos, fonts, icons, etc.)</p> <p>Tools and software (applications, plugins, web templates for websites, etc.)</p> <p>Tickets and reservations (e-tickets, hotel reservations, etc.)</p> <p>Online courses and training (any paid online courses and trainings)</p>	
<p>Criteria:</p> <p>The category causes the greatest concerns about the likelihood of purchasing a low-quality/illegal/non-valid digital product.</p> <p>Necessity to spend more time on the whole purchasing process.</p> <p>Presence of some extra fears about making online payments while buying digital goods from these categories.</p>	

Presence of high probability to seek for help or advice before or during purchasing a product from the category.

PART 3. DIGITAL SECURITY

You are asked to rate a number of statements about personal digital competencies on a scale from 1 to 5, where 1-strongly disagree with the statement, 5 - strongly agree with the statement.

I understand that data about my online activities (for example, past purchases, viewed products) is analyzed for marketing purposes.

I am aware of the risk of fraudulent attempt to acquire sensitive information such as passwords and credit card details in an e-Commerce platforms.

I know what data is needed to enter and where to make payments online.

I can create password-protected online profile with personal data on the e-Commerce platforms.

I can manage my online account and add, change, and delete personal information if necessary.

I can add, change and delete my payment data in personal profile in e-Commerce platforms.

I can successfully make online payments.

I feel completely safe when shopping online, using online banking or using public services that require private data (feel safe when using, for ex. credit card details)

I have a very proactive attitude towards using different e-Commerce platforms and creating new personal profiles.

PART 4. DIGITAL COMMUNICATION

You are asked to rate a number of statements about personal digital competencies on a scale from 1 to 5, where 1-strongly disagree with the statement, 5 - strongly agree with the statement.

I know that the direct seller of the digital good and the online platform where I can buy it are not always the same parties. (For example, you can purchase software from Microsoft on Ozon.ru, which is only an intermediary party in the sale process.)

I am aware that when making an online purchase, I can ask for help from the online support service of the e-Commerce platform.

I can easily share my positive/negative feedback about buying digital products with other buyers.

I always carefully choose the style of communication with other people online.

PART 5. DIGITAL LITERACY

You are asked to rate a number of statements about personal digital competencies on a scale from 1 to 5, where 1-strongly disagree with the statement, 5 - strongly agree with the statement.

I understand how search engines operate, classify and display results of digital goods.

I know that some of the postings shown while digital goods' search can be part of promoted content.

I can search for information on various electronic platforms about the digital goods I need.

I can make a good use of search filters to limit the number of search results.

I can easily understand new technologies and applications (easily learn how to use new services, etc.)

I have a habit of evaluating information very critically (considering both source and placement). (For example, information about the product, the source of the product placement, comments about the product, and so on.)

I have a very proactive attitude towards finding and collecting information about digital goods.

PART 6. DIGITAL RIGHTS

I have an extensive knowledge of the legal framework for publishing, commenting, or selling digital products on the Internet. (know the law of marketing, rumors, spam, copyrighting, private photos and speculation on the web)

I know that online stores can legally charge different customers different amounts for the same product.

I can determine whether digital products placed on the platform are suitable for legal consumption or not.

I can claim a violation of my consumer rights if I deem it necessary.

I can easily understand when an inappropriate and illegal action with digital good is being performed by other users on the Internet. (For example, user shares materials (texts, images, audio, video files, etc.) that contain violence, aggression, obscene language, and so on.)

I always study the terms and conditions of purchase and use of a digital product before purchasing it.

I do not support the digital goods consumption if I recognize any signs of illegal publishing/using/downloading etc.

PART 7. TELL US ABOUT YOURSELF

Your gender:

- Male
- Female

Your age category:

- <18
- 18 – 25 y.o.
- 26 – 35 y.o.
- 36 – 45 y.o.
- 46 – 55 y.o.

Choose the region where you currently live:

Republic of Karelia

Komi Republic

Arkhangelsk region

Vologda region

Kaliningrad region

Leningrad region

Murmansk region

Novgorod region

Pskov region

Saint Petersburg

Nenets Autonomous district

The highest level of education you have completed (or still in process):

- Secondary education
- Specialized secondary education
- Bachelor's Degree
- Master's Degree
- Postgraduate study
- Other: ...

Which of the following categories best describes your employment status?

- I am getting a secondary education
- I am getting a higher education
- I work (part-time, combine with my studies)
- I work (full-time, do not combine with my studies)
- I own business

- Freelancer / self-employed
- In retirement
- Unemployed

What is your approximate average income?

- < 30,000 rub
- 30,000 rub – 60,000 rub
- 61,000 rub – 90,000 rub
- 91,000 rub – 120,000 rub
- 121,000 rub – 150,000 rub
- > 150,000 rub

Factor analysis

Table 1 - Shapiro-Wilk normality test results for variables from Digital Security dimension

VARIABLES	W	P-VALUE
I understand that data about my online activities (for example, past purchases, viewed products) is analyzed for marketing purposes.	0.67708	< 2.2e-16
I am aware of the risk of fraudulent attempt to acquire sensitive information such as passwords and credit card details in an e-Commerce platforms.	0.69186	< 2.2e-16
I know what data is needed to enter and where to make payments online.	0.60935	< 2.2e-16
I can create password-protected online profile with personal data on the e-Commerce platforms.	0.57058	< 2.2e-16
I can manage my online account and add, change, and delete personal information if necessary.	0.59373	< 2.2e-16
I can add, change and delete my payment data in personal profile in e-Commerce platforms.	0.64213	< 2.2e-16
I can successfully make online payments.	0.50298	< 2.2e-16
I feel completely safe when shopping online, using online banking or using public services that require private data (feel safe when using, for ex. credit card details)	0.91249	1.503e-12
I have a very proactive attitude towards using different e-Commerce platforms and creating new personal profiles.	0.87235	1.836e-15
I know that the direct seller of the digital good and the online platform where I can buy it are not always the same parties. (For example, you can purchase software from Microsoft on Ozon.ru, which is only an intermediary party in the sale process.)	0.77678	< 2.2e-16
I am aware that when making an online purchase, I can ask for help from the online support service of the e-Commerce platform.	0.81186	< 2.2e-16
I can easily share my positive/negative feedback about buying digital products with other buyers.	0.60945	< 2.2e-16
I always carefully choose the style of communication with other people online.	0.47559	< 2.2e-16
I understand how search engines operate, classify and display results of digital goods.	0.69373	< 2.2e-16
I know that some of the postings shown while digital goods' search can be part of promoted content.	0.65243	1.776e-12
I can search for information on various electronic platforms about the digital goods I need.	0.71248	1.835e-15
I can make a good use of search filters to limit the number of search results.	0.83549	1.536e-12
I can easily understand new technologies and applications (easily learn how to use new services, etc.)	0.97455	< 2.2e-16
I have a habit of evaluating information very critically (considering both source and placement). (For example, information about the product, the source of the product placement, comments about the product, and so on.)	0.57708	< 2.2e-16
I have a very proactive attitude towards finding and collecting information about digital goods.	0.48386	1.446e-12
I have an extensive knowledge of the legal framework for publishing, commenting, or selling digital products on the Internet. (know the law of marketing, rumors, spam, copyrighting, private photos and speculation on the web)	0.61933	1.636e-15

I know that online platforms can legally charge different customers different amounts for the same digital product.	0.55958	< 2.2e-16
I can determine whether digital products placed on the platform are suitable for legal consumption or not.	0.67933	< 2.2e-16
I can claim a violation of my consumer rights if I deem it necessary.	0.54413	< 2.2e-16
I can easily understand when an inappropriate and illegal action with digital goods is being performed by other users on the Internet. (For example, user shares materials (texts, images, audio, video files, etc.) that contain violence, aggression, obscene language, and so on.)	0.54028	< 2.2e-16
I always study the terms and conditions of purchase and use of a digital product before purchasing it.	0.61124	1.736e-15
I do not support the digital goods consumption if I recognize any signs of illegal publishing/using/downloading etc.	0.47244	< 2.2e-16

Digital Security dimension

Table 2 – KMO and Bartlett’s Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.722
Bartlett's Test of Sphericity	Approx. Chi-Square	252.153
	df	15
	Sig.	.000

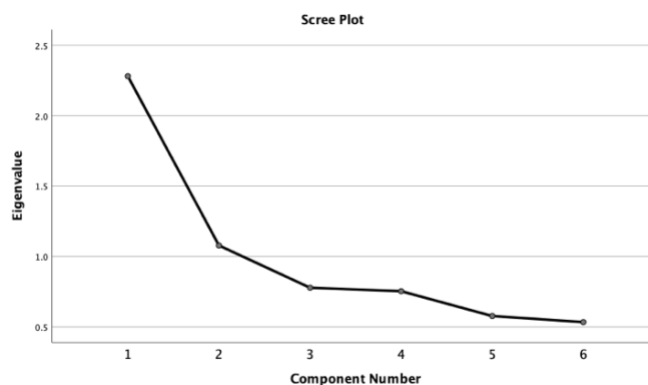


Figure 1 –Parallel Analysis Scree Plots (Digital Security dimension)

Table 3 – Total Variance Explained for Digital Security dimension, SPSS output

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,280	38,004	38,004	2,280	38,004	38,004	1,919	31,976	31,976
2	1,078	17,964	55,967	1,078	17,964	55,967	1,439	23,991	55,967
3	0,778	12,965	68,932						
4	0,753	12,555	81,487						
5	0,577	9,618	91,105						

6	0,534	8,895	100,000						
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Table 4 – Rotated Component Matrix for Digital Security dimension, SPSS output

Rotated Component Matrix ^a		
	Component	
	1	2
I know what data is needed to enter and where to make payments online.	0,604	
I can create password-protected online profile with personal data on the e-Commerce platforms.	0,721	
I can manage my online account and add, change, and delete personal information if necessary.	0,677	
I can add, change and delete my payment data in personal profile in e-Commerce platforms.	0,727	
I feel completely safe when shopping online, using online banking or using public services that require private data (feel safe when using, for ex. credit card details)		0,863
I have a very proactive attitude towards using different e-Commerce platforms and creating new personal profiles.		0,776

Digital Communication dimension

Table 5 – KMO and Bartlett’s Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,624
Bartlett's Test of Sphericity	Approx. Chi-Square	164,830
	df	3
	Sig.	0,000

Table 6 – Total Variance Explained

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1,833	61,106	61,106	1,833	61,106	61,106
2	0,722	24,064	85,171			
3	0,445	14,829	100,000			

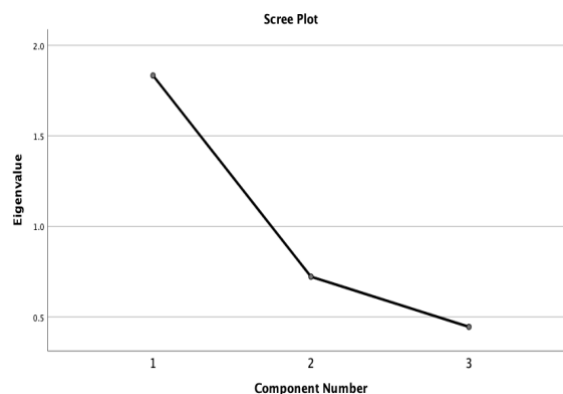


Figure 2 – Parallel Analysis Scree Plots (Digital Communication dimension)

Table 7 – Component Matrix

Component Matrix ^a	
	Component
	1
I know that the direct seller of the digital good and the online platform where I can buy it are not always the same parties. (For example, you can purchase software from Microsoft on Ozon.ru, which is only an intermediary party in the sale process.)	0,813
I am aware that when making an online purchase, I can ask for help from the online support service of the e-Commerce platform.	0,841
I always carefully choose the style of communication with other people online.	0,682

Digital Literacy dimension

Table 8 – KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,770
Bartlett's Test of Sphericity	Approx. Chi-Square	493,024
	df	21
	Sig.	0,000

Table 9 – Total Variance Explained

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,857	40,812	40,812	2,857	40,812	40,812	2,275	32,502	32,502
2	1,205	17,216	58,029	1,205	17,216	58,029	1,787	25,526	58,029
3	0,862	12,308	70,337						
4	0,629	8,990	79,327						
5	0,544	7,765	87,092						
6	0,510	7,285	94,377						
7	0,394	5,623	100,000						

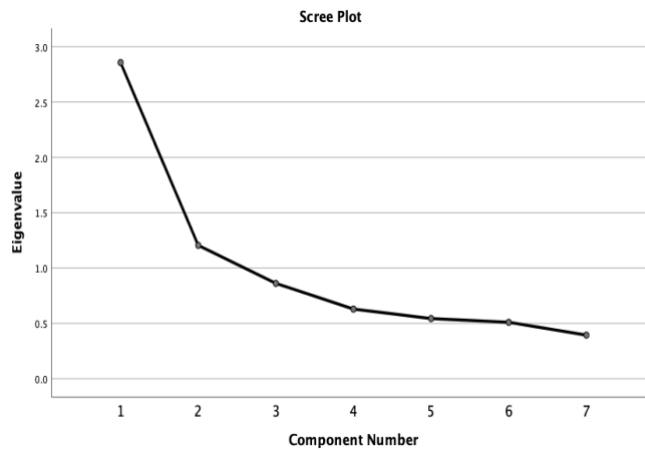


Figure 3 –Parallel Analysis Scree Plots (Digital Literacy dimension)

Table 10 – Rotated Component Matrix

Rotated Component Matrix ^a		
	Component	
	1	2
I understand how search engines operate, classify and display results of digital goods.	0,773	
I know that some of the postings shown while digital goods' search can be part of promoted content.	0,662	
I can search for information on various electronic platforms about the digital goods I need.	0,565	
I can make a good use of search filters to limit the number of search results.	0,574	
I can easily understand new technologies and applications (easily learn how to use new services, etc.)	0,735	
I have a habit of evaluating information very critically (considering both source and placement). (For example, information about the product, the source of the product placement, comments about the product, and so on.)		0,820
I have a very proactive attitude towards finding and collecting information about digital goods.		0,743

Digital Rights dimension

Table 11 – KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,637
Bartlett's Test of Sphericity	Approx. Chi-Square	173,268
	df	10
	Sig.	0,000

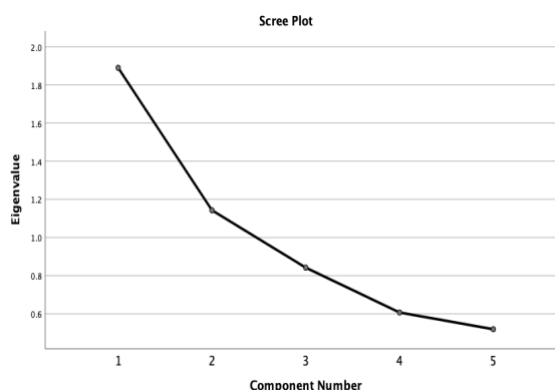


Figure 3 –Parallel Analysis Scree Plots (Digital Rights dimension)

Table 12 – Total Variance Explained

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1,890	37,799	37,799	1,890	37,799	37,799	1,763	35,258	35,258
2	1,143	22,852	60,651	1,143	22,852	60,651	1,270	25,393	60,651
3	0,842	16,836	77,487						
4	0,607	12,136	89,622						
5	0,519	10,378	100,000						

Table 13 – Rotated Component Matrix

Rotated Component Matrix ^a		
	Component	
	1	2
I have an extensive knowledge of the legal framework for publishing, commenting, or selling digital products on the Internet. (know the law of marketing, rumors, spam, copyrighting, private photos and speculation on the web)	0,790	
I can determine whether digital products placed on the platform are suitable for legal consumption or not.	0,694	
I can easily understand when an inappropriate and illegal action with digital goods is being performed by other users on the Internet. (For example, user shares materials (texts, images, audio, video files, etc.) that contain violence, aggression, obscene language, and so on.)	0,808	
I always study the terms and conditions of purchase and use of a digital product before purchasing it.		0,733
I do not support the digital goods consumption if I recognize any signs of illegal publishing/using/downloading etc.		0,753

Ordinal linear regression results

Table 1 – Variables coded for ordinal linear regression

Coded variables	Initial Variable
F1_DS	Digital Security skills
F2_DS	Digital Security attitude
F3_DC	Digital Communication knowledge & skills
F4_DL	Digital Literacy knowledge & skills
F5_DL	Digital Literacy attitude
F6_DR	Digital Rights knowledge & skills
F7_DR	Digital Rights attitude
Purchase_frequency_audio	Purchase frequency of “Audio-based” digital goods category
Purchase_frequency_video	Purchase frequency of “Video-based” digital goods category
Purchase_frequency_text	Purchase frequency of “Text-based” digital goods category
Purchase_frequency_image	Purchase frequency of “Image-based” digital goods category
Purchase_frequency_soft	Purchase frequency of “Software and tools digital goods category
Purchase_frequency_tickets	Purchase frequency of “Tickets and reservations” digital goods category
Purchase_frequency_courses	Purchase frequency of “Online courses and trainings” digital goods category

1. Dependent variable: digital goods purchase frequency from «Audio-based» category

Table 2 - Model Fitting Information

Model Fitting Information				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	949,831			
Final	851,538	98,293	39	0,000

Table 3 - Goodness-of-Fit

Goodness-of-Fit			
	Chi-Square	df	Sig.
Pearson	1877,039	1779	0,052
Deviance	848,765	1779	1,000

Table 4 - Pseudo R-Square

Pseudo R-Square	
Cox and Snell	0,369
Nagelkerke	0,382
McFadden	0,103

Table 5 – Omnibus test

Omnibus Test ^a		
Likelihood Ratio Chi-Square	df	Sig.
98,293	39	0,000

Table 6 - Parameter Estimates

Parameter Estimates											
Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test			Exp(B)	95% Wald Confidence Interval for Exp(B)	
				Lower	Upper	Wald Chi-Square	df	Sig.		Lower	Upper
Threshold	[Freq_sound=0]	1,386	1,3799	-1,318	4,091	1,010	1	0,315	4,001	0,268	59,802
	[Freq_sound=1]	1,956	1,3818	-0,752	4,665	2,004	1	0,157	7,074	0,471	106,138
	[Freq_sound=2]	2,685	1,3875	-0,034	5,405	3,746	1	0,053	14,663	0,966	222,490
	[Freq_sound=3]	5,344	1,4116	2,577	8,111	14,332	1	0,000	209,386	13,163	3330,662
	[Freq_sound=4]	6,545	1,4271	3,748	9,342	21,032	1	0,000	695,620	42,425	11405,615
	[Freq_sound=5]	7,849	1,4883	4,932	10,766	27,812	1	0,000	2562,185	138,612	47360,877
[Sex=female]		-0,657	0,2266	-1,101	-0,213	8,407	1	0,054	0,518	0,333	0,808
[Sex=male]		0 ^a							1		
[Age=<18]		0,662	0,8304	-0,966	2,289	0,635	1	0,425	1,938	0,381	9,869
[Age=18-25]		0,300	0,4627	-0,607	1,206	0,419	1	0,517	1,349	0,545	3,342
[Age=26-35]		0,248	0,4521	-0,638	1,134	0,301	1	0,583	1,282	0,528	3,109
[Age=36-45]		0,200	0,4552	-0,692	1,092	0,194	1	0,660	1,222	0,501	2,981
[Age=46-55]		0 ^a							1		
[Education=bachelor's degree]		0,185	0,4060	-0,611	0,981	0,208	1	0,649	1,203	0,543	2,667
[Education=master's Degree]		0,346	0,4145	-0,467	1,158	0,695	1	0,404	1,413	0,627	3,184
[Education=postgraduate study]		0,961	0,8243	-0,654	2,577	1,361	1	0,243	2,616	0,520	13,158
[Education=secondary education]		1,212	0,6732	-0,107	2,531	3,242	1	0,072	3,360	0,898	12,572
[Education=specialized secondary education]		0 ^a							1		
[Income=<<30,000]		-0,521	0,4334	-1,370	0,329	1,444	1	0,229	0,594	0,254	1,389
[Income=>151,000]		-1,215	0,5314	-2,257	-0,174	5,232	1	0,022	0,297	0,105	0,840
[Income=121,000-150,000]		-1,151	0,5350	-2,200	-0,103	4,631	1	0,031	0,316	0,111	0,902
[Income=30,000-60,000]		0,006	0,3911	-0,761	0,772	0,000	1	0,989	1,006	0,467	2,164

[Income=61,000-90,000]	-0,730	0,3678	-1,451	-0,009	3,943	1	0,047	0,482	0,234	0,991
[Income=91,000-120,000]	0 ^a							1		
F1_DS	0,518	0,2418	0,044	0,991	4,582	1	0,032	1,678	1,045	2,695
F2_DS	0,259	0,1403	-0,016	0,534	3,414	1	0,065	1,296	0,984	1,706
F3_DC	-0,024	0,1630	-0,343	0,296	0,021	1	0,884	0,976	0,709	1,344
F4_DL	-0,281	0,1596	-0,594	0,032	3,106	1	0,078	0,755	0,552	1,032
F5_DL	-0,153	0,1317	-0,411	0,105	1,343	1	0,247	0,858	0,663	1,111
F6_DR	0,253	0,1095	0,039	0,468	5,361	1	0,021	1,288	1,040	1,597
F7_DR	0,259	0,1137	0,036	0,482	5,174	1	0,023	1,295	1,036	1,619
(Scale)	1 ^b									

Table 7 – Test of Parallel Lines

Test of Parallel Lines ^a				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	851,538			
General	698.009 ^b	153.529 ^c	195	0,987

2. Dependent variable: digital goods purchase frequency from «Video-based» digital goods category

Table 8 - Model Fitting Information

Model Fitting Information				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	1073.498			
Final	1052.528	20.970	21	0,000

Table 9- Goodness-of-Fit

Goodness-of-Fit			
	Chi-Square	df	Sig.
Pearson	1818.027	1797	.359
Deviance	1045.597	1797	1.000

Table 10- Pseudo R-Square

Pseudo R-Square	
Cox and Snell	.365
Nagelkerke	.367
McFadden	.119

Table 11- Omnibus Test

Omnibus Test ^a		
Likelihood Ratio Chi-Square	df	Sig.
40.970	21	0,000

Table 12- Parameter Estimates

Parameter Estimates											
Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test			Exp(B)	95% Wald Confidence Interval for Exp(B)	
				Lower	Upper	Wald Chi-Square	df	Sig.		Lower	Upper
Threshold	[Freq_video=0]	-2,163	1,2679	-4,648	0,322	2,910	1	0,088	0,115	0,010	1,380
	[Freq_video=1]	-1,270	1,2637	-3,746	1,207	1,009	1	0,315	0,281	0,024	3,344
	[Freq_video=2]	-0,745	1,2632	-3,221	1,731	0,347	1	0,556	0,475	0,040	5,648
	[Freq_video=3]	0,660	1,2682	-1,826	3,146	0,271	1	0,603	1,935	0,161	23,241
	[Freq_video=4]	1,740	1,2790	-0,766	4,247	1,852	1	0,174	5,699	0,465	69,898
	[Freq_video=5]	3,003	1,3205	0,415	5,592	5,173	1	0,023	20,154	1,515	268,158
[Sex1=female]		-0,484	0,2160	-0,907	-0,060	5,016	1	0,125	0,616	0,404	0,941
[Sex1=male]		0 ^a							1		
[Age1=<18]		-0,130	0,8169	-1,732	1,471	0,026	1	0,873	0,878	0,177	4,352
[Age1=18-25]		0,098	0,4677	-0,819	1,015	0,044	1	0,834	1,103	0,441	2,759
[Age1=26-35]		0,469	0,4578	-0,429	1,366	1,048	1	0,306	1,598	0,651	3,919
[Age1=36-45]		0,107	0,4634	-0,801	1,016	0,054	1	0,817	1,113	0,449	2,761
[Age1=46-55]		0 ^a							1		
[Education1=bachelor's degree]		-0,051	0,4039	-0,843	0,741	0,016	1	0,900	0,950	0,431	2,097
[Education1=master's Degree]		0,222	0,4099	-0,581	1,026	0,294	1	0,588	1,249	0,559	2,789
[Education1=postgraduate study]		0,890	0,7166	-0,515	2,294	1,541	1	0,214	2,434	0,598	9,914
[Education1=secondary education]		0,477	0,6480	-0,793	1,747	0,542	1	0,462	1,611	0,452	5,737
[Education1=specialized secondary education]		0 ^a							1		
[Income1=<30,000]		-0,305	0,4079	-1,104	0,494	0,559	1	0,455	0,737	0,331	1,640
[Income1=>151,000]		-0,684	0,5141	-1,692	0,323	1,773	1	0,183	0,504	0,184	1,381
[Income1=121,000-150,000]		-0,525	0,5010	-1,507	0,457	1,097	1	0,295	0,592	0,222	1,580

[Income1=30,000-60,000]	-0,288	0,3592	-0,992	0,416	0,641	1	0,423	0,750	0,371	1,516
[Income1=61,000-90,000]	-0,560	0,3407	-1,228	0,108	2,702	1	0,100	0,571	0,293	1,114
[Income1=91,000-120,000]	0a							1		
F1_DS	-0,074	0,2303	-0,525	0,377	0,103	1	0,749	0,929	0,591	1,459
F2_DS	0,023	0,1345	-0,241	0,286	0,029	1	0,865	1,023	0,786	1,332
F3_DC	0,041	0,1587	-0,270	0,352	0,066	1	0,798	1,042	0,763	1,422
F4_DL	-0,248	0,1575	-0,557	0,060	2,488	1	0,115	0,780	0,573	1,062
F5_DL	-0,093	0,1269	-0,342	0,156	0,538	1	0,463	0,911	0,710	1,168
F6_DR	0,053	0,1048	-0,153	0,258	0,252	1	0,016	1,054	0,858	1,294
F7_DR	0,163	0,1067	-0,046	0,372	2,341	1	0,026	1,177	0,955	1,451
(Scale)	1b									

Table 13- Test of Parallel Lines

Test of Parallel Lines ^a				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	1052.528			
General	771.710 ^b	280.818 ^c	105	.675

3. Dependent variable: digital goods purchase frequency from «Software and Tools» category

Table 14 - Model Fitting Information

Model Fitting Information				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	853.606			
Final	815.447	38.159	21	.012

Table 15 - Goodness-of-Fit

Goodness-of-Fit			
	Chi-Square	df	Sig.
Pearson	2136.018	1797	.062
Deviance	811.288	1797	1.000

Table 16 - Pseudo R-Square

Pseudo R-Square	
Cox and Snell	.414
Nagelkerke	.422
McFadden	.244

Table 17 - Omnibus Test

Omnibus Test ^a		
Likelihood Ratio Chi-Square	df	Sig.
38.159	21	.012

Table 18 - Parameter Estimates

Parameter Estimates											
Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test			Exp(B)	95% Wald Confidence Interval for Exp(B)	
				Lower	Upper	Wald Chi-Square	df	Sig.		Lower	Upper
Threshold	[Freq_soft=0]	0,293	1,3163	-2,287	2,873	0,050	1	0,824	1,340	0,102	17,687
	[Freq_soft=1]	1,939	1,3205	-0,649	4,527	2,156	1	0,142	6,951	0,522	92,474
	[Freq_soft=2]	2,972	1,3221	0,381	5,564	5,053	1	0,025	19,534	1,463	260,740
	[Freq_soft=3]	4,783	1,3568	2,124	7,443	12,427	1	0,000	119,482	8,363	1707,089
	[Freq_soft=4]	4,919	1,3635	2,247	7,592	13,016	1	0,000	136,888	9,457	1981,347
	[Freq_soft=5]	6,878	1,6488	3,646	10,110	17,401	1	0,000	970,633	38,332	24577,938
[Sex1=female]		-0,222	0,2224	-0,657	0,214	0,993	1	0,319	0,801	0,518	1,239
[Sex1=male]		0 ^a							1		
[Age1=<18]		-0,188	0,7944	-1,745	1,369	0,056	1	0,813	0,829	0,175	3,932
[Age1=18-25]		0,292	0,4887	-0,666	1,250	0,357	1	0,550	1,339	0,514	3,489
[Age1=26-35]		-0,279	0,4715	-1,204	0,645	0,351	1	0,553	0,756	0,300	1,905
[Age1=36-45]		-0,107	0,4771	-1,042	0,828	0,050	1	0,822	0,898	0,353	2,289
[Age1=46-55]		0 ^a							1		
[Education1=bachelor's degree]		0,404	0,4087	-0,397	1,205	0,977	1	0,323	1,498	0,672	3,337
[Education1=master's Degree]		0,782	0,4189	-0,040	1,603	3,480	1	0,062	2,185	0,961	4,966
[Education1=postgraduate study]		1,306	0,7484	-0,160	2,773	3,047	1	0,081	3,693	0,852	16,009
[Education1=secondary education]		0,299	0,6192	-0,914	1,513	0,234	1	0,629	1,349	0,401	4,540
[Education1=specialized secondary education]		0 ^a							1		
[Income1=<30,000]		-0,749	0,4090	-1,550	0,053	3,351	1	0,067	0,473	0,212	1,054
[Income1=>151,000]		-0,523	0,5698	-1,640	0,594	0,843	1	0,358	0,593	0,194	1,810
[Income1=121,000-150,000]		-0,787	0,5272	-1,820	0,246	2,228	1	0,136	0,455	0,162	1,279
[Income1=30,000-60,000]		-0,681	0,3542	-1,375	0,014	3,691	1	0,055	0,506	0,253	1,014

[Income1=61,000-90,000]	-0,554	0,3439	-1,228	0,120	2,598	1	0,107	0,574	0,293	1,127
[Income1=91,000-120,000]	0 _a							1		
F1_DS	0,492	0,2333	0,035	0,950	4,452	1	0,035	1,636	1,036	2,585
F2_DS	0,156	0,1453	-0,129	0,441	1,152	1	0,283	1,169	0,879	1,554
F3_DC	-0,484	0,1694	-0,816	-0,152	8,165	1	0,104	0,616	0,442	0,859
F4_DL	-0,116	0,1726	-0,455	0,222	0,454	1	0,501	0,890	0,635	1,249
F5_DL	-0,147	0,1298	-0,402	0,107	1,285	1	0,257	0,863	0,669	1,113
F6_DR	0,253	0,1101	0,037	0,469	5,274	1	0,022	1,288	1,038	1,598
F7_DR	0,066	0,1128	-0,155	0,287	0,339	1	0,561	1,068	0,856	1,332
(Scale)	1 _b									

Table 19 - Test of Parallel Lines

Test of Parallel Lines ^a				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	815.447			
General	745.710 _b	815.447	105	.980

4. Dependent variable: digital goods purchase frequency from «Tickets and reservations» category

Table 20 - Model Fitting Information

Model Fitting Information				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	905,023			
Final	834,818	70,205	39	0,002

Table 21 - Goodness-of-Fit

Goodness-of-Fit			
	Chi-Square	df	Sig.
Pearson	1733,829	1779	0,774
Deviance	830,659	1779	0,809

Table 22 - Pseudo R-Square

Pseudo R-Square	
Cox and Snell	0,410

Nagelkerke	0,412
McFadden	0,277

Table 23 – Omnibus test

Omnibus Testa		
Likelihood Ratio Chi-Square	df	Sig.
70,205	39	0,002

Table 24 - Parameter Estimates

Parameter Estimates											
Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test			Exp(B)	95% Wald Confidence Interval for Exp(B)	
				Lower	Upper	Wald Chi-Square	df	Sig.		Lower	Upper
Threshold	[Freq_tickets=0]	1,011	1,4445	-1,820	3,842	0,490	1	0,484	2,748	0,162	46,619
	[Freq_tickets=1]	2,301	1,4433	-0,528	5,130	2,542	1	0,111	9,986	0,590	169,020
	[Freq_tickets=2]	4,687	1,4650	1,816	7,558	10,236	1	0,001	108,532	6,146	1916,717
	[Freq_tickets=3]	6,103	1,4799	3,203	9,004	17,009	1	0,000	447,355	24,602	8134,518
	[Freq_tickets=4]	6,648	1,4879	3,732	9,564	19,963	1	0,000	771,150	41,750	14243,520
	[Freq_tickets=5]	8,392	1,5561	5,342	11,442	29,081	1	0,000	4409,912	208,861	93111,430
[Sex1=female]		0,100	0,2247	-0,341	0,540	0,197	1	0,657	1,105	0,711	1,716
[Sex1=male]		0 ^a							1		
[Age1=<18]		0,291	0,8894	-1,452	2,034	0,107	1	0,744	1,338	0,234	7,646
[Age1=18-25]		0,164	0,5041	-0,824	1,152	0,105	1	0,745	1,178	0,439	3,163
[Age1=26-35]		-0,011	0,5028	-0,997	0,974	0,000	1	0,982	0,989	0,369	2,649
[Age1=36-45]		0,068	0,4994	-0,910	1,047	0,019	1	0,891	1,071	0,402	2,850
[Age1=46-55]		0 ^a							1		
[Education1=bachelor's degree]		0,322	0,4330	-0,527	1,171	0,552	1	0,457	1,380	0,590	3,224
[Education1=master's Degree]		0,802	0,4419	-0,064	1,668	3,291	1	0,070	2,229	0,938	5,300
[Education1=postgraduate study]		1,380	0,7953	-0,178	2,939	3,012	1	0,083	3,977	0,837	18,901
[Education1=secondary education]		0,311	0,7265	-1,113	1,735	0,183	1	0,669	1,365	0,329	5,667
[Education1=specialized secondary education]		0 ^a							1		
[Income1=<30,000]		-0,312	0,4260	-1,147	0,523	0,538	1	0,463	0,732	0,317	1,686

[Income1=>151,000]	0,684	0,5805	-0,453	1,822	1,390	1	0,238	1,982	0,635	6,184
[Income1=121,000-150,000]	-0,364	0,5543	-1,451	0,722	0,431	1	0,511	0,695	0,234	2,059
[Income1=30,000-60,000]	-0,108	0,3789	-0,851	0,634	0,082	1	0,775	0,897	0,427	1,886
[Income1=61,000-90,000]	-0,217	0,3648	-0,932	0,498	0,353	1	0,552	0,805	0,394	1,646
[Income1=91,000-120,000]	0 _a							1		
F1_DS	0,608	0,2557	0,107	1,109	5,656	1	0,017	1,837	1,113	3,032
F2_DS	-0,230	0,1454	-0,515	0,055	2,496	1	0,114	0,795	0,598	1,057
F3_DC	0,363	0,1667	0,037	0,690	4,751	1	0,029	1,438	1,037	1,994
F4_DL	-0,055	0,1617	-0,372	0,262	0,115	1	0,735	0,947	0,690	1,300
F5_DL	-0,037	0,1330	-0,298	0,224	0,077	1	0,782	0,964	0,743	1,251
F6_DR	-0,051	0,1112	-0,269	0,167	0,214	1	0,644	0,950	0,764	1,181
F7_DR	0,122	0,1131	-0,099	0,344	1,173	1	0,279	1,130	0,906	1,411
(Scale)	1 _b									

Table 25 – Test of Parallel Lines

Test of Parallel Lines ^a				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	1012,731			
General	986.007 _b	1012,731	195	0,854

5. Dependent variable: digital goods purchase frequency from «Online courses and trainings» category

Table 26 - Model Fitting Information

Model Fitting Information				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	903.366			
Final	876.984	26.382	21	.002

Table 27 - Goodness-of-Fit

Goodness-of-Fit			
	Chi-Square	df	Sig.
Pearson	1954.942	1797	.065
Deviance	872.825	1797	1.000

Table 28 - Pseudo R-Square

Pseudo R-Square

Cox and Snell	.381
Nagelkerke	.385
McFadden	.129

Table 29 - Omnibus Test

Omnibus Test ^a		
Likelihood Ratio Chi-Square	df	Sig.
26.382	21	.002

Table 30 - Parameter Estimates

Parameter Estimates											
Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test			Exp(B)	95% Wald Confidence Interval for Exp(B)	
				Lower	Upper	Wald Chi-Square	df	Sig.		Lower	Upper
Threshold	[Freq_courses=0]	2,736	1,3237	0,142	5,331	4,273	1	0,039	15,428	1,152	206,550
	[Freq_courses=1]	4,049	1,3346	1,433	6,664	9,202	1	0,002	57,318	4,191	784,000
	[Freq_courses=2]	5,743	1,3528	3,092	8,395	18,021	1	0,000	312,006	22,010	4422,858
	[Freq_courses=3]	6,575	1,3678	3,894	9,256	23,108	1	0,000	716,877	49,114	10463,716
	[Freq_courses=4]	6,796	1,3736	4,104	9,488	24,478	1	0,000	894,296	60,568	13204,470
	[Freq_courses=5]	8,010	1,4368	5,194	10,826	31,080	1	0,000	3011,399	180,198	50325,287
[Sex1=female]		0,411	0,2204	-0,021	0,843	3,479	1	0,062	1,508	0,979	2,324
[Sex1=male]		0 ^a							1		
[Age1=<18]		1,170	0,9085	-0,611	2,951	1,659	1	0,198	3,222	0,543	19,118
[Age1=18-25]		0,670	0,5022	-0,315	1,654	1,778	1	0,182	1,954	0,730	5,229
[Age1=26-35]		0,847	0,4922	-0,117	1,812	2,964	1	0,085	2,334	0,889	6,123
[Age1=36-45]		1,189	0,5025	0,204	2,173	5,596	1	0,068	3,282	1,226	8,788
[Age1=46-55]		0 ^a							1		
[Education1=bachelor's degree]		0,129	0,4079	-0,671	0,928	0,100	1	0,752	1,138	0,511	2,530
[Education1=master's Degree]		0,436	0,4159	-0,380	1,251	1,097	1	0,295	1,546	0,684	3,493
[Education1=postgraduate study]		0,861	0,8826	-0,869	2,591	0,952	1	0,329	2,366	0,420	13,348
[Education1=secondary education]		0,805	0,7196	-0,605	2,215	1,251	1	0,263	2,237	0,546	9,165
[Education1=specialized secondary education]		0 ^a							1		
[Income1=<30,000]		-0,112	0,4166	-0,929	0,704	0,073	1	0,788	0,894	0,395	2,022

[Income1=>151,000]	0,051	0,5470	-1,021	1,124	0,009	1	0,925	1,053	0,360	3,076
[Income1=121,000-150,000]	-0,422	0,5626	-1,525	0,681	0,563	1	0,453	0,656	0,218	1,975
[Income1=30,000-60,000]	-0,124	0,3616	-0,833	0,584	0,118	1	0,731	0,883	0,435	1,794
[Income1=61,000-90,000]	-0,358	0,3505	-1,045	0,329	1,044	1	0,307	0,699	0,352	1,389
[Income1=91,000-120,000]	0 ^a							1		
F1_DS	0,370	0,2296	-0,080	0,820	2,595	1	0,007	1,448	0,923	2,270
F2_DS	0,171	0,1384	-0,101	0,442	1,520	1	0,218	1,186	0,904	1,555
F3_DC	-0,039	0,1605	-0,353	0,276	0,058	1	0,810	0,962	0,702	1,318
F4_DL	0,028	0,1626	-0,291	0,346	0,029	1	0,865	1,028	0,748	1,414
F5_DL	-0,053	0,1261	-0,300	0,195	0,174	1	0,676	0,949	0,741	1,215
F6_DR	-0,016	0,1071	-0,226	0,194	0,021	1	0,884	0,984	0,798	1,214
F7_DR	0,065	0,1121	-0,155	0,284	0,334	1	0,563	1,067	0,857	1,329
(Scale)	1 ^b									

Table 31 - Test of Parallel Lines

Test of Parallel Lines ^a				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	876.984			
General	504.624 ^b	372.360 ^c	105	.768

6. Dependent variable: digital goods purchase frequency from «Text-based» category

Table 32 – Model Fitting Information

Model Fitting Information				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	681,639			
Final	646,994	34,644	21	0,031

Table 33 - Goodness-of-Fit

Goodness-of-Fit			
	Chi-Square	df	Sig.
Pearson	1533,330	1797	1,000
Deviance	641,449	1797	1,000

Table 34 - Pseudo R-Square

Pseudo R-Square	
Cox and Snell	0,304
Nagelkerke	0,318
McFadden	0,250

Table 35 - Omnibus Test

Omnibus Test ^a		
Likelihood Ratio Chi-Square	df	Sig.
34,644	21	0,031

Table 36 - Parameter Estimates

Parameter Estimates											
Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test			Exp(B)	95% Wald Confidence Interval for Exp(B)	
				Lower	Upper	Wald Chi-Square	df	Sig.		Lower	Upper
Threshold	[Freq_text=0]	2,969	1,5024	0,025	5,914	3,907	1	0,048	19,481	1,025	370,189
	[Freq_text=1]	4,246	1,5125	1,282	7,211	7,880	1	0,005	69,828	3,602	1353,662
	[Freq_text=2]	5,419	1,5262	2,428	8,411	12,609	1	0,000	225,743	11,338	4494,699
	[Freq_text=3]	5,954	1,5378	2,940	8,968	14,990	1	0,000	385,148	18,910	7844,517
	[Freq_text=4]	6,590	1,5631	3,526	9,653	17,775	1	0,000	727,678	33,999	15574,616
	[Freq_text=5]	7,712	1,6679	4,443	10,981	21,377	1	0,000	2234,480	85,001	58739,359
[Sex1=female]		0,365	0,2529	-0,131	0,860	2,080	1	0,149	1,440	0,877	2,364
[Sex1=male]		0 ^a							1		
F7_DR		0,175	0,1248	-0,069	0,420	1,972	1	0,160	1,192	0,933	1,522
[Age1=<18]		-0,024	0,9381	-1,863	1,815	0,001	1	0,980	0,976	0,155	6,139
[Age1=18-25]		-0,453	0,5106	-1,453	0,548	0,786	1	0,375	0,636	0,234	1,730
[Age1=26-35]		-0,796	0,5098	-1,795	0,203	2,440	1	0,118	0,451	0,166	1,225
[Age1=36-45]		-0,933	0,5336	-1,978	0,113	3,054	1	0,081	0,394	0,138	1,120
[Age1=46-55]		0 ^a							1		
[Education1=bachelor's degree]		0,848	0,5764	-0,282	1,978	2,165	1	0,141	2,335	0,755	7,228
[Education1=master's Degree]		0,886	0,5715	-0,234	2,006	2,404	1	0,121	2,426	0,791	7,437

[Education1=postgraduate study]	0,822	0,8461	-0,836	2,480	0,944	1	0,331	2,275	0,433	11,947
[Education1=secondary education]	-0,033	0,7864	-1,574	1,508	0,002	1	0,967	0,968	0,207	4,519
[Education1=specialized secondary education]	0a							1		
[Income1=<30,000]	0,051	0,4772	-0,884	0,986	0,011	1	0,915	1,052	0,413	2,681
[Income1=>151,000]	1,077	0,5853	-0,070	2,224	3,388	1	0,066	2,937	0,933	9,248
[Income1=121,000-150,000]	0,195	0,6054	-0,991	1,382	0,104	1	0,747	1,216	0,371	3,983
[Income1=30,000-60,000]	0,000	0,4233	-0,830	0,829	0,000	1	0,999	1,000	0,436	2,292
[Income1=61,000-90,000]	0,222	0,4060	-0,574	1,018	0,299	1	0,585	1,249	0,563	2,767
[Income1=91,000-120,000]	0a							1		
F1_DS	-0,257	0,2567	-0,760	0,246	1,002	1	0,317	0,773	0,468	1,279
F2_DS	0,028	0,1540	-0,274	0,330	0,033	1	0,857	1,028	0,760	1,391
F3_DC	0,078	0,1881	-0,290	0,447	0,173	1	0,677	1,081	0,748	1,563
F4_DL	0,420	0,1917	0,044	0,795	4,793	1	0,029	1,521	1,045	2,215
F5_DL	0,126	0,1492	-0,167	0,418	0,709	1	0,400	1,134	0,846	1,519
F6_DR	-0,020	0,1287	-0,272	0,232	0,024	1	0,877	0,980	0,762	1,261
(Scale)	1b									

Table 37 - Test of Parallel Lines

Test of Parallel Lines ^a				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	646,994			
General	.000 ^b	646,994	105	.892

7. Dependent variable: digital goods purchase frequency from «Image-based» category

Table 38 – Model Fitting Information

Model Fitting Information				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	580,031			
Final	507,882	72,149	21	0,000

Table 39 - Goodness-of-Fit

Goodness-of-Fit			
	Chi-Square	df	Sig.
Pearson	895,363	888	0,425
Deviance	505,110	888	1,000

Table 40 - Pseudo R-Square

Pseudo R-Square	
Cox and Snell	0,205
Nagelkerke	0,243
McFadden	0,124

Table 41 - Omnibus Test

Omnibus Testa		
Likelihood Ratio Chi-Square	df	Sig.
72,149	21	0,000

Table 42 - Parameter Estimates

Parameter Estimates											
Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test			Exp(B)	95% Wald Confidence Interval for Exp(B)	
				Lower	Upper	Wald Chi-Square	df	Sig.		Lower	Upper
Threshold	[Freq_image=0]	-3,015	1,4993	-5,953	-0,076	4,044	1	0,044	0,049	0,003	0,927
	[Freq_image=1]	-1,503	1,4924	-4,428	1,422	1,015	1	0,314	0,222	0,012	4,144
	[Freq_image=2]	0,578	1,5120	-2,385	3,542	0,146	1	0,702	1,783	0,092	34,530
[Sex1=female]		0,198	0,2660	-0,323	0,720	0,556	1	0,456	1,219	0,724	2,054
[Sex1=male]		0 ^a							1		
[Age1=<18]		-1,391	1,1286	-3,603	0,821	1,520	1	0,218	0,249	0,027	2,272
[Age1=18-25]		0,495	0,5712	-0,625	1,614	0,750	1	0,386	1,640	0,535	5,024
[Age1=26-35]		0,295	0,5619	-0,806	1,397	0,276	1	0,599	1,344	0,447	4,041
[Age1=36-45]		0,575	0,5463	-0,496	1,646	1,107	1	0,293	1,777	0,609	5,184
[Age1=46-55]		0 ^a							1		
[Education1=bachelor's degree]		0,922	0,5229	-0,103	1,947	3,108	1	0,078	2,514	0,902	7,005

[Education1=master's Degree]	1,084	0,5422	0,021	2,146	3,994	1	0,146	2,955	1,021	8,553
[Education1=postgraduate study]	1,567	0,8839	-0,166	3,299	3,141	1	0,076	4,790	0,847	27,084
[Education1=secondary education]	1,541	0,8986	-0,221	3,302	2,939	1	0,086	4,667	0,802	27,162
[Education1=specialized secondary education]	0 ^a							1		
[Income1=<30,000]	-0,504	0,4785	-1,442	0,434	1,111	1	0,292	0,604	0,236	1,543
[Income1=>151,000]	-0,420	0,6564	-1,707	0,866	0,410	1	0,522	0,657	0,181	2,378
[Income1=121,000-150,000]	-0,394	0,6015	-1,573	0,785	0,429	1	0,512	0,674	0,207	2,192
[Income1=30,000-60,000]	-0,277	0,4269	-1,114	0,559	0,422	1	0,516	0,758	0,328	1,749
[Income1=61,000-90,000]	-0,715	0,4082	-1,515	0,085	3,070	1	0,080	0,489	0,220	1,089
[Income1=91,000-120,000]	0 ^a							1		
F1_DS	-0,336	0,2609	-0,847	0,176	1,655	1	0,198	0,715	0,429	1,192
F2_DS	-0,371	0,1887	-0,741	-0,001	3,862	1	0,059	0,690	0,477	0,999
F3_DC	0,116	0,1699	-0,217	0,449	0,463	1	0,006	1,123	0,805	1,566
F4_DL	-0,645	0,1894	-1,016	-0,274	11,592	1	0,051	0,525	0,362	0,761
F5_DL	-0,379	0,1458	-0,665	-0,094	6,777	1	0,069	0,684	0,514	0,910
F6_DR	0,138	0,1228	-0,102	0,379	1,269	1	0,260	1,148	0,903	1,461
F7_DR	0,408	0,1423	0,129	0,686	8,205	1	0,004	1,503	1,137	1,987
(Scale)	1 ^b									

Table 43 - Test of Parallel Lines

Test of Parallel Lines ^a				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	507,882			
General	456.293 ^b	51.589 ^c	42	0,147

Cluster analysis

Table 1 – General statistics of clusters

	Cluster 1	Cluster 2	Cluster 3
“Text-based” purchase frequency	56% do not buy	63% do not buy	73% do not buy
“Audio-based” purchase frequency	47% once a month 19% do not buy	43% once a month 21% do not buy	54% once a month 24% once in 2/3 months
“Video-based” purchase frequency	28% once a month 27% do not buy	21% once a month 22% made one-time 26% do not buy	31% once a month 20% made one-time 24% do not buy
“Image-based” purchase frequency	68% do not buy 24% made one-time	79% do not buy 14% made one-time	41% do not buy 31% made one-time
“Software and Tools” purchase frequency	38% made one time 36% do not buy 13% once in 2/3 months	40% do not buy 38% made one time 14% once in 2/3 months	33% do not buy 27% made one-time 20% once in 2/3 month 20% once a month
“Tickets and reservations” purchase frequency	50% once in 2/3 months 17% once a month	49% once in 2-3 month 26% once in a month	51% once in 2-3 months 21% once a month 17% made one-time
“Online courses and trainings” purchase frequency	39% do not buy 25% once in 2/3 months 20% made one-time	33% made one-time 30% once in 2-3 months 27% do not buy	40% made one-time 30% do not buy 26% once in 2-3 months
Sex	40% male 60% female	45% 55%	47% 53%
Age	59% - 18-25 17% - 26-35 12% - 36-45 9% - <18	52% - 18-25 23% - 26-35 14% - 36-45	37% - 36-45 23% - 26-35 16% - 18-25 19% - 46-55

Education	46% - masters 33% - bachelors 12% - secondary	50% - masters 32% - bachelors 9% - specialized	51% - bachelors 21% - masters 13% - specialized
Income	32% - <30 22% - 30-60 20% - 61-90 19% - 91-120	29% - 30-60 26% - <30 20% - 61-90	36% - 61-90 19% - 30-60 17% - <30