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INNOVATION ATTRIBUTES AS DRIVERS OF ADOPTION INTENTION: THE CASE OF RUSSIAN CONSUMERS

Master's Thesis by the 2nd year student
Concentration - Information Technologies and Innovation Management
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ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

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АННОТАЦИЯ

Автор	Василькова Дарья Андреевна
Название магистерской диссертации	Атрибуты инноваций как драйверы намерения их принятия на примере российских потребителей
Факультет	Менеджмент
Направление подготовки	Информационные технологии и инновационный менеджмент
Год	2018
Научный руководитель	Хуан Фрейшанет Солирвисенс
Описание цели, задач и основных результатов	Цель данного исследования заключается в идентификации отношений между атрибутами инноваций и намерением принятия инноваций российскими потребителями платформ медицинских онлайн-консультаций онлайн. Исследование ставит своей задачей решить исследовательскую проблему определения параметров модели отношения атрибутов инноваций и намерения принятия российскими потребителями платформ медицинских онлайн-консультаций. Исследование было построено согласно модели Роджерса принятия решений об инновациях, с наиболее актуальными дополнениями, предложенными Капуром, Двиведи и Уильямсом. Количественное исследование было проведено через онлайн опрос 244 российских потребителей, с дальнейшим факторным анализом и множественной регрессией. Результатом исследования стали параметры модели влияния атрибутов инновации на намерение ее принятия российскими потребителями платформ медицинских онлайн-консультаций. В финале исследования были выдвинуты предложения по использованию результатов исследования на практике.
Ключевые слова	Атрибуты инноваций, намерение принятия инноваций, диффузия инноваций, телемедицина, российские потребители

ABSTRACT

Master Student's Name	Vasilkova Daria
Master Thesis Title	Innovation Attributes as Drivers of Adoption Intention: case of Russian consumers
Faculty	Management
Main field of study	Information technologies and Innovation management
Year	2018
Academic Advisor's Name	PhD., Joan Freixanet Solervicens
Description of the goal, tasks and main results	The goal of this research is to identify relationships between innovation attributes and adoption intention in perception of russian consumers of online medical consultation platforms. The study is aiming at covering the research problem of defining parameters of model of relationships of innovation attributes and online medical consultation platforms' adoption intention of Russian consumers. The research was formed after Rogers' model of innovation-decision process from diffusion of innovation theory, with recent developments suggested by Kapoor, Dwivedi and Williams. Quantitative research was conducted via online survey of 244 Russian consumers, with further application of factor analysis and multiple regression. The result of this research are parameters of model of innovation attributes that influence online medical consultation platforms adoption intention of Russian consumers, with discussion of implications of these parameters for managerial practice.
Keywords	Innovation attributes, innovation adoption intention, diffusion of innovation, telemedicine, Russian consumers

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INTRODUCTION

With growing complexity of consumer needs and development of markets, power of consumer is stronger than it has ever been. In the era of industrial production, when almost any product could be replicated relatively quickly, it is particularly hard for companies to stay competitive. One of the ways for a company to escape pressure enforced by competition is introduction of innovations, which allows efficient product differentiation. However, innovation is not the goal in itself, but the mean of satisfying consumer needs. Therefore not merely the fact of innovation, but the extent to which consumers would be willing to adopt the innovation is what contributes to firm performance. This makes the topic of innovation adoption highly relevant for modern business.

Notably, on the early stages of product lifecycle, when the innovative product does not have a developed history of consumption, innovation adoption cannot be measured, as it requires historical data on the fact of innovation adoption. In order to have a certain base for company planning, it is feasible to conduct research of pre-experience perceptions of innovation by consumers by identifying existing innovation adoption intention.

Adoption intention is formed on the base of perceived innovation attributes. A number of theories aiming to outline innovation adoption attributes is developed, with two main schools of thought distinguished. The first school is focused on intrinsic characteristics of innovation, while the second school concentrates on general environmental conditions that influence perception of innovation. The most prominent theory of the first school of thought is innovation-decision theory by Rogers, with recent developments suggested by Kapoor. These theories prove high interdependance of innovation attributes and adoption intention, outlining innovation attributes that impact innovation adoption intention. For this research the first school of thought was chosen, as it tackles aspects of innovation on which companies have direct influence, as opposed to the second school of thought, which aims to measure broader spectrum of environmental conditions, most of which are not under company's ability to be changed. In particular, Rogers' innovation-decision theory was chosen due to its' specific focus on innovation and extensive story of theory application in managerial studies.

The market of telemedicine and online medical consultation (OMC) platforms in particular was chosen as the base for theory application due to the following reasons. First, with the introduction of law that regulates these platforms in the January of 2018, this innovation is currently in the beginning of its' adoption cycle: if the market of "doctor-doctor" telemedicine is developed worldwide and already has standards, the market of "doctor-patient" telemedicine is yet unsettled. This makes research on innovation adoption in the market of telemedicine highly applicable for managerial practice, giving a possibility for deriving practical outputs. In the same

time, the market of telemedicine accounts for 20% of annual growth of overall healthcare market, making it the most rapidly developing segment of this market (Foley, 2017).

Secondly, as online medical consultation platforms is a recent technology in Russian context, there are no empirical studies on innovation adoption intention of telemedicine platforms of Russian consumers.

Therefore, the goal of this study is to identify relationships between innovation attributes and adoption intention of Russian consumers of online medical consultation platforms.

Theories of innovation adoption, originally created on the base of countries with developed economy, had proven to work differently depending on the place and industry they are applied to (Chiangwa & Alexander, 2016; Hsu, Lu & Hsu, 2007). Therefore, the research gap covered by this study is the fit of innovation adoption intention theories to behaviour of Russian consumers regarding online medical consultation platforms.

The research questions covered in this paper are:

Q1. Are there relationships between innovation attributes and adoption intention of Russian consumers of OMC platforms?

Q2. What innovation attributes have influence on adoption intention of consumer of OMC platforms?

Consequently, the research problem of this study is definition of parameters of a model of relationships between innovation attributes and adoption intention of OMC platforms for Russian consumers.

The goal of the research is to identify relationships between innovation attributes and adoption intention in perception of russian consumers of online medical consultation platforms.

The results yield contribution to both existing research and managerial community. The present study contributes to the existing research by confirmation of feasibility of use of constructs derived from innovation-decision theory for Russian consumers.

Practical implications of results of this study is its' contribution to overall deeper understanding of consumer motivation for use of online medical consultation platforms, allowing better focus of marketing activities and increasing probability of higher innovation adoption rate.

The study is organized in the following way: in the first chapter the existing literature on innovation adoption is overviewed and innovation attributes for research are outlined. Next, current state of russian online medical consultation platforms is reviewed, and six hypotheses using innovation adoption theories are suggested. In the second chapter the research design is justified. In the third chapter, quantitative analysis is conducted with IBM SPSS Statistics tool to test the hypotheses; the results and managerial implications are discussed in the fourth chapter of this study. In the conclusion, overall results of this study are outlined.

CHAPTER I. OVERVIEW OF RESEARCH ON INNOVATION ADOPTION

1.1 General discussion on innovation and marketing of innovation

In the following section of this study definition of innovation is given, reasons for companies to introduce innovations are overviewed, and role and specifics of marketing of innovation are discussed.

1.1.1 Definition and classification of innovation

Universally accepted definition of innovation does not exist, with "novelty" being the most common attribute associated with the concept. This rises a reasonable question: to whom exactly it is new and in which way. From marketing point of view, novelty is related to consumer perception, giving marketing a significant influence over the definition of novelty (Garcia, 2011). The scientific community insists on scientific novelty, while managerial approach is focused on impact that innovation has on business. As this paper lies in the field of management, managerial definition of innovation would be adopted. Innovation from managerial point of view is defined as "the process of implementing new ideas to create value for an organization" (Yale Information Technologies Services, 2014).

Moreover, this thesis is devoted to innovation in healthcare, which is specifically defined as: "the introduction of a new concept, idea, service, process, or product aimed at improving treatment, diagnosis, education, outreach, prevention and research, and with the long term goals of improving quality, safety, outcomes, efficiency and costs" (Omachonu and Einspruch, 2010).

Innovation could originate in various parts of organization, not only the R&D department. Typology of innovation is based on the object being innovated and includes product, process, marketing and organizational innovation: product innovation being the significant improvement of a good or service; process innovation is new or slightly improved production or delivery method; marketing innovation is new marketing method including changes in product packaging or design, promotion, pricing, or placing; organizational innovation is related to new business practices, workplace organization or external relations (Organisation for Economic Co-operation and Development & Statistical Office of the European Communities, 2005). Nowadays innovation is considered to be the most significant ingredient of economy (Hoque, 2012). However, with innovation serving as enabler of economic shift, it is the implementation of innovation to the company structure that defines the impact it will have on the firm and on the market as a whole. In order to stay competitive, companies are forced to continuously introduce innovations, at the same time assessing whether these technologies are contributing to long-term growth, analyzing risks of innovation commercialization in conditions of uncertainty, all while keeping the customer-oriented view (Ganguly, 2017).

Innovation is not a direct transfer of new scientific knowledge to products; it is a process of development and launch of new products, processes, and services to market. This process can take many forms, which arises a need for creation of a classification of innovation.

A need to classify innovation according to extent of its' impact led to development of a number of dichotomous scales. However, the most common scale was developed by Christensen, The Innovation Matrix, which classifies innovation according to, firstly, the extent to which a problem that innovation solves is defined and secondly, the domain to which innovation belongs.

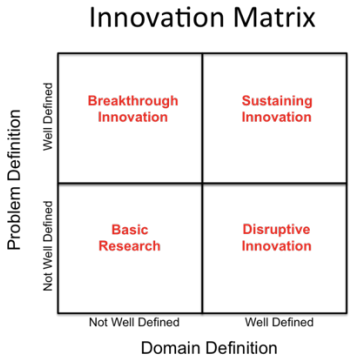

Figure 1. Innovation matrix. (Source: Christensen).

Business focuses on sustaining and disruptive innovation. Sustaining innovation develops existing markets by improving existing products, what results in gaining higher profit margins from already existing customers (Deloitte, 2017). Disruptive innovation, in turn, develops new markets by offering new products to either new customers or those who were underserved by the previous product offer. Christensen notes that few innovations are intrinsically sustaining or disruptive by nature, with disruptive impact being delivered when the innovation is shaped into strategy (Christensen, 2015).

Scholars of different disciplines have varying view on innovation: while economists observe innovation as an outcome, sociologist consider it a process. Managerial scholars focus on innovation adoption, connecting those two viewpoints.

Having established a definition of innovation, it is feasible to move on to discussion of the reasons why innovation occurs in firms.

1.1.2 Company's incentives to innovate

The reason for which companies aim to introduce innovation is tackled by three groups of economic models that aim to explain forces behind innovation: game-theoretical models, endogeneous growth models and evolutionary models.

Game-theoretical models focus on R&D decisions in strategic environment, with the main idea of two incentives for innovation: threat of potential innovation by competing firms and search of higher profits. However, no unified model is suggested, requiring adaptation of the model to

specific market situations (Easley & Kleinberg, 2010). Evidence in support of this theory was found in research of Russian companies by Gurkov, which states that “the perception of rapid changes in technologies and products” and “positive assessment of market trends” are strong predictors of regular innovations in Russian industrial firms (Gurkov, 2013).

Endogenous growth models focus on mechanisms by which competition impacts innovation, stating that when competition is high, companies have higher incentive to innovate in hope of escaping from this competition (Kogan, Papanimolaou, Seru & Stoffman, 2012). The same tendency occurs when in markets with low level of competition it suddenly rises: companies are forced to innovate. There is scientific evidence that in highly competitive environment increase in R&D investment of one company leads to consequent increase of R&D investment in closely competing company (Aghion, Bechtold, Cassar & Herz, 2014). Such tendency is explained by increase of profits related to increase of toughness of price competition due to furthering of technological leadership of the current leader, enlargening the gap between leader and followers, and making the leader more likely to innovate, while followers have lower profits due to tough competition and therefore less means to innovate (Gottinger, 2016). Market structure in this case demonstrates dependencies: in case of successful innovation implementation, leading firm get profits of a monopolist, while followers get profits of duopolist. However, it is necessary to consider possible conflict which could arise in process of innovation between static and dynamic efficiency of a firm, meaning, respectively, the most efficient combination of a firm’s current resources, and development of processes in order to improve future efficiency (Zhang, 2017). This conflict could be described in other words as conflict between short-term and long-term performance.

Evolutionary approach rejects basic assumptions of rationality and economic equilibrium, instead focusing on dynamic processes (Cantwell, Dunning & Lundan, 2009). It compares economic growth to evolutionary biology, relying on variety, selection and imitation. The most fit companies survive in the marketplace, with imitation of the best practices being the strongest tool. Therefore, innovation as economic development is a result of selection process through competition of various practices. in markets where imitation is easy, it is industry followers or entrants who will create major innovations due to behavior of incumbent firms: having already captured a high share of post-innovation market, incumbents tend to invest less on an innovative project than followers.

Table 1. Economic models on company's incentives to innovate. (Source: author).

	Game-theoretical models	**Endogenous growth models**	**Evolutionary models**

Company's incentives to innovate	Threat of potential innovations by competitors	Escaping high competition	Innovation as a source for evolutionary growth and eventual firm survival
	Higher profits	-	-

Although these models suggest different incentives for company to innovate, all of them are intersected at the core idea of innovation as the mean of firm response to market conditions, making innovation the mean of firm survival.

As this section establishes the high need for modern companies to innovate in order to stay competitive on the market, the next step is to analyze the role of marketing for innovative products and what are the differences between marketing of innovation and traditional marketing.

1.1.3 Marketing of innovative products

Marketing of innovations is application of marketing technologies throughout the whole lifecycle of innovative product, from market launch to exit from the market, with the aim of obtaining long-term market advantages (Korokoshko, 2013). There are several reasons why marketing is particularly important for innovations in order to be successful.

Firstly, marketing involvement from the initial stages of product creation is crucial for resolving trade-offs between the technical design and consumers' need. The role of marketing in launching innovative products to the market is usually underrated by innovation developers, although empirical evidence confirms that cooperation between R&D and marketing increases success rate of new product. Garanin, a CEO of marketing company Mybrandbrand, states: "For a year I conduct about 100–120 examinations of projects, and we have to state that 90% of developers do not understand or recognize the marketing, they find technology to be the most important. As a result, <…> they are sent to a marketing expert to create a product from the ground up. <…> Product, including the innovative one, is built for people, and thus for the market and with marketing" (Georgiev, 2013).

Secondly, companies face a specific issue with innovations, which impact on firm performance can be moderated with marketing: the so-called problem of appropriability of the return to knowledge assets (Hall & Sena, 2017). This is a problem when companies cannot fully benefit from their own innovations because of rapid appearance of imitating products on the market. In markets where imitation is easy, it is industry followers or entrants who create major innovations due to behavior of leading firms: having already captured a high share of post-

innovation market, leaders tend to invest less on further development of innovations than followers. On the contrary, minor innovation typically occurs within market leaders, especially in markets where patent protection is strong (Gottinger, 2016). Solution for overcoming the problem of appropriability of innovation results is building a brand and creating loyalty via marketing tools, which increases costs for imitators and allows innovative companies to capture more value from their innovations.

Having identified reasons behind high importance of marketing for innovative products, as the next step it is feasible to observe specifics of marketing of innovation compared to marketing of traditional products.

Firstly, one of obstacles for marketing of innovation is measurement of innovation success, as there is no standardized scale that allows comparison between firms or products in terms of innovation. Although there are some exceptions when innovation could be identified technically, for example, performance of semiconductors, or when innovation could be attributed to welfare, quality changes or other economic proxies, in general the success of innovation is hard to measure (Gottinger, 2016). Consequently, measurements applied by traditional marketing set unrealistic expectations for market share and sales volume, creating a distorted view for company management. That is the reason why innovative companies tend to focus rather on risk reduction for investors than on predicting performance of innovation (Komisarova, 2011).

Secondly, significant limitation of traditional marketing for innovative products is that its' techniques are leaning on historical data and past experiences of consumer, while with innovative products consumers could not possibly have past experiences, leaving companies without the base for marketing planning.

Therefore, companies have to rely on the primary research of consumers' pre-experience perceptions of innovation in order to plan their marketing effors. Milekhin, a president of research holding ROMIR, supports this idea: "Why would we need previous experience, if we are creating a new one? There is, of course, an exception: it is the knowledge of human nature, psychology, needs, ability to perceive what we are going to offer him (consumer)" (Georgiev, 2013).

Research pillar that covers consumers' pre-experience perception of innovations is research on innovation adoption intention, which outlines important drivers that have impact on eventual adoption of innovation. Theories on adoption intention are further described in the next section of this study.

1.2 Theories on consumer behavior towards innovation adoption

Literature studying innovation from consumers' perspective could be divided into three topics: innovation adoption, innovation diffusion and domestication of innovation. Although

innovation diffusion and innovation adoption are related, they represent two different concepts: innovation diffusion stands for the number of users that innovation accumulated over time, while innovation adoption describes "the decision process in which decision-making unit makes use of an innovation" (Rogers, 2003).

Diffusion research is represented by longitudinal studies of diffusion process, and includes numerous quantitative measurements of the same sample over time.

Domestication research focuses on social, political and cultural consequences of innovation.

Adoption literature overviews factors that influence behavioral intention and use behavior. This kind of research includes once-off surveys aiming to research whether consumers intend to use a certain technology. Notably, there are different constructs used in such literature: adoption intention and actual adoption. The main difference between innovation adoption intention and actual innovation adoption research is that the first aims to uncover consumers' feelings and emotions, while the latter focuses on more factual concepts.

As it was discussed in the previous section of this paper, this study focuses on innovation adoption, due to this direction of research possessesing strong practical value.

1.2.1. Research on Innovation Adoption

Various viewpoints on innovation adoption are present in the literature: while in social sciences innovation adoption is viewed as a process, economists tend to outline innovation as a static phenomenon, as an outcome.

However, in managerial sciences innovation is mostly viewed as a process. Such perspective provides more complex view on this phenomenon, as it allows to distinguish dynamics that influence the transition from lack of knowledge about the innovation to its' actual adoption. Rogers describes innovation adoption as a process through which a decision-making unit, who can be either a consumer or an organization, goes (Rogers, 2003). Every stage has a distinct nature, experiences influence of different factors and therefore, should be overviewed separately.

Table 2. Adoption models. (Source: Khan, 2017).

Rogers, 2003	**Frambach & Schillewaert, 2002**	**Cooper & Zmud, 1990**
Knowledge	Awareness	Initiation
Persuasion	Consideration	Adoption
Decision	Intention	Adaptation
Implementation	Adoption decision	Acceptance
Confirmation	Continued use	Routinization

		Infusion

Rogers' innovation-decision theory states that there are five stages of innovation adoption: the initial stage is knowledge, then followed by persuasion; the next stage is decision about the innovation, which results in innovation implementation; and finally, confirmation (Rogers, 2003). This theory evenly covers the whole process of innovation adoption. However, some theories are more focused on certain parts of the adoption process: thus, the research of Cooper & Zmud is emphasizing consumer behavior at post-adoption stages (Cooper & Zmud, 1990). In this terms this theory is closer to body of research on domestication of innovation, which is devoted to consequences that innovations have on society and government. Moreover, the theory is devoted to a specific niche of informational technologies. Flambach and Schillewaert suggest three stages of adoption process; however, although viewing innovation as a process, the theory still defines adoption as a binary variable of adoption or non-adoption, without describing drivers of other stages (Frambach & Schillewaert, 2002).

Rogers' theory is the best fitting for the purposes of this research, as it has a distinct focus on innovation; moreover, a well-established body of literature devoted to these theories gives possibility for comparison among various innovations.

As for this study, the persuasion stage is researched, as it results in forming consumer adoption intention. At this stage an individual had already gone through the process of learning about the innovation. During this stage consumer forms a set of attitudes towards an innovation that in most cases stimulate a consistent set of actions in relation to this innovation; the main difference of persuasion stage from other stages is that the main activity is connected with consumers' emotions and feelings (Rogers, 2003). At the outcome of this stage a negative or positive adoption intention is formed; at the next stage a change in behavior is expected, which is innovation adoption or innovation rejection (Rogers, 2003). There is a tendency that adoption intention directly influences actual adoption, although there could be some exceptions when strong environmental conditions are present.

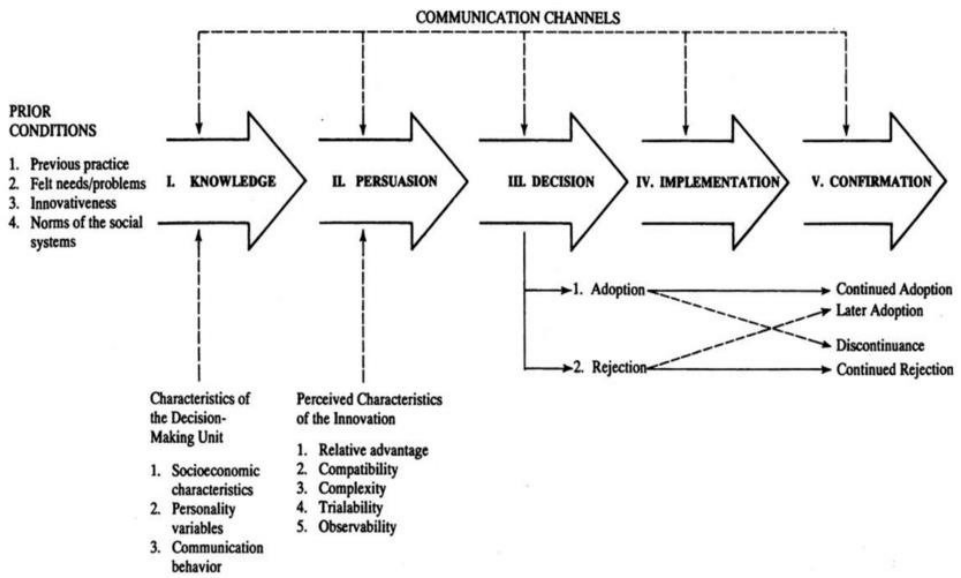

Figure 2.Innovation-decision process. (Source: Rogers).

Having identified Rogers' innovation-decision theory as the base for defining adoption intention, it is feasible to discuss theories on innovation attributes next.

1.2.2 Research on Innovation Attributes

There are two main approaches to measuring perception of innovation attributes. The first approach concentrates on intrinsic characteristics of innovation that influence innovation adoption by end users. This school of thought is largely based on Rogers' innovation-decision theory, which was further developed by Tornatzky and Klein, Moore and Benbasat and most recently, by Kapoor, Dwivedi and Williams (Tornatzky & Klein, 1982; Moore & Benbasat, 1991; Kapoor et al, 2014).

The second approach focuses on environmental conditions that influence innovation perception of consumers, with the aim of predicting technology adoption by potential end user. The school was initiated with Theory of Reasoned Action (TRA), which later developed into Theory of Planned Behavior (TPB). The latest theory in the field is Unified Theory of Acceptance and Use of Technology (UTAUT), which synthesized TAM and TPB. Review of these theories is provided further.

<u>Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB)</u>

The Theory of Reasoned Action (TRA) aims to predict intentions and behaviors of individuals in a real-life environment, without considering the nature of product or service as innovative or traditional. Basic assumption of theory states that behavior is a function of behavioural intention, which, in turn, is conditioned by attitudes towards certain actions. The decision-making process is described through relationships between Attitude, Subjective Norms and Behavior, with information available to the consumer serving as a mediator of the process.

However, the main criticism of TRA is that it measures willingness and does not consider resources that consumers needed to take action on the product, therefore being inefficient in predicting individual's actual behaviors. This led to development of additional construct of behavioral control, which captures the degree to which an individual has the ability to assume a certain behavior, all in all forming the Theory of Planned Behavior (TPB). The theory states that actual behavior is a consequence of one's intention, which is formed by attitude. In this case, the individual's attitude is defined as "an individual's positive or negative feelings regarding a particular behavior" (van der Linden, 2011). Other constructs that impact consumer's behavior are subjective norms that put constraints on behavior and perceived behavioral control, which was described previously.

Thus, Theory of Planned Behavior, developed on the basis of Theory of Reasoned Action, connects individual's beliefs to their actual behavior. However, the theory is critisized due to the fact that it does not take into consideration individual's needs, which have power to affect consumer behavior regardless of his attitudes (Belkhamza & Niasin, 2017).

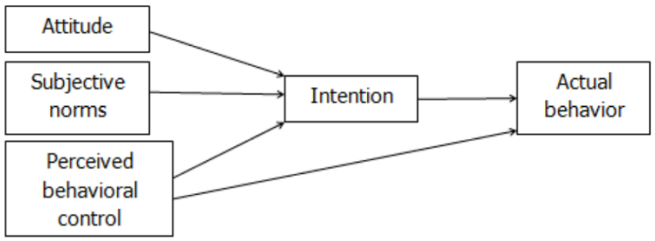

Figure 3. Theory of Planned Behavior model. (Source: Belkhamza).

This theory is not chosen to be applied for purposes of this study, as its' construct do not consider the nature of products, not distinguishing differences in adoption intention between traditional and innovative products.

Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT)

The theory was first developed by Venkatesh, Thong and Xu in 2003 for organizational context and later revised in 2012 to be suited for non-organisational, consumer context (Venkatesh, Thong & Xu, 2012). The theory was developed in particular for IT technologies (Dwivedi, Rana, Jeyraj, Clement & Williams, 2017). Currently is one of the most common theories in infortmational systems and technology adoption literature. Having a strong focus on consumer adoption decisions, the main difference of this theory from Rogers' theory is that it considers environmental context (with constructs of facilitating conditions). Moreover, the theory is concentrated on idea of behavioral intention, which is much broader than adoption intention.

UTAUT was initially synthesized from Technology Acceptance Model (TAM) and Theory of Planned Behavior (TPB). The theory includes four factors which are used to predict behavioral intention for technology usage (Venkatesh et al, 2016); factors could be seen in the model below. The main idea of the model is that attitude has the main role in behavioral intention of adoption of IT technologies.

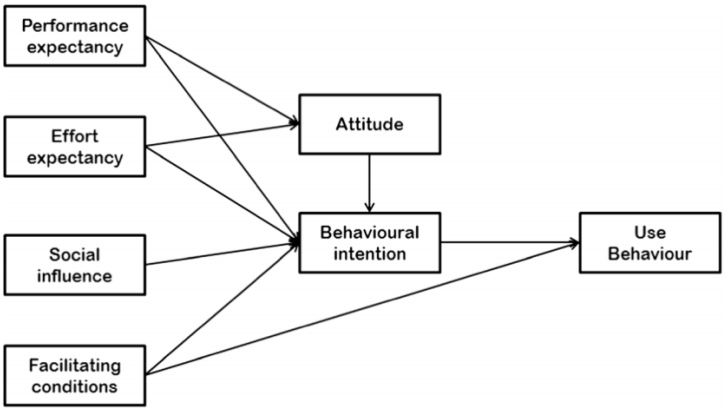

Figure 4. Unified Theory of Acceptance and Use of Technology model. (Source: Dwivedi et al).

Although initially the theory was created for analysis of innovation adoption in organizations, over the years it has been applied for non-organizational context as well, such as user adoption of mobile banking and usage continuance intention for social networks (Workman, 2014; Sun, Liu, Peng, Dong & Barnes, 2014). However, although this theory is widely applied in research, it is specifically aimed at IS/IT systems, which makes the focus of the theory too narrow for the goal of this research.

Innovation-decision theory

As it was outlined in the previous section of this study, innovation-decision theory is focused on innovation in particular. As the main ideas of the theory were addressed in the previous section of this paper (see Figure 2), it is feasible to overview innovation attributes suggested by this theory in this part. In order to assess product characteristics' influence on overall rate of innovation adoption, five attributes were defined in the original research, which are described below (Kotler & Keller, 2015).

Relative advantage – advantages perceived by consumers in comparison with superseding products (Rogers, 2003). This construct correlates with "performance expectancy" in UTAUT. However, this attribute had been put under criticism as too general, as it could include economic, social and other factors depending on innovations' specifics. In further research Kapoor states that this construct is mostly measured through cost or accessibility constructs (Kapoor et al, 2014).

Compatibility – degree to which new product fits consumers' value system and previous experience (Rogers, 2003); Complexity – relative difficulty of perception or application of a new

product (Ibid); Trialability – degree to which innovation can be tried on a limited basis (Ibid); Observability – degree to which new product is easy to describe and understand for other people (Rogers, 2003). In some cases, researchers choose to specify this construct by three other ones: Image (degree to which use of innovation is considered to increase social status), Visibility (degree to which use of particular innovation is apparent, which leads to increasing discussion of innovation, which consequently attributes to increased innovation adoption rate) and Result Demonstrability (tangibility of results of innovation use) (Kapoor et al, 2014). This construct coincides with Social Influence in UTAUT theory. Theory of planned behavior describes these constructs under the general title of Attitude.

Rogers' theory is critisized for missing important facets of complex and networked technologies, like electrical supply systems, chemical imdustries and transportation systems (Lyytenin, 2001). However, the theory is considered to be efficient in describing a static technological artifact in a homogeneous population and it is widely applied in managerial studies.

As constructs of previously described theories are intersecting, for the sake of understanding a unified table was created.

Table 3. Comparison of constructs of innovation perception in theories. (Source: author).

School of thought	**Innovation-decision theory**		**Adoption of technology theories**	
	Rogers	**Kapoor et al**	**TPB (Ajzal)**	**UTAUT (Venkatesh)**
Innovation attributes	Relative advantage	Cost	Attitude	Performance expectancy
-	-	Accessibility		-
-	Complexity	Ease of operation		Effort expectancy
-	Compatibility	Riskiness		-
-	Trialability			-
-	Observability	Social Approval		Social Influence
-		Image		
-		Visibility		
-		Result Demonstrability		
-	-	Voluntariness		-
-	-	-		-

-	-	-		-
Consumer characteristics	Adoption Intention	-	Perceived behavioral control	Behavioral Intention
-	-	-	Subjective norms	-
-	-	-	Adoption intention	-
Environment	-	-	-	Facilitating conditions

All in all, as it was already identified in the previous section, Rogers' theory is the most fitting for the goal of this research. Firstly, this theory is focused on innovation in particular, which makes it more considerate of the specific nature of innovation in comparison with other theories of technology acceptance bv consumers. Secondly, the theory has well-defined attributes of innovation that have impact on adoption intention. These attributes proved to be highly applicable in a large number of managerial studies.

Therefore, Rogers' attributes of innovation-decision theory was chosen for further analysis. As the research objective is to study the impact of innovation atributes on consumers' adoption intentions of OMC platforms, the next section overviews the market of telemedicine. After market overview, constucts for research are justified based on the research in the industry and hypotheses are suggested.

1.3 Online medical consultation platforms as part of telemedicine

The industry chosen for analysis is the industry of telemedicine, and the particular product is online medical consultations (OMC) platforms.

There are two reasons justifying this choice of product. The first reason is that legal framework for telemedicine in Russia was introduced in January 2018 (Russia Today, 2018), giving companies opportunities for development of new services. This caused a wave of investments, with companies aiming to achieve bigger market share (CNews, 2018). However, the market is not established yet, which urges companies to look for ways to make consumers adopt their platforms. This makes research on innovation adoption in this industry highly relevant for managerial practice, as it can provide insights into consumers' perception of OMC platforms. Moreover, as the legislation for the industry was introduced only recently, online medical consultation platforms are considered to be an innovation, as they coincide with the definition of innovation as the product which is perceived as "novelty" by consumers.

The second reason is the rapid growth of telemedicine, which accounts for 20% of overall growth of healthcare industry in the world (Foley, 2017). This makes the market of telemedicine highly attractive for companies. Consequently, the research on consumer adoption intention of OMC platforms can give ideas for gaining competitve advantage by developing innovation attributes that consumers find to be more important.

This section provides definition of telemedicine and online medical consulation platforms. Moreover, overview of telemedicine market in the world is provided and specifics of Russian market of telemedicine are discussed.

1.3.1 Definition of telemedicine and online medical consultation platforms

Telemedicine is defined by World Health Organisation as "the delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities" (World Health Organisation, 2010).

Telemedicine facilitates partnership and collaboration between different entities and fosters the emergence of new forms of virtual organizations. These virtual organizations are not limited by physical distance, but are facilitated through high-speed telecommunications that allow face-to-face exchange of data. Various means of telemedicine are unified by four aspects:

1. The aim is to provide medical support;
2. It is designed to overcome geographical barriers, connecting users who are present in different locations;
3. It involves various types of ICT;
4. Its' goal is improving health outcomes (World Health Organisation, 2010).

While still being in stage of early development, telemedicine already trasforms the way healthcare services are delivered, improving the healthcare system in three ways:

1. by increased access to healthcare specialists;
2. reduced costs;
3. improved health outcomes (Guttman, 2017).

This paper focuses on one particular mean of telemedicine, which is online medical consultations (OMC). Online medical consultation (OMC) relates to internet-based remote patient-doctor consultations (Al-Mahdi, Gray & Lederman, 2015). Although term "remote consultations" is generally more spread, the term of OMC is applied to avoid confusion. First, the definition of OMC excludes non-internet-based consultations, e.g. those provided via telephone. Moreover, it

excludes doctor-doctor consultations, limiting the term to online-based patient-doctor consultations, therefore focusing on consumer services.

OMC technology introduces a way of providing healthcare services which is radically different from the way these services are currently provided to patients. The doctor-patient relationship is expanded to include an interaction that precludes physician-patient physical contact. A patient could be examined by a doctor on a large physical distance. In this way, telemedicine constitutes a major influence on the way that the relationship between a physician and a patient develops and on expectations regarding this relationship. Consequently, OMC carries a shift in the way patients look for medical consultation, giving consumers possibility to choose not only time and place of medical consultation, but also possibility to make informed decisions of which specialists to address, in the same way they do for other online services.

1.3.2 Telemedicine in the world

The primary benefit of telemedicine technologies is its' ability to remove geographical barriers, enabling healthcare services to customers in remote locations with limited access to physical points of healthcare. The technology shown to reduce healthcare costs and transportation burdens (Menachemi, Burke & Ayers, 2004), however, adoption of telemedicine is inconsistent and problematic due to technology, financial and privacy barriers. Rural areas, which are particulary vulnerable in terms of healthcare accessibility, experience high influence of factors of low disposable income of population, high costs of implementing medical technologies infrastructure and bandwith Internet availability. Financial issues are connected to lack of reimbrusement for telemedicine services. Adoption of telemedicine depends greatly on medical organisation's willingness and ability to sign up for this service, which makes barriers for adoption of those systems by health system workers a topic for a number of researches (Helitzer, Heath, Maltrud, Sullivan & Alverson, 2003; Hu, Chau & Cheng, 2002).

Most active users of telemedicine solutions are women, which could be explained by the fact that they are generally more careful about their health (Djamasbi & Wilson, 2015). As for the age distribution, telemedicine solutions are usually used by consumers of 25-34 age group, as they are more prone to adopt technologies in general (Adams, Shankar & Tecco, 2016). This information is later used in this study for analyzing the sample received in the research.

With 20% of annual growth, telemedicine is currently the most rapidly growing segment of healthcare market (Foley, 2017). The demand for telemedicine solutions increases every year due to the following reasons: increasing amount of chronic illnesses that require continuous monitoring, growing demand for healthcare (Grand View Research, 2017) and growing geriatric

population, with 70% of all healthcare costs in Europe attributed to chronic illnesses of older people (Frost & Sullivan, 2017).

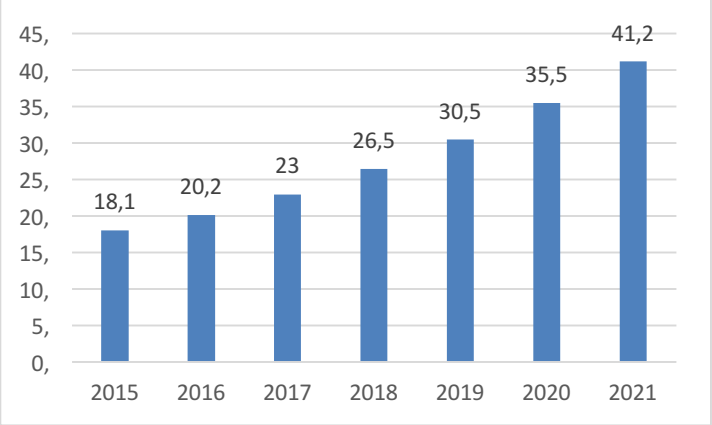

Figure 5. Global telemedicine market size from 2015 to 2021 (in billion U.S. dollars). (Source: Statista).

Telemedicine is implemented in a number of countries, including Germany, Norway, Finland, Scotland, Japan, North Korea, Mexico, India, Botswana (Schug, 2014). The pioneering country in terms of telemedicine is USA, where first steps towards e-health were made 40 years ago. However, a number of barriers for growth of telemedicine resulted in rather low penetration of these technologies: currently around 15% of health institutions implemented telemedicine, although 90% of doctors agree that it is a highly practical tool (Men, 2015). Taking online medical consultation platforms in particular, 39% of organisations that implemented telehealth solutions have patient-driven apps and online portals (Foley & Lardner, 2014). Major issue, apart from technology adoption barriers mentioned before, is credibility of telehealth solutions: 48% of health executives state that they have problems with convincing their doctors to trust in telemedicine options (Foley & Lardner, 2014). However, with introduction of telemedicine the average number of days spent in the hospital decreased by 25%, and a number of physical doctor appointments shrinked by 70% (Forbes, 2017).

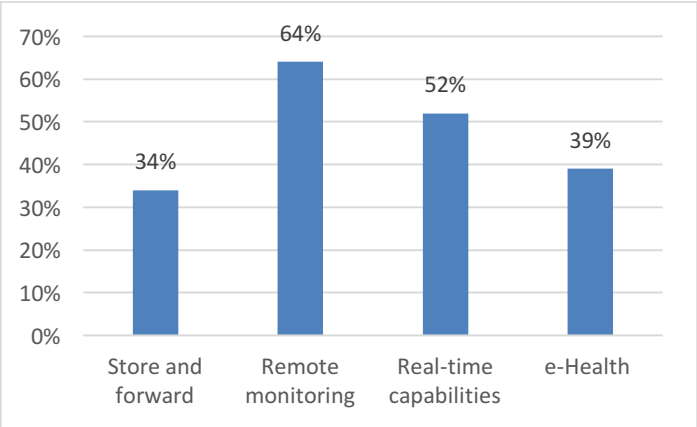

Figure 6. Telemedicine practices implemented by USA healthcare organisations. (Source: Foley & Lardner).

However, USA experience of telemedicine adoption is not compatible with Russian reality due to a number of differences in healthcare legislation of USA and Russia. Firstly, in USA private practices are allowed for doctors, making the process of recruiting specialists for medical consultation platforms and overall management of operations easier. Secondly, due to structural differences in state healthcare financing, consumers in USA could get reimbursement for their use of telemedicine services from insurance companies, which drastically changes consumer perspective on these services. Organization of state healthcare system in USA differs from that of Russia, making the general cost of healthcare much higher for consumers in USA (Jogerst, Duly, Hesli & Saha, 2006), which serves as additional incentive for consumers to use telemedicine solutions.

1.3.3 Internet and Health in Russia

Future Health Index report of 2017 states that usage of Internet for retrieving information about health is higher among russian consumers who are not satisfied with healthcare system – those who do not trust healthcare system and do not believe that healthcare system suits their needs (Philips, 2017). This category of consumers is relatively large: 38% of russian consumers do not make appointment in state clinics when they are sick, preferring to look for cures themselves (BBC, 2016).

Table 4. Attitude to healthcare system and Internet usage for health information among russian people. (Source: Philips).

	People who trust healthcare system		**People who believe that healthcare system suits their needs**	
	Yes	**No**	**Yes**	**No**

People who use Internet to get information about health	61%	72%	57%	72%

More than 7,5 million of search queries a day are devoted to health issues, which accounts for approximately 4% of all search queries, making health one of the most popular search categories overall; the largest topics among search queries are medecines (34%) and deceases and their symptoms (30%) (Yandex, 2016). Queries about medecines are mostly devoted to doctor-prescribed medecines, with some information search on medical appliances, vitamins and alternative medicines. Search queriea on on deceases and their symptoms have two main directions depending on search engine user's situation: the first one, when a user aims to find explanation for specific symptoms; and the second one, when a user already knows his diagnosis and is willing to discover more about it.

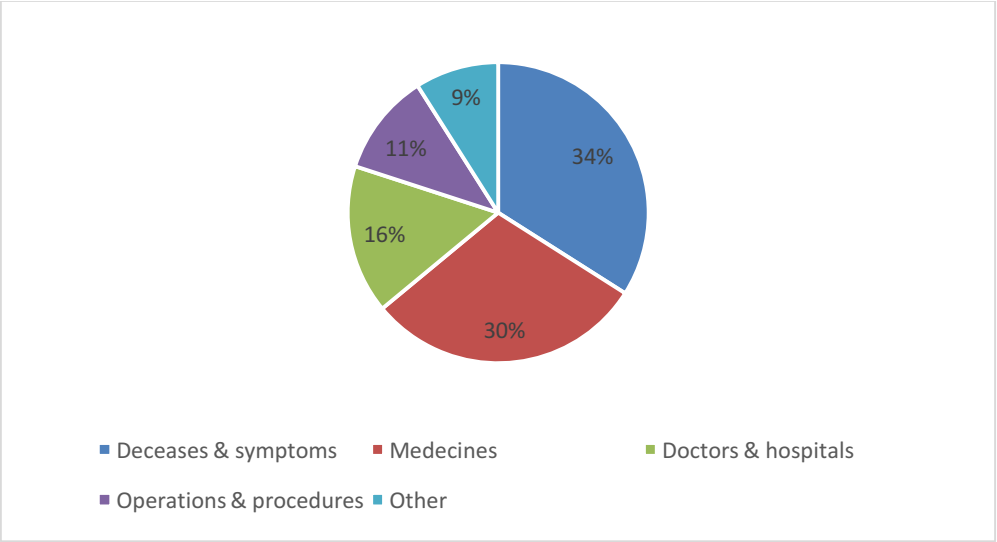

Figure 7. Search queries on health issues, 2016. (Source: Yandex).

It could be concluded that russian people often use Internet as a source for information about their own health issues.

Taking search queries on OMC platforms specifically, the most popular queries ones are devoted to acute conditions (35%), which are conditions with sudden onset and severity; followed by childcare questions (25%) and skin conditions (12%) (Kalyanina, 2017).

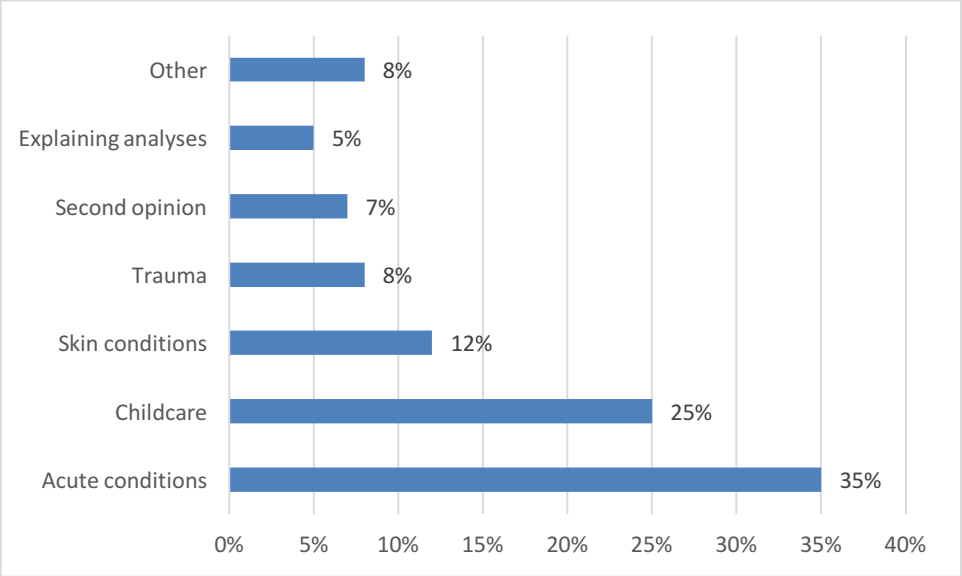

Figure 8. Queries on online medical consultation platform Pediatr 24/7. (Source: Mobile Medical Technologies).

Those results are supported by studies that show that telemedicine services are appreciated as means for solving emergency situations or minor problems (Turner, Thomas & Reinsch, 2004). However, another important output of studies show that consumers believe physical appointment to doctor is preferable: USA consumers do not perceive telemedicine as a viable healthcare method.

85% of search queries of OMC platforms come from regions, with 15% coming from Moscow and Saint-Petersburg, supporting the notion of accessibility as the main benefit of telemedicine technologies (IRI Institut Razvitiya Interneta, 2016). Although doctors of OMC platforms cannot give a diagnosis or prescribe medicines, they could provide a second opinion on existing diagnosis, explain results of analyses, help to define which doctor a patient should address in a clinic.

Barriers for adoption of telemedicine technologies by patients include: age, level of education, computer literacy – explained by lack of exposure to technology and training; bandwidth – which is considered a proxy for adoption of technologies; and also unawareness, high expectations of users, apathy, socieoeconomic status (Kruse, Karem, Shifflett, Vegi, Ravi & Brooks, 2018).

1.3.4 Legal framework for telemedicine in Russia

Since January 1st, 2018, Russian federal law on telemedicine took effect. The law allows for medical care assistance through medical technology by conducting consultations and consiliums that support distance cooperation of doctors inside medical community, as well as distance cooperation of doctors and patients or their representatives, and distance monitoring of

health conditions. Since January 1st, 2019 it will be possible to receive compulsory health insurance certificate and online drug prescriptions (Russia Today, 2018). However, the law does not permit diagnosis statement, only allowing it at physical consultation. Doctors are required to be attached to a medical institution, be a staff of medical organization, and give consultations during their working hours (Mediametrics Doctor, 2017). Nevertheless, consumers who did not get diagnosis can ask for recommendations on what actions to take immediately, which analyses to take and what specialist to visit. Doctors from OMC platforms are trained to give recommendations in a way that they do not hinder the law restrictions.

Introduction of this law creates new business opportunities for medical companies who can create additional value by implementing online solutions for their customers, as well as for Internet-based aggregators like Google and Yandex, who could use their existing capacities to create platforms for connection of numerous service providers with customers.

1.3.5 Current state of online medical consultation platforms in Russia

OMC platform providers could be classified into three groups: the first one includes companies specialized on IT-service and development of medical platforms. One of the most prominent companies in this group is MMT, which owns Pediatr 24/7 and Online Doctor.

The second group consists of medical institutions which offer remote health monitoring and consultations. Doctor Ryadom belongs to this group, as it is a brunch of Moscow-based private hospitals of the same name. The third group is represented by IT and telecommunications companies that develop telemedicine platfroms on the base of traffic they already have, with the most notable example of Yandex.Health.

Business model of these companies looks the following way: first, service developers negotiate agreements with hospitals for signing up their doctors for conducting online consultations. On this stage companies and hospitals also agree on the way they will split consumers' payments. Next, doctors have training sessions, where they are taught to work with platform and to communicate correctly with customers. The latter is particularly important due to law restrictions which do not allow making a diagnosis or prescription of medicines on the first consultation. Simultaneously a system for control of consultations' quality is developed.

Changes in regulation served as boost for development of telemedicine market: DOC+ gained $5 mln by Baring Vostok and Yandex, which resulted in launch of Yandex.Health and developments of first digital hospital in Russia (RBC, 2016); telecommunications provider MTS and chain of private clinics Medsi announced a launch of own OMC platform (CNews, 2018). As of 2018, there are several B2C online medical consultation platforms, which are: Pediatr 24/7, Onlinedoctor, Doctor Ryadom, Yandex.Health, Sprosi vracha, DOC+, OK'Doctor.

According to website visitation statistics, Yandex.Health is the most popular service with overall result of 19000K visitors/monthly (Yandex, 2016).

Most of services have both websites and mobile applications, which gives telemedicine companies additional communication channel with consumers.

Those platforms offer online consultations by certified specialist through chat, video-conference or audio calls. The price of consultations is usually pre-assigned by service providers, either fixed price for all doctors or price depending on doctor qualification or his area of specialisation. Another model is applied by Sprosi vracha: patients post questions online and assign the price for consultation themselves. A number of doctors give their brief consultations in written form, and the payment goes to consultation of customer's choice.

Table 5. Online medical consultation platforms in Russia. (Source: author).

	Doctors available	**Cost structure**	**Price**	**Page visits/month, estimated**	**App available**
Yandex. Health	Pediatrician; therapist; otolaryngologist; psychologist; gastroenterologist; urologist; dermatologist; cosmetologist; neurologist; veterinarian	One-at-a-time payment	1st consultation - 99RUR; second+ - 499RUR	19000K	Yes
Doctor ryadom	Pediatrician; therapist; psychologist; otolaryngologist; gastroenterologist; urologist; cardiologist; neurologist	One-at-a-time payment	1200RUR/Consultation	8K	Yes
Sprosi vracha	Pediatrician; therapist; otolaryngologist; cardiologist; gastroenterologist; urologist; dermatologist; cosmetologist; neurologist; veterinarian	One-at-a-time payment	Fee pre-set by customer, not less than 200RUR	19K	No

DOC+	Pediatrician; therapist; otolaryngologist; gastroenterologist; nutritionist; urologist; cardiologist; neurologist	One-at-a-time payment	Pediatrician and therapist - 499RUR/consultation; other specialists - 799RUR/consultation	8K	Yes
Online doctor	Pediatrician; therapist; psychologist; otolaryngologist; gastroenterologist; nutritionist; urologist; endocrinologist; cardiologist; neurologist	One-at-a-time payment/Bundles for certain deceases	Fee depending on doctors' qualification: 800-2000RUR/consultation or programs: diabetis support - 3000RUR/month; therapist support - 12000RUR/month	6K	Yes
OK'Doctor	Pediatrician; therapist; gastroenterologist; urologist; dermatologist; cosmetologist; neurologist; trichologist; endocrinologist; rheumatologist; immunologist; nephrologist; pulmunologist	One-at-a-time-payment; Bundle, monthly	1st consultation - free; second+ consultation - 300RUR; bundle - 350RUR/month, 3200RUR/year	4K	Yes

Pediatr 24/7	Pediatrician; therapist; psychologist; otolaryngologist; gastroenterologist; nutritionist; urologist; ophtalmologist; endocrinologist; cardiologist; neurologist	One-at-a-time payment	Fee depending on doctors' qualification: 800-2500RUR/consultation	2K	Yes

As it can be seen from the table, among market players there is a number of well-established companies in various business spheres: healthcare, telecommunications, Internet search engines. With recent changes in the legal framework, which give companies opportunities for development of new services on the market of telemedicine, those companies are aiming to achieve higher market share. This makes the market highly competitive, which can be observed through an impressive number of projects in the field of telemedicine. In such circumstances, insights into which product attributes have more impact on consumer's adoption intention could serve as a base for efficient product differentiation.

1.4 Choice and justification of constructs for the research model

As Rogers' innovation-decision theory was used for this study, constructs for the research model are taken after attributes of innovation as defined by Rogers at the persuasion stage of consumer innovation-decision journey. To outline hypotheses, existing research on application of the theory on the market of telemedicine was taken together with information of the market of online medical consultation platforms. In the following section hypotheses are substantiated.

Relative advantage: accessibility and cost

The attribute of relative advantage belongs to Rogers' theory. The research states that constructs of relative advantage, together with complexity and compatibility have the most impact on consumer adoption intention. The construct of relative advantage was deemed as too general by some researchers, who suggested finding more specific measurements, which are most commonly represented by economic value of innovation, but not necessarily limited to it (Tornatzky & Klein, 1982). Therefore, this construct have to be specified for further research.

In line with the research of Kapoor et al, accessibility is indeed a source of relative advantage, and it is feasible to analyze the magnitude of influence of the accessibility construct on adoption intention (Kapoor et al, 2014).

The main benefit of telemedicine is widely considered to be its' ability to remove geographical barriers for providing healthcare for patients even in remote areas. The research of

telemedicine acceptance among African American consumers showed that accessibility is a primary source of relative advantage of telemedicine (Sheba, Hamilton & Baker, 2012). Moreover, survey of Russian consumers using telemedicine services imply that the issue of accessibility of healthcare is highly relevant for consumers: according to WCIOM survey, 37% of respondents are unable to contact doctors due to their absence or long queues, and 34% state that the main issue of healthcare for them is faulty organization of hospital functioning (WCIOM, 2015). Representatives of business of telemedicine also state accessibity as highly important: Yandex technology transfer officer Grigory Bakunov believes that the increasing level of accessibility of medical assistance is the most important benefit of online medical consultation services (Suleimanov, 2016).

However, given the limitations on activities that online medical consultation platforms currently are able to perform due to legislation, it is questionable whether those platforms would be able to close the accessibility gap for healthcare services in consumer's perceptions. According to legislation, it is prohibited for doctors to state a diagnosis or prescribe medicines if the first consultation with a specialist happens online. Additionally, as application of telemedicine requires broadband Internet available, they wouldn't be available in Russian remote locations which are truly underserved by healthcare services, as there could be issues with connection: as of 2017, average Internet penetration in villages is 59%, in cities with population of 100-500k is 71% (FOM, 2017). Therefore, OMC platform services in their current state might be not available to meet the expectations of the consumers in terms of accessibility, and considering that the perception of accessibility as relative advantage is dependent upon consumers' mindsets, it is to be researched whether the construct of accessibility serves as a driver for adoption intention.

H1. Higher perceived accessibility will positively influence adoption intention of OMC platforms.

Another aspect of construct of relative advantage in the innovation-decision theory is widely connected with economic benefits that consumers receive from using the innovation (Kapoor et al, 2014). In line with the research of Kruse et al, cost is considered a driver of telemedicine adoption process, with high price of telemedicine services being the primarily source for slowing down the adoption process mentioned in 13% of articles on telemedicine adoption (Kruse et al, 2018).

From the managerial perspective, the importance of construct of cost is confirmed by Grigory Bakunov of Yandex.Health (Suleimanov, 2017), who states that low costs of medical consultations on OMC platforms is one of the core value propositions of OMC platforms in Russia. As stated by Viktor Belogub, one of the founders of OMC platform DOC+, another advantage in terms of cost is that a price for telemedicine services is fixed, so the customer knows amount of

final receipt prior to the consultation, which is often not the case with physical consultations (Onufrieva, 2016).

However, it is questionable whether construct of cost would be considered significant by Russian consumers because of specifics of Russian state healthcare system. Costs of Russian state healthcare services are compensated by the government with means received through tax payments, which makes traditional medical services free of direct charges from consumers. On the contrary, costs of OMC platforms services require direct payments from consumers, which could lead to negative perception of any cost attributed to medical service, and result lack of significant reaction to changes in cost, as the issue would be the existence of cost whatsoever.

Another aspect that casts doubt on the significance of construct of cost as a driver for OMC platform adoption is that research on telemedicine discussing the importance of construct of cost tends to overview the construct from societal perspective, putting emphasis on economic benefits in terms of public policy and comparing alternative costs of telemedicine compared to traditional healthcare. Consumers' attitude towards costs of telemedicine is not thoroughly analyzed, with lack of understanding of importance that construct of cost has compared to other constructs and whether it comes as a first priority.

This leads to application of number of varying pricing practices on OMC platforms, with no established clear view on which pricing strategy is the most suitable for telemedicine industry due to its' emerging nature in Russia (Kalyanina, 2017). Understanding to which extent consumers' adoption intention depends on costs of OMC platforms is highly relevant in terms of defining boundaries of possible trade-offs between price and perceived value of innovation.

H2. Lower perceived cost will positively influence adoption intention of OMC platforms.

Complexity

Complexity is "the degree to which innovation is difficult to understand or use" (Al-Gahtani, 2003). In decision-adoption process Rogers suggests that complexity is one of three most significant constructs on the persuasion stage, explained by the fact that on this stage an individual mentally applies idea of innovation to his situation, trying to understand whether this innovation is suitable for him and what benefits it could bring (Rogers, 2003).

The construct of complexity in the original innovation-decision theory by Rogers was addressed by CEO of online medical consultation platform DOC+ Ruslan Zaidullin, who states in the interview that the convenience of service on the platform is the key factor for consumer when deciding whether to adopt or to reject telemedicine (Rambler, 2017). President's counselor on Internet issues German Klimenko also believes that it is crucial for telemedicine services to be convenient for consumers (Spiridonov, 2016).

On the other hand, evaluation of complexity differs among different consumers depending

on their general familiarity with technologies (Nørskov et al, 2015). Moreover, it is feasible to suggest that consumers tend to evaluate complexity only when they gain first-hand experience with telemedicine platform, struggling with evaluation of complexity on pre-experience stages such as the persuasion stage which is touched upon by this research. Therefore, whether complexity has significant role in forming adoption intention on persuasion stage requires further investigation.

H3. Lower perceived complexity will positively influence adoption intention of OMC platforms.

Compatibility

In line with research of Oliveira et al, innovation in healthcare is adopted faster if it includes only redevelopments of existing solutions instead of being completely new to the world, e.g. belonging to disruptive type of innovation (Oliveira, Azevedo & Canhão, 2014). This idea is developed in research of Menachemi et al, which states that from the patients' view, if telemedicine technologies use already existing technologies and infrastructure, it allows faster understanding and use (Menachemi et al, 2004). The construct of compatibility coincides with this idea, as compatibility is characterised as "the degree to which innovation is consistent with past experiences of potential adopters" (Rogers, 2003). The construct of compatibility was also highlighted by Rogers as one of the key drivers for adoption intention on persuasion stage.

Another explanation for significance of compatibility is networks effects, which describe situations when increase of consumption of a product in one market leads to increase in demand for a product in a different market (Gottinger, 2016). Network effects are capable of creating links between current and future markets, when company has to be competing strongly in current market in order to supply the future market of innovation. Reasons for those links include history of past consumption, expectations of what products other consumers will use, investition of knowledge into consumption of current product. In the context of compatibility Rogers discusses this issue as innovation negativism – which is a case when consumer reject the innovation and consequently rejects future innovation connected to the initial one (Rogers, 2003). Thus, high degree of compatibility with innovation that was already rejected by consumer hinders possibility of consumer accepting another innovation connected to the initial one. In case of online medical consultation platforms innovation negativism applies to negative experience with telemedicine, which could lead to construct of compatibility having negative relationships with adoption intention. Therefore, the direction of relationship between compatibility and adoption intention is to be researched.

As it is considered that OMC platforms are most often used via smartphones, it is sufficient to propose that consumers find OMC platforms more appealing if they are compatible with present models of their phones.

H4. Higher perceived compatibility will positively influence adoption intention of OMC platforms.

Trialability

Amount of efforts required to try out the innovation without fully committing to it is defined as trialability (Rogers, 2003). Given the opportunity to try an innovation on a limited base, consumers lower the uncertainty in terms of perceived risks and benefits of innovation. In certain cases, first-hand experience is even considered to be more significant for consumers than outwardly inflicted opinions on innovation (Lee, 2004). A number of researches applying innovation-decision theory for adoption of various innovations showed that trialability has an impact on adoption intention, such as in the case of renewable energy technologies (Reyes-Mercado & Rajagopal. 2017) and computer technology (Al-Gahtani, 2003).

Nevertheless, although trialability is an essential construct of the theory, it is feasible to assume that this attribute of innovation is not able to overweight other innovation attributes in case of OMC platforms, as level of commitment required for adoption of this innovation is relatively not high. The reason for that is OMC platforms do not imply significant one-off costs in terms of consumers' share of wallet, as compared to the level of commitment required for more capital-intensive innovations, such as, for instance, innovative IT devices. Given this, consumers do not have large sunk costs in case they purchase service on OMC platforms and then eventually decide not to use it again. All in all, this results in lack of need for possibility to try the OMC platform service on a limited base. This is supported by the research of Sheba et al, which states consumers' preference on persuasion stage to focus on aspects of innovation which could be addressed without first-hand experience with telemedicine (Sheba et al, 2012). Therefore, the impact of construct of trialability is a subject for further analysis.

H5. Higher perceived trialability will positively influence adoption intention of OMC platforms.

Observability

Observability is defined as the degree to which results of using the innovation are visible to others (Al-Gahtani, 2003). Significant aspect in terms of observability of OMC platforms services is that results of their application are immediately visible, as medical consultation is received instantly. The process of diffusion of innovation benefits from higher observability, as it allows more consumers to discover the innovation on higher rate (Cain and Mittman, 2002). Additionally, adoption intention of a number of innovations proved to be influenced by observability (Adams et

al, 2017; Reyes-Mercado & Rajagopal, 2017).

However, whether higher observability actually influences the adoption intention in terms of telemedicine is a question to be researched. In line with the research of Rogers, observability does not have primary importance on the persuasion stage; additionally, the study states that technology innovations where software aspect is more dominant than hardware aspect possess less observability, and this is the case with OMC platforms (Rogers, 2003). Moreover, evaluation of observability is difficult at the persuasion stage, when consumers have not tried the innovation themselves and therefore are not able to define the extent to which results of using the innovation are visible (Sheba et al, 2012).

H6. Higher perceived observability will positively influence adoption intention of OMC platforms.

CHAPTER II. RESEARCH METHODOLOGY FOR THE STUDY

2.1 Choice and justification of the research design

The research design is created according to research questions outlined in the previous chapter:

Q1. Are there relationships between innovation attributes and adoption intention in perception of russian consumers of OMC platforms?

Q2. What innovation attributes have influence on adoption intention of consumer of OMC platforms?

The starting point of approaching innovation adoption of certain products builds on top of general theoretical research on innovation adoption, innovation attributes and telemedicine market specificities. However, as it was previously identified, although current market trends justify interest in innovation adoption of online medical consultation platforms, the existing research does not cover this gap. The previous chapter overviewed the current state of research on consumers' adoption of innovations, outlining the most relevant theory for this study. Additionally, the market of online medical consultations platforms in Russia was reviewed. On the base of this information hypotheses about process of innovation adoption on the market of online medical consultations in Russia were developed. The next step is designing a quantitative research, which is followed by data analysis and conclusions. The overall plan of the research is provided in the following figure.

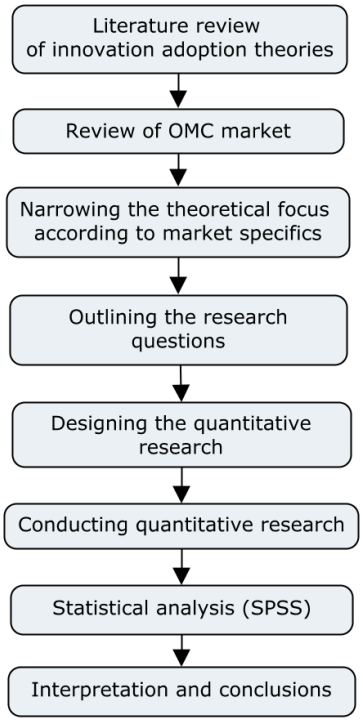

Figure 9. Research process: from the literature review to the recommendations. (Source: author).

The main goal of this research is to identify relationships between innovation attributes and adoption intention of Russian consumers of online medical consultation platforms.

Consequently, *the research problem* is defining parameters of model of relationships between innovation attributes and adoption intention of Russian consumers of OMC platforms.

The approach applied in this paper is *deductive*, as this approach aims to test existing theories on real-life data. In this case the theory is innovation-decision theory by Rogers, with further developments by Kapoor et al, and the real-life data is gathered of the online medical consultation platforms market.

The type of this research is *exploratory*, as it seeks to find out the magnitude of influence of variables on adoption intention and to find evidence for applicability of Rogers' theory.

The research is also *applied*, as it aims to add new knowledge to already existing field and to create practical recommendations for marketing of online medical consultation platforms.

The *quantitative* method of research, in particular survey was chosen, which aligns with deductive approach of this paper. Standardized data collected through questionnaire allows for comparison between respondents and for outlining patterns of adoption behavior. The choice of this method is validated by Rogers, who states “research designs consist mainly of correlational analyses of cross-sectional data” as the most appropriate for studying innovation adoption (Rogers, 2003). As a result of the analysis, objective measurements are collected, available for further interpretation.

Procedures applied in the process are bibliography secondary data analysis and a survey

focusing on Russian consumers.

2.2 Data collection

The process of data collection is non-linear, as every stage discovers new data that might influence the conclusions of the previous steps, as well as provide the need for adjusting the research design. The questionnaire for quantitative research was created in English, with further translation to Russian in order to reach more respondents of russian-speaking sample and therefore to ensure higher validity of results.

Sampling method applied is self-selection – a method where respondents take part in a survey voluntarily. The questionnaire was created via online survey tool Typeform and distributed through the following resources:

1. Group chats of students of SPbU, MSU, FinEc universities;
2. In groups devoted to science and health in Vk.com;
3. Through personal networks applying "snowball effect", with additional respondents reached through personal network.

A total of 244 responses was collected, with a total of 225 responses left for analysis due to missing data and age restrictions, as use of OMC platforms is available from the age of 18. Further case elimination was conducted in the course of regression analysis. The sampling size proved to be sufficient for the purpose of this research, as the rule of thumb states that for sufficient regression analysis the ratio of predictors to number of respondents should be at least 1:15 (Field, 2013), and this condition is met with the ratio of 1:28.

2.3 Questionnaire design

Constructs to be researched were chosen based on secondary research, with justification of their choice provided in the section 1.4 of this paper. The list of variables and their measurement items applied in questionnaire is shown in the table below. The questionnaire design was created with measurement items for variables adopted from literature on innovation-decision theory (Yang et al, 2016; Chiangwa & Alexander, 2016; Hsu et al, 2007). The measurement items for the construct of accessibility were designed by the author, with the insights from the literature review and existing measurement items from other researches. Constructs are measured by 5-point Likert scale, with some of the variables having more than one measurement items. All in all, the questionnaire includes 23 closed-ended questions, with 18 questions on constructs and 5 demographic questions.

Constructs of technology trust and company trust were initially included in the questionnaire, but eventually omitted in the course of further analysis. The definitions for constructs, as well as argumentation for their application were provided in the previous chapter.

With this questionnaire, predictive power of constructs is examined and compared within a single study based on the same sample of respondents.

Although hypotheses about cost and complexity state that there are negative relationships between independent variables and dependent variable of adoption intention, to avoid reverse-coding measurement items for cost and complexity were worded in opposite way. Thus, construct of cost is worded so the higher value of measurement item implies perception of cost as being lower; construct of complexity is also worded in a way that the higher value of measurement item of complexity implies perception of complexity as being lower. Therefore, the higher values for the measurement items of cost and complexity are attributed to perception of these constructs as being lower (lower cost, lower complexity), and vice-versa, the lower value for these measurement items mean perception of these constructs as being higher (higher cost, higher complexity). The full questionnaire is provided in the appendix, while in this part specific variables are overviewed.

Table 6. List of variables and variable measurements. (Source: author).

	Variables	**Measurement items title**	**Variable measurement items**	**Source**
1	Accessibility	Availability	I would be able to use OMC anytime, anywhere.	Author
2		Contacting needed specialist	OMC is trustworthy method of contacting the specialst I need at any place of the world.	
3		Immediate medical help	OMC will allow me to find medical help immediately when I need it.	
4	Cost	Affordability	I can afford the cost of Online Medical Platform.	Chiangwa and Alexander, 2016
5	Complexity	Understandability	My use of an Online Medical Consultation Platform would be clear and understandable.	Chiangwa and Alexander, 2016
6		Ease of becoming skilled in usage	It would be easy for me to become skilled at using an Online Medical Platform.	
7		Ease of usage	I would find Online Medical Platforms easy to use.	
8		Ease of learning to use	Learning to operate an Online Medical Platform would be easy for me.	
9	Compatibility	Compatible with current phone	OMC website/app is compatible with my current phone service.	Yang et al, 2016
10	Trialability	Trial possibility	Before deciding whether to use any OMC, I would be able to try one out.	Hsu et al, 2007
11		Sufficient time for trying	I will be permitted to use an OMC on a trial basis long enough to see what it could do.	

12	Observability	Sharable results	I would have no difficulty telling others about the results of using an OMC platform.	Hsu et al, 2007
13		Clear results	The results of using an OMC platform are apparent to me.	
14	Company Trust	Company trustworthiness	The company will be trustworthy.	Yang et al, 2015
15	Technology Trust	Technology trustworthiness	The technology will be trustworthy.	Yang et al, 2016
16	Adoption intention	Usage intention	I intend to use an Online Medical Platform in the next 12 months.	Yang et al, 2016
17		Usage prediction	I predict I will use an Online Medical Platform in the next 12 months.	
18		Usage planning	I plan to use an Online Medical Platform in the next 12 months.	
19	Personal innovativeness	-	(Innovator) Before the official announcement of OMC, I felt interested in OMC and tried to figure it out. I began to use OMC in the innovation stage, even though the usage environment is not mature.	Hsu et al, 2007
		-	(Early adopter)I made the decision to use OMC on the basis of my intuition. In my imagination, OMC will be a useful and playful instrument. I began to use OMC in the early stage.	
		-	(Early majority) I hesitate to use OMC due to wondering if it will become popular. I will not make the decision till I am sure that the function of OMC is complete (i.e., cross-site transfer) and its usefulness and playfulness clarified.	
		-	(Late majority) I know that OMC will become popular. But I will decide to use OMC only after its specification standard is complete and its service support is established well.	
		-	(Laggard) I will not use OMC, even though it is very popular. But if OMC is built into another necessary facility (e.g., a phone), I will think about it.	

The resulting research model looks the following way:

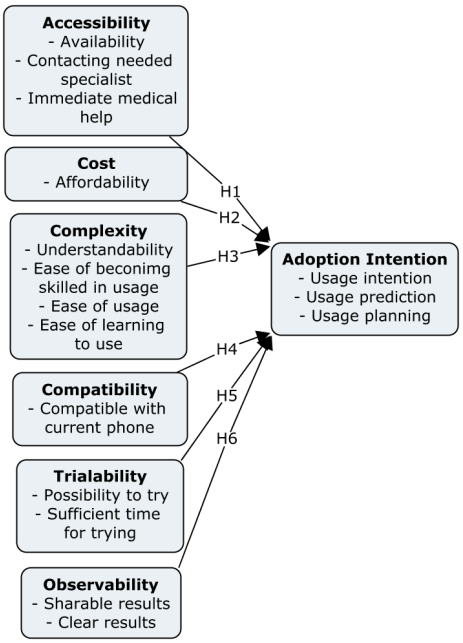

Figure 10. Research model. (Source: author).

2.4 Statistical techniques

IBM SPSS Statistics is applied for analysis of data from the online survey, with Microsoft Excel used as a medium for transfering results from the survey platform.

To test the hypotheses, the following techniques were utilised: descriptive statistics, reliability analysis, principal factor analysis (PCA) and regression analysis.

Desriptive statistics with frequency distributions to analyse the demographic data of the respondents to check the fit of respondents' profiles to required parameters.

In order to assess the data, *reliability analysis* is performed. The most common technique for this purpose is Cronbach's alpha, and it was applied for constructs in this study.

Principal factor analysis using components (PCA) with varimax rotation is performed to check distinctions between constructs and define whether there are underlying factors under measurement items. Components were chosen for analysis instead of factors, as they are considered to be more accurate (Tabachnik & Fidell, 2007). Varimax rotation was applied to test the degree that variables load on each component. This method of rotation was chosen as it does not permit correlation between components, which fits the research design of this study (Field, 2013).

Regression analysis to test the hypotheses, in order to estimate the relationships between constructs (independent variables) and adoption intention (dependent variable). This type of analysis is commonly used in research on Rogers' theory (Chiangwa & Alexander, 2016; Hsu et al, 2007; Reyes-Mercado & Rajagopal, 2017; Yang et al, 2016). The first step of the analysis is initial regression run with a number of independent variables and one dependent variable.

Hierarchical implementation model for the regression was chosen, as Rogers' theory states that importance of constructs of relative advantage (which is represented by accessibility and cost), complexity and compatibility is higher than that of others. Next, casewise diagnostics of residuals (distance between line of regression model and a data point) is used to define whether there are cases that bias the model due to the amount of influence they have on it, and the cases with influence of more than +/-3 are excluded. Removing certain cases requires a re-run of regression. In order for regression model to be generalizable, its' residuals have to meet certain assumptions, which are: linearity, homoscedasticity (the spread of residuals should be similar at all points of predictor variable), independence of errors (meaning errors of the model are not correlated) and normality (whether the dataset follows the normal distribution). Moreover, there should be no multicollinearity (one predictor variable should not be able to predict another predictor variable). Linearity and homoscedasticity are checked through scatterplots. Independence of errors is checked with Durbin-Watson test, where the value should lie between 1 and 3. Normality is checked via histograms, which show whether data is normally distributed. If those assumptions are met, it is assumed that the results of the regression model could be generalized to the population.

Further description of analysis of data is provided in the next chapter.

CHAPTER III. DATA ANALYSIS

3.1 Descriptive statistics

Gender distribution of survey respondents is uneven: 71% of respondents are female. Although it might seem as a limitation for generalization of results, upon research provided in the first chapter of this paper it was found that women access e-health solution more often than men, suggesting that results coincide with general population distribution of OMC platforms consumers, where most active users are female (Djamasbi & Wilson, 2015; Lemire, Paré, Sicotte & Harvey, 2008; Andreassen, Bujnowska-Fedak, Chronaki, Dumitru, Pudule, Santana, Voss & Wynn, 2001). Therefore, sample is reflective of general population of OMC platform users in terms of gender distribution.

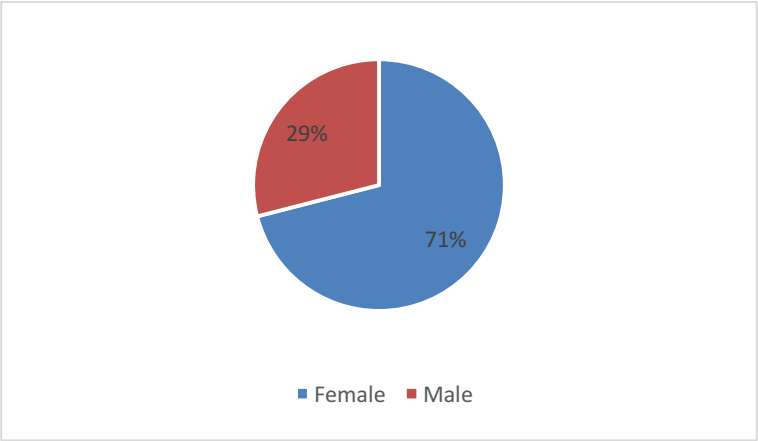

Figure 11. Respondents' gender distribution. (Source: analysis results).

Concerning consumers' age, 50% belonged to 18-24 age group, and 33% belonged to 25-34 age group, with both those groups accounting for 83% of all responses. Such distribution, although somehow skewed, generally coincides with usage practices among various age groups: the highest usage of telemedicine solutions is attributed to consumers of 25-34 age group (Adams, Shankar & Tecco, 2016). Elder people generally have more negative attitudes towards computers and use them less than consumers of younger generations.

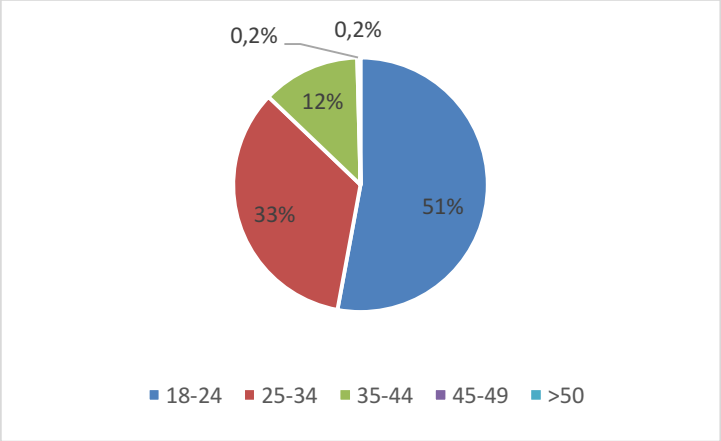

Figure 12. Respondents' age distribution. (Source: analysis results).

As for the highest education level achieved, 77% of respondents had higher education, 0,4% had post-graduate education and 1% had PhD degree.

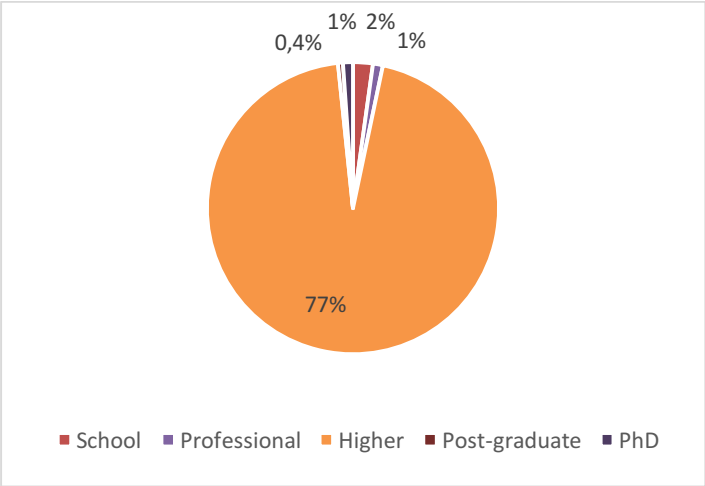

Figure 13. Respondents' education level distribution. (Source: analysis results).

As for the level of disposable income, 54% of respondents possess upper medium level of income, which altogether with 16% of respondents of medium income and 8% of respondents of high income allow to assume that sample includes respondents with the level of disposable income which allows using OMC platorms service.

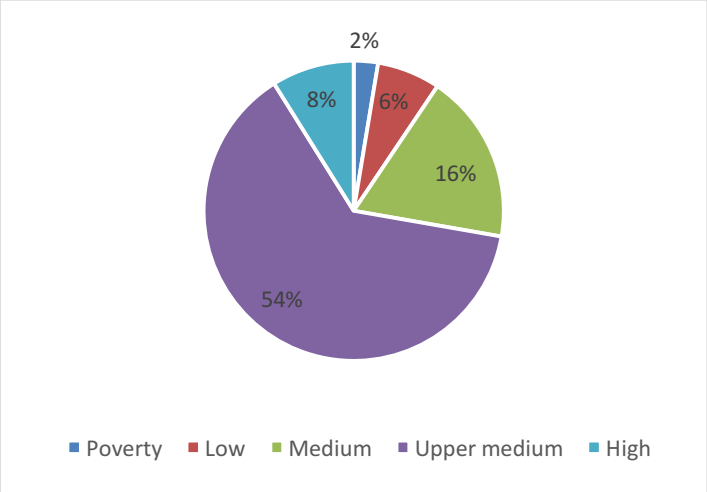

Figure 14. Respondents' level of disposable income. (Source: analysis results).

All in all, the sample is appropriate for the purpose of this study, as it consists mostly of target consumers of OMC platforms: women, age of 25-34, with disposable income which allows use of telemedicine platforms. As online medical consultation platforms are aimed at a very general population, no further specification of the sample is need. Therefore, the sample reflects general population and therefore possesses informational value.

3.2 Data assessment

Boxplot graphs of each construct were created to identify outliers, which resulted in elimination of 16 cases, leaving overall 209 cases for further analysis.

Next, before testing hypotheses, reliability analysis testing internal consistency of measures is conducted. For the purpose of reliability analysis Cronbach's alpha was used, which

is a most common measure of scale reliability. As results of the analysis, measures proved to consistently reflect constructs they are measuring, therefore possessing practical utility for further statistical analysis. Results of 0 indicate unreliable scale, 1 – totally reliable, with sufficient results falling between 0,5-0,7 (Field, 2013). Although Cronbach's Alpha for the construct of Trialability showed results of 0,483, which is borderline of the assumed amount of 0,5, but acceptable, it was used for further analysis as all variable measurements, including this one, were adopted from previous research where these measurements proved to be reliable (Hsu et al, 2007).

Table 7. Cronbach's alpha for Accessibility. (Source: IBM SPSS Statistics outputs).

Reliability Statistics

Cronbach's Alpha	N of Items
,718	3

Table 8. Cronbach's alpha for Complexity. (Source: IBM SPSS Statistics outputs).

Reliability Statistics

Cronbach's Alpha	N of Items
,891	4

Table 9. Cronbach's alpha for Trialability. (Source: IBM SPSS Statistics outputs).

Reliability Statistics

Cronbach's Alpha	N of Items
,483	2

Table 10. Cronbach's alpha for Observability. (Source: IBM SPSS Statistics outputs).

Reliability Statistics

Cronbach's Alpha	N of Items
,723	2

Table 8. Cronbach's alpha for Adoption Intention. (Source: IBM SPSS Statistics outputs).

Reliability Statistics

Cronbach's Alpha	N of Items
,920	3

Factor analysis (PCA) was conducted to check whether existing variables measure the same constructs. For this purpose, Kayser-Meyer-Olkin (KMO) measure of sampling adequacy was calculated for individual measurement items. All KMO measures are slightly greater than the required minimum amount of 0,5, meeting the general requirements of factor loadings, with the exception of Observability_2, which was excluded from further analysis. The measurement items that are left are valid and could be used for analysis.

Table 11. Kayser-Meyer-Olkin (KMO) measure of sampling adequacy. (Source: outline from IBM SPSS Statistics outputs).

Item	KMO
Accessibility_1	0,910
Accessibility_2	0,914
Accessibility_3	0,909
Cost	0,878
Complexity_1	0,926
Complexity_2	0,883
Complexity_3	0,900
Complexity_4	0,895
Compatibility	0,905
Trialability_1	0,913
Trialability _2	0,924
Observability_1	0,921
Observability_2	-0,121

As the next step, eigenvalues associated with each factor were calculated for all factors, which resulted in outlining 6 factors. The results of varimax rotation showed six factors with eigenvalues greater than 1, which altogether account for 78,081% of variation. These results could be interpreted as confirmation of the existence of six factors undelying the data, consequently, confirming the theoretical model proposed. All eigenvalues are greater than 1, therefore meeting the general requirements (Levin, 2007).

Table 12. Factors' eigenvalues after rotation. (Source: outline from IBM SPSS Statistics outputs).

Factor	Number of items in the scale	Eigenvalues	% of Variance	Cumulative variance
Accessibility	3	2,276	18,968%	18,968%
Cost	1	1,946	16,213%	35,181%
Complexity	4	1,458	12,151%	47,332%
Compatibility	1	1,387	11,561%	58,893%
Trialability	2	1,226	10,214%	69,107%
Observability	1	1,077	8,974%	78,081%

Factor loadings were defined for every factor to confirm that measurement items belong to factors proposed by theoretical model. All factor loadings are greater than 0,5, which meets the requirements of being higher than the requested limit of 0,5 (Kaiser, 1974). Overall results indicate that Factor 1 corresponds to Accessibility, factor 2 – to Cost, factor 3 – to Complexity, factor 4 – to Compatibility, factor 5 – to Trialability, factor 6 – to Observability.

Table 13. Factor loadings. (Source: IBM SPSS Statistics outputs).

Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
Acc_1	,863					
Acc_2	,820					
Acc_3	,759					
Cost		,841				
Comp_1			,780			
Comp_2			,833			
Comp_3			,847			
Comp_4			,838			
Compatibility				,578		
Trial_1					,897	
Trial_2					,725	
Observability_1						,757

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

3.3 Testing hypotheses

In order to test the hypotheses a multiple regression model was generated, as it allows to identify relationships between subjects. Initial run of regression analysis resulted in identifying ten residuals with evidence of bias. 95% of cases in the sample are expected to have standardised residuals within the range of +/-2, and 5% are expected to have standardized residuals outside those limits (Field, 2013). As sample size is N=209, 10 cases are expected to be outside of those norms. The analysis shows exactly 10 cases, however, two cases out of ten with standartised residuals greater than 3, which would mean a high influence of these cases on final model: cases №1 and №115.

Table 14. Casewise diagnostics of initial regression run. (Source: IBM SPSS Statistics outputs).

Casewise Diagnostics[a]

Case Number	Std. Residual	AdoptionIntention	Predicted Value	Residual
1	-3,096	6	10,40	-4,400

14	2,026	17	14,12	2,879
20	-2,017	11	13,87	-2,866
47	2,154	10	6,94	3,060
115	3,060	12	7,65	4,349
116	-2,231	11	14,17	-3,171
126	-2,152	10	13,06	-3,058
158	-2,065	10	12,93	-2,934
179	2,212	16	12,86	3,144
198	-2,073	5	7,95	-2,946

a. Dependent Variable: AdoptionIntention

Those two cases were excluded from the sample, resulting in 207 responces left for regression analysis. Re-run of regression proved to have all cases with standardized residuals within acceptable limits of +/-2.

Table 15. Casewise diagnostics of regression re-run. (Source: IBM SPSS Statistics outputs).

Casewise Diagnostics[a]

Case Number	Std. Residual	AdoptionIntention	Predicted Value	Residual
13	2,194	17	14,02	2,977
19	-2,154	11	13,92	-2,923
46	2,261	10	6,93	3,068
59	-2,031	13	15,76	-2,756
114	-2,274	11	14,09	-3,086
120	-2,084	11	13,83	-2,828
124	-2,103	10	12,85	-2,853
125	2,064	10	7,20	2,801
156	-2,093	10	12,84	-2,840
177	2,366	16	12,79	3,210
196	-2,216	5	8,01	-3,007

a. Dependent Variable: AdoptionIntention

With R^2 = 0,814 the final model explains 81,4% of variance of the dependent variable. As the hierarchical implementation was chosen, initial model with R^2 = 0,506 accounts for 50,6% of variance. Durbin-Watson test confirms that assumption of independence of errors is met, with the result lying beween 1 and 3.

Figure 15. Model summary. (Source: IBM SPSS Statistics outputs).

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	,711[a]	,506	,496	2,199	,506	51,686	4	202	,000	
2	,902[b]	,814	,808	1,357	,308	165,363	2	200	,000	2,327

a. Predictors: (Constant), Compatibility, Accessibility, Cost, Complexity

b. Predictors: (Constant), Compatibility, Accessibility, Cost, Complexity, Trialability, Observability

c. Dependent Variable: AdoptionIntention

ANOVA produced F-ratio F = 51,686 for the first model and F = 145,653, which is significant at p<0.001. As F is greater than 1, it means that the generated model generally improved the prediction of the outcome compared to the level of inaccuracy of the model. This result implies that there is less than 0,001 chance that such F-ratio could appear if the null hypothesis was true, confiming fairly good degree of prediction of the regression model (Field, 2013).

Table 16. Results of ANOVA. (Source: IBM SPSS Statistics outputs).

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	999,956	4	249,989	51,686	,000[b]
	Residual	977,001	202	4,837		
	Total	1976,957	206			
2	Regression	1608,781	6	268,130	145,653	,000[c]
	Residual	368,176	200	1,841		
	Total	1976,957	206			

a. Dependent Variable: AdoptionIntention

b. Predictors: (Constant), Compatibility, Accessibility, Cost, Complexity

c. Predictors: (Constant), Compatibility, Accessibility, Cost, Complexity, Trialability, Observability

There are no values of Pearson's Correlation Coefficients of r>.9 present, meaning there is no evidence of multicollinearity in the data. No multicollinearity is also confirmed by the VIF values, which are below 10 for all coefficients, and tolerance statistics, which are all above 0,2 in Coefficients table (Table 18) (Field, 2013).

Table 17. Correlations summary. (Source: IBM SPSS Statistics outputs).

	N	Pearson's correlation coefficient	Sig.
AdoptionIntention	207	1	0,002
Accessibility	207	0,649	0,000
Cost	207	0,338	0,024
Complexity	207	0,485	0,000
Compatibility	207	0,367	0,053
Trialability	207	0,790	0,000
Observability	207	0,784	0,000

Post-hoc analysis on residuals was conducted to check whether the model is generalizable to the general population. Assumptions of model linearity and normal distribution are tested through the graphs: histogram and partial p-p plot; graphs on each variable shown in the appendix demonstrate no evidence of homoscedasticity present.

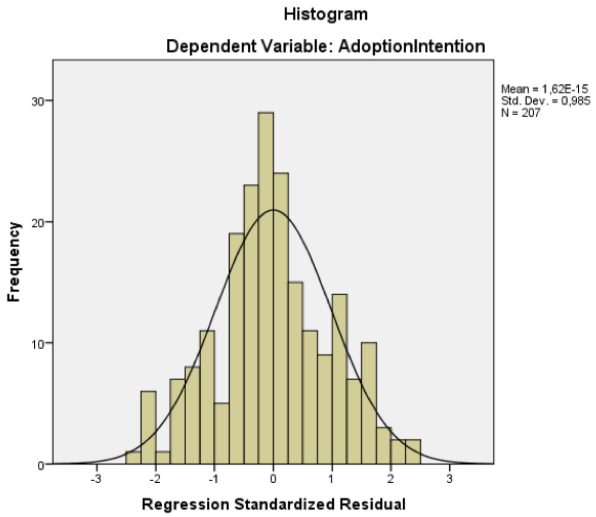

Figure 16. Histogram of the regression model. (Source: IBM SPSS Statistics outputs).

The histogram confirms that the residuals follow normal distribution, therefore assumption of normality is met. Partial p-p plot confirms that the assumption of linearity is met.

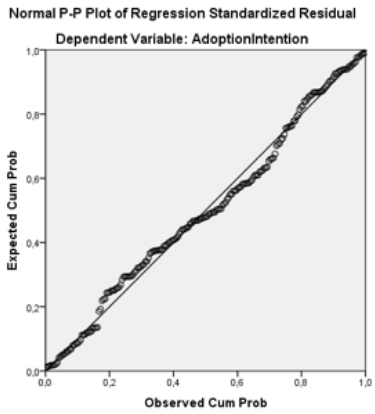

Figure 17. Partial p-p plot of residuals of the regression model. (Source: IBM SPSS Statistics outputs).

Having identified that the model could be generalized, the next step is to confirm or reject hypotheses based on this model.

The regression model indetified relationships between adoption intention and accessibility, lower complexity, trialability and observability on the adoption intention. Therefore, hypotheses *H1, H3, H5* and *H6* are supported, with higher accessibility (,135 at p<,01), lower complexity (,141 at p<,001), higher trialability (1,180 at p<,001) and higher observability (1,259 at p<,001) proving to have relationships with the adoption intention.

Cost and compatibility have unacceptable value of p>.05; moreover, their confidence

intervals are crossing zero, meaning that the effect of variable could not be definitively given a positive or negative direction, also indicating possibility of no effect present at all. Therefore, hypotheses *H2* and *H4* are rejected due to lack of definitive relationships with adoption intention.

Table 18. Coefficients table. (Source: IBM SPSS Statistics outputs).

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	2,143	,846		2,531	,012	,474	3,812		
	Accessibility	,569	,065	,489	8,723	,000	,440	,697	,834	1,199
	Cost	,272	,168	,093	1,618	,107	-,059	,603	,787	1,270
	Complexity	,210	,055	,239	3,848	,000	,102	,317	,680	1,470
	Compatibility	,148	,173	,054	,859	,391	-,192	,489	,661	1,513
2	(Constant)	1,803	,523		3,447	,001	,772	2,834		
	Accessibility	,135	,047	,116	2,882	,004	,043	,227	,618	1,618
	Cost	,066	,105	,023	,624	,533	-,142	,273	,766	1,305
	Complexity	,141	,034	,160	4,154	,000	,074	,208	,670	1,493
	Compatibility	,030	,107	,011	,277	,782	-,181	,240	,658	1,519
	Trialability	1,180	,122	,402	9,638	,000	,938	1,421	,576	1,738
	Observability	1,259	,126	,422	10,021	,000	1,011	1,506	,562	1,779

As the result of the analysis, the following hypotheses were confirmed:

H1. Higher perceived accessibility will positively influence adoption intention of OMC platforms.

H3. Lower perceived complexity will positively influence adoption intention of OMC platforms.

H5. Higher perceived trialability will positively influence adoption intention of OMC platforms.

H6. Higher perceived observability will positively influence adoption intention of OMC platforms.

And the following hypotheses were rejected:

H2. Lower perceived cost will positively influence adoption intention of OMC platforms.

H4. Higher perceived compatibility will positively influence adoption intention of OMC platforms.

Further discussions of these findings are provided in the next chapter.

CHAPTER IV. MANAGERIAL IMPLICATIONS AND DISCUSSION

4.1 Discussions of the findings

The goal of this study was to identify relationships between innovation attributes and adoption intention of russian consumers of online medical consultation platforms. To meet this goal, specific research questions were outlined:

Q1. Are there relationships between innovation attributes and adoption intention of Russian consumers of OMC platforms?

Q2. What innovation attributes have influence on adoption intention of consumer of OMC platforms?

The industry of research is online medical consultation platforms, which currently experiences rapid development due to new legislation recently introduced in Russia.

Upon literature analysis, Rogers' innovation-decision theory was chosen as the most appropriate for deriving innovation attributes to be analysed, with addition of the attributes of accessibility and cost suggested by Kapoor. Based on this theory six hypotheses about relationships of innovation attributes and adoption intention were suggested.

The empirical research was organized in the form of quantitative study, as this organisation of research allows for outlining consumer behavior patterns. For the quantitative study, a questionnaire of 23 questions aiming to capture the perception of innovation attributes was developed. Data from 244 russian consumers was collected through online survey tool.

After initial data asessment via reliability check and factor analysis (PCA), multiple regression analysis was performed to identify relationships between innovation attributes and adoption intention.

As a result, relationships were identified between the following innovation attributes and adoption intention: variables of accessibility, trialability and observability proved to have positive relationships with variable of adoption intention, meaning that higher values of these attributes are associated with higher values of adoption intention; variable of complexity proved to have inverse relationship with variable of adoption intention. However, attributes of cost and compatibility did not prove to have relationships with adoption intention. Theoretical and managerial implications of these results is provided in the next section.

The analysis provides an answer to the first research question: there are relationships between most of innovation attributes and adoption intention of Russian consumers of OMC platforms, with the exception of attributes of cost and compatibility.

As for the second research question, innovation attributes of accessibility, complexity, trialability, observability showed to have relationship with adoption intention of consumer of OMC platforms, with higher accessibility (,135 at p<,01), lower complexity (,141 at p<,001), higher trialability (1,180 at p<,001) and higher observability (1,259 at p<,001) positively related to adoption intention.

4.2 Theoretical implications

This research contributes to existing field of innovation-decision research. Another contribution created by this research is that to the empirical research of telemedicine in Russia.

Findings of this study suggest that Rogers' theory is highly relevant for the market of OMC platforms, as it provides efficient explanation for consumers' adoption intention of this innovation. Under further examination it was found that not all of the attributes mentioned by the original model have strong relationships with adoption intention of OMC platforms, with attributes of accessibility, complexity, trialability and observability having relationships with adoption intention, and attributes of cost and compatibility not having relationship with adoption intention. Morevover, quantitative study showed that although innovation attributes of Rogers innovation-decision model are relatively good in explaining of the most part of variance (81,4%) in adoption intention of OMC platforms, they could not account for prediction of the overall adoption intention, suggesting that there are other attributes which could be added to the model.

Accessibility proved to be one of the most important attributes in consumers' perception. These results are in line with the research of Sheba et al, which found high impact of accessibility on telemedicine adoption by African American consumers (Sheba et al, 2012). As the construct of accessibility was not included in the original Rogers' innovation-decision theory, but was developed later by Kapoor on the base of Rogers' theory, significance of relationships of accessibility and adoption intention proves that suggested developments of theory are very relevant.

The attribute of cost showed to have no definitive relationships with adoption intention. Lack of effects of cost on adoption intention could be explained by lack of reference price for the product due to its' novelty. Reference price is defined as monetary value of a product that consumers use for evaluating any other prices for this product. When a new product is launched, it does not have established reference price: as the value of new product is not clear for the consumers, the base of comparison is not defined (Gladkikh, 2013). In the case of OMC platforms, consumers are not yet familiar with the product, as it was launched recently. Therefore, there is no base for comparing the price. This finding demonstrates a certain level of consumers' flexibility in terms of various price levels, implying more freedom for the company to experiment with pricing strategies. However, importance of cost could be changing on later stages of Rogers' innovation-decision model (Rogers, 2003); therefore, pricing strategy could not be fully based on the assumption that consumers would be ready to pay at any price point. Moreover, as soon as reference price is established in consumers' mindset, the importance of cost is expected to change.

The construct of compatibility did not prove to be relevant: relationships with adoption intention were not identified. The explanation could be attributed to the theory of switching costs. According to this theory, consumers are considered to face three types of switching costs: financial, procedural and relational. Financial switching costs include exit and entry fees, sunk costs, lost reward points of layalty programs; procedural costs include time and effort needed to

locate, adopt and use new provider; relational switching costs, which are defined as loss of established personal relations with brand, and in some cases with its' employess (Liang, Lee & Tung, 2014). Attribute of compatibility is related to procedural switching costs, as the use of OMC platforms does not imply any exit fees, but implies changes in time and effort needed for installing OMC platforms applications and learning to operate them. However, as OMC platform does not require special gadgets, but any smartphone of computer, the overall amount of effort is not significant, which could be the reason behind the tests' results.

4.3 Managerial implications

The fact that findings showed that not all of the innovation attributes mentioned by the original Rogers' theory have strong influence over adoption intention could be used as idea for focusing marketing campaigns. As it was found that consumers are paying more attention to accessibility, complexity, trialability and observability, marketing campaigns could be built around this focus.

Accessibility proves to be significant for consumers, therefore, it is feasible for company to focus its' marketing on this construct for further penetration of the market. Accessibility could be approached in marketing campaigns from the sense of consumer's comfort, emphasizing the possibility that OMC platforms have for contacting specialists from any point of the world and saving time on physical appointment.

Moreover, in line with research by Welch et al, consumers generally prefer using telemedicine to see their personal healthcare providers (52%), rather than communicating with unfamiliar specialists from the same organisation (35%) or specialists from different organisations (19%) (Welsch, Harvey, O'Connell & McElligott, 2017). Taking into account the importance of accessibility found by this study, these findings mean that consumers are likely to be highly interested in OMC platforms which can provide services of their personal specialists. This emphasizes the need for creating a broad network of medical scientists, facilitating consumers' contact with their own providers. From the marketing point of view, it suggests that efficient promotion of OMC platforms could be done directly through medical organisations, and also through the specialists telling their patients about platforms.

Cost showed to have no significant relationships with adoption intention. For business this means more flexibility in terms of pricing OMC platforms services: companies have opportunity for experimenting with flexible pricing strategies, which results in higher margins without risk of losing customer share.

Moreover, understanding of perception of innovation attributes is useful for the company not only at the stage of product promotion, but also at the very beginning of the product cycle,

therefore allowing a better alignment of product characteristics to consumer's perceptions. At the stage of product development importance of characteristics of accessibility, complexity, trialability and observability are to be taken into account, aligning R&D efforts to make the final product more suited to the consumer expectations.

The attribute of complexity, which showed to have relationship with adoption intention, identifies the importance of user-friendliness of OMC platforms. Companies could be actively engaging with consumers from early stages of platform development to make sure the final product meets the requirements of lower complexity. Furthermore, when the product is launched, seeking feedback from consumers and implementing changes according to this feedback allows for further product development.

Construct of trialability, which also proved to have positive relationship with adoption intention, emphasizes the importance for consumers to be able to experience services of OMC platforms on a limited basis. High impact of both trialability and accessibility suggests campaigns that allow consumers to try the service free of charge or with significant discount, using experience for confirming the perception of accessibility and therefore triggering consumer to move from the persuasion stage to further stages.

As attribute of observability was measured through willingness to share results of using platforms with other consumers, relationships between attribute of observability and adoption intention suggest opportunities for companies to use Word-of-Mouth for promotion of online medical consultation platforms.

4.4 Limitations and further research

There is a number of limitations connected to this study. Firstly, among limitations considering sample characteristics of the survey is city distribution of respondents. Respondents of the survey were mostly obtained through personal network, and therefore they are mostly citizens of Saint-Petersburg and Moscow, making the results relevant for big cities. Differences in the life-style between consumers of big and smaller cities could lead to different perception of importance of attributes.

Secondly, the appropriability of parametric tests with Likert scale is a widely discussed question. However, although use of Likert scales for parametric tests creates debates in scientific community, precedents for using parametric analysis for Likert scale has been established in researches on Rogers' theory, and therefore they could be considered applicable (Adams et al, 2017; Hsu et al, 2007; Nørskov et al, 2015).

Thirdly, the regression analysis showed that constructs explained 81,4% of variance, allowing to accept the regression model, but also meaning that 18,6% of variance stays

unexplained. Therefore, while this research showed that there is influence of certain innovation attributes from innovation adoption theories on adoption intention, those attributes only account for a share of incentives on why consumers choose to adopt or reject innovation.

Moreover, while there is a general tendency of adoption intention to predict further innovation adoption or rejection, there are some cases where discrepancies appear between adoption intention and actual adoption decision (Rogers, 2003). Consequently, positive adoption intention does not necessarily result in actual innovation adoption, as environmental conditions also influence the adoption decision.

As for the further research, little attention was focused both in current study, as well as in previous studies in the field on the inter-relationships between innovation attributes, and thus the theoretical potential of their influences has not been fully investigated. This topic could serve as a base for more in-depth researches of consimers' perceptions of innovation attributes.

Moreover, findings of current research suggest further analysis of the environmental reasons why consumers tend to adopt or reject the innovation. While in current research innovation attributes were studied separately from environmental conditions, for the next step of analysis innovation attributes could be taken together with environmental conditions, and their influence on consumer adoption intention as well as interrelations are to be analyzed.

Additionally, innovation of online medical consultation platforms could be studied over time, evaluating the gap between adoption intention and actual adoption.

Another direction of further research is a fit of innovation adoption theories to other industries in Russia. Such research would pile up and eventually lead to creation of a new pillar of research on innovation adoption specifics in Russia. Taking into consideration the geometrically progressing rate of innovations' introduction, research in this area would be highly in demand for managerial purposes.

CONCLUSION

Innovations have to be adopted by consumers in order to be considered successfully commercialized. Therefore, it is feasible for companies to understand which innovation attributes drive adoption intention. The research on innovation adoption intention provides possibilities for companies to look deeper into consumers' pre-experience perceptions of innovations. Such research helps to lower the level of uncertainty usually surrounding launch of every innovation.

The market of online medical consultation platforms was chosen as the base for research due to recent appearance of favorable conditions for this market in the form of new legal framework on telemedicine, which served as incentive for new services' development: the market experienced a boost of investments, with a large quantity of new projects announced.

Existing theories on consumers' perception of innovation were overviewed, leading to the choice of Rogers' innovation-decision theory as the most appropriate for the goal of the study, due to the theory's specific focus on innovation. Innovation attributes of Rogers' theory with additions by Kapoor were evaluated with the literature on telemedicine adoption and articles about specifics of telemedicine in Russia. As the result, six hypotheses about relationships of innovation attributes and adoption intention of Russian consumers of online medical consultation platforms were formulated.

The quantitative research was conducted among Russian consumers of online medical consultation platforms, with the aim of investigating the relationships between identified innovation attributes of telemedicine platforms and adoption intention. The findings of this study led to acceptance of hypotheses about existance of relationships between perception of accessibility, complexity, trialability, observability and adoption intention; however, hypotheses about relationships between perception of cost, compatibility and adoption intention were rejected due to lack of evidence of existence of these relationships.

The findings of the study bring theoretical and practical contribution to the field of innovation adoption of telemedicine solutions, as the results could be used by both researchers of innovation adoption and managers of online medical consultation platforms.

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APPENDIX

Appendice 1. Questionnaire

Choose the number which describes the extent to which you agree to the following statements. (5-point scale, where 1 – Completely Disagree, 5 – Completely Agree).

1. I would be able to use Online Medical Consultation platform anytime, anywhere.
2. Online Medical Consultation platform is trustworthy method of contacting the specialst I need at any place of the world.
3. Online Medical Consultation platform will allow me to find medical help immediately when I need it.
4. I can afford the cost of Online Medical Consultation platforms.
5. My use of an Online Medical Consultation platform would be clear and understandable.
6. It would be easy for me to become skilled at using an Online Medical Consultation platform.
7. I would find Online Medical Platforms easy to use.
8. Learning to operate an Online Medical Platform would be easy for me.
9. Online Medical Consultation platform website/app is compatible with my current phone service.
10. Before deciding whether to use any Online Medical Consultation platform, I would be able to try one out.
11. I will be permitted to use an Online Medical Consultation platform on a trial basis long to see what it can do.
12. I would have no difficulty telling others about the results of using an Online Medical Consultation platform.
13. The results of using an Online Medical Consultation platform are apparent to me.
14. The company will be trustworthy.
15. The technology will be trustworthy.
16. I intend to use an Online Medical Platform in the next 12 months.
17. I predict I will use an Online Medical Platform in the next 12 months.

18. I plan to use an Online Medical Platform in the next 12 months.

19. Choose an option which describes you best:

- Before the official announcement of OMC, I felt interested in OMC and tried to figure it out. I began to use OMC in the innovation stage, even though the usage environment is not mature.
- I made the decision to use OMC on the basis of my intuition. In my imagination, OMC will be a useful and playful instrument. I began to use OMC in the early stage.
- I hesitate to use OMC due to wondering if it will become popular. I will not make the decision till I am sure that the function of OMC is complete (i.e., cross-site transfer) and its usefulness and playfulness clarified.
- I know that OMC will become popular. But I will decide to use OMC only after its specification standard is complete and its service support is established well.
- I will not use OMC, even though it is very popular. But if OMC is built into another necessary facility (e.g., a phone), I will think about it.

20. Your gender:

- Female
- Male

21. Your age:

- Less than 18
- 18-24
- 25-34
- 35-44
- 45-49
- More than 50

22. Your education:

- School
- Professional education, college

- Higher education
- Post-graduare degree
- Doctor of Science

23. Your annual income:

- Enough to buy a car or an apartment
- Enough for food, clothes, durable goods, not enough to buy a car or an apartment
- Enough for food and clothes, not enough to buy durable goods
- Enough for food, not enough to buy clothes
- Enough for food