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Graduate School of Management

Master in International Business

# FACTORS AFFECTING CONSUMER BEHAVIOR IN CONTEXT OF SERVICE USING AFTER ITS DIGITALIZATION

Master's Thesis by the 2nd year student

MIM-2016

Anton Titov

Research advisor

Senior Lecturer

Olga N. Alkanova

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## ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ
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## АННОТАЦИЯ

| | |
|---|---|
| ФИО студента | Титов Антон Станиславович |
| Тема магистерской диссертации | Факторы, влияющие на поведение потребителя, в случае пользования сервисом после его дигитализации |
| Факультет | Высшая школа менеджмента, Санкт-Петербургский государственный университет |
| Программа | 080200 «Менеджмент» |
| Год окончания | 2016 |
| ФИО научного руководителя | Алканова Ольга Николаевна |
| Описание целей, задач и основных результатов исследования | Цель исследования состоит в выявлении факторов, влияющих на использование мобильных приложений для потребления услуг, а также изменение частоты использования услуги.<br><br>Факторы, которые имеют потенциальное влияние на использование мобильных приложений для потребления услуг, а также изменение частоты использования услуги были частично заимствованы из третьей теоретической модели принятия технологий, теории о диффузии инноваций и единой теории принятия и использования технологий. В качестве статистического метода был применен регрессионный анализ для определения факторов, влияющих на использование мобильных приложений для потребления услуг, а также изменение частоты использования услуги. Результаты статистического анализа, показали статистически значимую зависимость между использованием мобильного приложения для потребления услуг и фасилитирующими условиями, контролем над получением услуги, субъективное удовольствие от пользования.<br><br>В случае оценки взаимосвязи на изменение в частоте использования, статистически значимая зависимость была найдена между зависимой переменной и контролем над получением услуги, наличием триальной версии, отношением к использованию. |
| Ключевые слова | Мобильные приложения, дигитализация, единая теория принятия и использования технологий, диджитал услуги. |

## ABSTRACT

| | |
|---|---|
| Master Student's Name | Anton Titov |
| Master Thesis Title | Factors affecting consumer behavior in context of service using after its digitalization |
| Faculty | Graduate School of Management, Saint-Petersburg University |
| Program | 080200 «Management» |
| Year | 2016 |
| Academic Advisor's Name | Alkanova N. Olga, Senior Lecturer |

| Description of the goal, tasks and main results | The objective of the current research is to identify the factors that determine the usage of mobile applications for service consumption and change in usage frequency . |
|---|---|
| | The factors that can potentially influence the mobile applications usage were derived from the Technology Acceptance Model 3, the Diffusion Theory and the Unified Theory of Acceptance and Use of Technology. The regression analysis was used in order to find corresponding relationships. |
| | The analysis showed the strongest significant positive relationship between the mobile application use and facilitating conditions, service delivery control and perceived enjoyment. |
| | Concerning change in usage frequency, significant factors are service delivery control, trialability (reverse relationship) and attitude towards using. |
| Keywords | Digitalization, mobile applications, UTAUT model, digitalized service |

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**INTRODUCTION**

Today, many traditional services as banking, retail, transportation, etc. are transforming into online variations. Companies are stating that online channel is becoming one of the most priority area of development (McKinsey, 2015). With the rise of touchphones, this trend experiences new boost. It leads to digitalization of customer experience by existing players in certain industries (traditional banks develop their online and mobile services) or even to emergence of new, most likely, IT companies entering traditional industries (Uber, Airbnb or Skyscanner) and reshaping their standards (Forbes, 2016). Some relevant fields as online banking and online retail have extensive research in background. However, there are not so many researches of online channel penetration into other industries. Moreover, the impact of mobile devices usage expansion on consumer behavior is currently continued. According to Statista research (2016), the overall number of smartphone users worldwide is going to reach 2 billion in 2016 and continues growing quite rapidly. The growth exceeds 10-15% per year until 2019 (statista.com, 2016; emarketer.com, 2014). Thus, studies on this topic become outdated very fast.

New tech start-ups emerge, new services appear, new consumer behavior forms. In addition, available papers are aimed more on specific companies and their newly developed products or services. Hence, this study is aiming to analyzing the impact of certain services technological transformation (without company focus) on consumer behavior. In other words, this thesis is an attempt to understand whether current innovative technological products which, basically, provide online (mobile) access to a traditional service, reshape consumer behavior, particularly, form new habit to use them in the new way and more frequently.

This situation on the market has been formed recently, consequently, the research of this problem is limited. Usually, switching behavior is examined either within one offline service or online service (Keaveney, 2001; Chiu et al, 2005). However, the phenomenon of switching from offline version of service to its digitalized (mobile) version is not well studied, hence this area is determined as research gap which is going to be filled in this study.

In legacy understanding, the concept consumer behavior is based solely on the act of purchase (Laudon, Bitta 1993). Contemporary works determine Consumer Behavior as "behavior that consumers display in searching for, purchasing, using, evaluating and disposing of products and services that they will expect satisfy their needs" (Schiffman, Kanul,2007). It could be inferred from the definition, that frequency of purchase of certain service could be treated as a part of consumer behavior. Therefore, the part which is going to be in focus of this work is relevant to the consumer behavior concept.

The problem is going to be studied on the example of two services, which are:

1. Mobile banking
2. Taxi ordering

Each service has been chosen for several reasons. First, according to Gartner (2015) recently, many companies have started providing these services via mobile applications. Second, the penetration of mobile versions of these services continues to grow. Third, both services are different and do not have a lot in common, so, analyzing this set of services, we mitigate try to mitigate bias arising from specificity of certain service.

Potentially, the results of  this study could shed light on determination factors which lead to successful service technological transformation, hence, to define possible services that are not yet massively transformed but have great potential in that perspective. Thus, this goal could be possible direction of future research.

Research goal of the current study is to define factors that lead to consumer behavior change, in particular, using the certain service more frequently in case of service digitalization, and statistically test the influence of those factors on the frequency of the service usage.

The research object is consumers in context of banking and taxi services. The research subject is factors affecting consumer behavior in the process of using digitalized services.

First chapter of this paper is devoted to observation of main terms and concepts from the topic of the study. As a result, first, specifics of research object and subject are going to be determined, second, research design and methodology is going to be defined, which is described in chapter 2. Chapter 3 contains interpretation of statistical analysis and primary conclusions. The last chapter is devoted to the discussion of the results, describing practical and theoretical implications.

# 1 LITERATURE REVIEW

The following chapter contains review of main concepts related to the topic of the study. The purpose of this review is to identify peculiarities of consumer switch from offline to digitalized version of service from different angles. These peculiarities could be a basis for forming factors influencing the consumer decision to use digitalized service for further statistical testing. First, as **digitalization** concept is not obvious, we are going to review it first. The important thing is to observe the case in different dimensions, thus, second, the concept of *service* is going to be analyzed in order to find possible service-related specifics which could influence consumer decision. The third step is observation of *consumer behavior* and *switching behavior,* in particular, for the purpose of narrowing research focus to specific aspects of consumer behavior which are relevant to research topic. Also this chapter will help to identify the research gap which is going to be filled in with this research. Next is *digitalization in context of e-commerce* analysis performed for seeking possible reasons of switch from the background of digitalized (mobile) service specifics. The last part of the chapter is devoted to revising acknowledged technology adoption models in order to first, find possible generalized appropriate factors for digital service usage context and second, to lean on verified methodology for new model development.

## 1.1 Digitalization

We start this chapter with the analysis of digitalization concept. We will consider digitalization of traditional "offline" services as well as such a term as a pure digital company which provides online services from the beginning.

To move further with discussion on digitalization of services or digital services we first consider "digitalization" concept. In this part we have a closer look to the meaning of "digitalization" concept. Beforehand we need to make clear that two concepts 'digitization' and 'digitalization' are not mixed up.

'Digitization' and 'digitalization' are two concepts that are closely associated and often used interchangeably in different ranges of research works. Although there is a clear distinction between these terms.

The Oxford English Dictionary (OED) refers to the first uses of the terms 'digitization' and 'digitalization' in connection with computers in the mid-1950s. In the OED, digitization means "The action or process of digitizing, and the conversion of analogue data (especially in later use images, video, and text) into digital form." Digitalization in the meantime refers to "the adoption and/or increase in use of computer or digital technology by an industry, organization, country, etc."

Thus in our paper we use this distinction and define digitization as "material process of converting individual analogue streams of information into digital bits". In contrast, we refer to digitalization as the way in which many spheres of social life are restructured around digital communications and media infrastructures. Below we discuss digitalization concept in detail.

The first use of the term "digitalization' in conjunction with computerization refers to the year 1971. The essay written by Robert Wachal (Tate et al, 2014) was published in the North American Review. In this essay, the author discusses the social implications of the "digitalization of society" in the context of considering objections to, and potentials for, computer-assisted humanities research. From that point research works about digitalization have grown into a massive literature. The researchers are concerned less with the specific process of converting analogue data streams into digital bits but more the ways that digital media structured, shaped, and influenced the contemporary world. In this sense, digitalization has come to refer to the structuring of many and diverse spheres of social life around digital communication and media infrastructures. We further focus on a few prominent works that touch the topic of digitalization implications that scholars have traced across some of the many different spheres of social life.

Manuel Castells (Tate et al, 2014) at his work observes the digitalization of "the new economy, society, and culture". He views "digitalization" as one of the defining characteristics of the new era. Castells is part of a broader group of scholarship that points out the underlying media and communications system as a way to explain or understand most of the aspects of contemporary social life. According to van Dijkargues (Tate et al, 2014) – "we will have a single communications infrastructure that links all activities in society for the first time in history". This communication system is fully characterized as "new media". It is often defined as "old media that have been transformed through their reconfiguration into devices capable of managing digital signals".

There are some ways that researches have analyzed how digitalization shapes the contemporary world. Authors have focused on globalization rise – a process that has both facilitating and been facilitated by the expansion of the economy beyond national borders via digitalization. Both digitalization and globalization of the economy have subsequently eroded national sovereignty, reshaped conceptions of place and materiality, and facilitated new circulations of culture, commodities, capital, and people. For example only in the field of finance, many scholars have shown how digital media are now central to global capital flows.

Although there are a lot of different researches and publications on the topic of "information society" – most of them trace their roots to the early work by Daniel Bell and Fritz Machlup (Tate et al, 2014). In their work the authors mentioned global shifts in national economies patterns. Many scholars would have agreed with Bell and Machlup that "computer technology is just the same to the information age, what was mechanization to the Industrial Revolution".

Some other researchers have identified "digitalization" as bringing about convergence across the media, which drives many of the broader social and technical changes outlined below. For example ability of digitization to produce a medium that simulates or consolidates all other media – means that the digital must ultimately be percept as a "generalized medium" that consolidates "diverse forms of information", or that is ultimately "mediumlessness". Thus, the rise of digital media "has entailed a reconsideration of what a medium is, because the digital computer can reproduce or simulate all other known media".

Researchers have explored the idea of convergence across a number of different processes and spheres of social life. They identified a number of different forms of convergence. For the clarity sake, we summarized existing information into four key dimensions of convergence which is related to digitization and digitalization. These are the following types of convergence: infrastructural, terminal, functional and rhetorical, as well as market convergence (Tate et al, 2014).

We referring to infrastructural convergence in this paper as to perhaps the most common form of convergence discussed in the literature. Scholars describe how digitization brings about the convergence of the material infrastructures to communication. There are two main forms of this type of convergence. First, network or "infrastructure" convergence refers to the physical network of wires and tubes that undergird the communication infrastructure. Because digitized information can be manipulated and understood nearly by any digital system, "any network can be used to transmit all kinds of digital signals". This means that "a single physical device – be it wires, cables, or airwaves – able to deliver services that in the past were provided separately".

The other convergence type, device or terminal convergence, refers to how digitization entails the consolidation of multiple media devices into a single one. The simple example here is a smartphone, which now replaces number of "outdated" devices (telephone, computer, camera, audio recorder, calendar, calculator, notepad, etc.).

After reviewing some of the works on digitalization concept, we now defined the "digitalization" as the "adoption and/or increase in use of computer or digital technology by an industry, organization, country, etc." Although the term digitalization is went far beyond this definition – we use and mean in our paper the definition provided by OED.

## 1.2 Services

Contemporary market provides variety of goods and services to be consumed. In our study we are going to focus on services, or on electronic services if to be more specific. However, before deep dive in the specific topic of the study, it is required to observe concepts that are more abstract in order to understand its nature and specifics.

The concept of service is going to be observed. First of all, it should be mentioned, that this concept has a variety of definitions. The reason of that is extreme diverse of services as such (Lovelock et al, 2010). Thus, it is tough task to combine such things as management consulting and medical insurance within one common term.

One of widespread definitions reads as follows "activity or series of activities of a more or less intangible nature that normally, but not necessarily, take place in the interaction between the customer and service employees and/or physical resources or goods and/or systems of the service provider, which are provided as solutions to customer problems" (Groenroos, 2001). Christopher Lovelock et al (2011) outlined two definitions. The first is "Any act, performance or experience that one party can offer to another and that is essentially intangible and does not result in the ownership of anything, but nonetheless creates value for the recipient. Its production may or may not be tied to physical product." And the second is "Services are processes (economic activities) that provide time, place, form, problem solving or experiential value to the receiver." The first one looks like edited version of service definition by Kotler (1999): "A service is any act or performance that one party can offer to another that is essentially intangible and does not result in ownership of anything. Its production may or may not be linked to a physical product."

Thereby, it could be concluded that term "service" has been contradistinguished from term "good" which is defined, as a material that satisfies human wants and provides utility. (Bannock et al. (1998). Defining service term, scholars stress out intangibility as the main differentiator from the "good" term. Vargo and Lusch suggested (2004) different approach: they define service as "the application of specialized competences (knowledge and skills) through deeds, processes, and performances for the benefit of another entity or the entity itself." Therefore, they use service provider perspective to describe the concept, putting differences between service and good on the back burner.

Edvardsson et al. (2005) conducted interesting research: they sent short text with statement and question about "service" term to the experts in respective field. And then analyzed frequency of keywords used by them. Hence, they received the following results: while commenting and explaining "service" term, 6 experts out of 11 mentioned "performance" term, 5 experts mentioned "processes" term and 3 of them mentioned "deeds". Some experts also used "activities" and "experience" for an explanation.

The researchers concluded that the most widespread definitions could be divided into two groups. First group contains definitions which are focused on distinguishing services from products. The other group focuses on service as a perspective to value creation. Edvardsson et al (2005) drew the conclusion that the former approach is rather outdated and already lost its usefulness, while the latter one shed the light on the most important part of 'service' concept.

Although, some scholars think that approach of opposing services to products is outdated, for this study, in order to get bigger exposure, it is important to familiarize with it.

Classical explanation of the difference between product and service told us that goods could be determined as physical objects, while services always include actions (Berry, 1980). One of the primary goals of early stages of services studying was to distinguish between the concepts of product and service. At that time 4 specific distinctive characteristics were found: intangibility (impossible to touch services), variability (hard to meet two identical services), fragility (the effect from service is not infinite), simultaneous creation, delivery and consumption (impossible to store services) (Zeithaml, 1985). Contemporary studies provide more comprehensive analysis of this topic (Lovelock, 2011).

1. *Buyers are not becoming owners of the services.* Service sale is more similar to rental of any good, not the sale of one. Choosing criteria of a product to own are different to choosing criteria of a product to rent.

2. *Services are intangible.* The intention to make the service as tangible as it is possible is fair. To do so, it is better to describe each step of service delivery and manage each one separately.

3. *Intense consumer involvement into "production process".* Consumer behavior and experience could help or prevent in the service delivery process. Sometimes, managing customers as employees is necessary. Self-service option has to be considered. Location and office hours have to be convenient for customers. A company has to manage its assets to make customer experience more attractive and convenient.

4. *Company's employees and customers are sometimes considered as a part of delivered service.* It is crucial to manage employees and clients as their behavior could impact experience of other clients. Hiring of employees with developed hard and soft skills is required. Management has to maintain solid motivation of personnel. Serve customers from different segments at the same time and location could decrease average satisfaction from the service.

5. *Impossible to ensure permanent resource and outputs quality.* For services it is harder to manage consistent quality control. As for goods, standardization might help to get more consistent quality. Set up automated systems also could be helpful in achieving consistent output.

6. *It is hard for consumers to evaluate service quality.* Setting trustful atmosphere between service company and the client is critical. Keeping clients informed could make them confident about their choice.

7. *Impossible to store.* So, the company has to develop strategy of effective demand management. It is required to manage "production capacity" in order to meet forecasted level of demand.

8. *Time factor.* In contrast to products, consumer invest not only money to buy it but also his time. Therefore, management has to be aware of time limits and priorities of clients. For majority of services higher amount of time required to get a service perceived negatively. A company could compete on the basis of faster service speed, longer office hours, lower awaiting time.

9. *Services could be delivered through both offline and online channels.* It is a good idea to consider electronic delivery of some information pieces, make service delivery available globally.

After service concept outline, we are going to review how customers actually consume services. Again, what is the difference between product consumption and service consumption? Christian Groenroos (2001) describeв the difference between product and service consumption the following way: product consumption is consumption of a *result*, while service consumption is consumption of a *process*. However, term "consumption" does not perfectly fit in service provision process. For majority of services, we can capture that the only thing being consumed is time for both sides, service provider and service buyer.

Often, customers are not paying only for a service to get one. Also, they are obliged to have indirect costs in order to get a service. Nonfinancial costs could be structured in 4 precise categories (Lovelock, 2011)

1. *Cost of time* is integral part of service process. Time spent in the service process could be treated as opportunity cost, as customers could use this time earning additional money.

2. *Physical effort*, for instance, fatigue or discomfort, also, could be a part of receiving service process. This happens when the customer has to be in specific place to receive a service or in the case of self-service.

3. *Psychological burden,* for instance, intellectual effort, stressful conditions, or fear, usually takes place in case of choosing service from a set of them. Or sometimes even in the process of receiving a service.

4. *Sensory stimuli* which are uncomfortable feelings from each of 5 types of senses. For instance: loud unexpected sound, inside cold, unpleasant taste or smell, or even underdressed personnel.

These are possible nonfinancial costs which occurred before or during receiving a service. There are also costs which have to be paid after receiving a service. These costs are the most

undesirable ones. For instance, after taking a car to the auto repair, it turns out that after fixing one issue another one comes up and this new issue cannot be fixed in this auto repair, so you have to drive to another place that is far away from your current location. Hence, the customer has to spent additional time and money to satisfy his need. Another case is that for updating international passport you have to submit all your documents in one specific place and then you have to go to another place to pay fee for it. These 2 cases are examples of *costs after service.* The first one, concerning car repair, is *post problem solving,* the second one, concerning passport update, is *post action requirement.*

We should not forget about financial costs. They are not as straightforward as they seem to be. It is often the case when the customer pay more than he or she expected. Sometimes, companies require some prerequisite before receiving specific service, or simply, the service turns out to be more expensive than it was expected. Thus, we can divide financial costs as *expected* and *unexpected* costs. Figure 1 represents costs structure.
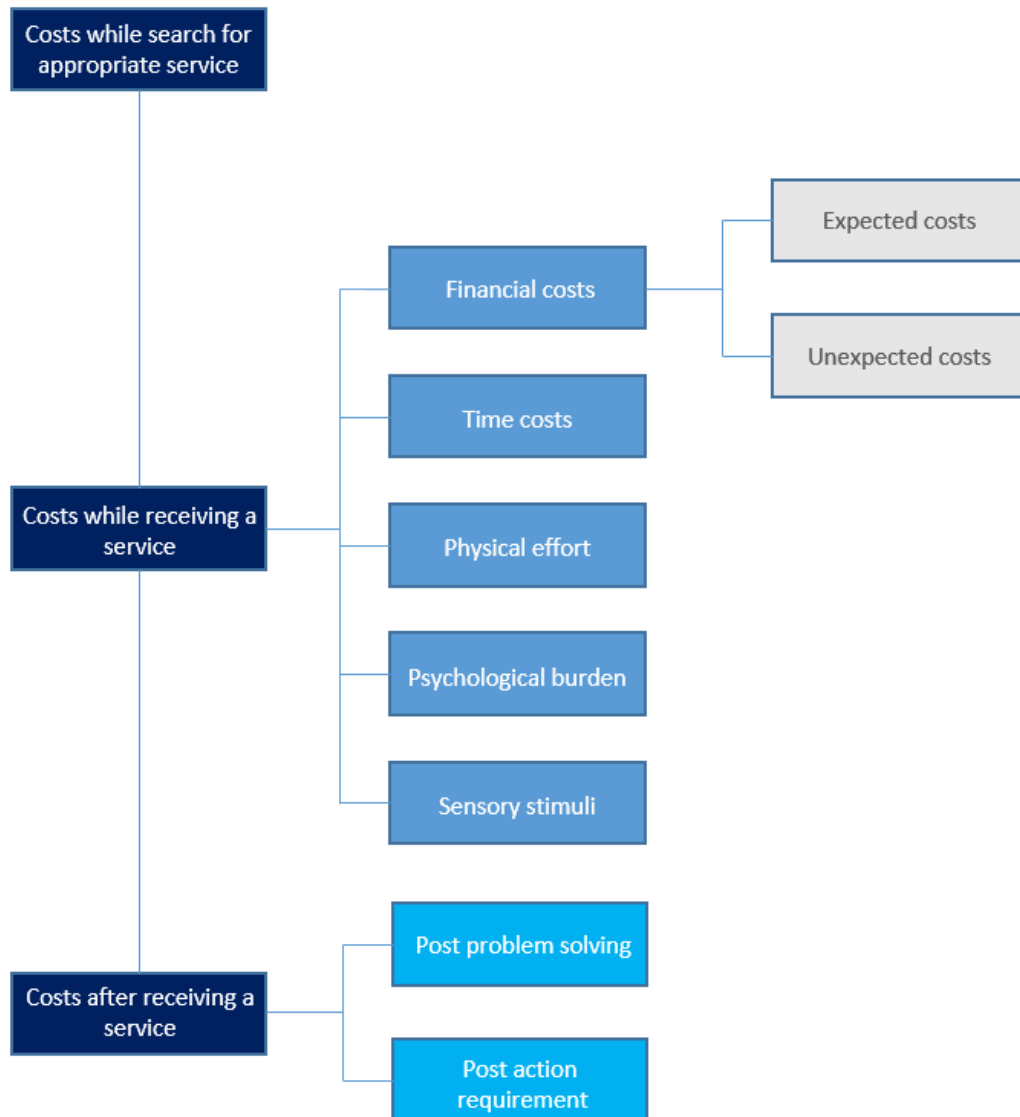
Figure 1 – The service costs structure (Lovelock, 2011)

In the context of current study digitalized or electronic services is going to be observed. Thus it is important to mention, that cost part is critical in the sense that in the case of electronic service some part of costs are usually disappeared. This might be one of competitive advantages toward traditional services. Hence, financial and nonfinancial costs might be a determination factor of mobile application use for service consumption, consequently it is considered for empirical part of the stydy.

## 1.3 Consumer behavior

Consumer behavior reflects the totality of consumers' decisions with respect to the acquisition, consumption, and disposition of goods, services, activities, experiences, people, and ideas by (human) decision-making process over time (Hoyer et al, 2012).

Consumer behavior is the behavior that consumers display in searching for, purchasing, using, evaluating and disposing of the products and services that they expect will satisfy their

needs. Consumer behavior is focused on how individuals, households or families make decisions to spend their available resources as time, money and effort on consumption related items. Within consumer behavior discipline researchers learn how consumer decides about whether to buy or not to buy certain goods or services, how they feel during this process, and how they actually behave physically during searching, choosing, purchasing and using goods or services (Shiffman et al, 2007).

Actual study is an attempt to observe several aspects of consumer behavior. Particularly, the focus is on switching from traditional way of certain service consumption to digital or mobile means. Beside this, we are going to examine the presence of interconnection between such decision and change in usage frequency of those certain services.
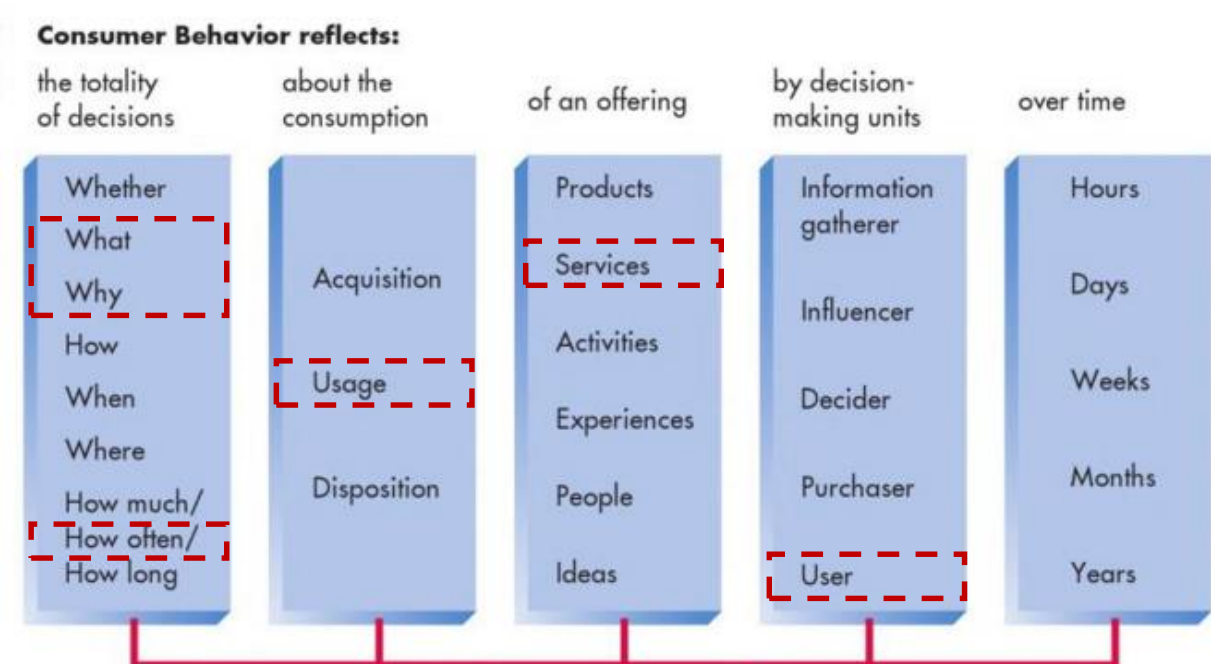


Figure 2 – Consumer behavior possible aspects (Hoyer et al, 2012)

According to Hoyer et al (2012), figure 2 shows all possible aspects of consumer behavior. The marked aspects are those aspects which are going to be explored in current study. At the beginning of observable consuming behavior comes service acquisition. We are interested *how* people are going to acquire a service: in traditional or digital (mobile) way and *why* they make such decision. After the fact of acquisition of the offering consumers start using it, which is at the very core of consumer behavior, according to Krugman et al, 1995. Hereby, as for "how often" aspect, we are going to verify the idea that consumers tend to increase the service usage frequency in case of consumption via digital channel.

In order to understand the concept of consumer behavior Pieters and Vernblanken suggest distinguishing several aspects of behavior (Pieters and Verplanken, 1991).

1. *Control of behavior*. People tend to control their temporary environment. This is obvious desire, as human beings cannot survive in pure chaotic environment, so it subconsciously gravitates to systematize things around it. Moreover, constant changes entail stress for an individual. Thus, behavior is often directed towards individual's position.

2. *Objective versus subjective*. External part of behavior is measurable and might be considered as objective. Consumers execute some visible actions: they walk around book shelfs, for instance, they take books in their hand, read titles, contents of a book, look at book's cover. Nevertheless, when an observer is going to get the intention of one specific consumer, its goals and reasons why he or she acts that certain way, he faces an internal part of his behavior. Behavioral analysis cannot be complete without understanding of hidden part – consumer's motives. However, all attempts to describe internal part of behavior, or interpret it are going to be subjective. The most adequate way to get full interpretation to ask subject of behavior to share his or her intensions, even though such interpretation might be biased as well. Anyway, for a full explanation and interpretation of behavior subjective self-reporting insights are needed (Wells et al, 1966).

3. *Scripts*. Behavior does not stand on its own, it consists of connected sequence of behaviors. For instance, in case of online shopping consumer realize the set of actions: turns on his laptop, tablet or smartphone, puts search inquiry into search engine, chooses one of online stores provided, looks for desired good in its catalog, looks for its price and other specifics, fills in respective forms with payment information, waits for deliver, receives the product and starts using it. This is the example of 'script' of behaviors, which form entire 'online shopping'. A script is a schema of the order in which certain behaviors or acts and conversations in general (and sometimes in a stereotypical way) take place.

4. *Feedback*. Behavior usually provides feedback to goals, needs, values, knowledge, etc. People tend to receive external assessment of their performance, whether they are in right way to reach their goals or not. Feedback provides them this assessment. On the basis of this information they can modify their behavioral patterns in order to achieve what they want to achieve. The following feedback intensions could be outlined:

   - *Learning function*. While getting the results of certain behavior, it is possible to determine what previous actions are correct and what are not. Thus, by means of feedback, consumers could learn the consequences of their behavior and redirect its vector towards their goals.

- *Habit formation*. Feedback can help in habit formation and its strengthening. In case when consumer deviate from their regular routines and this brings negative outcome, they are more likely to get back to their previous routines and keep doing this.

- *Internalization*. Feedback throws light on consequences of consumer's behavior. From this perspective, existing attitudes of an individual could be replaced with new ones. Thereby, positive or negative outcomes from consumer behavior could impact their convictions. (Antonides et al, 1998)

Gerrit Antonides and W. Fred van Raaij (1998) outline hierarchy of behavior. This framework helps to structure all components of behavior. Framework includes 4 degrees in which the person thinks about his/her own behavior. First level is single act, the basic part of behavior (example: I turned the light off). Second level is so called behavioral domain which is a whole group of connecting behaviors that in most cases lead to a certain goal in other words a set of behaviors frequently organized around a common goal. Example: I do not use electricity for no purpose. The goal is the next level of behavior hierarchy. Example: I cut my electricity bills by, at least, 10 percent. The value is the last and the most abstract category. Example: I want to use as much resources as I need, in sustainable manner (Antonides et al, 1998).

Another way to structure the content of behavior is divide it with the help of questions:

- Question 'What?' addresses the level of behavioral domain. Example: I am trying to find cheapest way to spend 6 nights in Greece during my holiday.

- Question 'Why?' addresses the level of goals and values. Example: I want to save more money for entertaining during the trip.

- Question 'How?' address the basic level of simple actions. Example: I use hotel booking websites which provides options with lowest prices.

The 'how'- question refers to specific explanation of behavior. It requires explanation of how specifically a person is going to reach his goal in terms of basic actions. For instance in order to lower costs for living, one can look for a hostel, or even try to find host for several nights for free using couchserfing.com. Thereby, there are many more acts by which living costs could be reduced.

The 'why'- question asks for an abstract explanation of behavior. It addresses the reasons, goals and values. It is more likely that for certain person the answer to 'why' question determines the answer on 'how'- question. For an individual, his values and goals are primary. That means that one chooses means of achieving his goals, finding the answer on 'why'- question before. At

the same time, for external observer it is unclear what 'why' underlies the basic acts. Thus, for the observer for each act there are many possible reasons, goals and values.
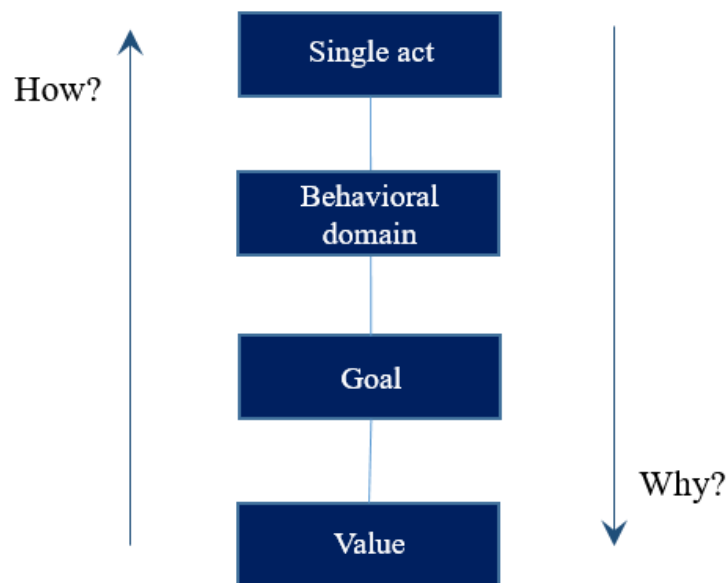


Figure 3 – Consumer behavior levels (Wells and Foxall, 2014)

Means-end hierarchy of single acts, behavioral domains, goals and values is shown in figure 3. When behavior is defined as single act, in order to receive comprehensive view external observer could ask the question 'Why do you do that?', thus, one has to follow top-down approach to explain his behavior, starting with behavioral domain, and finishing with goals and values. In case when the observer managed to identify values of behavior subject, it is a good intension to ask the question 'How do you do that' to get full understanding.

In many cases it is crucial to outline costs and benefits of behavior. This kind of costs and benefits distinction gives better understanding of why consumers act in certain ways and do not act in other ways. Most of the time consumers act economically in the sense that they try to maximize benefits and minimize costs. Basically, an action is undertaken in case the benefits of it outweigh its cost from the behavior subject point of view. Thus, the perception of costs and benefits is subjective and therefore might differ. It depends on benefits and costs precision and time gap between action and consequence. Sometimes, characteristic of application to the society or individual emphasizes separately, however, it might be interpreted as part of precision level. (Rex and Homans, 1962).

The benefits of the behavior are usually defined at quite high level for instance, one could think, 'How happy would I be, if I only got master degree'. The same person most likely thinks about the cost at much more precise level 'I paid money for it. Also, I have to stop all alternative activities, both business and fun and put so much effort to study'. Thereby, the individual considers

financial and opportunity costs. T. Verhallen classified time and effort as behavioral costs. In order to make an individual behave in certain way it is ideal to set cost perception at abstract level before he/she begins it. During its realization one becomes aware at operational level of acts, efforts and time expenses (Verhallen, 1984).

Time difference between costs and benefits significantly influences consumers' behavior. A good example is smoking. For a smoker instant (short-term) benefit of relaxation from smoking outweigh long-term consequence as poor health. This is called positive time preference.

Individual benefits sometimes comes with societal costs. Take an example of answering to a phone call in a library. In this case individual benefit might be receiving some urgent information, while societal cost is disturbing people round due to out loud speech.

Thus, taking into account all stated above, consumer high level behavior algorithm could be derived. Before the fact of the purchase the consumer makes a decision about possible purchase, this decision is based on consumer's goals and values which contains the individual's motivation, thus address questions what, why, how, when, how often, etc. Consumer compares costs and benefits of the purchase, understands whether the purchase is beneficial or not and depending on his subjective assessment performs behavioral act. After the fact of first purchase habit might be formed, so the consumer does not evaluate costs and benefits until something significant occurs, as change in product/service price, change in consumer's goals, etc. Thereby, such algorithm might be considered in the case when individual did not use traditional services previously, so, the first interaction with the service happened online with digitalized version of it. However, it is less likely to happen often. More frequently, before starting using digitalized service, consumers already uses traditional one, so the fact of switching takes place. In order to review the latter case, the observation of concept of switching behavior is going to be performed.


## 1.4 Switching behavior

One of the basic definition of 'consumer switching behavior' is the behavior of consumers in shifting their attitude from one brand (product) to another brand (product) (Zkiene and Bakanauskas, 2006). However, it is possible to find more detailed and at the same time, more generalized one, for instance, consumer switching behavior is referred to the times when consumer chooses a competing choice rather than the previously purchased choice on the next purchase occasion (Rabin et al, 2014). In other words, switching behavior reflects the decision that a consumer makes to stop purchasing a particular service (Boote, 1998).

According to Roos and Gustafsson (2007), customers might switch the service provider firm for different reasons, for instance, existing service provider no longer meets customers'

requirements due to their changing circumstances or customers receive more beneficial offers from other market players or customers just want to see variety in front of them.

The other researchers derive 4 categories of factors which highly affect consumer switching behavior:

1) Cultural factors. Probably, the major influencing factors, which are related to the cultural environment, which surrounds the customer and forms and forms his living, needs and wants referred to his culture, sub-culture and social class.

2) Social factors. Societal norms and values, affecting the behavior, shared with the closest, reference groups, as family members and friends.

3) Personal factors. Personal characteristics like age, life cycle, occupation, income and lifestyle.

4) Psychological factors. Factors as motivation, perception, learning, beliefs, attitudes, and thinking could also affect consumer decision whether to buy or not to buy certain service. (Zeeshan et al, 2015)

Keaveney (1995) has conducted research which identifies more than 800 critical behaviors of service firms that forced customers to switch services. Derived reasons that push customers for switching were classified into eight categories. These categories worth to be observed in order to gain deeper understanding of switching behavior concept.

1) *Pricing* factor includes all critical switching behaviors that involve prices, price deals, price promotions, rates, fees, charges, service charges, surcharges, coupons and penalties. Customers might switch services in case when:
   - actual prices exceed reference prices;
   - prices are considered as too high relative to internal normative price;
   - prices are considered as too high relative to the services received;
   - prices are considered as too high relative to competitive prices.

2) *Inconvenience* factor includes critical cases when feel inconvenienced by the service provider's working hours, location, waiting time before being served. Customers might switch services when:
   - customer discovers another service provider option with more suitable schedule;
   - customer discovers another service provider option with more suitable location;
   - getting an appointment takes too long relative to customer's internal, normative point;
   - service delivery takes too much time relative to normative reference point or to service provider promises;

3) *Core service failures* factor includes critical cases that happens when some mistake or technical problem takes place. Customers might switch services when:
   - core service mistakes have longitudinal nature and mistakes series leads to service quality decrease;
   - single serious mistake occurs which completely denies service delivery;
   - multiple mistakes occur during one service encounter;
   - mistakes concerning billing occur (incorrect or not timely billing);
   - damage is caused to customer's side while serving.

4) *Service encounter failures* factor includes critical cases of unpleasant personal interaction with service firm's employees. Customers might switch services when:
   - service personnel does not listen to a customer;
   - service personnel rushes when it is inappropriate;
   - service personnel ignore customer's requests;
   - service personnel is not successful in execution of their obligations.

5) *Employee responses to service failure* factor includes critical cases of inappropriate reaction to occurred issue of service provider employees. Customers might switch services when:
   - they face reluctant response;
   - employees fail in managing the issue;
   - they face patently negative responses, blaming them back.

6) *Attraction by competitors* factor reflects cases when customers switch because they find more attractive option, regardless of satisfaction level previous service. Customers might switch services when:
   - they find more personable offering;
   - they find more reliable offering;
   - they find option with higher quality.

7) *Ethical problems* factor includes cases which seem immoral, illegal, unsafe, etc. for customer. Customers might switch services when:
   - they reveal dishonesty in service providers activities;
   - they face overly aggressive selling behavior from employees;
   - they receive unsafe or unhealthy offerings.

8) Last category is involuntary switching and seldom-mentioned incidents. It includes cases which are basically out of control of either the customer or the service company. Such switch might be a cause when:
   - the customer had moved;

- the service provider had moved;
- insurance or other third-party payer had changed alliances.

Additionally, this category serves for responses mentioned one-two times. According to the study, failed service encounters, responses to failed service and pricing are top reasons why customers tend to switch between services.

Another study done by Lee and Murphy (2005) states the other set of switching determinants in case of cellular network service. However, the results might be relevant to the wider set of services.

The top reason from the study results is *price.* Price fluctuations might cause the loyalty-switching transition. Authors suppose that such effect arises especially with regard to commoditized products and services.

Service quality is top2 switching determinant. Thus, perceived decline in services quality level might also cause the loyalty-switching transition. Customers tend to consider good service quality as unconditional event. Thereby, they always expect good service and do not tolerate poor one. Also, the researchers divide quality into two parts: technical and functional. The first group means technical execution of declared service characteristics, while the second one means entire interaction with the provided service. Unsatisfying technical quality is likely to be a reason for switching than unsatisfying functional quality.

The third ranked reason is loyalty programs. Attractive loyalty program of the competitive service provider might be a reason to switch current provider.

Next comes behavioral factors. By them, the authors mean such behaviors as variety seeking or impulse buying. This factor is extremely irritating for managers as effort, which they put for customer retention maximization, might be helpless due to behavioral factor.

Top5 factor is brand trust. This factor is particularly important in case of service consumption as customers have no chance to evaluate the offering prior to paying for it (Liljander and Strandvik,1995). The exception here is giving customer a trial version. However, in case of services it is not always possible. The authors of the research suppose that low rank of the factor in their study is commoditized observed service.

The last factor is reference group influence. This factor reflects social influence from relatives, friends or mates. Often, this factor plays more significant role than in observed study (Bearden and Etzel, 1982). The researches use the same explanation of such phenomenon – cellular service is perceived as commodity from the side of consumers. (Lee and Murphy, 2005)

Bruhn and Georgi (2006) suggest reasons for service switching behavior classification in a different dimension. They divide these reasons into 3 groups:

1) Customer-related switching reasons are those reasons which concern customer characteristics as age, sex, lifestyle, preferences, etc. They have more or less direct connection with the service provider and are directly connected to customers' needs.

2) Provider-related switching reasons are those reasons which concern perceived service quality and customer satisfaction. In order to manage customer retention executives have to deal with this category of reasons.

3) Competition-related switching reasons are those reasons which concern actions from current service provider competitors. This action might include marketing efforts affecting customer's decision to use specific company as a provider or new offering which is treated by consumer as more favorable one.

Thus, we should state that current study is focused on competition-related and customer-related switching factors. In other words we are interested in those reasons which attract consumer to try a new service, not those which repulse customer from service in use. To this group of factors we could refer costs, which we already outlined, loyalty programs, and reference group influence. We are not going to focus on brand factor as the purpose of the study is to examine switching from digital to non-digital service regardless brand names of its providers.

As we see, switching behavior is studied in the context of either non-digital services or digital ones (Keaveney and Parthasarathy, 2001). The latter studies specifically focuses on consumers' characteristics which differentiate 'switchers' from 'continuers'. The fact of switching is stated in the case when online service consumer just stops using it. For instance, one has e-mail box of the online service provider, is subscribed to their newsletters, he also check the on their web portal. Suddenly, this person cease to use any service from that provider. In observed study, such case is interpreted as service switch. However, it is not obvious whether this lost client actually changes the provider or stops use any online services to satisfy specific needs.

Consequently, it is possible to conclude that the consumer switch from non-digital to digital service is limited and could be treated as research gap which is going to be approached with the current study.

The current study is an attempt to partly explain consumer decision to switch from non-digital to digital (online, electronic, mobile) service which satisfy common needs. In order to prepare such research, we have to get familiarized with the concept of online/digital/electronic/mobile service.

**1.5 Digitalization of products and services: shift to e-commerce**

By digital or online product and services we understand the products and services being sold by using digital technologies, e.g. via Internet.

Online product and services sales can affect both demand and supply – market fundamentals. As for the demand side, it precludes potential customers from inspecting goods before the purchase. Moreover, online sellers tend to be newly formed firms and may have less reputation or brand capital to signal or bond quality. These factors may create information asymmetries between sellers and buyers that are not present in services and products purchased offline. Also sales via Internet often involve a delay between purchase and consumption when a product should be physically delivered. However, in the same time e-commerce technologies reduce consumer search costs; make the search easier compare to different producers' products and prices (Lieber and Syverson, 2011).

As for the supply side, selling online enables new distribution technologies that lead to reducing supply chain costs, improving of service, or sometimes both. Both the new distribution technologies and the reduction in consumer search costs combine to change the geography of markets; geographical space may matter less online. Finally, combining further both sides of the market we might notice that online sales face different tax treatment comparing to the offline sales. We discuss each of these factors in this section further.

The information asymmetries appear in a more obvious way when purchasing online for a several reasons (Lieber and Syverson, 2011). The most obvious one is: consumer does not have the opportunity to physically examine the good at the point of buying. There potential lemons problem arise where unobservable varieties are selected into the online market. Another reason is that online retailing is relatively new; retailers have less brand capital than the established traditional retailers. Also another factor is that some consumers' concerns about the security of online transactions.

Due to information asymmetries can lead to market inefficiencies, both consumers and sellers (especially sellers of high quality goods) have incentives to structure transactions and form market institutions to alleviate lemons problems. Some examples of such efforts on the part of online sellers exist. Some firms such Zappos offer free shipping on purchases and returns, which moves closer to making purchases conditional upon inspection. Although, a delay between ordering and consumption inherent to online commerce still can create a wedge.

As an alternative approach a convey prior to purchase the information that would be gleaned by inspecting the product could be in place. Garicano and Kaplan (2001) examining used cars which were selling via online auction – Autodaq, and physical auctions. Researchers found little evidence of adverse selection or informational asymmetries. They referred this to actions that

Autodaq has taken so that to reduce information asymmetries. Besides offering extensive information on each car's condition and attributes, something that the tools of e-commerce could make easier, Autodaq brokers arrangements between potential buyers and third-party inspection services. As an example, Jin and Kato (2010) examine the market for the collections of baseball cards and showed how the use of third-party certification has alleviated information asymmetries. They find a big increase in use of professional grading services when eBay began being used by customers for buying and selling baseball cards. Another form of disclosure is described by Lewis (2009). Using data from eBay Motors, he discovers positive correlation between the number of pictures that the seller posts and the winning price of the auction. Although, he does not find evidence that information voluntarily disclosed by seller affects the probability that the auction listing results are in a sale.

Instead of telling consumers about the product itself, firms can try to establish a reputation for quality or some other brand capital. Smith and Brynjolfsson (2001) use data from online price comparison site to study an online book market. They found that brand has a significant effect on buyers demand. Consumers are ready to pay an extra $1.72 (the normal item price in the sample was about $50) to purchase from one of the big three book online retailers: Amazon, Borders, and Barnes & Noble. We have an evidence that the premium is due to perceived reliability of the quality of services in bundles, and particular shipping times. In online auction markets, rating systems allow even not big sellers to build reputations, although Hortaçsu and Bajari (2011) (conclude that the evidence about if the premium accrues to sellers with high ratings is ambiguous. Better metric of an effect of reputation in such markets comes from the field experiment provided by Resnick et al. There, an experienced eBay seller with a very good feedback rating sold matched lots of postcards. A randomized subset of the lots was sold by the experienced eBay seller, using its own identity. The other subset was sold by the same seller, but using a new eBay identity without any buyer feedback history. The lots sold using the experienced seller identity received winning bids that were approximately eight percent higher. More recently, Adams et al (2006) evaluate whether seller ratings affect how much buyers are willing to pay for Corvettes on eBay Motors. Most of the previous research had dealt with items of small value where the role of reputation might have a relatively modest influence. Collectable sports cars, however, are clearly high value items. In that market, Adams et al. find very little (even negative) effect of seller ratings.

In another recent paper, Cabral and Hortaçsu (2010) use a different approach and find an important role for eBay's seller reputation mechanism. They first run cross-sectional regressions of prices on seller ratings and obtain results similar to Resnick et al. Next, using a panel of sellers to examine reputation effects over time, they find that sellers' first negative feedback drops their

average sales growth rates from +5% to –8%. Further, subsequent negative feedback arrives more quickly, and the seller becomes more likely to exit as her rating falls.

Outside of online auction markets, Waldfogel and Chen (2013) look at the interaction of branding online and information about the company from a third party. They find that the rise of information intermediaries such as BizRate leads to lower market shares for major branded online sellers like Amazon. Thus other sources of online information may be a useful substitute for branding in some markets.

While a lot of digital media that is purchased online can be used almost immediately after purchase online purchases of physical goods typically involve delivery lags that can range from hours to days and occasionally longer. Furthermore, these delayed-consumption items are the kind of product most likely to be available in both online and brick-and-mortar stores, so the role of this lag can be particularly salient when considering the interaction between online and offline market channels.

The traditional view of a delay between choice and consumption is as a waiting cost. This may be modeled as a simple discounted future utility flow or as a discrete cost. In either case, this reduces the expected utility from purchasing the good's online version. However, more behavioral explanations hold out the possibility that, for some goods at least, the delay actually confers benefits to the buyer in the form of anticipation of a pleasant consumption experience. This holds out the possibility that the impact of delay on the relative advantage of online channels is ambiguous. Though one might think that if delay confers a consistent advantage, offline sellers should offer their consumers the option to delay consumption after purchase rather easily. This, to say the least, is rarely seen in practice.

It is generally accepted that search costs online are lower than in offline markets. The rise of consumer information sites, from price aggregation and comparison sites to product review and discussion forums, has led to large decreases in consumers' costs of gathering information. This has important implications for market outcomes like prices, market shares, and profitability.

Online search is not fully free; several papers have estimated positive but not high costs. Bajari and Hortaçsu (2011), for example, find the implied price of entering an eBay auction to be $3.20. Brynjolfsson et al(2010) write that the maximum cost for viewing additional pages of search results on a books shopbot is $6.45. Hong and Shum (2013) in their turn estimate the median consumer search cost for textbooks as the less than $3.00. Nevertheless these costs are less for most of the consumers than the value of the time it would take them to travel to the offline seller.

Online sales affect how goods get from producers to customers. In some industries, the internet was the reason of disintermediation, a diminishment or sometimes the entire removal of links of the supply chain. Thus, between 1997 and 2007, the number of travel agencies offices fell

by about half, from 29,500 to 15,700. This was accompanied by a large increase in consumers' propensity to directly make travel arrangements – and buy airline tickets in particular – using online selling sites.

E-commerce technologies have also brought changes in a way sellers worked out the orders. Firms can easily assess the state of demand for their products and turn this information into orders sent to manufacturers and wholesalers. This has reduced the need for inventory holding.

An example of how increased speed of communication along the supply chain affects distribution costs is a practice referred to as "drop-shipping." In drop-shipping, retailers transfer orders to wholesalers who then ship directly to the consumer, bypassing the need for a retailer to physically handle the goods. This reduces distribution costs. Online-only retailers in particular can have a minimal physical footprint when using drop-shipping; they only need a virtual storefront to inform customers and take orders (Lieber and Syverson, 2011).

The main effects of opening a concurrent online sales channel in an industry may have implications for firms' competitive strategies. These strategy choices may interact with the equilibrium changes.

A major factor that influences company's' joint strategies on offline and online markets is the degree of connectedness between offline and online markets for the same product. This connectedness might be multidimensional. It can include a demand side: how good customers view the two channels as substitutes. It can include the supply side: if online and offline distribution technologies are complementary.

**The research findings** of Michael Fitzgerald et al stated that according to 78% of respondents, achieving digital transformation will become critical to their organizations within the next two years. However, 63% said the pace of technology change in their organization is too slow. The most frequently cited obstacle to digital transformation was "lack of urgency." Only 38% of respondents said that digital transformation was a permanent fixture on their CEO's agenda. Where CEOs have shared their vision for digital transformation, 93% of employees feel that it is the right thing for the organization. But, a mere 36% of CEOs have shared such a vision (Fitzgerald et al, 2013).

**FIGURE 7**

# CULTURE CLASH

Entrenched attitudes of fear and ignorance beat down digital transformation within many corporate cultures.

Competing priorities – "we don't have time for this right now"
53%

Lack of familiarity with digital – "we don't know how to do that"
52%

Resistance to new approaches – "this is the way we've always done it"
40%

Digital Transformation threatens current power structures – "I will lose influence in my organization"
23%

Internal politics – "it doesn't have the right political support"
21%

Risk aversion – "it's not worth the risk"
18%

*What are the most significant cultural barriers to Digital Transformation in your organization? Select up to 3.*

Percentages refer to respondents who clicked this option versus total number of respondents who answered this question.

Figure 4 – Attitude towards digital transformation (Fitzgerald et al, 2013).

One company that has succeeded is Starbucks. In 2009, after dismal performance cut the company's stock price in half, Starbucks looked to digital to help re-engage with customers. It created a vice president of digital ventures, hiring Adam Brotman to fill the post. His first move was to offer free Wi-Fi in Starbucks stores, along with a digital landing page with a variety of digital media choices, including free content from publications like *The Economist*. It sounds simple, but as Brotman says, "we were not just doing something smart around Wi-Fi, but we were doing something innovative around how we were connecting with customers." Brotman is now chief digital officer at Starbucks, where he and Curt Garner, Starbucks' chief information officer, have formed a close working relationship, restructuring their teams so that they collaborate from the very start of projects. Last year, they cut 10 seconds from every card or mobile phone transaction, reducing time-in-line by 900,000 hours. Starbucks is adding mobile payment processing to its stores, and is processing 3 million mobile payments per week. Soon, customers will order directly from their mobile phones. Using social media, mobile and other technologies to change customer relationships, operations and the business model has helped Starbucks re-engage with customers and boosted overall performance. Its stock price has also bounced back up from roughly $8 in 2009 to nearly $73 in July 2013 (Fitzgerald et al, 2013).

At Intel, there is no lack of a sense of urgency; the company knows mobile technology is upending its market. The company has failed multiple times to become an important provider of mobile processors, including turning down the opportunity to provide chips for the original iPhone. Intel's culture has long been built around maintaining market dominance through intense internal competition, said Kim Stevenson, its chief information officer. Now, Intel believes it needs a more collaborative culture to help it gain an edge in mobile processors. To start this cultural change, Intel's top 25 executives gathered for a strategy discussion led by Stevenson and the head of human resources. First, the group had to agree on the overall vision, the need for cultural change in order for Intel to compete effectively in the emerging mobile market. Then it had to create ways to bring people together. That would mean breaking down barriers to communication that existed in the company's culture of rivalry. Among steps Intel took to improve communications were adding 220 video conferencing rooms, electronic white boarding, and adding search functions to its SharePoint implementation. All company employees are now on an internal social network. Intel has also set up teams based on accounts, not internal departments. Intel is taking small, concrete steps towards changing its culture, rather than massive, risky leaps. The small-step strategy is one many companies could adopt when trying to transform. As one survey respondent said, "The kind of transformation being adopted does not give much leeway for failure and the cost to the organization's reputation and brand is great. A thoughtful and piloted approach needs to be adopted." Small steps do not mean companies lack urgency. According to Stevenson, "We had the top 25 executives in the company buy in to the strategy. You have to admit that your competitive culture needs to change to be successful in the future, and we want to change before it's evident on the outside that we need to change, right? And I think that's a really key premise." (Fitzgerald et al, 2013).

Another important factor in creating an innovative way to communicate with customers is mobile application channel. It allows to interact with company's services or even consume them and pay for them via mobile applications.

IBM IBV C-suite study stated mobile banking is considered as one of the most popular services used via mobile application. Also, statistics on Techcrunch (2014) shows that among bank account holders in US, almost 50% will use mobile applications by 2017.

The set of activities executed via mobile banking application has been increasing since first mobile banking applications have arisen. In the beginning of mobile banking apps evolution bank clients used them for the purposes of checking their bank account statement and transaction history. Contemporary mobile banking applications allow to perform much broader set of actions

including cross-banking money transactions, payments for various services, deposits making, loans requests, etc (Lardinois, 2012).

Obviously, bank account statement is the number which each bank client want to absolutely control. In this case, the mobile application is the instrument giving the opportunity to increase control over the service – saving client's money. Prior to mobile banking applications, the way how client could check his account statement or transaction history was very complex and time consuming, confirms McKinsey (2014). While mobile banking was evolving, other more advanced banking services were successfully adopted in mobile applications, allowing users to operate with well-known services in more convenient way. Additional control provided by mobile app could be related to other services operating through mobile application channel. This idea is reasonable because the app is capable to deliver more detailed information in a given time frame than phone call or in-person meeting.

Another good example of popular digitalized service is taxi ordering. The main player on this market is American company – Uber. Uber operates the Uber mobile app which allows consumers with smartphones to request a ride which is then routed to Uber driver who is signed in Uber platform. In many countries there are local companies which replicates Uber business model, Russia is not an exception in this case. According to the RBC (2016) estimations such companies occupied more than 50% of taxi market in Moscow. Today, taxi aggregator service companies continue to expand in Russian regions. However, the market share will hardly reach the level of Moscow market share as the number of smartphones users in regions is significantly lower than in other Russian regions.

Uber top management, Travis Kalanick and Ryan Graves, shared their ideas with CNBC (2016) and RBC (2016) about the idea that reliability and high frequency of use are key success determinants of service they provide. This statement could be potentially transferred to many other services provided via mobile application. Firstly, reliability of applications was doubtful when the speed of mobile internet was limited by 2G networks. Also, smartphones performance has increased significantly since couple of years ago. These factors create an opportunity to develop reliable service based on mobile app. Still, it is crucial to utilize these factors in right way in order to develop demanding mobile application. Secondly, frequency of use determinant seems to be relevant to other possible services because the mobility is the essence of smartphone, which means that offering services via this channel, constant availability of one has to be considered or even treated as an advantage.

### 1.3 Acceptance behavior models

Since 1960s substantial research has been done aiming to finding the determinants of the technology acceptance among users. Today, numerous theories and models are developed to explain IT adoption process.

The evolution of these theories is connected with the development of information technologies and market trends. Early theories considered mainly technical features as the main factors of the technology adoption, while the later theories included also the network-related determinants such as social influence (Venkatesh, 2006). As there is the large number of theories and models of technology adoption in the research literature, the focus in the current study will be made on the most influential ones. The most influential theories and models based on the citation analysis and qualitative content analysis (Korpelainen, 2011) are going to be reviewed.

Theory of Reasoned Action (TRA).

Theory of reasoned action (figure 5) is a widely studied model. Its development belongs to social psychology field. While developing the model Ajzen and Fishbein (1976) was aiming to distinguish the concepts of attitudes, beliefs, intensions and behaviors (Al-Gahtani and King, 1999). The theory of reasoned actions was introduced in 1967 and till present time has been improved and reshaped by many researchers (Talukder, 2014). The main assumption, which underlies TRA, is that human beings are rational as a rule and they can make systematic use of information available to them (Ajzen and Fishbein, 1976). The name of the theory is justified with the idea that in general people tend to be aware of reasons of their actions and think of them before decide to act or not to act in certain way. The ultimate goal of the theory is to interpret and predict an individual's behavior (Ajzen and Fishbein, 1978).

Theory of reasoned action implies that there are two factors determining individual's behavioral intension to perform the behavior, which in its turn, determines the actual person's behavioral act:

- an individual's attitude towards particular behavior
- subjective norms concerning behavior to perform

The first determinant basically reflects individual's judgement whether specific behavior is positive or negative. While the second determinant reflects the perceived social pressure strength arising in the case of behavior performing. These two factors are thought to form behavioral intension which eventually leads to the behavior performing.
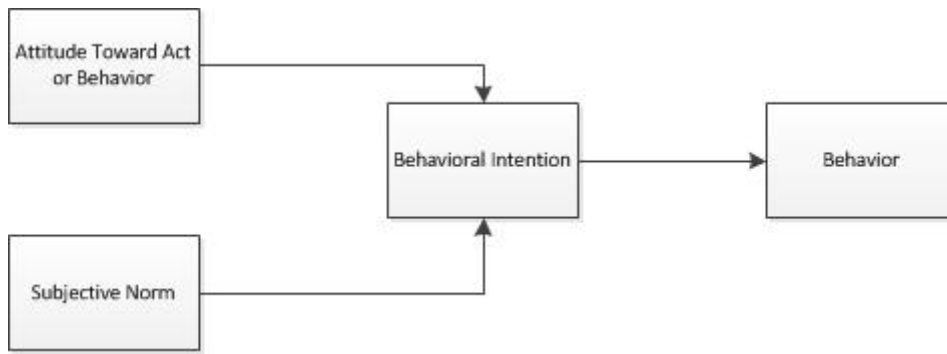
Figure 5 - Theoretical model of Reasoned Action (Fishbein and Fishbein, 1976)

As it was stated previously, during developing stage of the model the researchers were aimed to create general behavioral model lacking any kind of context. Hereafter, TRA was used as a basis for development other models connected with acceptance behavior regarding information technology.

Technology Acceptance Model (TAM)

As an adaptation of theory of reasoned action, Davis et al (1989) introduced the theory of acceptance model, which happened in 1986. As distinct from TRA, the new model was aimed to consider both internal and external factors influencing the behavior. Moreover, this model narrowed behavior in general to the specific information technology acceptance.
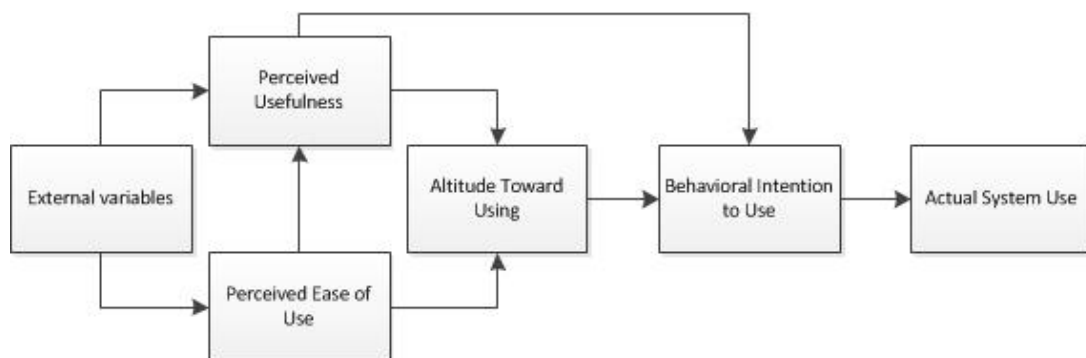


Figure 6 - The technology acceptance model (Davis,1989)

The TAM (figure 6) is designed to describe and explain acceptance of technology in organizational context (Carlsson et al, 2006). According to the theory, the usage of technology is affected by perceived *ease of use* and *perceived usefulness* of the technology. *Perceived ease of use* was defined by Fred Davis as "the degree to which a person believes that using a particular system would enhance his or her job performance". By *perceived usefulness* Davis means "the degree to which a person believes that using a particular system would enhance his or her job performance". Both these factors determine the *attitude toward using* the technology. The behavioral intention to use the system is the function of perceived usefulness and attitude (positive or negative) towards using the system. Behavioral intention, in its turn, influences the actual system use (Davis, 1989).

Since it was developed, the theory has been expanded twice. The second version was introduced in 2000 by Venkatesh and Davis. In that version one of two main factors was updated. From that point of time perceived usefulness was determined by 5 factors which are:

- *Subjective norm* - the degree to which an individual perceives that most people who are important to him think he should or should not use the system
- *Image* - the degree to which an individual perceives that use of an innovation will enhance his or her status in his or her social
- system
- Job relevance - The degree to which an individual believes that the target system is applicable to his or her job
- Output quality - The degree to which an individual believes that the system performs his or her job tasks well
- Result demonstrability - The degree to which an individual believes that the results of using a system are tangible, observable, and communicable

Also, 2 moderators of subjective norm were added:

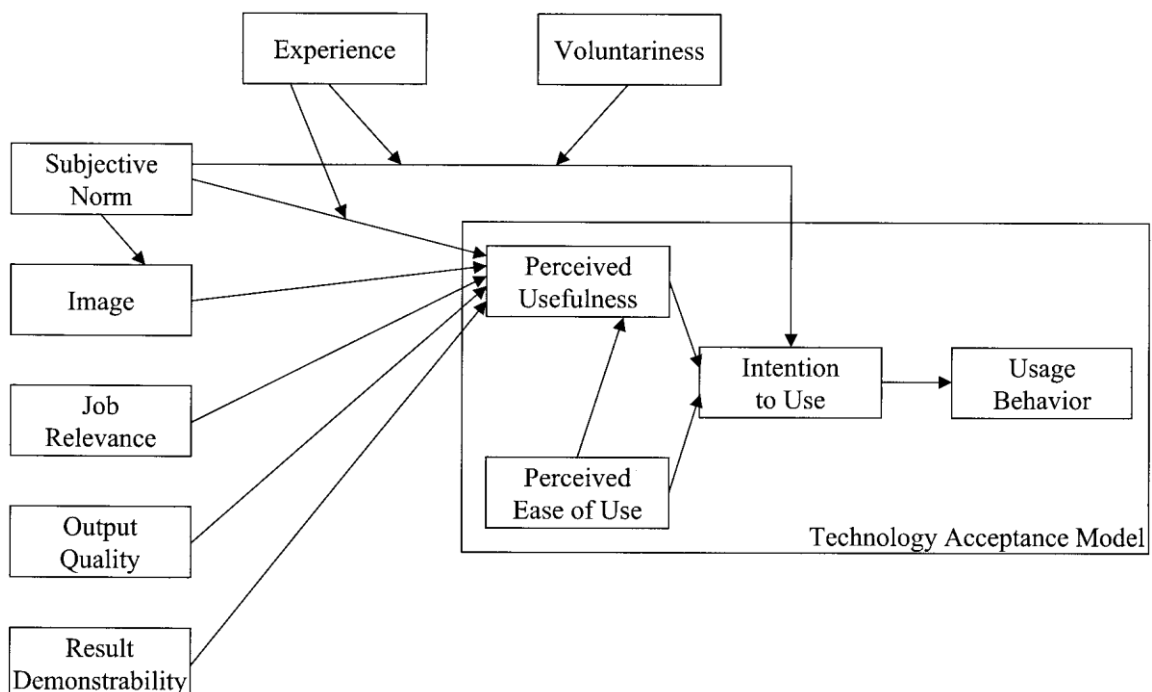- Experience
- Voluntariness



Figure 7 -- Proposed TAM2—Extension of the Technology Acceptance Model
(Venkatesh and Davis, 2000)

The second extension (figure 7) of the technology acceptance model was introduced in 2008 by Venkatesh and Bala. The main improvement was incorporation anchors and adjustment determinants of perceived ease of use into the model. Those determinants are:

- *Computer Self-Efficacy* - The degree to which an individual believes that he or she has the ability to perform a specific task/job using the computer
- *Perception of External Control* - The degree to which an individual believes that organizational and technical resources exist to support the use of the system
- *Computer Anxiety* - The degree of "an individual's apprehension, or even fear, when she/he is faced with the possibility of using computers
- *Computer Playfulness* - The degree of cognitive spontaneity in microcomputer interactions
- *Perceived Enjoyment* - The extent to which "the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use"
- *Objective Usability* - A "comparison of systems based on the actual level (rather than perceptions) of effort required to completing specific tasks"
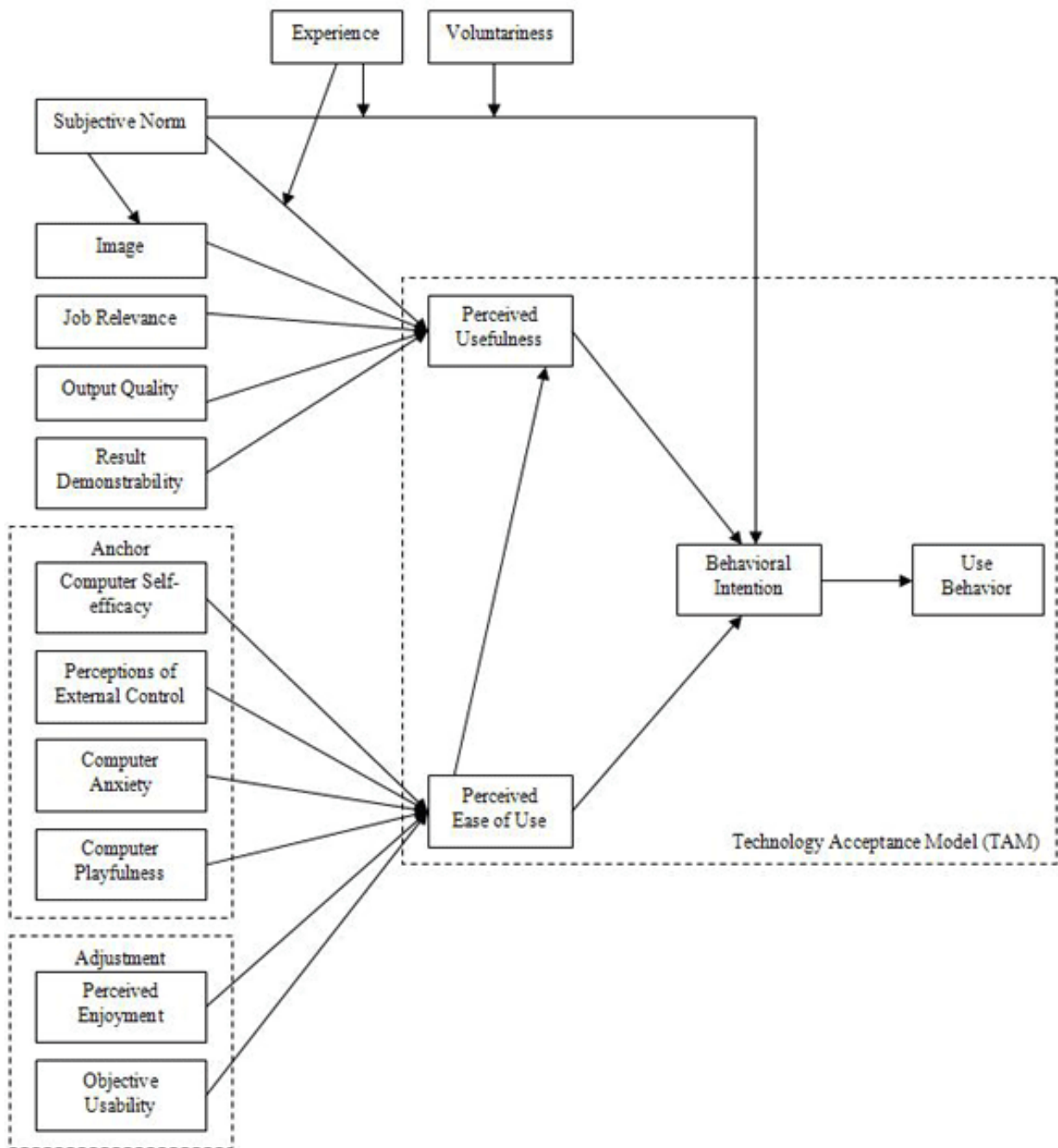
Figure 8 -- Proposed TAM3—Extension of the Technology Acceptance Model
(Venkatesh and Bala, 2008)

Diffusion Theory

The Diffusion Theory was developed in 1962 by Everett Rogers to give explanations on how new ideas and innovations spread in the society, define the role that the networks play in the diffusion process and analyze the behaviors of different segments of users. Rogers (1962) argues that diffusion is the process by which an innovation is communicated, the characteristics of the innovations, the structure of the decision process that leads to either adoption or rejection of innovations.

Figure 9 – The theoretical model of diffusion of innovations (Rogers, 1962)

The most important finding of the theory is that all innovations must have specific set of qualities to become successful in the community. Evaluation of these qualities might contribute to the innovation fast adoption. According to the theory (1962), there are five main qualities of innovations that define the rate of their adoption and as a result their success in the social group.

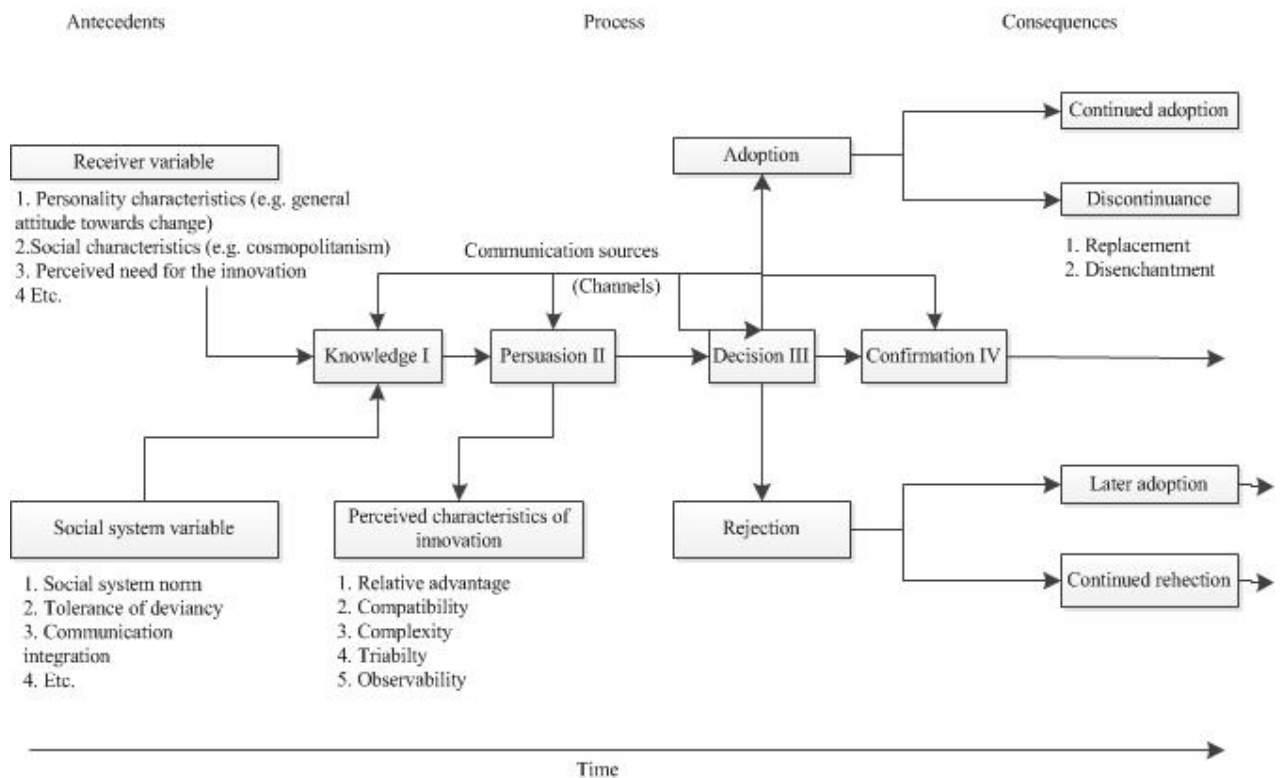1) Relative advantage represents "the degree to which an innovation is perceived as better that the idea it supersedes" and measured in social and economic gains, the convenience, the user's satisfaction level. In the essence of the factor there is an argument that the greater the relative advantage of the innovation is, the more likely users will adopt it without any complications.

2) Compatibility defined as "the degree to which an innovation is perceived as being consistent with the exiting values, past experiences and needs of potential adopters". The innovation is less likely being adopted, if it does not fit the social norms that exist in the community.

3) Complexity is the perceived ease of use of the innovation. The innovation will be adopted quickly in the community if it is simple for the user's perception and if it does not require additional skills to be operated.

4) Trialabilty represents "the degree to which an innovation might be experimented with on a limited basis". The innovation that tried by the adopter is less likely to spread since the adopter will associate more risks with its future use.

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5) Observability represents the extent to which the adopter is able to observe the results of the innovation adoption. The higher observability of the innovation adoption outcomes, the more certain the user is and the more intensive the discussion is in the community.

The model has several limitations, in particular, Wolfe (1994) criticized the model for the absence of the innovation characteristics changes which take place over time. Chatterjee (2012) concluded that the assumed linearity of the stages in the adoption process is another limitation of the diffusion of innovation model. The problem here is that there is a probability that adopters skip one or more steps of the innovation adoption process.

Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh together with other scholars (2003) developed The Unified Theory of Acceptance and Use of Technology (UTAUT) which was based on the analysis and empirical comparison of popular user acceptance models including the innovation diffusion theory (Rogers, 1962) Theory of Reasoned Actions (Ajzen, 1980), the social cognitive theory (Bandura, 1986, the Technology Acceptance Model (Davis, 1989), the theory of planned behavior (Ajzen, 1991), the motivational model (Davis, 1992), a model comprising the technology acceptance model and the theory of planned behavior (Taylor and Todd, 1995). This unified theory was proposed as the attempt to remove the difficulties many researchers face while choosing among various models or specific constructs across them for the research (Venkatesh et al, 2003).
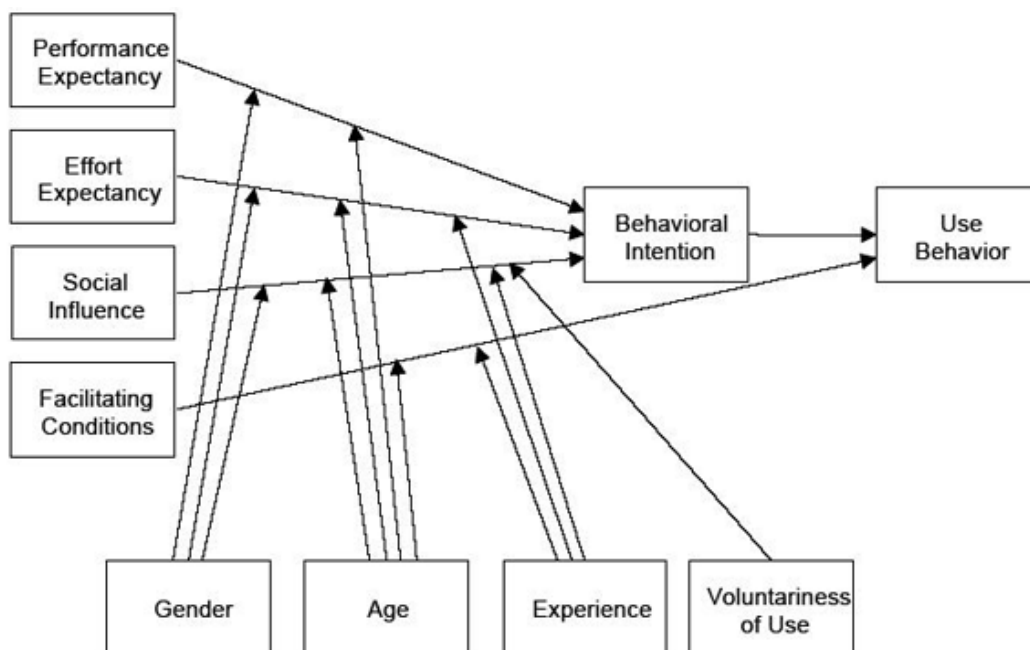


Figure 9 – The Unified Theory of Acceptance and Use of Technology (Venkatesh et al 2003)

Venkatesh et al (2003) included two groups of constructs in his model – direct and indirect determinants of the user acceptance behavior (Figure X). The constructs that reflect the direct influence on the user behavior include performance expectancy, effort expectancy, social influence and facilitating conditions. Indirect determinants are attitude toward using technology, self-efficacy and anxiety are considered to be indirect determinants. Also, the specific role in the model is designated to key moderators as gender, age, experience and voluntariness of use.

The UTAUT model was applied and proved quite successful in various studies (Eckhardt et al, 2009; Maldonado et al, 2010; Curtis et al, 2010) related to the technology acceptance theory.

All described models have their own context which makes incorporated factor relevant in every single case. Current study is aiming to derive mobile application usage for service consumption determination factors. Thus, several most relevant factors are going to be taken from the models and adapted to the context of our research in the manner of many similar studies (Moghavvemi, 2014; Cimperman et al, 2016; Qi Ma et al, 2015). These factors are effort expectancy, performance expectancy, social influence, anxiety, facilitating conditions, trialability, perceived enjoyment, attitude toward using. Context specific factors which were derived from the analysis of previous chapters include service delivery control, regularity of service use, reliability, financial costs decrease, nonfinancial costs decrease.

# 2 RESEARCH METHODOLOGY

In this chapter the methodological framework of the study is going to be described and explained. It includes research approach, data collection and data analysis.

## 2.1 Research Approach

Prior to conducting the research, the main thing which has to be done is identification of clear research problem.

The literature review has shown that services tend to continue its development in online. According to Criteo (2015), during last several years the number of financial transactions made via smartphones in Russia has significantly risen. This statistics means that the turnover from smartphone money transactions has increased accordingly. McKinsey (2015) stated that generally the number of offline services which somehow transform in order to serve clients online increases from year to year. It is reasonable to assume that the audience of service users through smartphones includes those consumers who switched from offline service analogs and those who previously did not use any service analog, in other words, latent demand. Since this market situation is rather new, the research of this problem is limited. However, large number of studies have already explored technology adoption in different contexts. Switching behavior has been also examined, within online service usage, for instance (Keaveney, 2001). Hence, in this case we could adapt and partly use models and frameworks of applicable studies with similar goals but different contexts. Thus, the main research problem of this study is to identify factors that have the strongest influence on consumer behavior in the context of service usage after its digitalization.

It is crucial to formulate research questions in order to set the research design that represents the framework for data collection and analysis accordingly and guides the entire execution of research methods (Bryman and Bell, 2003).

Based on the research problem, the main research questions being formulated are the following:

- RQ1 – What factors determine consumers' decision to switch to digitalized service?
- RQ2 – What factors determine the usage frequency change of a service after its digitalization?

Depending on the type of required data for answering research questions, the specific approach of a research conduction has to be chosen. Scientific research implies three main approaches in order to get reliable results of a study. They are quantitative, qualitative and mixed method that incorporates both qualitative and quantitative methods (Williams, 2007). For the purpose of this study quantitative research was chosen.

Quantitative research represents the collection and analysis of data that can be quantified and subjected to statistical treatment (Creswell, 2003). Quantitative method helps to establish and verify the mathematical relationship between different variables. In some cases it is also possible to generalize obtained results to the larger population (Leedy and Ormrod, 2014). Specifically, the causal comparative research was utilized, since it allows verifying the nature of independent variables influence to the dependent variables. Such approach was chosen in order to find the factors that determine consumers' decision to switch from offline services to digitalized ones.

Another research type classification is described by (Babbie, 2007). He derives three types of research:

- *Exploratory research* – is research usually conducted to cover problem which is not clearly defined. It uses to gather preliminary information, when researchers do not have enough verified information to make conceptual distinctions or posit an explanatory relationship (Shields, 2013);
- *Descriptive research* – is research conducted to describe characteristics of studied phenomenon or population. While examining these characteristics, it does not explain the existence of them (Shields, 2013);
- *Explanatory or causal research* – is research which investigates cause-and-effect relationship and test hypotheses about it. Within this research type two methods are outlines: experimentation and statistical research (Lynch, 2013).

The topic of this study is not well covered. Switching behavior from offline service to its digitized mobile form is nor well studied so far, thus there is little theory available to guide the development of hypotheses. Moreover, recognized models are going to be adapted in order to find relations between studied variables. In other words, this study is aimed to develop better understanding of the observed phenomenon. Thus, this research falls into the explanatory research category (Hair et al, 2011)

The next crucial stage of scientific research is to detail research design. According to Selltiz et al (1959), research design implies "the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure". Thereby, specific aspects of the research design as sample choice, data collection and variables formulation are going to be described further.

## 2.2 Theoretical model

Based on theoretical literature review we formed the set of constructs, which are basically factors, represents in figure 10.
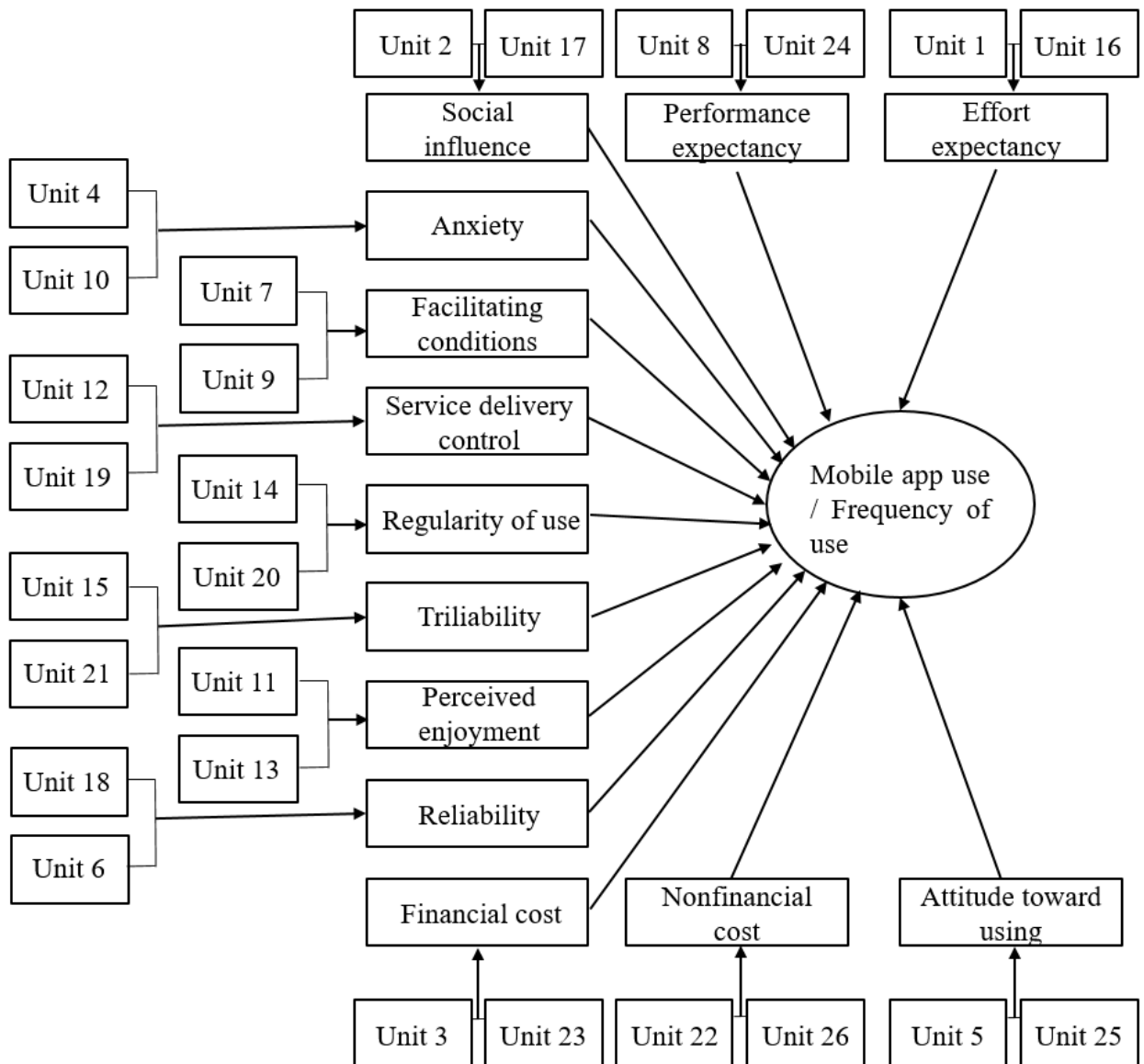


Figure 10 – The theoretical model of the study

These constructs could be divided into two groups. The first group contains constructs that could affect individual's decision whether to use an abstract technology or not. They are taken from Unified Theory of Acceptance and Use of Technology (Venkatesh et al, 2003), Technology acceptance model 3 (Venkatesh and Bala, 2008) and Diffusion Theory (Rogers, 1962). The purpose of these models were technology acceptance measurement in the organizational context. Hence, the context of each construct has to be adapted to the mobile application use, despite the fact that the core of the constructs remains the same. Most constructs are borrowed from UTAUT model as its authors empirically justified outperformance relative to other models (Venkatesh et al, 2003).

The second group of constructs is designed specifically for the purpose of this study in a manner of many other researches using technology acceptance models as the foundation for their study (Arpaci, 2014, Moghavvemi, 2014; Cimperman et al, 2016) These constructs reflects the specific relevant peculiarities of service usage or mobile application usage which are inferred from literature review described in chapter 1. The constructs are represented in Table 1.

Table 1 – The constructs incorporated in the theoretical model

| Construct | Theory of technology adoption | Definition |
|---|---|---|
| Effort expectancy | Unified Theory of Acceptance and Use of Technology | The degree of ease associated with the use of a mobile application for service consumption |
| Performance expectancy | Unified Theory of Acceptance and Use of Technology | The degree to which an individual believes that using a mobile application for service consumption will help him or her to attain gains in job performance. |
| Social influence | Unified Theory of Acceptance and Use of Technology | The degree of the social pressure experienced by the adopter regarding mobile application usage for service consumption. |
| Anxiety | Technology acceptance model 3 | The degree of an individual's apprehension, or even fear, when she/he is faced with the possibility of using mobile application for service consumption. |
| Facilitating conditions | Unified Theory of Acceptance and Use of Technology | The degree to which an individual believes that he has an access to required resources to support the use of a mobile application for service consumption |
| Service delivery control | - | The degree to which a mobile application increase the level of user's service delivery process control |
| Regularity of service use | - | The degree to which a regular need of service is required for mobile application use for service consumption |
| Trialability | Diffusion of Innovation | The degree to which a mobile application for service consumption may be experimented with on a limited basis. |
| Perceived enjoyment | Technology acceptance model 3 | The extent to which the activity of using a mobile application for service consumption is perceived to be enjoyable in its own right, aside from any performance |

| | | consequences resulting from application use |
|---|---|---|
| Reliability | - | The degree to which a mobile application seems to be reliable instrument for service consumption |
| Financial costs decrease | - | The degree to which usage of a mobile application for service consumption decreases financial costs for a user |
| Nonfinancial costs decrease | - | The degree to which usage of a mobile application for service consumption decreases nonfinancial costs for a user |
| Attitude toward using | Technology acceptance model 3 | The degree to which usage of a mobile application for service consumption is assessed positively |

Corresponding assumption are being outlined:

- Effort expectancy has positive interconnection with mobile application usage for service consumption and change in usage frequency

- Performance expectancy has positive interconnection with mobile application usage for service consumption and change in usage frequency

- Social influence has positive interconnection with mobile application usage for service consumption and change in usage frequency

- Anxiety has positive interconnection with mobile application usage for service consumption and change in usage frequency

- Facilitating conditions has positive interconnection with mobile application usage for service consumption and change in usage frequency

- Service delivery control has positive interconnection with mobile application usage for service consumption and change in usage frequency

- Regularity of service use has positive interconnection with mobile application usage for service consumption and change in usage frequency

- Trialability has positive interconnection with mobile application usage for service consumption and change in usage frequency

- Perceived enjoyment has positive interconnection with mobile application usage for service consumption and change in usage frequency

- Reliability has positive interconnection with mobile application usage for service consumption and change in usage frequency

- Financial costs decrease has positive interconnection with mobile application usage for service consumption and change in usage frequency
- Nonfinancial costs decrease has positive interconnection with mobile application usage for service consumption and change in usage frequency
- Attitude toward using has positive interconnection with mobile application usage for service consumption and change in usage frequency

## 2.3 Sample strategy

Sample selection is generic step of the entire research. From the type of chosen sample depends the direction of possible analysis outcomes and overall results of the study. The concept of population is also important. It represents the group of individuals that possess required characteristics and information for the research. For consistent results of the study, the researchers has to consider in advance the availability accessibility of the population's information (Philips et al, 2013).

Information gathering from the entire population is always impossible, thus in qualitative research the sample or subset is taken in order to collect required information from individuals in it and make further conclusions about entire population. Due to the fact that the sample represents the population, the individuals within the selected subset have to have similar characteristics as individuals from entire population. Thus, the consistent patterns identified during data analysis can be attributed to the entire population (Philips et al, 2013).

The significance of choosing the right method of sampling for the study should not be underestimated. Wrong sampling method might result in the poor representativeness of the subset for the entire population (Carver, 2010).

During sampling we tried to avoid sampling errors which occurred when the parameters of the sample are different from the parameters of the population (Harry, 2010).Target sample of the research are Moscow and Saint Petersburg residents aged from 18 to 30. Such sample was chosen for several reasons. First, we study the switching behavior from offline services to the digital services, particularly those which are available via smartphone. Thus, the selected sample has to be composed of individuals who are able to perform such switch. Obviously, owning a smartphone, in this case, is prerequisite for the service switching.

According to GFK (2016) research 16-29 years old age group has the highest metrics in terms of mobile internet usage. In Russia 70% from this age group uses mobile internet, 40% of population aged from 30 to 54 uses mobile internet, and only 5% of population aged 55 and higher uses it. We assume that those who use mobile internet use mobile applications as well.

Yandex published (2015) another research which stated that Moscow and Saint Petersburg are among those regions in Russia which has highest penetration of mobile internet, 57% and 53% respectively. There are the other two regions which are among the leaders in terms of that metrics, however, the average price of owned smartphones in these regions is significantly lower than its price in Moscow and St. Petersburg. Consequently, we can assume that large number of mobile internet users in those regions most likely do not acquire services via them due to poor technical characteristics of gadgets. Moreover, in Russian regions the penetration of banking cards and other electronic payment services is much lower than in Moscow and St. Petersburg (GFK, 2015). Hence, this might be one of the reasons, why service providers are not willing to provide their e-services in such regions.

Therefore, the information was collected from the sample of the population which more likely has an access to digitalized form of tradition services as taxi ordering or banking. This population is individuals living in St. Petersburg and Moscow aged from 18 to 30. Thus, for the purpose of this study residents of St. Petersburg and Moscow cities aged from 18 to 30 represent the whole population.

Hence, stratified random sampling would be the best fit in order to meet the goals of the study. Stratified sampling is the method of sampling wherein the entire population is divided into non-overlapping subsets called strata and then the random sampling is applied within strata (Cochran, 1978, Särndal et al., 2003). The stratified sampling has to be applied in the case when representatives of all subsets must be presented in the sample for the study. In the case of the study the population is going to be divided into two subsets to respondents' gender. According to the information about gender distribution of Moscow and St. Petersburg within targeted age range, provided by Russian Federal State Statistics Service (2014), it was decided to include equal number of male and female respondents. However, in the case of limited resources it is hard to conduct required procedures to select random sampling. Thus, convenience sampling has been done. Convenience sampling involves the sample being taken from the part of population which is easy to approach (Boxill et al, 1997). However, randomization of the sample gained was applied in order to increase the validity of data. Hence, the set of respondents from each of gender group was picked randomly in such a way that the final sample contained 270 respondents, 135 male and 135 female responses.

### 2.4 Data collection methods and procedures

Self-administered questionnaires were chosen as the instrument for data collection because this instrument provides the researcher with the possibility to collect the huge amount of data at the low cost of data collection, simplicity of administration, relatively high level of responses quality and during the short period time of data collecting (Schmee and Oppenlander, 2010).

Survey is one of the most popular methods of data collection to verify individuals' attitudes and explain their behavior (Fink, 2003).

The questionnaire was prepared in both the electronic and paper-based forms. The responses of paper-based questionnaire were collected in crowded places in the streets of St. Petersburg and Moscow. Each respondent was asked how old he is, in the case of target age group match the questionnaire was given to the respondent.

The Google Forms service was used in order to make the survey available for online audience. Social network website vk.com was used is order to distribute the questionnaire. Such approach was selected due to several reasons:

- According to GFK 97% of Russian population aged 16-30 (target population) are using internet which approves electronic form usage in the study.
- The portion of internet users located in St. Petersburg and Moscow within 18-30 age which uses vk.com is close to 80%, according to Brand Analytics (2015).
- Google Forms usage ensures avoiding missing data problem described by Goldstein et al (2007), so that each respondents cannot finish the survey until he answers each question in the survey.
- The last reason of the chosen approach is the low time cost of the data collection due to the fact that the survey distribution does not require personal involvement.

The time frame in which questionnaire responses were collected lasted 14 days, from 26th of April till 9th of May. Overall, more than 120 paper-based questionnaires and 310 online questionnaires were collected.

The introduction is considered to have a great influence on the response rate, so the most important information about the study has to be clearly described in the introduction (Bauman, 2000). Moreover, the respondents were informed that the data obtained via the questionnaire is confidential and is going to be used only for the purpose of the study.

Comprehensibility of questions and information retrieval are the main components of adequate service design (Tourangeau and Rassinski, 1988). This means that proper vocabulary has to be used for question formation in order to maximize clarity of the questions. Questions were tried to be formulated in the simplest way avoiding difficult and technical terms where it is possible. Each type of question was followed with appropriate instruction. Finally, questions were designed in the common format in order to minimize the cognitive effort (Graf, 2002).

The designed survey consists of 3 blocks of questions. First block contains two types of questions. First is about the fact of mobile banking and taxi ordering via mobile application usage. This type of questions has 'yes' and 'no' response options. The second type of questions concerns

service usage frequency in case of mobile application usage versus service usage frequency before start of mobile application usage. Respondents evaluated the service usage frequency subjectively using the Likert scale from 1 to 7 where 1 is 'very rarely' and 7 is 'very often'.

The second and the main block of questions contains 26 questions representing 13 constructs to be evaluated. Those constructs are: effort expectancy, performance expectancy, social influence, anxiety, facilitating conditions, service delivery control, attitude towards mobile services usage, regularity of service use, trialability, perceived enjoyment, reliability, financial costs decrease and nonfinancial costs decrease.

It was offered to the respondents to answer to each questions assessing mentioned constructs using 7 points Likert scale. All questions were formulated in the form of statement. Answering the question from this block respondents measured their level of agreement where 1 is strongly disagree and 7 is strongly agree.

The last block of questions contains questions about demographic data of respondents including the gender, age, city of residence.

The survey was conducted considering main possible errors which could be occurred during data collection stage. Usually, four main types of possible errors in data collection with the help of surveys are outlined: sampling error, coverage error, nonresponse error and measurement error (Dillman et al, 2009).

Sampling error was avoided as relevant proportions within the subset reflect entire population characteristics. Adequate conditions were organized in order to eliminate coverage error. One of the useful actions was utilization both paper-based and online versions of questionnaire. The non-response error was managed as first, online forms which restricted inappropriate survey filling were used, second, in case of paper-based survey distribution personal contact with each of respondent helped control correctness of survey filling. Only the measurement error could be occurred as in case of online survey, as there was no chance to explain the question, if it is required for a specific respondent. Thus, some questions formulation or measurement scale might be misinterpreted.

## 2.5 Data processing and Analysis

Due to the fact that information was collected by the means of survey and thus has a quantitative nature, statistical analysis has to be run in order to gain insights from the data and explain possible relationships (Hays, 1973).

As the aim of the study is to find factors affecting consumer behavior, the regression analysis could be the instrument to find the relationship between factors and consumer behavior criteria. Regression analysis is used to verify which among the independent variables are interrelated with the dependent variables (Gordon, 2015).

As it was already stated, exploratory research is conducted. Thus, no preliminary hypotheses about possible interrelation were developed.

In our case, the dependent variable represents the fact of digitalized service usage via mobile application in terms of taxi ordering and banking services. Consequently, based on responses, users might be categorized into 4 groups:

- People who use none of these two services
- People who use only mobile banking
- People who use only taxi service via mobile app
- People who use both services

From the theoretical point of view it does matter whether each respondent use specifically mobile banking or taxi ordering via app. Hence, it is reasonable to combine second and third categories into common one – people who use only one of two services. Thereby, 3 categories are formed in ordinal manner. They might be interpreted as follows:

- people who tend to ignore mobile applications as the instrument of traditional service usage;
- people who tend to consider mobile application as the instrument of traditional services usage;
- people who tend to prefer mobile application as the instrument of traditional services usage;

When the purpose of the analysis is to verify how well dependent variable representing ordinal outcomes, can be predicted by the responses to other questions, which might be quantitative, ordinal logistic regression could be applied (McCullagh and Agresti, 1985). Thus, ordinal logistic regression analysis was conducted in IBM SPSS Statistics tool.

Before running a regression, first, it is required to find Cronbach's alpha for the sets of units forming each construct/factor. This check allows to verify validity of the questionnaire testing reliability of designed scale. (Kaplan and Saccuzzo, 2012). Second, presence of collinearity between constructs has to be tested. This step has special importance when a large number of explanatory variable are included in a model (Hill and Adkins, 2001).

If there is no collinearity found between independent variables, then regression analysis can be run with entire set of 13 variables described above.

In order to find what factors determine the usage frequency of the service before and after switching to digitalized version the same approach was used. One important difference is that it was decided to run separate regression analyses for each service as way of using them differs significantly. Thus, samples for each regression compose of individuals who are actually users of the digitalized version of each service.

# 3  FACTORS OF SERVICE USAGE AFTER ITS DIGITALIZATION

In this chapter empirical results derived from regression analysis will be discussed. The entire process of data analysis is going to be described. Factors which determine mobile apps usage and change in its usage frequency are going to be defined.

## 3.1 Descriptive analysis of digitalized services users

The final sample contains 270 respondents from St. Petersburg and Moscow cities aged from 18 to 30. The gender distribution simulates the objective distribution of males and females in the targeted population.

All the following analysis basically was conducted in IBM SPSS Statistics tool with little use of Microsoft Excel program for sampling formation.

First, it is good intension to describe data in the context of the stratification pattern. For this study the gender distribution within the sample is important, thus gender stratification was conducted. Table 2 represents the number and proportion of service consumption via mobile application usage responses with the respect to respondent's gender. Where '0' usage level means person consumes neither of services via mobile app, '1' usage level means person consumes at least one of two services via mobile app and '2' usage level means person consumes both services via mobile app.

Table 2 – Usage level variable Crosstabulation

**Usage level * 2. Пол Crosstabulation**

|  |  |  | 2. Пол Gender | | Total |
|---|---|---|---|---|---|
|  |  |  | Ж F | M M | |
| Usage level | 0 | Count | 40 | 31 | 71 |
|  |  | % within 2. Пол | 29,6% | 23,0% | 26,3% |
|  | 1 | Count | 53 | 42 | 95 |
|  |  | % within 2. Пол | 39,3% | 31,1% | 35,2% |
|  | 2 | Count | 42 | 62 | 104 |
|  |  | % within 2. Пол | 31,1% | 45,9% | 38,5% |
| Total |  | Count | 135 | 135 | 270 |
|  |  | % within 2. Пол | 100,0% | 100,0% | 100,0% |

It can be inferred from the table 2, that overall proportion of males consumes at least one service is large than related female proportion. More significant difference is observed in the case of both services consumption via mobile apps. Hereby, the number of males in this group consists 62% from entire male respondents, while related female number is only 42%. This kind of distribution was expected as males are tend to adopt technologies at higher extent than females.

Additionally, this table shows the distribution of usage level outcome responses which close to the entire population characteristics and also is a good fit for further statistical analysis conduction as each of outcome category is represented in a decent number of responses.

## 3.2 Determinants of digitalized service usage

According to our research design, the first step is scale validation using Cronbach's alpha for each set of units. Table 3 represents values for each construct.

Table 3 – Reliability statistics

| Name of construct | Cronbach's alpha | Number of items |
|---|---|---|
| Effort expectancy | ,724 | 2 |
| Performance expectancy | ,811 | 2 |
| Social influence | ,774 | 2 |
| Anxiety | ,684 | 2 |
| Facilitating conditions | ,832 | 2 |
| Service delivery control | ,787 | 2 |
| Regularity of use | ,722 | 2 |
| Trialability | ,804 | 2 |
| Perceived enjoyment | ,757 | 2 |
| Reliability | ,782 | 2 |
| Financial costs | ,794 | 2 |
| Nonfinancial costs | ,637 | 2 |
| Attitude toward using | ,782 | 2 |

The next step is multicollinearity check. As we stated previously, this is required procedure for the models with big number of covariates. Table 3 represents collinearity statistics for one of independent variables.

Table 3 – Collinearity statistics

| | Collinearity Statistics | |
|---|---|---|
| Model | Tolerance | VIF |
| 1 Perform | ,349 | 2,869 |
| Social | ,465 | 2,151 |
| Risks | ,610 | 1,640 |
| Control | ,474 | 2,108 |
| Regular | ,738 | 1,355 |
| Trial | ,714 | 1,401 |
| Reliable | ,388 | 2,577 |
| Fincost | ,527 | 1,899 |
| Othercost | ,365 | 2,742 |
| Attitude | ,338 | 2,959 |
| Enjoy | ,365 | 2,739 |

a. Dependent Variable: Effort

All VIF values are lower than 3 which means no correlation between Effort variable and other variables. All combinations of the multicollinearity analysis was run. The great majority of VIF values was lower than 3.

The next step of analysis is checking whether the assumption of proportional odds is met or not. For this purpose it is needed to stress attention on the test of parallel lines which is presented in the figure X.

Table 4 – Test of Parallel lines

**Test of Parallel Lines[a]**

| Model | -2 Log Likelihood | Chi-Square | df | Sig. |
|---|---|---|---|---|
| Null Hypothesis | 506,710 | | | |
| General | 490,935 | 15,774 | 13 | ,262 |

The null hypothesis states that the location parameters (slope coefficients) are the same across response categories.

a. Link function: Logit.

If the assumption of proportional odds is met than the difference in fit between assessed odds models can be interpreted as not statistically significant. In this case $p$-value is going to be less than .05. As we can see the $p$-value for our model is greater than .05. Consequently, due to the positive outcomes of multicollinearity check and full likelihood test the ordinal logistic regression could be applied to analyze the collected data.

Next, ordinal logistic regression was conducted with 'Usagelevel (VARD)' as dependent variable and 13 following dependent variables: effort (VAR1), perform (VAR2), social (VAR3),

risks (VAR4), facility (VAR5), control (VAR6), regular (VAR7), trial (VAR8), enjoy (VAR9), reliable (VAR10), fincost (VAR11), othercost (VAR12).

After running the regression the following table represented in figure 11 came out.

**Warnings**

There are 538 (66,7%) cells (i.e., dependent variable levels by combinations of predictor variable values) with zero frequencies.

Figure 11 – Missing values combination warning

This means 538 different possible combinations of explanatory variables are not presented in the data, which could be the negative sign. In order to verify whether this issue is significant for quality of the model, overall goodness-of-fit tests should be conducted. First table represented in figure X below, contains Pearson and Deviance tests which measure how poorly the model fits the data. Consequently, we want this test not to have statistically significant results.

Table 5 – Goodness-of-Fit

|          | Chi-Square | df  | Sig. |
|----------|-----------|-----|------|
| Pearson  | 506,907   | 523 | ,685 |
| Deviance | 506,710   | 523 | ,687 |

Link function: Logit.

In our case both Pearson and Deviance tests have results (.685 and .687 respectively) far from statistical significance level.

The next model fitting information is shown in tables 5 and 6. However, according to Laerd expertise (2016), those measures represent the portion of variance explained not well, in any case, the values in these table goes along with the majority of similar studies.

Table 6 – Pseudo R-Square

| Cox and Snell | ,256 |
|---------------|------|
| Nagelkerke    | ,289 |
| McFadden      | ,136 |

Link function: Logit.

The likelihood ratio test is the best tool to verify the ordinal logistic model fitting characteristics. Its results presented in the table 7.

Table 7 – Likelihood ratio test

| Model | -2 Log Likelihood | Chi-Square | df | Sig. |
|---|---|---|---|---|
| Intercept Only | 586,577 | | | |
| Final | 506,710 | 79,868 | 13 | ,000 |

Link function: Logit.

According to the results, it might be concluded that the final model statistically significantly predicted the dependent variable over and above the intercept-only model, Chi-Square equals to 79,868, p < .05.

As the overall model is statistically significant, it is possible to form logistic regression equations using values from the table 8.

Table 8 – Parameter estimates

| Parameter | | B | Std. Error | 95% Wald Confidence Interval | | Hypothesis Test | | | Exp(B) | 95% Wald Confidence Interval for Exp(B) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Lower | Upper | Wald Chi-Square | df | Sig. | | Lower | Upper |
| Threshold | [Usagelevel=0] | 2,383 | ,8159 | ,784 | 3,982 | 8,529 | 1 | ,003 | 10,837 | 2,190 | 53,633 |
| | [Usagelevel=1] | 4,284 | ,8489 | 2,620 | 5,948 | 25,468 | 1 | ,000 | 72,541 | 13,740 | 382,987 |
| Effort | | ,168 | ,1645 | -,154 | ,491 | 1,047 | 1 | ,306 | 1,183 | ,857 | 1,634 |
| Perform | | ,034 | ,1343 | -,229 | ,297 | ,065 | 1 | ,799 | 1,035 | ,795 | 1,346 |
| Social | | -,100 | ,1435 | -,381 | ,181 | ,485 | 1 | ,486 | ,905 | ,683 | 1,199 |
| Risks | | -,087 | ,0914 | -,266 | ,092 | ,910 | 1 | ,340 | ,917 | ,766 | 1,096 |
| Facilit | | ,212 | ,1061 | ,004 | ,420 | 3,992 | 1 | ,046 | 1,236 | 1,004 | 1,522 |
| Control | | ,319 | ,1310 | ,062 | ,576 | 5,923 | 1 | ,015 | 1,376 | 1,064 | 1,778 |
| Regular | | -,204 | ,1120 | -,424 | ,015 | 3,319 | 1 | ,069 | ,815 | ,655 | 1,016 |
| Trial | | -,158 | ,1124 | -,379 | ,062 | 1,984 | 1 | ,159 | ,854 | ,685 | 1,064 |
| Enjoy | | ,493 | ,1383 | ,222 | ,764 | 12,685 | 1 | ,000 | 1,637 | 1,248 | 2,146 |
| Reliable | | ,099 | ,1330 | -,162 | ,359 | ,551 | 1 | ,458 | 1,104 | ,850 | 1,432 |
| Fincost | | ,208 | ,1315 | -,050 | ,466 | 2,498 | 1 | ,114 | 1,231 | ,951 | 1,593 |
| Othercost | | -,051 | ,1465 | -,338 | ,236 | ,120 | 1 | ,729 | ,950 | ,713 | 1,267 |
| Attitude | | -,225 | ,1599 | -,539 | ,088 | 1,986 | 1 | ,159 | ,798 | ,584 | 1,092 |
| (Scale) | | 1 [a] | | | | | | | | | |

Dependent Variable: Usage level
Model: (Threshold), Effort, Perform, Social, Risks, Facilit, Control, Regular, Trial, Enjoy, Reliable, Fincost, Othercost, Attitude
a. Fixed at the displayed value.

The first cumulative logit equation is the following:

$$Ln(Usagelevel)=2,383-(0,168*Effort+0,034*Perform-0,1*Social-$$
$$0,087*Risks+0,212*Facilit+0,319*Control-0,204*Regular-$$
$$0,158*Trial+0,493*Enjoy+0,099*Reliable+0,208*Fincost-0,051*Othercost-0,225*Attitude)$$

Another logistic regression equation for this dataset is

$$Ln(Usagelevel)=4,284-(0,168*Effort+0,034*Perform-0,1*Social-$$
$$0,087*Risks+0,212*Facilit+0,319*Control-0,204*Regular-$$
$$0,158*Trial+0,493*Enjoy+0,099*Reliable+0,208*Fincost-0,051*Othercost-0,225*Attitude)$$

Due to proportional odds assumption, the slope coefficients are the same, only the value of thresholds differs.

According to overall results it might be reported that a cumulative odds ordinal logistic regression with proportional odds was conducted in order to determine the the effect of 13 variables which are: effort expectancy (Var 1), performance expectancy (Var 2), social influence (Var 3), anxiety (Var 4), facilitating conditions (Var 5), service delivery control (Var 6), regularity of service use (Var 7), trialability (Var 8), perceived enjoyment (Var 9), reliability (Var 10), fnancial costs decrease (Var 11), nonfinancial costs decrease (Var 12), attitude toward usage (Var 13), on the dependent variable – the extent to which each person tends to consume services via mobile applications. The final model statistically significantly predicted the dependent variable over and above the intercept-only model.

It might be concluded that 3 explanatory variables have statistically significant effect on the dependent variable. These are VAR 5 - the degree to which an individual believes that he has an access to required resources to support the use of a mobile application for service consumption, VAR 6 - the degree to which an individual believes that a mobile application increase the level of user's service delivery process control and VAR 9 - the degree to which an individual believes that using a mobile application for service consumption is enjoyable, aside from any performance consequences resulting from application use.

## 3.3    Determinants of digitalized service usage frequency change

The next step is factors determination influencing the frequency of service consumption after the start using mobile application. Actually, the following analysis is an attempt to find answer on Research Question 2.

As it was described in methodology chapter, the sample for second regression constitutes taxi ordering service via mobile application users only. First, in order to decide about the coding pattern for usage frequency dependent variable, we have to analyze frequency of each value of

that metrics in the data we have. For this purpose we ran frequency of relative responses analysis. The results are represented in table 13.

Table 9 – Descriptive statistics of difference in usage frequency (taxi services users)

|  |  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | -3 | 4 | 2,5 | 2,5 | 2,5 |
|  | -2 | 7 | 4,5 | 4,5 | 7,0 |
|  | -1 | 6 | 3,8 | 3,8 | 10,8 |
|  | 0 | 26 | 16,6 | 16,6 | 27,4 |
|  | 1 | 16 | 10,2 | 10,2 | 37,6 |
|  | 2 | 27 | 17,2 | 17,2 | 54,8 |
|  | 3 | 31 | 19,7 | 19,7 | 74,5 |
|  | 4 | 17 | 10,8 | 10,8 | 85,4 |
|  | 5 | 8 | 5,1 | 5,1 | 90,4 |
|  | 6 | 15 | 9,6 | 9,6 | 100,0 |
|  | Total | 157 | 100,0 | 100,0 |  |

It was decided to ignore responses which indicate negative difference for two reasons: first, the nature of such consumer behavior is not considered while design this research, thus it might be related to negative experience with mobile application or even to misinterpretation of questions; second, the number of this type of responses is quite low. Hence, values from 0 to 6 were combined into 4 categories: the first category has 0 value and constitutes responses only with value 0, the second category has value 1 and combines responses with values 1 and 2, the third category has value 2 and combines responses with values 3 and 4 and the fourth category has value 3 and combines responses with values 5 and 6.

It is not required to test variable for multicollinearity, as in this case the same variables are used in order to predict the new dependent variable.

First what we receive after regression conduction is warning (represented in figure 12) about the portion of unavailable values combination in the data set.

**Warnings**

There are 420 (75,0%) cells (i.e., dependent variable levels by combinations of predictor variable values) with zero frequencies.

Figure 12 – Missing values combination warning (1)

Thus, the model fitting check has to be done. As we already stated, the way to verify the model is to use Model Fitting Information, represented in table 10.

Table 10 – Likelihood ratio test

**Model Fitting Information**

| Model | -2 Log Likelihood | Chi-Square | df | Sig. |
|---|---|---|---|---|
| Intercept Only | 374,908 | | | |
| Final | 339,287 | 35,620 | 13 | ,001 |

Link function: Logit.

According to the results, it might be concluded that the final model statistically significantly predicted the dependent variable over and above the intercept-only model, Chi-Square equals to 36,620, $p < .05$.

As the overall model is statistically significant, it is possible to form logistic regression equations using values from the table 11.

Table 11 – Parameter estimates (1)

**Parameter Estimates**

| Parameter | | B | Std. Error | 95% Wald Confidence Interval | | Hypothesis Test | | | Exp(B) | 95% Wald Confidence Interval for Exp(B) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Lower | Upper | Wald Chi-Square | df | Sig. | | Lower | Upper |
| Threshold | [Зависимая=1] | 2,434 | 1,2935 | -,101 | 4,969 | 3,541 | 1 | ,060 | 11,406 | ,904 | 143,936 |
| | [Зависимая=2] | 4,120 | 1,3224 | 1,528 | 6,712 | 9,705 | 1 | ,002 | 61,538 | 4,608 | 821,860 |
| | [Зависимая=3] | 6,084 | 1,3731 | 3,393 | 8,775 | 19,632 | 1 | ,000 | 438,755 | 29,747 | 6471,533 |
| Effort | | ,316 | ,1695 | -,016 | ,648 | 3,475 | 1 | ,062 | 1,372 | ,984 | 1,912 |
| Perform | | -,265 | ,1766 | -,611 | ,081 | 2,247 | 1 | ,134 | ,767 | ,543 | 1,085 |
| Social | | ,333 | ,1927 | -,045 | ,711 | 2,987 | 1 | ,084 | 1,395 | ,956 | 2,036 |
| Risks | | ,092 | ,1215 | -,146 | ,330 | ,576 | 1 | ,448 | 1,097 | ,864 | 1,391 |
| Facilit | | ,153 | ,1876 | -,215 | ,520 | ,661 | 1 | ,416 | 1,165 | ,806 | 1,683 |
| Control | | ,509 | ,1921 | ,132 | ,885 | 7,010 | 1 | ,008 | 1,663 | 1,141 | 2,424 |
| Regular | | ,269 | ,1599 | -,044 | ,583 | 2,836 | 1 | ,092 | 1,309 | ,957 | 1,791 |
| Trial | | -,336 | ,1510 | -,632 | -,040 | 4,937 | 1 | ,026 | ,715 | ,532 | ,961 |
| Enjoy | | ,021 | ,1799 | -,332 | ,373 | ,013 | 1 | ,908 | 1,021 | ,718 | 1,453 |
| Reliable | | -,054 | ,1874 | -,421 | ,314 | ,082 | 1 | ,775 | ,948 | ,656 | 1,369 |
| Fincost | | ,286 | ,2160 | -,137 | ,709 | 1,753 | 1 | ,186 | 1,331 | ,872 | 2,033 |
| Othercost | | ,080 | ,2133 | -,338 | ,498 | ,141 | 1 | ,707 | 1,083 | ,713 | 1,646 |
| Attitude | | -,620 | ,2295 | -1,070 | -,170 | 7,305 | 1 | ,007 | ,538 | ,343 | ,843 |
| (Scale) | | 1ª | | | | | | | | | |

Dependent Variable: Зависимая
Model: (Threshold), Effort, Perform, Social, Risks, Facilit, Control, Regular, Trial, Enjoy, Reliable, Fincost, Othercost, Attitude
a. Fixed at the displayed value.

As dependent variable has 4 levels, 3 different logistic regression equations could be derived. They are:

ln(Usagefrequency)=2,434-(0,316*Effort-0,265*Perform+0,333*Social+0,092*Risks+0,153*Facilit+0,509*Control+0,269*Regular-0,336*Trial+0,021*Enjoy-0,054*Reliable+0,286*Fincost-0,080*Othercost-0,620*Attitude);

ln(Usagefrequency)=4,120-(0,316*Effort-0,265*Perform+0,333*Social+0,092*Risks+0,153*Facilit+0,509*Control+0,269*Regular-0,336*Trial+0,021*Enjoy-0,054*Reliable+0,286*Fincost-0,080*Othercost-0,620*Attitude);

ln(Usagefrequency)=6,084-(0,316*Effort-0,265*Perform+0,333*Social+0,092*Risks+0,153*Facilit+0,509*Control+0,269*Regular-0,336*Trial+0,021*Enjoy-0,054*Reliable+0,286*Fincost-0,080*Othercost-0,620*Attitude);

The final model statistically significantly predicted the dependent variable over and above the intercept-only model.

Thus, it might be concluded that 3 explanatory variables have statistically significant effect on the dependent variable. These are VAR 6 - the degree to which an individual believes that a mobile application increase the level of user's service delivery process control, VAR 8 - the degree to which an individual believes that a mobile application for service consumption may be experimented with on a limited basis and VAR 13 - the degree to which usage of a mobile application for service consumption is assessed positively.

The next conducted analysis which is same as previous one but using those respondents, who consume banking services via mobile application. Again, in order to decide about the coding pattern for the new service usage frequency dependent variable, we have to analyze frequency of each value of that metrics in the data set. The results are represented in figure X.

Table 12 – Descriptive statistics of difference in usage frequency (mobile banking users services users)

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | -4 | 1 | ,6 | ,6 | ,6 |
| | -1 | 3 | 1,7 | 1,7 | 2,3 |
| | 0 | 88 | 50,6 | 50,6 | 52,9 |
| | 1 | 29 | 16,7 | 16,7 | 69,5 |
| | 2 | 31 | 17,8 | 17,8 | 87,4 |
| | 3 | 15 | 8,6 | 8,6 | 96,0 |
| | 4 | 5 | 2,9 | 2,9 | 98,9 |
| | 6 | 2 | 1,1 | 1,1 | 100,0 |
| | Total | 174 | 100,0 | 100,0 | |

The number of respondents who did not change the frequency of service consumption after start using mobile app represents 50% of entire set. Thus, in order to equalize the number of units in each category, it was decided to divide frequency into two categories as 1 – there is no change

in frequency, 2 – there is a change in frequency. Consequently, binomial logistic regression was conducted.

However, the model does not fit the data in data set which is implied in the following results in Table 13.

Table 13 – Omnibus Tests of Model Coefficients

|  |  | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 10,071 | 13 | ,688 |
|  | Block | 10,071 | 13 | ,688 |
|  | Model | 10,071 | 13 | ,688 |

For this type of logistic regression we can reference the "Model" row. P value is significantly greater than 0,05, thus the model is not statistically significant.

# 4  DISCUSSIONS AND CONCLUSIONS

This chapter is devoted to the main results and its interpretation synthesis. Theoretical contribution coming out from the quantitative analysis is explained in this chapter. Also, it is explained how company's management can use insights derived from the analysis. Finally, the limitations of the research and reasonable future directions of it are described in the last part of the chapter.

## 4.1 Analysis of theoretical base

The first part was devoted to the literature review which helped to identify research gap. The research switching behavior between online and offline services appeared to be limited. Also, the topic of the research was observed from the perspective of service, consumer behavior, switching behavior and digitalization concepts. This helped to determine relevant factors of mobile application usage for service consumption. Then, the overview of acknowledged technology adoption models was performed in order to select appropriate factors of technology adoption for the context of mobile applications. Finally, the specific model for current research was defined.

## 4.2 Explicit answers to research questions

Taking this research gaps into consideration the following research questions were being formulated:

- RQ1 – What factors determine consumers' decision to switch to digitalized service?
- RQ2 – What factors determine the usage frequency change of a service after its digitalization?

The ordinal logistic regression was applied in order to identify those constructs/factors which have the strongest influence on the consumers' decision to switch to digitalized service. The same type of analysis was used for identification of factors/constructs influencing the service use frequency. The constructs of the model were partly taken from Technology Acceptance Model 3 (Venkatesh and Bala, 2008), the Diffusion Theory (Rogers, 1962) and the Unified Theory of Acceptance and Use of Technology (Venkatesh et al 2003). These factors include effort expectancy, performance expectancy, social influence, anxiety, facilitating conditions, trialability, perceived enjoyment and attitude toward using. Also, according to literature review it was decided to add the following factors: service delivery control, regularity of service use, financial costs decrease, nonfinancial costs decrease and reliability.

Concerning Research Question 1, the statistical analysis has shown that 3 out of 13 constructs have statistically significant effect on dependent variable. Which means that facilitation conditions, service delivery control and perceived enjoyment affect consumer decision to switch

to digitalized service. Also, regularity of use and financial cost decrease factors have close to statistically significant effect on consumer decision to use digitalized service.

Concerning Research Question 2, the gathered data shows the increase of service frequency usage in the case of using digitalized version of the service. Due to high specificity of services used for analysis, it was decided to run separate regression for each service. In first case the frequency of taxi service usage was taken for the analysis. The statistical analysis has shown that 3 out of 13 constructs have statistically significant effect on dependent variable. These 3 constructs are service delivery control, trialability (negative relationship), attitude toward using. Another 3 constructs have close to statistically significant effect on usage frequency change. These are effort expectancy, social influence and regularity of service use. The model for usage frequency banking services turned out to be not statistically significant. It is assumed that such results are caused by the difficulty to measure frequency of using digital banking services by the respondents, because such actions as checking bank account statement and transaction history hardly perceived by customers as significant to mention uses of service.

## 4.3 Managerial implications

The empirical results can bring benefits to various companies' management. As we stated in the introduction, many companies are considering the opportunity to create their own mobile application for various purposes. One of the most popular is to provide or sell their services through this channel. Current study is providing the feasibility verification of the idea to try to digitalize services they provide into the form of mobile application.

In particular, company might conduct a survey among its customers in order to verify their attitude toward relevant factors of service usage. In order to understand whether a company might count on increase of their service usage frequency, another survey among the clients might be conducted on corresponding 3 significant factors.

Thus, a company's management might find out whether its customers have facilitation conditions to use a service mobile app for provided service consumption, whether they believe that they acquire additional control over the provided service in case of mobile app use, whether the company is capable to create pleasant user experience in developed mobile app. Although, the statistical results did not prove the significance of other factors, it might be worth for a company to stress attention on perceived regularity of services provided and possibility to decrease financial costs of the customers in case of service consumption via mobile app. The important note here is that approvable results of the factors measurement by a company do not imply that digitalization of their service is a good idea. However, in case when results of the factors measurement is not satisfying, it might be a signal for a company that the mobile app as a channel to provide services will not attract company's customers.

## 4.4 Limitations and future research

There are some limitations of the study to be taken into consideration. First, the age range of the survey participants has to be taken into account. Current research was focused on Moscow and St. Petersburg residence aged from 18 to 30. This was done for the purpose to reach those individuals who is owning a smartphone with the highest probability. Also, sample of surveyed individuals was not perfectly randomized, although the attempt to randomize the sample at some extent was made. Thus, the results of the study is hardly to be generalized to entire population of targeted group of people. Consequently, companies which are going to apply results of the study have to be aware of possible bias connected with difference between research sample and their customers.

The second limitation relates to the approach of finding factors influencing the change in usage frequency of the service. In current research design factors were assessed for each from two services separately. Thus, the results of the regression are significantly depended on service specifics.

Consequently, in order to gain more reliable results, first, future studies should use randomization for studied sample properly. Second, in order to provide generalized results of factors measurement in context of affecting service usage frequency, more services has to be taken for evaluating usage frequency pattern among them.

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## APPENDIX - Questionnaire units

Effort
Unit 1. I believe that it is convenient to use mobile app for service consumption.
Unit 16. I believe that mobile app use for service consumption is simple.

Perform
Unit 8. I believe that using mobile apps for service consumption frees additional time for other tasks execution.
Unit 24. I believe that mobile apps for service consumption gives an opportunity to be more efficient.

Social
Unit 2. My friends approve using mobile apps for service consumption
Unit 17. I believe that using mobile app for service consumption is a good sign about a person.

Risks (anxiety)
Unit 4. I believe that the risk of personal data loosing is insignificant using mobile app for service consumption.
Unit 10. I believe that the risk of payment data loosing is insignificant using mobile app for service consumption.

Facilit
Unit 7. I have required knowledge for using mobile apps for service consumption.
Unit 9. I have required resources for using mobile apps for service consumption.

Control
Unit 12. I believe that mobile app can give additional control over the consuming service.
Unit 19. I believe that mobile app could provide additional information to follow the process of service consumption.

Regular
Unit 14. I believe that the regularity of need could be a reason for using mobile app for service consumption.
Unit 20. I believe that mobile app for service consumption might be helpful in case of systematic purchase of a service.

Trial
Unit 15. I believe that mobile application for service consumption has to have trial version.
Unit 21. I believe that before the start of service consumption via mobile app, free service providing should be available.
Enjoy
Unit 11. I believe I would like using mobile app for service consumption.
Unit 13. I believe that using mobile app for service consumption is entertaining.

Reliable
Unit 6. I believe that mobile apps for service consumption operate faultless.
Unit 18. I would rely on mobile app to consume a service.

Fincost
Unit 3. I believe that service consumption via mobile app decrease user's financial costs.

Unit 23. I believe that in case of service consumption via mobile app the price of service usually decreases.

Othercost
Unit 22. I believe that using mobile app for service consumption user decrease his nonfinancial costs.
Unit 26. I believe that using mobile app for service consumption gives some nonfinancial benefits.

Attitude
Unit 5. I believe that mobile apps use for service consumption is advanced.
Unit 25. I believe that using mobile app for service consumption is a good idea.

Usage
Unit 27. Do you use mobile banking applications on Android, iOS, Windows Phone?
Unit 28. Do you use mobile application on Android, iOS, Windows Phone for taxi calling?

Frequency 1
Unit 27. How often did you use banking services prior to using mobile app for this purpose?
Unit 28. How often did you use banking services since using mobile app for this purpose?

Frequency 2
Unit 27. How often do you use taxi services prior to using mobile app for this purpose?
Unit 28. How often do you use taxi services since using mobile app for this purpose?