KAUNAS UNIVERSITY OF TECHNOLOGY

AIDA NAVIKAITĖ-VARANAVIČIENĖ

EVALUATION OF FACTORS INFLUENCING CUSTOMER BEHAVIOUR IN EHEALTH USE

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Scientific Supervisors:

2015 – 2019 Prof. habil. dr. Žaneta Simanavičienė, Kaunas University of Technology, Social Sciences, Economics, S 004).

2014 – 2015 Prof. dr. Valentinas Navickas, Kaunas University of Technology, Social Sciences, Economics, S 004).

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AIDA NAVIKAITĖ-VARANAVIČIENĖ

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2015 – 2019 Prof. habil. dr. Žaneta Simanavičienė, Kauno Technologijos Universitetas, Socialiniai mokslai, Ekonomika, S 004).

2014 – 2015 Prof. dr. Valentinas Navickas, Kauno Technologijos Universitetas, Socialiniai mokslai, Ekonomika, S 004).

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INTRODUCTION

Relevance of the study. Good health is a value per se, but it is important to note that it also fosters economic value. Looking from the individual perspective being in good health is beneficial for an individual solely. On the other hand, considering a broad perspective, when citizens are in good health they are socially and economically productive and retain their socio economic status. Regarding the report by MedTech Europe (2016): "…Europe cannot – from both an economic, social and equity point of view – afford not to have its citizens in good health"(p.3). Hence, good health should be considered as a major goal of a nation since this significant contribution relieves the young generation and the aging one from dealing with the financial and economic burdens of healthcare concluding in mitigated income and a loss of independence.

Taking into consideration the international level, the World Health Organizatiom, the European Union, and the United Nations foster high expectations of eHealth when it faces the major issues in global health care: curbing the costs of healthcare, ageing societies, consumerism, control and prevention of infectious diseases (Van Gemert-Pijnen Peters & Ossebaard, 2013). According to Ossebaard & Gemert-Pijnen (2016), eHealth fosters the opportunities for active patient participation such as self-management and self-care. Generally, eHealth unifies the public interests of healthcare quality, affordability and accessibility (Gaddi, Capello & Manca, 2014). For instance, Jung and Loria (2010), the Commission of the European Communities (2004), Ganesh (2004); González, Quesada, Urrutia & Gavidia (2006) also admit that eHealth is impactful on improving access to healthcare, supporting information exchange, mitigating costs, increasing revenue, and enhancing the quality of patient care.

The health sector is generally the biggest service of a nation with enormous financial injections and enhancing rapid pace (Hernandez, 2009). Moreover, social infrastructure, for instance, hospitals are important for promoting health and, of course, stimulate the welfare directly and indirectly (Snieska & Simkunaite, 2009). The digital revolution has impacted the society across all domains including healthcare. The advent of the information age, the adoption and use of a great variety of health information technology has become widespread in disease prevention, chronic disease management and health promotion (Kim & Park, 2012). Since the economic structure of developing countries majorly depends on the progress of technology, governments seek for innovative and dynamic approaches to go hand in hand with the hectic pace of technology (Damaskopoulos & Evgeniou, 2003). Moreover, the growing interest of end users' attitude to health information technology has elevated the significance of theories which forecast and clarify health information technology usage and adoption (Holden & Karsh, 2010).

In addition to this, Lemire, Pare, Sicotte & Harve (2008) highlight that there is a noticeable public engagement of the public in managing their own health, which has become a strategic issue in the field of health. Since many consider Internet as a source to increase personal participation in health promotion and disease prevention (Ybarra & Suman, 2006, Korp, 2006, Renahy & Chauvin, 2006) this trend inspires one to

strive for better perception of digitalization in healthcare. Digital health has been hailed for its ease of helping patients self-monitor, improve their understanding of diagnosis, inspire behaviour changes, permit dynamic interchanges of healthcare data among patients and healthcare institutions (Birnbaum, Lewis, Rosen, & Ranney, 2015). Of course, the level of eHealth is changing with technology innovation (Collins, Currie, Bakken, Vawdrey, and Stone, 2012) and it is expected to provoke a paradigm shift in the field of health care through the rapid information technology prevalence and pace (Kim & Park, 2012, Danaher & Lodbrok, 2019). Nevertheless, given the substantial practical relevance of eHealth, it seems paradoxical that academic publications on this topic had for some time been falling short of actual system implementations (Chiasson and Davidson, 2004). Therefore, this doctorial dissertation aims to close the academic gap through identifying the factors influencing customer behaviour in eHealth use.

Scientific problem and the extent of its investigation. Nowadays ubiquitous Internet access leads to a gradual transformation of conventional health care provision (Weaver et al., 2009). Society is more than ever before regarded to be and act more responsibly with their health and disease self-management (Fransen, Schaik, Twickler & Bot, 2011). People's interest in a technology-based intervention in their health was confirmed by research, which presents that 90% of patients are engaged in this improvement (Ranney et al., 2012). Moreover, digital health tools are determined as easily disseminated, low resource option to serve patients to take ownership of their health (Topol, 2015, Oldenburg, Chase, Christensen, & Tritle, 2013, Choo, Ranney, Aggarwal, & Boudreaux, 2012). Hence, people have a great variety of health information which is accessible via many different communication channels.

The term eHealth is relatively new (Rizo, Enkin & Jadad, 2005, Neter & Brainin, 2012) and originated in the year 2000, but has since become widely prevalent (Pagliari et al., 2005). Traditionally, eHealth is defined as the usage of information and communication technology (ICT) and mainly, the Internet, in order to improve health and healthcare. eHealth includes the interaction among these parts: healthcare professionals and patients, data transmission institution-to-institution. According to Mendoza, Okoko, Morgan, & Konopka (2013), the concept of eHealth consists of four main components, namely: mHealth, Health Information Systems, eLearning (distance learning), Telemedicine. Additionally, Suggs & Ratzan (2012) affirm that eHealth covers any transfer of treatment, services and health communication using digital technologies. But since the concept of eHealth is defined as multifaceted, and according to Karim and Söderholm (2009), illustrates a broad variation of potential conceptualizations, many scholars, such as Car, Tan, Huang, Sloot & Franklin, (2017), Munos et al., (2016), Jacobs, Lou, Ownby and Caballero (2016), Chauhan and Jaiswal (2017), Jimenez and Bregenzer (2018), Maunder, Walton, Williams, Ferguson and Beck (2018) have contributed with the research clarifying the term of eHealth and its implications.

Regarding the customer behaviour theories considering eHealth implementation the academic attention is appointed to three main theories: health belief, innovation diffusion and technology acceptance that were examined by Griffin, (2011), Scarinci, Bandura, Hidalgo & Cherrington, (2012), Dodel and Mesch, (2017), Zhang, Dalal and

Wang, (2013), Cao, Chen and Wang, (2014), Haghighi et al., (2017), Durodolu, (2016), Teo (2013), Chapman-Lambert, Azuero, Enah and McMillan, (2017), Jeong and Hamb, (2018).

Moreover, behavioural economics upholders are interested in health issues (Samson, 2018) and there is a plethora of evidence supporting the beneficial impact of eHealth (Norgaard et al., 2015, Gerber & Eiser, 2001, Oh, Zhou, Kreps & Kim, 2013, Wald, Dube & Anthony, 2007, Ross and Lin, 2003) but many provocations for future research, especially in identifying the factors influencing customer behaviour in eHealth use are required. Moreover, there is a large portion of academic literature which devotes the attention to research on eHealth carried out by: Lemire et al. (2008), Schweitzer and Synowiec (2012), Jacobs, Lou, Ownby and Caballero (2016), Ossebaard and Gebert-Pijnen (2016), Chauhan and Jaiswal (2017), Car, Tan, Huang, Sloot & Franklin (2017), Jimenez and Bregenzer (2018), Maunder, Walton, Williams, Ferguson and Beck (2018).

Notwithstanding the fact that eHealth services are a significant area of research, a better understanding of impacting factors could be helpful to qualitative and efficient future health initiatives. Moreover, many authors approve the idea that the industry of healthcare is commonly considered as having lagged behind other fields in the adoption and use of new information technologies (Chan, 2000, Hikmet and Chen, 2003, Linhoff, 2006, Duplaga and Leszczuk, 2006). Unfortunately, this field is underdeveloped in both ways – practice and theory (Brender, 2006, Hernandez, 2009, Banna, Hasan and Meloche, 2010), therefore, a deeper analysis and a uniform methodology are needed in order to improve the prevalence of eHealth use.

Scientific problem – what factors influence customer behaviour in eHealth use and how to evaluate the economic effects of using it.

Object – factors influencing customer behaviour in using eHealth.

The aim of the scientific research is to disclose the factors that have an impact on customer behaviour in eHealth use and propose a methodology for identifying and economically evaluating these factors as a step leading to influencing them.

The research aim is to be attained by reaching the following six-fold research objectives:

1. To disclose the peculiarities of eHealth concept and customer behaviour theories.
2. To single out the factors influencing customer behaviour in choosing eHealth use.
3. To propose a research model to examine the factors that have an impact on customer behaviour in choosing eHealth use.
4. To prepare a methodological framework which evaluates the factors that have an impact on customer behaviour in eHealth use from the economic point of view.
5. To conduct an empirical research and investigate the main factors affecting customer behaviour in choosing to use eHealth.
6. To discuss the empirical research results and propose practical adaptation.

Methods of research include:

1. A systematic and comparative analysis of the concept of eHealth, customer behaviour and factors influencing customer behaviour in eHealth.
2. Expert evaluation adapting the questionnaire with pairwise comparison values.
3. Public survey via collecting online responses indicating the level of importance perception of closed-ended questions which were rated on a 5-point Likert metric scale.
4. Analytic hierarchy process, logistic regression analysis, principal component analysis.
5. Empirical research results processed by IBM SPSS Statistics 25 and Microsoft Excel.

Scientific novelty of the research:

1. After a comprehensive academic literature investigation, it appears that factors influencing customer behaviour in eHealth use is highly unexplored. This study reveals and substantiates those structural constituents, which are structured into groups comprised of technological, organizational, security, health policy, economic, social, health belief, behaviour of technology use.
2. The dissertation provides a new structural framework incorporating and evaluating factor groups influencing customer behaviour in eHealth use from the economic point of view. This particular model expands the perception of eHealth and enriches the previously published academic methods.
3. The methodology applied for the model enables to evaluate the significant factors for customer behaviour in eHealth use from the economic point of view in future researches.
4. To the best knowledge of the author, it is one of the first attempts of such research. The proposed methodology is academically specific and unlike others, since the structural framework was verified through an analytic hierarchy process, logistic regression and principal component analysis integrating experts' and public survey.
5. The proposed methodology enables academic extrapolation through incorporating it into the factors influencing customer behaviour investigation in the particular eHealth tool investigation.
6. This study may contribute to future academic investigations which aim to examine the factors influencing customer behaviour in eHealth use and its implementation.
7. The conducted research has important economic implications of eHealth system development.

Structure of the dissertation. The research starts with the theoretical discussion of such concepts like eHealth, behaviour theories and the constructs which influence customer behaviour in eHealth use. The second section provides the methodology, the formulation of hypothesis and the structural model derived from the literature overview. The third section illustrates the employed statistical methods: logistic regression, principal component analysis, as well as the method of analytic

hierarchy process, and delivers the analysis of empirical research results. The final section presents the summarization and conclusions.

Limitations of the research.

1. One of the most challenging issues is choosing the factors. The offered model does not include all possible factors influencing customer behaviour in the use of eHealth. The selected ones stemmed from the theoretical investigation and were singled out regarding the author's subjective overview.
2. eHealth is a broad concept, hence, for future investigations it is recommended to narrow the research object according to a particular eHealth tool in order to obtain refined conclusions applicable exactly for that eHealth tool.
3. Both expert and public surveys were conducted in Lithuania, therefore, the empirical results can be applicable on the national level.
4. Public survey was carried out via collecting online responses and the anwer gathering method does not encompass those respondents who do not use internet.
5. Since the situation of eHealth implementation can change in the future, the factors affecting customer behaviour can also shift, therefore, the suggested model is recommended to be reviewed.

Scope of the thesis. The thesis consists of 136 pages, 39 tables, 16 figures, and 60 appendices. 397 references are applied in the study from Lithuanian and foreign resources.

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1. eHEALTH MODELS AND FACTORS INFLUENCING CUSTOMER BEHAVIOUR IN eHEALTH USE

The first section of the research study is devoted to disclosing the characteristics of the eHealth concept and customer behaviour theories: health belief, diffusion of innovation and technology acceptance. Additionally, the academic literature regarding factors influencing customer behaviour in eHealth use is investigated.

1.1. The concept of eHealth factors economic evaluation

The term eHealth is relatively new (Rizo, Enkin and Jadad, 2005, Neter and Brainin, 2012) since it originated in the year 2000, but it has since become widely prevalent (Pagliari et al., 2005). Traditionally, e-health is defined as the use of information and communication technology (ICT) and mainly, the Internet, in order to improve health and healthcare. Additionally, "eHealth is also combined with organisational change in healthcare systems and new skills, in order to improve health of citizens, efficiency and productivity in healthcare delivery, and the economic and social value of health" (European Commission, 2012, p.3). eHealth includes the interaction between healthcare professionals and patients as well as data transmission institution-to-institution. Eysenbach (2001) declares the concept of eHealth not from technological development side but as an evolving field at the intersection of such domains as business, public health and informatics, referring to the development of health services enhanced through the Internet or relative technologies. But the same author underscores the fact that eHealth is a dynamic concept. According to Mendoza, Okoko, Morgan, & Konopka (2013), the concept of eHealth consists of four main components: mHealth, Health Information Systems, eLearning (distance learning), and Telemedicine. Additionally, Suggs & Ratzan, (2012) affirm that eHealth: "Includes any transfer of health communication, services, surveillance or treatment through the use of digital means" (p.251). But the scarcity of eHealth definition is noted by Oh, Rizo, Enkin and Jadad, (2005), and Pagliari et al., (2005). Since the concept of eHealth is defined as multifaceted and, regarding Karim and Söderholm (2009), illustrates a broad variation of potential conceptualizations, Table 1 depicts the eHealth technologies and their application in health management.

In addition to distant information usage via communication technologies, Matusitz & Breen (2007) state that advanced information content firstly has to meet the needs among consumers and service providers. eHealth is characterised as a convenient way with easy access reaching a large target group and, more importantly, leading to positive health outcomes (Eland-de Kok, van Os-Medendorp, Vergouwe-Meijer & Bruijnzeel-Koomen, 2011). While eHealth interventions are stated as cure based on behaviour which is transformed via the Internet (Ritterband, Andersson, Christensen, Carlbring & Cuijpers, 2006).

Table 1. eHealth technologies and their application in health management

eHealth technology	What is it?	Application in health management
Web-based system	It is the system which consists of internet based websites in order to monitor and/or produce educational content regarding a health condition (Car, Tan, Huang, Sloot and Franklin, 2017).	Medication adherence observation, also education on chronic disease (Wiecha et al., 2015). It also may deliver the service of patients' communication with healthcare providers (Linn, Vervloet, Dijk, Smit & Weert, 2011).
Telehealth	Telehealth accounts for the delivery of healthcare services when care providers and patients are geographically separated. Information communication technologies are utilized for exchanging the diagnosis and treatment of diseases and injuries information, as well as research, assessment and for health professionals' constant education. It is especially beneficial for those who live in remote areas, aging populations and also vulnerable groups (WHO, 2011).	Online consultations, information exchange on chronic disease care and management of medicines (Verhoeven et al., 2007).
Wearable devices	Wearable devices are gadgets embedded with software, sensors, electronics that can be worn as accessories. The Internet of Things are also attributed to wearable devices, where a network of sensors can make data exchanges across platforms. These tools are advantageous for 24/7 monitoring and activity tracking.	Wireless technologies, fitness trackers, body sensor devices are beneficial for healthcare and life quality improvement (Fatema El-Amrawy, Pharm and Nounou, 2015). App-linked devices with installed sensors could be applicable for those who suffer from asthma attacks due to medicine management improvement (Munos et al., 2016). In addition to this, such biosensors like wearable patches, contact lenses are able to evaluate blood glucose and help to better manage insulin at the same time (Farandos, Yetisen, Monteiro, Lowe and Yun, 2015)
Mobile health apps	These are so-called software applications created for portable devices, for instance, tablet computers or smartphones in order to collect data, educate about disease and health, manage lifestyle, monitor illness.	It is useful for personalised reminders, for example, doctor's appointment, medicine refill. Moreover, it is convenient to incorporate into medicine taking as a part of managing chronic disease. Mobile health apps can serve as a support to monitor disease (Turner et al., 2013)
Short messaging service (SMS)	Text messaging is a useful tool for exchanging short extent information via phone or web. It is a cheap method to promote, remind and inform patients regarding their healthcare. It can also facilitate communication between healthcare providers and patients (WHO, 2011).	Studies have shown the augmentation of medication adherence incorporating SMS in healthcare. (Dayer, Heldenbrand, Anderson, Gubbins and Martin, 2013).

Table 1 (continued)

Electronic health records (EHRs)	Electronic health records which contain patients' medical information, treatment, laboratory results,and medications are provided instantly and securely to authorised users. Traditionally, it is implemented under the responsibility of a national health organization. The patient's collected medical history is typically available to health professionals (Car, Tan, Huang, Sloot and Franklin, 2017).	Medical information, treatment, laboratory results and decisions for medicine management.

Moen et al. (2012) notice that "Achievements in eHealth can support future demands within the healthcare system and improve the quality of life of citizens, patients and health providers"(p.2). This idea is proved by other resources, for instance, Jung, Loria (2010), Commission of the European Communities (2004), Ganesh (2004); González, Quesada, Urrutia and Gavidia (2006) who also admit that eHealth is impactful on improving the access to healthcare, supporting information exchange, mitigating costs, increasing revenue, enhancing the quality of patient care. In the document of "eHealth Action Plan 2012–2020 Innovative healthcare for the 21st century" released by the European Commission (2012), it is also stated that Information and Communication Technologies that are incorporated into health and healthcare systems can improve the quality of life, enhance their efficiency, and open up innovation in health markets. For this particular reason, the Dutch government has initiated the progress and adaptation of eHealth in order to reach their objective of establishing the quality of healthcare (Leenen, et. al.2016). The same authors note that the Dutch also apply eHealth as a means to manage health costs which play an important role, especially in an aging society. All in all, the choices for eHealth technologies are expected to expand with the provision of more flexibility in accessing healthcare (Car, Tan, Huang, Sloot & Franklin, 2017).

Advantages and disadvantages of eHealth. In order to comprise a critical rationale about the subject, in this particular research study of eHealth, it is worthwhile to embrace the advantages and disadvantages of it. Norgaard et al. (2015) pay attention to individuals and introduce 6 pillars of strengths and weaknesses which may be encountered engaging in digital health:

1. Feelings of safety and control
2. Skill of processing information
3. Involvement in own health
4. Active commitment to digital services
5. Accessibility to digital services that performs well
6. Using digital services that conform to personal needs

In order to have a broader overview regarding the pros and cons of eHealth a larger portion of research is needed. According to Gerber & Eiser (2001) patients who use the Web may be better informed with health outcomes and suitable health service resources. The extensive literature offers health information searching as purposeful information gaining from chosen sources that lead to health linked decision making (Oh, Zhou, Kreps & Kim, 2013). Moreover, people who search for health information are more likely to follow the prescribed medical treatment (Wald, Dube

& Anthony, 2007) because digital technologies may delegate patients to enhance their sense of responsibility and help to increase their control over disease (Broom, 2005) by supplying them with attitudes, self-awareness, understanding how to improve the life quality (Sharf, 1997).

What is interesting, some healthcare providers have postulated that this kind of empowerment warns patients to significant symptoms at an early stage and commits them to seek medical care (Laing, Hogg & Winkelman, 2004). Also, eHealth services can provide, for instance, via online support groups, the confidence in conducting participants' medical condition (Johnson, Ravert & Everton, 2001, Feenberg, Licht, Kane Moran & Smith, 1996). Patients are supported, encouraged and gain information (McKay, King, Eakin, Seeley & Glasgow, 2001, Podolsky, 1998). Moreover, eHealth services serve as an information source for healthcare specialists (Greenes, 2001) with a great variety of online courses, consultations with colleagues, journals, textbooks, and clinical guidelines. Additionally, eHealth services provide a tool to access personal health records. Patient approach to this information may simplify the doctor–patient communication, reduces travel costs for both sides, mitigates medical errors and encourages patients to play an active role in taking care of their health (Ross and Lin, 2003).

However, the use of eHealth technologies and its viable information also delivers a set of challenges, dilemmas, and potential disadvantages. Firstly, since there is a plentiful of highly variable information regarding health on the internet, the quality of it is questionable (Eysenbach and Diepgen, 2001). Health information may be misinterpreted or misleading (Cline and Haynes, 2001), endanger health outcomes and also conclude in inappropriate requests for clinical interventions (Eysenbach, Kohler, 2002, Ahmad, Hudak, Bercovitz, Hollenberg & Levinson, 2006). Of course, it depends on the source. Weisbord, Soule, Kimmel, (1997), and Kiley (2002) warn that misleading information can result in morbidity, anxiety or even mortality. Secondly, some socioeconomic groups can have limited access to the internet (Wald et al. 2007). For instance, wealthier, younger and educated people are more likely to seek health-related information (Murray et al., 2003) and also use eHealth technologies. Adults who have low health literacy level may encounter problems gaining access to information since the majority of health sites demand at least high school reading proficiency. Thirdly, the easily reachable information can cause adverse effects, such as frequent unnecessary visits to doctors which require time for both the patient and the health care provider (Murray et al., 2003). For instance, Cline and Haynes (2001) identified a number of issues which are faced by people who search health information using the internet and they contain disorganisation, search and access difficulties, information overload, overly technical language, a shortage of performance, a lack of regulation, and maladaptive behaviour. Fourth, health care professionals may confront unfamiliar information from patients that can be contradictable from their recommendations or may offer treatment that is unavailable (Eysenbach & Jadad, 2001). Moreover, some doctors appear to feel that their expertise is devalued and they loose the control of information (Hughes, Joshi and Wareham, 2008). The specialists need time to assess information, modify unrealistic patient hopes, and correct misconceptions (Massey, 2013, Tustin, 2010).

Nevertheless, Barlow, Wright, Sheasby, Turner & Hainsworth (2002) Ouwens, van der Burg, Faber & van der Weijden (2017), Groenewegen, Tofighy, Ryvlin, Steinhoff & Dedeken, (2014) believe that eHealth tools can support patients in such areas like self-management, symptoms monitoring, help to adhere to the treatment and change health behaviour. Hence, incorporating eHealth technologies in patients' daily life holds the promise of better healthcare provision (Hajli & Featherman, 2018).

Past academic research on eHealth. Since a body of various literature has elaborated the concept of eHealth, this section contains a list of previous empirical works in the field of eHealth (Table 2). The overview briefly presents the topics and findings.

Table 2. Past academic research on eHealth

Authors	Article title	Findings
Cline & Haynes (2001)	Consumer health information seeking on the Internet: the state of art.	A lack of information assessment skill add to consumers' vulnerability and increase the need for quality standards and norms for the evaluation of health information.
Ganesh (2004)	E-health drivers, applications, challenges ahead and strategies: a conceptual framework	The author presents the determinants that drive eHealth applications, as well as their adoption challenges and delivers a conceptual framework for reaching eHealth services.
Huntington et.al.(2004)	The general public's use of (and attitudes towards) interactive, personal digital health information and advisory services	Nevertheless, there is a noticeable consumer interest in health services but interaction is very poor. The research showed that only 10% of respondents used Website to contact and communicate with a doctor.
Salo et. al (2004)	Patients' use of the Internet to obtain medical information and patients' interest in being provided medical links to learn more about their medical condition	Half of the respondends have internet access and over half are interested in medical links provision.
McMullan (2006)	Internet for health information by the patient and how this could affect the patient-health professional relationship	The research resulted that the majority of health information search on the Internet is inquired by patients for specific medical conditions. Mainly, they explore how to manage their own healthcare independently or for reassurance after clinical encounter.
Wald, Dube and Anthony, (2007)	Untangling the Web – The impact of Internet use on health care and the physician-patient relationship	The study identifies the advantages of Web-acquired information which are: shared decision making, teamwork approach, time efficient usage, easy access of patient's information. Of course, disadvantages are also noted such as: misinformation, conventional physician-patient relationship shift, health literacy problem.

Table 2 (continued)

Authors	Article title	Findings
Lemire et al. (2008)	Determinants of Internet use as a preferred source of information on personal health.	The usage is directly related to five determinants: the importance given to the opinions of health professionals, perceived usefulness, the importance given to written media in searches for health information, concern for personal health and the trust placed in the information available on the site itself.
Schweitzer & Synowiec (2012)	The Economics of eHealth and mHealth	The study provides a framework for an evaluation of the economic benefits of eHealth .
Jacobs, Lou, Ownby and Caballero (2016)	A systematic review of eHealth interventions to improve health literacy	The study concludes that it is feasible to provide eHealth interventions in order to increase the skills of health literacy for people with different health conditions, socioeconomic backgrounds, and risk factors.
Ossebaard and Gebert-Pijnen (2016)	eHealth and quality in health care: implementation time	The authors present a Roadmap which approaches users' needs and also scales up eHealth technologies. The study presents a transformation of healthcare, encourage access, quality and affordability in the future.
Chauhan and Jaiswal (2017)	A meta-analysis of e-health applications acceptance	The study comes to the conclusion that eHealth applications acceptance is based majorly on the user type and not on the eHealth application type.
Car, Tan, Huang, Sloot & Franklin (2017)	eHealth in the future of medications management: personalisation, monitoring and adherence	The research incorporates eHealth in increasing personalisation and monitoring in patients'medicine management journey. Also, the authors overview overcoming barriers to eHealth implementation and present directions for future research.
Jimenez and Bregenzer (2018)	Integration of eHealth Tools in the Process of Workplace Health Promotion: Proposal for Design and Implementation	Applying eHealth tools in daily life can support workplace health promotion but regulations should not be left aside since quality and sustainable results are needed.
Maunder, Walton, Williams, Ferguson and Beck (2018)	A framework for eHealth readiness of dietitians	This particular study concludes with a conceptual framework for eHealth readiness of dietitians. It served as a tool to evaluate, measure and drive strategies for better preparation of dietitian profesionals.

eHealth drivers. Incorporating eHealth is a tough strategic decision, therefore, Ganesh (2004) proposes drivers of e-health which are composed of 4 major pillars: technical capabilities, consumer preferences, health system policy and economic considerations. A detailed explanation is listed bellow.

Technical capabilities:

- ✓ The capability of electronic communications to surpass geographical, time, and space constraints
- ✓ Electronic communications ensure improved access, connectivity and speed
- ✓ Availibility of portable, network-enabled health diagnostic and monitoring equipments.

Consumer preferences:

- ✓ Expanding the number of consumers utilizing health related information available online
- ✓ Demand for greater attendance and engagement in managing individual health status
- ✓ Demand for impartial access, differentiated services and personalized care
- ✓ Demand for timely approach to specialist expertise and knowledge
- ✓ Easiness in sharing health measurements

Health system policy:

- ✓ To increase current capabilities, extend scope, optimise the usage of rare resources
- ✓ To upgrade the quality of control and monitoring, decrease the costs and increase the process of organizational decision making via electronic sharing data
- ✓ To provide high-level health services

Economic considerations:

- ✓ Demand to switch care from hospital to home surroundings to minimize costs
- ✓ Decreasing telecommunications costs
- ✓ Demand for cost efficiency rationale for national health policy achievement

1.2. Customer behaviour theories

Health belief model. Specialists of promotion and health education usualy adopt the theory and frameworks based on interventions with the target to change behaviour in different environments. The health belief model was first developed in the 1950s by social psychologists Hochbaum, Rosenstock and Kegels working in the U.S. Public Health Services and is refered to as the most elaborated (Rosenstock, Strecher and Becker, 1994) and widely adapted (Glanz & Bishop, 2012) framework. Fortunately, it complies with diverse cultures (Griffin, 2011, Scarinci, Bandura, Hidalgo and Cherrington, 2012) for systemizing behavioural reactions to threats in both spheres: physical and online (Ng, Kankanhalli and Xu, 2009). Majorly, the health belief model aims to examine the linkages among beliefs, behaviours and attitudes.

Generally, the health belief model is a cognitive model. Dodel and Mesch (2017) posit that: „Cognitive health behaviour theories are a group of related perspectives that argue that a small number of beliefs and attitudes are the best proximal determinants of preventive behaviour“ (p.360). The model defines behaviour by plenty of beliefs about the danger to a person’s goodness and the efficiency and results of specific behaviours or actions (Sharma and Romas, 2012). Considering this, human beings are rational decision-makers who estimate the costs of taking precautions against the advantages that might be gained from them. Such authors like Sutton (2001) and Ng et al., (2009) present a limited version of rationality where persons oriented to the future assess the expenditures and advantages of a performance of behaviour in the most cost effective way due to the fact of incorrect beliefs, obsolete and false information. The conceptual health belief model is illustrated below (see Figure 1).

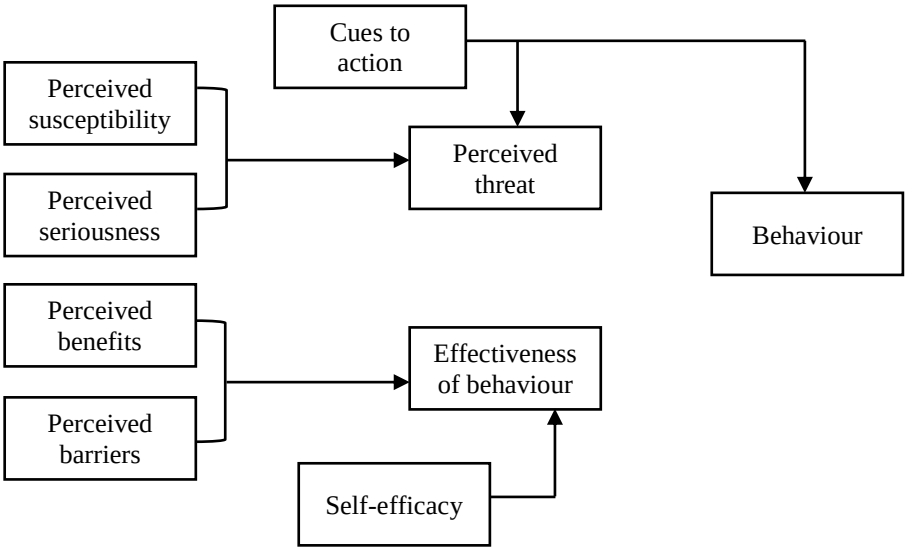

Fig. 1. Health belief model

Source: Morris, Marzano, Dandy and O'Brien (2012), Theories and models of behaviour and behaviour change, p.8

The constructs of the health belief model are explained in Table 3. The table is adapted from Hayden (2014), who also presents modifying variables, which are more individual features: education, culture, past experience, skills, motivations.

The key construct of the health belief model is the perceived threat. Generally, it is related to an individual's preparation to take action. It comprises of two main pillars: perceived susceptibility and perceived seriousness. The first one leads to a particular threat, while the second one is responsible for the expected outcomes that may result from it. According to Hayden (2014), personal susceptibility is one of the most effective understandings in fostering people to accept healthier behaviours. Meanwhile, according to Jones, Jensen, Scherr, Brown, Christy and Weaver (2015):

> …people will take action to prevent illness if they regard themselves as susceptible to a condition (perceived susceptibility), if they believe it would have potentially serious consequences (perceived severity), if they believe that a particular course of action available to them would reduce the susceptibility or severity or lead to other positive outcomes (perceived benefits), and if they perceive few negative attributes related to the health action (perceived barriers) (p.568)

Hence, if the unwanted health consequences do not affect an individual's life majorly, he/she will not be encouraged to keep away from it (Carpenter, 2010). Meanwhile, the construct of perceived seriousness indicates a personal belief about the seriousness of behaviour. But majorly, they both concern a person's perception about the negative outcomes.

There are also perceived benefits and a perceived barrier which are the antecedents of effectiveness of behaviour. According to Morris, Marzano, Dandy, O'Brien (2012):

> The perceived benefits associated with a behaviour, that is its likely effectiveness in reducing the threat, are weighed against the perceived costs of and negative consequences that may result from it (perceived barriers), such as the side effects of treatment, to establish the overall extent to which a behaviour is beneficial (p.7)

Table 3. Health belief model constructs chart

Perceived susceptibility	An individual's assessment of his or her chances of getting the disease
Perceived benefits	An individual's conclusion as to whether the new behaviour is better than what he or she is already doing
Perceived barriers	An individual's opinion as to what will stop him or her from adopting the new behaviour
Perceived seriousness	An individual's judgement as to the severity of the disease
Cues to action	Factors that will start a person on the way to changing behaviour
Self-efficacy	Personal belief in one's own ability to do something

Source: Hayden J.A., Introduction to Health Behavior Theory, 2014, p.35

Hence, an individual should understand that the target behaviour results in positive benefits and barriers should be overcome in order to adopt a new behaviour.

Another key component of the model is an individual's perceived capacity to accept behaviour, in other words, self-efficacy. Basically, people do not even start doing something new if they do not believe in their ability to do it. Although people believe that the behaviour is useful, if they do not believe in the ability to do it, their chances of trying are low. But in actuality, the factor of self-efficacy is rarely encompassed in the health belief model (Carpenter, 2010).

The health belief model distinguishes the dualistic nature of the construct cues to action: internal and external. Internal is responsible for symptoms of ill health, while the external is linked with media campaigns or the reception of other information. Moreover, the cues to action trigger the factual acceptance of behaviour. As Hayden (2014) explains that generally cues to action are individuals, events or issues that lead people to shift their behaviour and it can be exemplified by articles in media, family member disease, advice from others, products' health warning labels.What is interesting, these cues influence the understanding of threat and they can also provoke or retain the behaviour.

Changing the behaviour means that individuals have to feel personally vulnerable to health damage, understand the possible outcomes as severe, and realize that taking action can end in two ways: either prevent them, or diminish the risk at an acceptable cost with several barriers (Nisbet and Gick, 2008). Moreover, an individual must have the so-called self-efficacy, feel competent, in order to perform and maintain the new behaviour. Of course, some kind of internal or external trigger is a requirement to ensure actual behaviour. But if the individual views the threat as not so dangerous they are very unlikely to accept mitigating behaviour. Undoubtedly, the

financial and pragmatic issues also have an impact, i.e. high costs and low benefits, accordingly.

The authors also criticize this framework stating that it has weak predictive power and arguing that it can only forecast around 10% of behavioural variance (Harrison, Mullen and Green, 1992). Literature suggests two main criticisms of this model: first, social or economic determinants of behaviour are absent, and second, its elements and rules about their inter-relationships are not well defined (Morris et al., 2012).

However, Jackson (2005) explains the latter problem: „this model [rational choice] is inadequate as a basis for understanding and intervening in human behaviours for a number of reasons. In particular it pays insufficient attention to the social norms and expectations that govern human choice and to the habitual and routine nature of much human behaviour. It also fails to recognise how consumers are locked into specific behaviour patterns through institutional factors outside their control" (p.133).

Despite the fact that the health belief model is designed in the field of healthcare, it has been also adapted in other fields in order to predict patterns of behaviour. There are numerous scholars that implemented this conceptual framework, of course, with its variations: Munro, Lewin, Swart and Volmik (2007); Rutter and Quine (2002), Nisbet and Gick (2008), Webb, Sniehota and Michie, (2010); Ejeta, Ardalan, Paton and Yaseri, (2016), Chapman-Lambert, Azuero, Enah and McMillan, (2017). Such authors like Carpenter, (2010), Mehri, Nadrian, Morowatisharifabad, Akolechi, (2011), Zhang, Dalal and Wang, (2013), Cao, Chen and Wang, (2014), Haghighi et al. 2017) postulate the health belief model as a successful concept to forecast and promote cognitive elements among human beings in distinctive surroundings.

In this particular case, it is also significant to overview the previous studies and their findings, which are sumamrised in Table 4 below. The academic studies of scholars Tanner-Smith and Brown (2010), Carpenter (2010), Wang, Zang, Bai, Liu , Zhao and Zhang (2013), Jones et al. (2015), Ahadzadeh, Sharif, Ong and Khong (2015), Hoda,Youssreya, Sahar & Manal (2016), Jeong and Hamb, (2018), Sundstrom, Brandt, Gray, & Pierce, (2018) are presented with brief descriptions of the findings.

Table 4. Past academic researches on the health belief model

Authors	Article title	Findings
Tanner-Smith and Brown, (2010)	Evaluating the Health Belief Model: A critical review of studies predicting mammographic and pap screening	The article aimed to examine the health belief model from a theoretical point of view. It was found that perceived benefits and barrier constructs have the strongest support as compared to other constructs. While disease perception has the weakest support.
Carpenter (2010)	A Meta-Analysis of the Effectiveness of Health Belief Model Variables in Predicting Behavior	18 studies were examined to find out whether the assessment of beliefs can forecast behaviour in the future. Elements of the health belief model differ regarding their effectiviness as predictors of behaviour. Hence, the strongest predictors were identified as benefits and barriers.

Table 4 (continued)

Authors	Article title	Findings
Wang, Zang, Bai, Liu , Zhao and Zhang (2013)	Health Belief Model-based nursing intervention on Chinese patients with moderate to severe chronic obstructive pulmonary disease: a randomised controlled trial	Regarding this study, it was cloncluded that nursing intervention adapting the health belief model with moderate to severe chronic obstructive pulmonary desease patients can increase two constructs – self-efficacy and health belief in health management.
Jacobs, Lou, Ownby and Caballero (2016)	A systematic review of eHealth interventions to improve health literacy	The study concludes that it is feasible to provide eHealth interventions in order to increase the skills of health literacy for people with different health conditions, from various socioeconomic backgrounds, with different risk factors.
Ossebaard and Gebert-Pijnen (2016)	eHealth and quality in health care: implementation time	The authors present a Roadmap which approaches users' needs and scales up eHealth technologies. The study proposes a transformation of healthcare, encourage access, quality and affordability in the future.
Chauhan and Jaiswal (2017)	A meta-analysis of e-health applications acceptance	The study comes to the conclusion that eHealth applications acceptance is based majorly on the user type and not on the eHealth application type.
Car, Tan, Huang, Sloot & Franklin (2017)	eHealth in the future of medications management: personalisation, monitoring and adherence	The research incorporates eHealth in increasing personalisation and monitoring in patients' medicines management journey. Also, the authors overview overcoming barriers to eHealth implementation and present directions for future research.
Jimenez and Bregenzer (2018)	Integration of eHealth Tools in the Process of Workplace Health Promotion: Proposal for Design and Implementation	Applying eHealth tools in daily life can support workplace health promotion but regulations should not be left aside since qualitative and sustainable results are needed.

Diffusion of innovation theory. Originally, the diffusion of innovation theory was published in 1962 and subsequently has been prevalent in the issues of health and development (Greenhalgh, Robert, Macfarlane, Bate and Kyriakidou, 2004). The theory aims to describe a process by which a novel idea or innovation disseminates over a social system over time (Rogers, 2003). This theory puts emphasis on innovation as a representation of behaviour change. Morris et al. (2012) note: „Consequently, it is perceived attributes of an innovation that determine its rate of adoption to a greater extent than the characteristics of the adopters" (p.13-14).

According to Rogers, (2003) there are four major determinants describing the change of behaviour: time, communication channels, social systems and innovation. The same author posits that diffusion is a process in which innovation is informed via particular channels over a period of time among the members of a social system. It is a unique type of communication 23nnovatio the content of the message with new ideas. Drawing on the diffusion of innovation theory, it is significant to perceive that behaviour will change faster if those innovations are considered as better options than the ones used before. Moreover, it is important to consider them as coherent with the existing values, needs, and experiences of potential adopters. Additionaly, it is significant to understand that they are not complex, but rather easy to understand,

testable, and the outcomes are visible. However, different communication channels have extraordinary influence in terms of innovation diffusion.

Interestingly, Rogers (2003) alleges that a person's choice regarding innovation is the evolution that takes place over time. Moreover, the individuals choice comprises of a set of actions visualised below (Figure 2). The overall innovation-decision process arises from five actions: knowledge, persuasion, decision, implementation, and confirmation. The first phase is knowledge which is defined as a decision-making step. This step is disclosed to the presence of innovation and gains some perception of how it operates. The second phase is persuasion where the decision-making unit shapes a 24nnovation or unpreferable attitude toward and the innovation happens. Persuasion is followed by the decision phase. The decision phase is responsible for engaging in activities leading to the option to adapt or reject the innovation. Implementation is the last phase of the innovation-decision process. It occurs when the decision-making unit uses the innovation. The ending phase is confirmation. It occurs when the decision-making unit considers the enhancement of an innovation decision already done, but the individual has the ability to reverse this decision if exposed to conflicting messages about the innovation. Of course, there are scholars who implement the extended form of innovation-decision process with an inclusion of routinsation of innovation because its adoption is no longer stated as innovative and items of 24nnovation are adopted to their full potentiality (Nutley, Davies, & Walter, 2002).

KNOWLEDGE ⟶ PERSUASION ⟶ DECISION ⟶ IMPLEMENTATION ⟶ CONFIRMATION

Fig. 2. Innovation-decision process phases

Source: Degerli, A., Aytekin & Değerli, B. (2015). Procedia – Social and Behavioral Sciences, p.1555

What is interesting is that after confirmation, counting on the individual attitude and the support for innovation adoption, adoption or discontinuance appears within this level (Sahin, 2006). According to Sahin (2006), there are two reasons for discontinuance. The first one happens if the person refuses the innovation adoption for replacing it. This kind of discontinuance is called replacement discontinuance. The second one appears when an individual rejects the innovation because he/she is not satisfied with it or it does not meet the person's needs. This kind of discontinuance is called disenchantment discontinuance.

All in all, diffusion of innovation theory serves as help in the comprehensive understanding of an individual's activity starting from the knowledge phase to confirmation of innovative technology. The next section elaborates on the other behaviour model regarding the adaptation of digital technologies.

Technology acceptance model. Regarding the opinion of Marangunic and Granic (2015), permanent development of technology, particularly information and communication technology, initiate the dilemma to decide whether to accept or reject pioneering technology. But the pace with which individuals are able to accept advanced and dynamic technologies depends on such factors like availaibility of

technology, consumers' needs, convenience, security and others (Lai, 2017). The technology acceptance model (TAM) was designed in the 1980s due to the fact that workers were not cultivating information technologies developed for them (Davis, Bagozzi and Warshaw, 1989). The originators of this particular model reasoned that the core argument of it was to identify the factors which serve as a help to enhance the information technology acceptance. Determining the contributors help organizations to manipulate them in order to initiate acceptance and thus increase the usage of IT.

In order to understand fully the origin of technology acceptance model a clear explanation is needed. To compose TAM, its pioneers adapted the Theory of Reasoned Action, that is the general of behavioural theory, and has been proven to be significant in understanding such variety of behaviours as exercising, voting and so on (Fishbein and Ajzen, 1975). Incorporating this theory into the new contexts, new studies were initiated to expand the appropriate variables for better understanding of IT usage behaviour. Regarding Mathieson (1991) and Sjana (1996) the most significant antecedent to the usage of IT is behavioural intention. Behavioural intention is referred to as the factor that can be reliably predictable (Chau and Hu, 2002). Moreover, behavioural intention is affected by an individual's attitude towards adapting and using IT (Holden and Karsh, 2010). The same scholars specify that, attitude consists of two antecedents that are perceived ease of use and perceived usefulness. Perceived usefulness is considered as the one which affects behavioural intention independently.

What is interesting, TAM is the theoretical framework that has gone through many transformations. Authors Holden and Karsh, (2010) present them in their study and the changes are depicted below. As it is visualized in Figure 3, the factor of social influence is captured, for instance, the individuals' whose opinion is important: colleagues, friends, supervisors. These individuals foster end users and their perception towards IT acceptance and evaluation that is commonly named subjective norm (Holden and Karsh, 2010). What is more, TAM appoints the intention that it can serve as a help to envisage the individual's motivation to perform a behaviour and a great variety of skills (Durodolu, 2016). According to Huda, Rini, Mardoni and Putra (2012) intention is identified by three elements:

1. personal in nature which depicts human perception and attitude
2. subjective norm which presents social influence
3. perceived behavioural control

Accordingly, an individuals' purpose to teach a particular skill can be originated on those previously mentioned factors. Additionally, Teo (2013) states that an individual's behaviour is impacted by the motive to perform the behaviour, to be more precise, the real behaviour is predicted by the individual's behavioural intention to deal with the activity.

Lately, the most significant attempt of academic literature to consolidate IT acceptance was concluded in the Unified Theory of Acceptance and Use of Technology (Venkatesh, Morris, Davis, G. and Davis, F., 2003). The result resembles Figure 3 below.

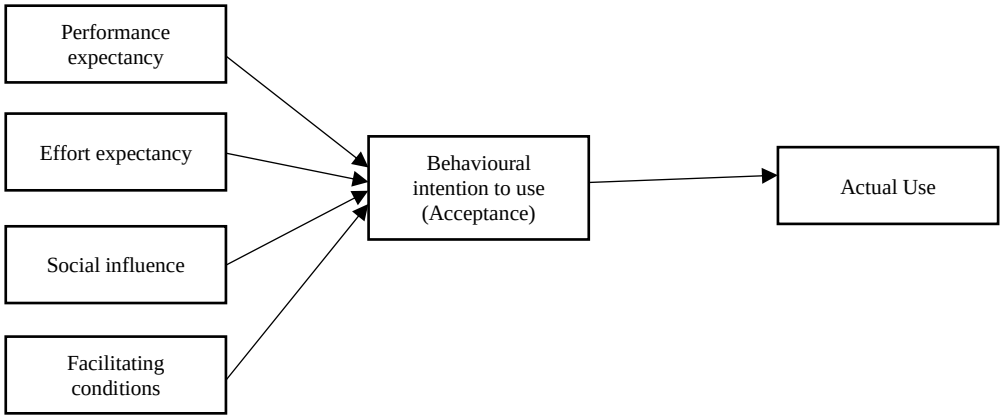

Fig.3. Unified Theory of Acceptance and Use of Technology.
Source: Holden & Karsh, (2010), The Technology Acceptance Model: Its past and its future in health care

The Unified Theory of Acceptance and Use of Technology converts perceived usefulness into performance expectancy construct, while subjective norms transformed into social influence and perceived ease of usefulness into effort expectancy. Since many studies aimed to conduct and adapt the TAM, the table below displays the prior academic papers that incorporated this framework.

Table 5. The past research on technology acceptance model in health care

Authors	Article title	Findings
Wu, Wang and Lin, (2007)	Mobile computing acceptance factors in the healthcare industry: A structural equation model	This research study considers the primary insights that are important antecedants of adapting mobile healthcare in order to enhance healthcare specialists' mobile healthcare systems adoption. The proposed theoretical framework accounted for 70% of the variance in behavioural intention on new information technology acceptance. The authors provide suggestions for implemementing such factors like security and privacy, information quality for future research.
Holden and Karsh, (2010)	The Technology Acceptance Model: Its past and its future in health care	This study concludes that the technology acceptance model forecasts the fundamental portion of the usage or acceptance of health IT. Moreover, the theory can also contribute with several modifications.
Pai and Huang, (2011)	Applying the Technology Acceptance Model to the introduction of healthcare information systems	The analysis reflects that the offered constructs, such as system quality, influence the user's intention through the mediating constructs, perceived ease of use, perceived usefulness are positively related with end user's intention to adopt technology in the healthcare system.
Ketikidis, Dimitrovs Bath and Lazuras (2012)	Acceptance of Health Information Technology in Health Professionals: An Application of the Revised Technology Acceptance Model	The analysis concluded that only perceived ease of use directly effects health IT usage. But the impact was not evident regarding these elements: usefulness, relevance and subjective norms. The findings suggest that transformations of the original technology acceptance model are required in order to have a better understanding of support and endorsement of Health IT for healthcare specialists.

Table 5 (continued)

Authors	Article title	Findings
Strudwick, (2015)	Predicting Nurses' Use of Healthcare Technology Using the Technology Acceptance Model: An Integrative Review	The study results present that the technology acceptance model with adopted variables would be able to result in a better explanation of nurses' adoption of healthcare technology. Technology vendors should recognize the most important elements which influence the adoption and appropriate use of technology and elaborate suitable improvements accordingly.
Lai (2017)	The literature review of technology adoption models and theories for the novelty technology	This analysis shows potential adoptions for technology applications for future studies. It contributes with comprehensive and conceptualized models and theories that may impact past, current and future technology adoption.

Nowadays, TAM has been incorporated worldwide in order to understand the adoption of the great variety of information systems (Surendran, 2012). Thus, TAM is a distinguished theory that aims to examine the attributes which impact technology use. And finally, taking into consideration Holden and Karsh (2010), the Unified Theory of Acceptance and Use of Technology is the latest and promising theoretical framework with impressive applicability alternatives – early examinantions clarified 70% of variance in behavioural intention, and approximately 50% of actual use.

1.3. Factors influencing customer behaviour in eHealth use

This section of the research study elaborates on the factors influencing customer behaviour in choosing eHealth selected from past academic and empirical research studies. Each factor group is described further with the peculiarities of each construct and extensions of scholars' perceptions.

1.3.1. Technological factors

Technological determinants put emphasis on the technical ability of the eHealth system in order to meet the stakeholders' needs. Khoja, Durrani, Scott, Sajwani, & Piryani, (2013) and Leon, Schneider & Daviaud (2012), distinguish these characteriscs as technological factors' input: data quality, user-friendliness, adaptability, accuracy, flexibility, reliability, efficiency. Fanta and Pretorius' (2018) idea states that the acceptance of technology is impacted by subdimensions of technological factors: information quality, system quality and service quality. Table 6 presents each factor with explanations.

Table 6. Technological factors of eHealth

Technological factors	Descriptions
System quality	Traditionally, system quality is closely related to portability, functionality, reliability, ease of use, integration and significance of the information technology (Petter, DeLone & McLean, 2003).
Information quality	Information quality reflects the relevance, completeness, accuracy, timeline, and consistency of the data saved in eHealth database (Gorla, Somers, & Wong, 2010).

Table 6 (continued)

Service quality	Service quality refers to assurance, empathy of technical support, reliability, responsiveness, up-to-date hardware and software to alleviate the use of information system (Petter, DeLone & McLean, 2003). The degree of general support introduced to end-users to their needs and expectations (Gorla, Somers, & Wong, 2010, Fanta and Pretorius, 2018)

Source: Fanta and Pretorius, 2018

Domínguez-Mayo et al. (2015) presented systematic quality characteristics of eHealth. They distinguished a dualistic approach – external/internal quality and quality in use. External/internal quality evaluates eHealth systems and their behaviour. The external/internal quality compounds of these elements: portability, usability, accessibility, reliability, maintainability, functionality, continuity, and efficiency. They are briefly described as follows:

- ✓ Functionality. It is the state of being functional which is especially linked with the set of capabilities related with electronic devices, their software and hardware. This particular factor comprises of four main dimensions: security, accuracy, compliance, and interoperability.
- ✓ Usability. It is the feature to be learned, understood, and used under peculiar conditions.
- ✓ Accessibilty. This concept defines the degree to which a device, service or product is accessible to as many individuals as possible.
- ✓ Suitability. It indicates a set of characteristics that impact both the attempt required for use and personal evaluation.
- ✓ Maintainability. It specifies the easiness with which a product can be retained to repair defects and their causes.
- ✓ Reliability. It is the characteristic of the system to accomplish its required tasks under particular conditions at a specific time.
- ✓ Continuity. It is the feature of attaining the condition or the quality of being continuous.
- ✓ Efficiency. It means the extent to which both resources, time and effort are used well in order to complete the task. Generally, it is a specific result with the least quantity of waste or unnecessary effort.
- ✓ Portability. It is the characteristic of adapting the same system in different platforms. This feature helps to reduce the costs.

Quality in use is the second pillar of eHealth quality characteristics. It evaluates the impact of eHealth use in a specific context. It compounds of these elements: satisfaction, productivity, effectiveness, and safety.

- ✓ Satisfaction. Refers to the state of being satisfied, contentment in possession, gratification of desire.
- ✓ Safety. Considers the condition of being safe, protected from emotional, physical, social, financial and other types of accidents.
- ✓ Productivity. Evaluates the efficiency of production. This measure is described as a total production per unit of a total input.

- ✓ Effectiveness. The characteristic of gaining the wanted result. When something has been completed with the expected result it is deemed to be effective.

According to Keltner (1998), there has been a declaration of quality concern. Basing on the accessible tools through the internet and also individual experience, patients have perceptions about the quality of online information (Wilson and Risk, 2002, Goetzinger, Jungkun Park, Lee and Widdows, 2007). What is more, erroneous health information on the internet enhances the risk of dangerous treatment attempts, wrong self-diagnosis, and cancelling health specialist visits (Fox and Pewinternet, 2013). A strong argument for qualitative health information is given by Tao, LeRouge, Smithn & De Leo, (2017):

> Given the magnitude of the amount and use of health information on the Web and its significant impact on consumers' health care decisions, as well as their overall approach to maintaining health, it is imperative that health websites provide consumer-perceived quality health information used for healthcare consumers making informed health care decisions and other health care–related purposes (p.3-4)

Such authors as Berland et al. (2001), Eysenbach, Powell, Kuss and Sa (2002), Seidman, Steinwachs, Rubin, (2003), Stvilia, Mon, Yi (2009), Zhang, Sun, Xie (2015), Devine T, Broderick, Harris, Wu and Hilfiker (2016) define health information quality as a complicated task since there is a large number of criteria, various perspectives and measurements. Hence, one thing is clear – there is no consensus on what attributes constitute information quality.

Further, health care consumers' understanding of information quality influences the ease of use and perceived usefulness of health information system (these two constructs are described further in this section) which influences their continued use of the system (Lemire, Paré, Sicotte and Harvey, 2008, Pai and Huang, 2010, Mou and Cohen, 2014).

1.3.2. Social factors

The relevance of e-readiness. The term "e-readiness" is relatively new in the academic literature (Dada, 2006) and regarding Khoja et al. (2007), the field of e-readiness is very rarely found in studies. Traditionally, it is considered as a response to the rising digital division between developing and developed countries (Masi, Suarez-Balcazar, Cassey, Kinney and Piotrowski, 2003). Common sense says that e-readiness is the people's inclination to encompass and use new technologies in order to accomplish tasks in daily life and at work (Parasuraman and Colby, 2001).

Moreover, the Center for International Development at Harvard University (2000) defines e-readiness as the level to which community is ready to involve in the Networked World. It is estimated by evaluating a community's progress in the fields that are most crucial for information and communications technologies adoption. Hence, evaluation of all these elements gives the representation of community's readiness. And the value to community stems from assessing it's inimitable challenges and opportunities. Another point of view is presented in the Economist

Intelligence Unit (2006): "state of play of a country's ICT infrastructure and the ability of its consumer, businesses and governments to use ICT to their benefit" (p.1).

Hence, taking into consideration the previously mentioned descriptions of e-readiness, it could be consedered as a capability of society to use ICT as infrastructure to transmit the traditional economy to digital one. It stimulates the global market via producing individuals with capabilities to take part in a new economy, hence fostering human capabilities and economic performance. Additionally, Potnis and Pardo (2011) notice that life quality of nations is examined through the perspective of e-readiness, though, it is significant to adapt ICT in order to hinder the lag within other economies.

The dynamic information reached through e-readiness has become a key factor of the international socio-economic progress and drastic usage of ICT in the fields of business and industry (Saesor & Liangrokapart, 2012). In the past year, the influence of electronic networks has increased exponentially in both the developed and developing societies (Vosloo & Belle, 2005, Eweni, 2012, Alaaraj and Ibrahim, 2014). The available studies indicate that e-readiness is assessed by evaluating healthcare institutions, government status, and individuals in the fields most crucial for adoption (Rashed, Al-Eryani and Shama, 2010, Alaaraj and Ibrahim, 2014). Taking into account the individual's technology readiness score, Parasuraman and Colby (2001) grouped technology consumers into four categories: pioneers, explorers, skeptics and laggards.

Since e-readiness is regarded as one of the crucial factors of development of any country, it indicates the transformation of society involving the transfer from traditional methods and relations to modern ways of thinking and practising it in pivotal fields: education, health and production. Hence, scholars need to be involved in order to find out the key drivers that enable decision makers to identify the key variables that foster the positive outcomes (Babcock, 2005).

Moreover, it can be stated that e-readiness is closely related to the enrichment of human capital, national economy, and government in developing countries (Alaaraj and Ibrahim, 2014). Therefore, Grigorovici (2004) raises the question whether there is causal linkage between a new economy and the phenomenon of ICT progress. Additionaly, e-readiness is reffered to as a competitive advantage in the networked economy (Molla et al. (2008). The Economist Intelligence Unit (2006) note that when governments initiate the utilization of digital technologies and supply its services online, the individuals' capability to use digital technologies skillfully enhances, while the country's legal system, economy and business are characterised as more efficient and transparent. In addition to this, Lanvin and Qiang (2004) claim that e-readiness can meaningfully contribute to the economic evolution by enhancing its productivity in adopting ICT in industries.

Hence, e-readiness is reffered to as a key factor that even stimulates competitiveness and, of course, business opportunities (Janom & Zakaria 2008). Mutulaa and Brakel (2006) distinguish such benefits like business transactions, enhancements of their operations and mamagament, quality improvement, time saving, and faster delivery of services. Furthermore, it tends to increase cost effectiveness, reduce manpower requirements, and enhance the choice of services. And consequently, these benefit in procurement expenditure reduction, ability to

share information, and improvement in genereal skill of employees. All in all, since e-readiness enhances globally, many countries aim to implement an applicable infrastructure in order to obtain such e-readiness levels which would be sufficient to benefit in the emerging global economy (Lou, 2010).

Social influence. Generally, social influence is the level to which a person perceives the others' opinion whether he/she should try and use new technology (Venkatesh et al., 2003). Basically, social environment hinges on relatives, friends and seniors as sources who have an impact on an individual's behaviour. Of course, people tend to tailor their beliefs regarding the group in which they operate (Kate, Haverkamp, Mahmood and Feldberg, 2010). In addition to this, Bandura (1978) offers that an individual learns and adopts the behaviour reasoned by what he/she sees in social groups. People are affected by the majority because it is more likely that a person will take over the same attitude, when a number of people have it. The group of scholars comprised of Davis, Bagozzi and Warshaw (1989) underscore the significance of social influence in information technology adoption and use. While Karahanna and Straub (1999) clarify that social influence has a strong linkage with the individual's technology use.

The prominence of social influence on technology use and adoption has been enormously acknowledged (Kesharwani and Tripathy, 2012). In recent years scholars have incorporated the construct of social influence in the TAM framework (Patel, K.J. and Patel, H.J. 2018). Studies (Venkatesh et al., 2003, Sudeep, 2007) empirically prove the fact that social influence acts as a positive influencing factor in the adoption of technology.

The interesting conceptualization of social influence in technology adoption is visualized by Lorenz and Buhtz (2017) (Figure 4). As it is seen from the figure, the interaction between social referents and focal user defines the movement of social influence which may be two-directional – reciprocal and multidirectional. While the interaction between technology and user defines the scope of social impact as technology develops from the tool level to social level. Eventually, the interaction between social referents and technology affects the degree of social influence. It can be supportive or dismissive. The multidimensional view of social influence in technology acceptance is extrapolated below.

Firstly, such scholars like Bagozzi, (2007), Junglas, Goel, Abraham and Ives (2013) stress the importance of the fact that current conceptualizations of social influence are stated to be unidirectional and interpret an individual as the target of social behaviour, rather than a pioneer of social interactions. Hence, typically individuals are described as the obtaining end of others' hopes and expectations. But the focal user may not accept others' opinion, and can influence the social group in which he/she operates. Therefore, the sole individual's influence to the social sphere is being left behind.

Secondly, a great variety of academics have judged the technology acceptance framework because of its limitation: one-to-one interaction between two pillars, user and information technology (Junglas et al., 2013). Regarding this idea, the focal user is portrayed as a sole information processor (Sproull and Faraj (1997). According to Lorenz and Buhtz (2017) "…the social component of information system

technologies – the social interactions embedded within the use of a technology – and, in turn, limits our understanding of the social dynamics at play" (p.2342). So, if an individual is using technology, he/she is affected by social impulses before, after and during the usage.

And thirdly, the linkage between technology and social referents should be discussed. The initiators of the multidimensional view of social influence in technology adoption Lorenz and Buhtz (2017) emphasize the importance of comprehensive studies for actual belief and behaviours of social referents toward technology. The authors ensure that incorporating social referents' beliefs into the studies it would result in rich and objectively academic work. For instance, some studies have already addressed this subject through adapting such constructs like perceived usefulness, experience and others (Gallivan, Spitler and Koufaris, 2005, Brown, Dennis and Venkatesh, 2010).

As for the generalization of multidimensional view of social influence in technology adoption, it could be reflected in its pioneers' Lorenz and Buhtz, (2017) citation: "Combining all these dimensions allows us to move from an insulated to an integrated perspective of social influence on technology adoption" (p.2343).

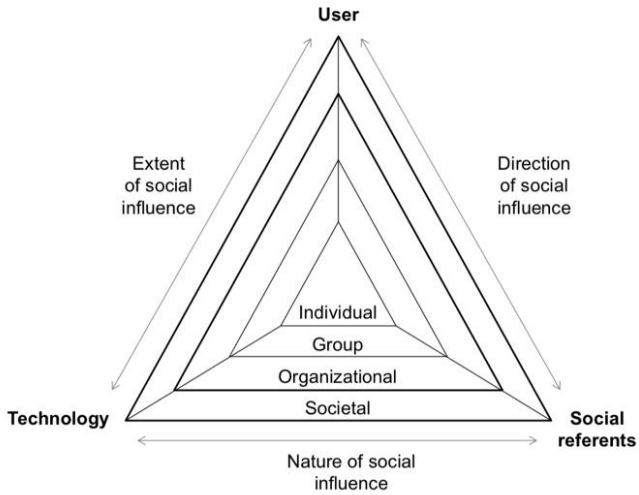

Fig. 4. Multidimensional view of social influence in technology adoption
Source:Lorenz and Buhtz, 2017

Nowadays Wildenbos, Peute and Jaspers (2016) elucidate that social support can be a very significant psychological contributor in fostering behaviour changes since such shifts are stimulated through interaction from relevant individuals in his/her surroundings. Moreover, the same scholars claim that "eHealth interventions aiming at health behaviour changes that fail to consider the role of social support in facilitating healthy behaviour could lead to unintended consequences like unmotivated patients…" (Wildenbos, Peute and Jaspers, 2016, p.117). Regarding the idea of Smedley and Syme (2000) that mortality and morbidity can be decreased via behavioural and social interventions put social influence in the centre of academic attention. As such, a promising research avenue for scholars may be to examine the

social influence in the eHealth. Building upon these insights this research study aims to incorporate the factor of social influence in the examination of eHealth use.

Perceived ease of use. Rogers (1962) confirms that perceived ease of use is the term that illustrates the level to which innovative technology is understood as not difficult or complex to learn or operate. A similar explanation of this particular term is provided by scholars Venkatesh et al. (2003) who notify that it is level of ease related with the usage of the system. Extensive research contributes to the evidence of considerable impact of perceived ease of use on intentions to use (Adams, Nelson and Todd, 1992, Ramayah, Jantan, Noor and Ling, 2003, Guriting and Ndubisi, 2006). Moreover, perceived ease of use is also considered as a customers' discernments concerning the result of this experience (Davis, 1993). Interestingly, researchers dispute that perceived ease of use is the level to which an individual assumes to be true that utilizing a demanding method would be costless (Mathieson, 1991, Gefen and Straub, 2000).

According to Zeithaml, Parasuraman, and Malhotra (2002) perceived ease of use clarifies the scope to which progress is straightforward. While Hong, Thong, Wong, & Tam, (2002) note that it is simpler to utilize the system which is found to be useful for the particular individual. A wide variety of academic studies stressed their attention to the considerable effect of perceived ease of use on usage intention, whether it be indirectly or directly (Guriting and Ndubisi, 2006, Hernandez and Mazzon, 2007, Wang, Wang, Lin, Tang, 2003, Venkatesh and Morris, 2000). Considering the academic insights, generally, perceived ease of use measures the level of an easiness to learn, comprehend and work.

What is interesting, perceived ease of use together with perceived usefulness have a considerable influence on individuals' intentions to accept technology (Chen and Barnes, 2007). These two elements are the core pillars of Technology Acceptance Model. Calisir and Calisir (2004) convince that the two constructs of perceived usefulness and perceived ease of use are of paramount significance in settling the quality of individuals' interactions with technology interfaces. This opinion is consistent with the idea of Razmak and Bélanger (2018), who state that these elements are "important factors in the usability testing for any technological system" (p.309).

Perceived usefulness. Perceived usefulness has been a prevalent term especially in the field of technology adoption and was elucidated by Davis (1993) as individuals' understanding that utilizing new technology will improve their operations and overall performance. The same author underpins that perceived usefulness is a significant factor of technology adoption. It is also specified as the level to which an individual presumes that technology enhances their productivity (Mathwick, Malhotra and Rigdon, 2002). While such authors like Liao and Cheung (2002), Eriksson, Kerem and Nilsson (2005), Laforet and Li, (2005), Jahangir and Begum (2008) state that perceived usefulness is refered to as a subjectice probability explaining that utilizing technology would help the particular individual to complete the task in a faster manner. Similarly, Mathwick, Rigdon and Malhotra (2002) postulate that the factor of perceived usefulness can be described as the level to which an individual deems a technology to augment his or her performance.

Gao and Bai (2014) stress the fact of clear communication shortage identifying the benefits of technology for potential users. In this context, Perera, Zaslavsky, Christen, & Georgakopoulos (2014) point out that the most significant advantage of technology is the ability to manage huge information flow effectively and in a timely manner. Moreover, the existing literature, for instance, Gao and Bai (2014), Choi & Kim (2016), Prayoga & Abraham (2016) on internet of things technology announced a remarkable impact of perceived usefulness on use. The beneficial part of technology is distinguished by El-Haddadeh, Weerakkody, Osmani, Thakker and Kapoor (2018) who stress the importance of smart devices which enable users to gather real-time information that impact their daily life. For instance, Cheong and Park, (2005), Chiu, Lin and Tang (2005) discovered that perceived usefulness has a positive impact on online purchase intentions. While scholars Guriting and Ndubisi, (2006), Chen and Barnes, (2007), and Eriksson, Kerem and Nilsson (2005) provide the evidence of perceived usefulness importance on adaptation intention. Therefore, it also refers to customers' discernments with respect to the result of the experience. (Davis, 1993). Moreover, Tan and Teo (2000) offers that the perceived usefulness is a crucial factor in defining the adaptation of innovations.

As a consequence, the greater the perceived usefulness of eHealth, the more likely it will be adopted. Therefore, this factor is found to be important for the empirical examination in this particular research study.

1.3.3. Behaviour of technology use factors

Attitude towards eHealth. Traditionally, attitude is considered the way an individual evaluates various angles of the social surroundings in which he/she behaves. The term "attitude" has been in the academic research field, especially, psychology, for a long time (Brusilovsky, Kobsa and Nejdl, 2007). According to Hogg and Vaughan (1998), attitude is a universal feeling or positive/negative assessment about an issue, objects or a person. A plethora of academic works examined the attitude towards eHealth, for instance, Richards et al. (2005), Andresen (2008), Banna, Hasan and Meloche (2010), Hendrikx, Pippel, Wetering and Batenburg, (2013), Hofstede, Bie, Wijngaarden and Heijmans (2014), Sezgin and Yıldırım (2014), Olok, Yagos and Ovuga (2015), Armani et al. (2016), Giannoul and Hyphantis (2017), Al-Khatlan, Alazmi and Almutairi (2017), Holderried et al. (2018). According to Hofstede, Bie, Wijngaarden and Heijmans (2014), "A crucial factor for successful implementation of eHealth is a positive attitude toward eHealth of its intended users, e.g. the patients" (p.969) The academic research presented by Andresen (2008) revealed interesting conclusions: healthcare specialists are more sceptical about eHealth in comparison with patients. The empirical study of Armani et al. (2016) contributed with the appraisment of understanding surroundings of eHealth by stating that healthcare specialists require more information regarding the potential advantages to gain more efficient and timely care. Another study by Al-Khatlan, Alazmi and Almutairi (2017) concluded that healthcare specialists had less practice and knowledge than expected, therefore, more resources are needed to stimulate them using eHealth and elevate their knowledge.

The most recent report titled "Attitudes towards the Impact of Digitisation and Automation on Daily Life" (2017) by the EU displayed the findings of the base 27 901 respondents from all the EU. What is interesting, that people from Northern European countries are more likely to have online access to the health records, than the respondents from Eastern European countries (European Commision, 2017). Generally, after questioning the citizens of 21 countries, at least half of them preferred the online access to their health status reports. The higher numbers were calculated for Finland (82%), Denmark (80%) and Estonia (73%), while the lowest for Hungary (32%) Austria (34%) and Germany (38%). But it is worth noting that the citizens of Estonia, Finland and Denmark had the highest proportion of respondents who adopted online healthcare services over the last 12 months. The particular report illustrates several sociodemographic issues presented below:

- ✓ individuals aged 55 and over showed the least motivation for online access to their health and medical records, 38% comparing to the number of younger respondents 59%–64%
- ✓ respondents who used the internet in their daily life more prefer online access comparing to those who use it often or sometimes, the proportion is 64% and 44%, accordingly
- ✓ White colar workers, students, and the self-employed showed the most interest in this access.
- ✓ The more time is spent on education, the more likely an individual would want this access: 51%–67% compared with 27% among those with the lowest education level

In summary, the academic and empirical literature reveals that a positive attitude reassures the successful adoption of eHealth. However, it is more complicated. The key principle in attitude is the linkage between attitude and behaviour, and since attitude pilots actual behaviour, the next section is devoted to actual eHealth literacy.

eHealth literacy. According to Eng (2002), eHealth literacy can be described as the use of Internet in order to improve the health. Another definition is presented by Norman and Skinner (2006) who state that eHealth literacy is the individual's capability to search, find and perceive the information from the electronic sources and also apply it for dealing the health issues. Paek & Hove (2012) stress the fact that it is not a static individual characteristic, but a competence which continually evolves. To be more precise, eHealth literacy is a great variety of skills that develops over time, and it must be comprehended, assessed and used for healthy choices, health risks avoidance and qualitative life attainment (Zarcadoolas, Pleasant and Greer, 2006). Parker and Ratzan (2010) note that eHealth literacy appears when the capability of those who require health information combines with the information need and complexity. An interesting perception is presented by Norman and Skinner (2006). The authors believe that eHealth literacy is comprised of six core literacies:

1. Health literacy. This skill pertains the interaction with the health system and involvement in suitable healthcare. An individual can read, comprehend and apply the health information.

2. Traditional literacy. This concept encompasses the ability to understand and read the text and the skill to speak and write consistently.
3. Computer literacy. It describes a general knowledge of computers, software, hardware, and how they work (Computerhope, 2018).
4. Information literacy. An information literate person is portrayed as the one who knows what available resources to incorporate in order to find specific information, is able to establish search strategies, and can select outcomes in order to extract the relevant information.
5. Media literacy. It is the capability to approach the media, to comprehend and critically assess different facets of the media and its content, and to produce communications in a variety of settings (European Commission, 2007).
6. Scientific literacy. According to Norman and Skinner (2006) scientific literacy presents the health information with research results in order to reveal the consumers how science is carried out.

The new concept for eHealth literacy is presented by Kayser et al. (2018) and is described as a model which hinges on inductive and systematic methods that aim to determine the full scope of elements essential for individuals attempting to comprehend and use eHealth technologies. Despite the fact that the concept of eHealth is heterogenous, one thing is clear – in these modern ages eHealth literacy is particularly crucial for several grounds. Firstly, health related skills serve as a help for a better understanding of widely accessible information. Secondly, it stimulates positive health outcomes (Manganello, 2008, Rasu, Bawa, Suminski, Snella and Warady, 2015). And thirdly, eHealth literacy empowers individuals to act responsibly regarding their better health (Schulz, Fitzpatrick, Hess, Sudbury-Riley and Hartung (2017).

1.3.4. Economic factors

Since digital transformation fosters the conventional healthcare models towards modern ones it is worth to elaborate on the economical benefits that stem from adapting eHealth. The academic literature (Jung and Loria 2010, Commission of the European Communities 2004, Ganesh 2004, González, Quesada, Urrutia and Gavidia 2006, Ross and Lin 2003) highlights the significance of eHealth implementation in reducing costs. Therefore, this section presents the economic factors which are singled out in three main sections: client, provider and other stakeholder (Table 7). Each part delivers a detailed list of factors.

Table 7. Economic factors

Client	Provider	Other stakeholders
Medical effectiveness	**Healthcare services**	**Increased productivity**
Reduced morbidity Avoided mortality	Reduced length of hospital stay Avoided hospitalisations Avoided hospital readmissions Avoided emergency room visits	Increased productivity of workers (less travel, less illness) Avoided cases of communicable diseases More efficient access to healthcare for special groups (prisoners, etc.)

Table 7. (continued)

Client	Provider	Other stakeholders
Employment	Avoided laboratory tests	
Increased earnings	Avoided patient transportation to healthcare facilities Avoided physician office/clinic visits	
Healthcare services and others	Avoided referrals	
Increased access to healthcare Increased health knowledge/ability to self-care Faster and more accurate diagnosis and treatment Reduced waiting and/or consultation time Increased medication adherence	Reduced length of consultation Increased medication adherence Increased knowledge transfer among practitioners Increased accuracy and faster diagnosis and treatment Increased patient satisfaction	
Decreased travel	Decreased travel and/or home visits for staff	
Increased employment/leisure/classroom time Avoided travel expenditures: transportation, accommodation, and other expenses Decreased risk of job loss: less time away from work for travel	Increased employment time (productivity) Avoided travel expenditures: transportation, accommodation	

Source: Dávalos, French, Burdick & Simmons (2009), p.939.

Considering the client's perspective, traditionally, medical effectiveness is related with health improvement. Many studies focus on such health outcomes as: the level of blood pressure (Fonda et al. 2007, Abrahamian, Schueller, Mauler, Prager, & Irsigler, 2002), daily activities (Finkelstein, Speedie, & Potthoff, 2006) or mortality (Dávalos, French, Burdick & Simmons, 2009). Besides medical effectivenes, the decrease of travel costs is also a widely studied issue as a benefit of eHealth. It is useful if a person lives in a remote area. Moreover, eHealth services are valuable for caretakers who have patients who are disabled, elderly or children. Hence, eHealth reduces travel costs by utilizing communication technologies and academic literature highlights this fact (Schaafsma, Pantazi, Moehr, Anglin & Grimm, 2007, Harper, 2006). Seeking for the diagnosis and treatment requires refusal of leisure time, worktime and reduces the wages at the same time. In this context, it can be noted that eHealth enables to avoid the waiting time for consultations (Baldwin, Clarke, Hands, Knott, & Jones, 2003). Additional contribution of eHealth is the medication adherence, and patients' ability of self-care (Piette et al.,2000, Dayer, Heldenbrand, Anderson, Gubbins, & Martin, 2013).

Regarding the economic factors from providers' perspective it is worth highlighting that one of the major economic benefits is avoidance of unnecessary healthcare services. Academic studies accept the fact that eHealth stimulates the reduction of emergency department visits (Lehmann, Mintz, & Giacini, 2006, Malasanos, Burlingame, Youngblade, Patel, & Muir, 2005), home visits (Myers, Grant, Lugn, Holbert, & Kvedar, 2006), hospital stay duration (Benatar, Bondmass,

Ghitelman, & Avitall, 2003), the length of consultations (Daucourt, Petitjean, Chateil, & Michel, 2005), and the number of hospitalizations (Myers, Grant, Lugn, Holbert, & Kvedar, 2006)

Dávalos, French, Burdick & Simmons (2009) have a consensus that basing on a comprehensive review of the academic literature there is a noticable gap within the economic evaluations of the digital tools contribution. The shortage of long-term studies is a major challenge. The main issue of scarcity of long-term studies can be explained by the fact that eHealth services per se are quite new. Moreover, the lack of appropriate data undermines the quality and soundness of economic evaluation. In addition to this, there are also no obtained consensus of united guidelines or methodology to conduct such studies.

1.3.5. Organisational factors

The felicitous accomplishment of an eHealth system is impacted by the operating environement and its dynamic interaction with technology (Fanta and Pretorius, 2018). Rippen, Pan, Russell, Byrne & Swift (2013) explain the concept of operating environment as the organisational settings that have an impact on the adoption and the eHealth technology use in healthcare facilities. The organisational factors are specified in Table 8.

Table 8. Organisational factors of eHealth implementation

Organisational factors	Descriptions
Organisational structure	Reconciliation of different healthcare groups to operate together and attain the organization goal (Lluch, 2011).
Information culture	It comprises of the values and regulations of an organisation, end-users' practices in the use of information and technology (Aqil, Lippeveld & Hozumi, 2009)
Resources	Approachability of ICT infrastructure, financial and human resources (Aqil, Lippeveld & Hozumi, 2009).
Management support	The support and encouragement of top management that encompasses the stimulation of system use, understanding the advantages of the system, allocating resources and the purpose to see customers' satisfaction using the systems (Al-Mamary, Shamsuddin, & Aziati, 2014).
Organisational policy	The method assuring extrinsic and intrinsic strategic sequency while exploiting technology (Cresswell, Majeed, Bates & Sheikh, 2012)
Workflow processes	The method by which operating processes are administered, arranged and executed by users (Lluch, 2011).

Source: Fanta and Pretorius, 2018

Meanwhile, Aqil, Lippeveld & Hozumi (2009) remind that healthcare teamwork in the health organisation which is affected by the practices, values and resources of that organisation plays an important role in transfering the good practice of eHealth to the patients. Successful implementation of eHealth also depends on the culture of the organisation, the resources of finances, materials and people (Aarts, Peel & Wright, 1998).

Undoubtedly, educated and trained health workers, as well as fixed assets consist a part of the health system. Moreover, it is important to highlight the fact that technological progress makes a huge impact on the medical institutions' capital and old gadgets become outdated when the new and improved technologies emerge. Corresponding this fact and eHealth tools prevalence, medical institutions should shift not only the traditional medicine thinking but also the technologocial boundaries. Revoliutionary advances in medical insitutions should go hand in hand. Modern technological infrastructure ensures a continuous development of healthcare providers' competence, as well as a better and more accurate treatment.

1.3.6. Health belief factors

Health consciousness. Health-trelated encouragement to upgrade health and prevent disease is refered to as the primary cause of health behaviour in most academic studies (Newsom, McFarland, Kaplan, Huguet, & Zani, 2005). The way people understand their health status is impacted by a great variety of factors, which could be socioeconomic, cultural, and/or environmental conditions. The common sense is this (Eurostat, 2018): "Not surprisingly, the older you get, the lower is the perception of being in good health — this is the same for both women and men" (p.7). According to the report "The Life of Women and Men in Europe" (2018), it can be noted that of those who are aged 16 to 44, 87% of men and 85% of women in the European Union in 2016 felt that they were in good health. The number decreased with the higher age: 65% of men and 62% of women whose age ranges from 45 to 64, and for those aged 65 and over, to 42% and 36%, respectively. In almost all Member States, a larger proportion of men than women had a perception of positive attitude towards their health. What is interesting is that this difference increases with age.

Jayanti and Burns' (1998) define health consciousness as "the degree to which health concerns are integrated into a person's daily activities" (p.10). Health conscious patients are familiar and in charge of their wellness, and they are encouraged to improve their health by applying healthy behaviours (Newsom, McFarland, Kaplan, Huguet and Zani, 2005). Moreover, health conscious individuals are aware of the consequences and worry about their health, therefore, they are motivated to improve it (Ahadzadeh, Sharif, Ong and Khong, 2015). Hong (2009) distinguishes five groups of research regarding the subject of health consciousness:

1. involvement in health behaviours;
2. psychological consideration to individual's health;
3. health information searching and usage;
4. personal obligation;
5. health motivation.

Based on these five groups, health-conscious individuals are responsible for their health, involve themselves in such activities like health information seeking in a great variety of sources, and finally, apply this knowledge in future behaviour. According to Iverson and Kraft (2006) and Michaelidou and Hassan (2008), individuals who are health conscious centre their attention on health-related topics, search information and take preventive actions. Moreover, Chen (2013) notes that

health consciousness is a significant psychographic factor that serves as a help to forecast health attitudes and behaviours. Forthofer and Bryant (2000) claim that people who are more health conscious are referred to as "targets of greatest opportunity" (p.37) since they are more likely to get involved in new and healthy activities. Research also offers the idea that health conscious individuals are more willing to try new healthy products since they search for ways and methods that enable them to control their health (Naylor, Droms and Haws, 2009). People who are health conscious are more preventive and open to new medical options comparing to those who are stated as less health conscious (Dickinson and MacKay, 2014, Dutta-Bergman, 2004).

According to Ahadzadeh, Sharif, Ong and Khong (2015), research of the dimension of health consciousness impacts health-seeking behaviour while health consciousness positively impacts health-related Internet use. The significance of health consciousness as a predictor of the adoption of communication channels for health information searching is discussed by Dutta-Bergman (2006). This could be explained by the solid argument of Moorman and Matulich, (1993) who convince that health consciousness increases the quantity of information about health acquired from such media sources like radio and television programs, newspapers, books, and magazines. Concerning the same notion, Basu and Dutta (2008) claim that health conscious people prefer participating in both communities – offline and online. But today the attention mainly is concentrated at the internet and according to Ahadzadeh, Sharif, Ong and Khong (2015) the Internet has given the opportunity for people to be active in taking care with their health through searching the health informotaion via electronic devices. Hence, it can be assumed that individuals who are health conscious prefer all kinds of health information sources (Gould, 1990) and easily engage in health searching behaviour. Of course, they are also highly motivated to maintain a healthy lifestyle.

Perceived threat. Perceived threat is one of the construct of Health Belief Model (HBM). The HBM suggests that trust in individual threat, in conjunction with the effectiveness of introduced behaviour, forecasts the probability of involving in that behaviour (Kim and Park, 2012). Basically, individuals' perceived threat is evaluated by two domains: perceived seriousness and perceived susceptibility. The study of Kim and Park (2012) concluded with the results that perceived threat significantly impacts health individuals' behavioural intention and attitude. The model presented by McKinley and Ruppel (2014) involved perceived threat as a construct which directly effects behavioural intention. Mou, Shin and Cohen (2016) explain the antecedents of perceived threat in this way: perceived severity are the consequences if the threat realizes, while perceived susceptibility is the individual health-related threat. Since HBM notes that health behaviour hinges on the level to which individuals consider they are vulnerable, and since their perceived suscepatibility and vulnerability is high, they are more likely to take preventive steps against their health threat (Mou, Shin and Cohen, 2016). Hence, it could be assumed that a higher level of susceptibility to one or several health threats is more likely to raise individuals' intentions to accept eHealth services.

According to Sun, Wang, Guo and Peng (2013), if individuals who search for health information refer to themselves as those who are more likely to suffer from a disease because of not taking responsibility to obviate a health-linked threat, they are more likely to involve in digital health services in order to increase their health-seeking behaviours and ability of self-management. The study of Mou, Shin and Cohen (2016) showed that the use of online health information services is health-related behaviour and is coherent with the Health Belief Model, while health threat is considered as a significant influential factor to this behaviour.

1.3.7. Security factors

According to Sahama, Simpson and Bill (2013), the term "privacy" is not fully defined since it hinges on cultural variables. Information privacy involves the gathering, surveillance, usage and disclosure of personal data. Hence, it is easy to identify any individual when operating such sensitive information. Considering health information sensitivity, technological options are frequently proposed. But one thing is worth to specify that the majority has the wrong perception. Such supporters assume that the provision of information security is a sole technological issue. Sahama, Simpson and Bill (2013) note that it is significant to consider the fact that health information is disposed by people, so it is a continuous interaction between the information user and information systems. Therefore, supplementary security issues should be taken into account. And these could embrace the trainings, education, policy and practices of security implications for all stakeholders.

Moreover, this idea is supported by the European Union Agency for Network and Information Security (ENISA, 2015): "A very significant priority for ensuring security in eHealth appears to be access control, as it is the instrument to control data protection – both in terms of integrity and privacy - and ensure that the user who has access to a specific information is well-trained and able to use it efficiently for the appropriate purpose" (p.29). The research presented by Healthcare Information and Management Systems Society (2015) have proved the fact that cyber incidents related to eHealth security can have a tremendous societal influence. In addition to this, a recent 2015 ENISA survey on Critical Information Infrastructures showed that 12 out of 18 Member States that participated in the questionnaire refer to healthcare as a critical field. With this in mind, all suitable measures in order to secure health information technologies systems and assets should be incorporated.

The landscape of EU data protection has currently been transferred into the unified document of General Data Protection Regulation (GDPR). This new legal safeguard for EU member states data privacy has become applicable in 2018. This regulation exerts a profound influence on processing health data since it enables the establishment of explicit consent for operating with the subject's personal and sensitive data.

1.3.8. eHealth policy

eHealth is the priority for the European Commission. Hence, there are three distinguished activities (ENISA, 2015):

1. To enrich citizens' health by offering health-related information accessible – among countries when significant using eHealth tools.
2. To reach the eHealth tools' characteristics: user-friendly, more effective and widely accepted by involving patients' healthcare specialists in strategy and implementation.
3. To enhance healthcare quality and availability by incorporating eHealth into health policy and harmonize the EU members' financial, political and technical strategies.

The European Union proposed an eHealth plan for the period 2012–2020 which aims to (Europe Commission, 2012):

- ✓ Elucidate legal terms of eHealth;
- ✓ Assure superior interaction between systems;
- ✓ Supply support and education for both patients and healthcare professionals;
- ✓ Present patient-centric technologies and more personalised approach to medicine;
- ✓ Propose a free of charge legal suggestion for start-ups and entrepreneurs of Information and Communications Technology.

During the eight-year term, the European Commission assigns €8 Bn and propose a great variety of initiatives, which contain:

- ✓ Foster eHealth to citizens;
- ✓ Propose legal management of cross-border telemedicine;
- ✓ Evaluate productivity attainment, cost–benefits, business models;
- ✓ Sponsor innovation, development and research.

eHealth education for patients and medical workforce. Digital competencies have been already determined as core skills which health professionals must hold in order to supply the services that meet the present and future population needs (World Health Organization, 2013, Ross, Stevenson, Lau and Murray, 2016). Moreover, strategies for future health specialists' education should be taken in mind. But the existing workforce should not be left aside. Therefore, the current medical workforce should be incorporated in scaling up their digital skills via initial education. Hence, Melchiorre, Lamura and Barbabella (2018) consolidate with the importance of education by acknowledging that: "a cultural acceptance to change should be based on the provision of education and training to patients, family caregivers and health professionals on digital health literacy, which contribute in a complementary way to achieve patient-centred care, empowerment and self-management" (p.17).

In 2017, Digital Skills for the Health Workforce: EU*US eHealth Work Project was presented in Malta. The substantial aim of the EU and US collaboration stems from the demand for eHealth skills development and deployment, also training programs. Hence, the four-fold goals from this dualistic collaboration in workforce development are:

1. To reach the supply of health professionals that are highly proficient in the use of eHealth and have digital skills;
2. To insure that current and future health workforces have sufficient skills in eHealth;

3. To support the collaboration between the public and private sector eHealth entities for investing time and financial resources into developing, using, and implementing eHealth;
4. To harmonize the standards, cultivate competencies and generate useful tools to sponsor this work.

Moreover, the evidence that eHealth training and coaching stimulates the use of eHealth is approved by Wootton (2012), Talboom-Kamp, Verdijk, Kasteleyn, Numans and Chavannes, 2018). The need to develop eHealth users' skills is also highlighted by Viswanath et al. (2013), McAuley (2014), Feng and Xie (2015), Latulippe, Hamel and Giroux, (2017). In conclusion, the massive expansion of eHealth technologies should align with the training and education intensity, quality and scope.

Financial incentives and legislative framework. The academic researches have shown that financial injections from the government to eHealth can stimulate the solution to incorporate eHealth in a daily routine (Fontaine, Ross, Zink and Schilling, 2010, Police, Foster and Wong, 2010, Lluch, 2011, Benavides-Vaello, Strode and Sheeran, 2016, Ross, Stevenson, Lau and Murray, 2016). Financial incentives can comprise of pay-for-performance/results initiatives (Lau et al., 2012, Lluch, 2011), financial sponsorships for medical institutions (Ludwick and Doucette, 2009), free access to devices or services (Melchiorre, Lamura and Barbabella, 2018), reimbursements for use (Hsieh and Lin, 2011, Lau et al., 2012, Melchiorre, Lamura and Barbabella 2018).

However, Melchiorre, Lamura and Barbabella (2018) agree that the shortage of adequate financial incentive mechanism in result negatively influences the probability to propose suitable internal and external assessments of eHealth. This may restrain the opportunity of development and innovation of new eHealth gadgets (Black et al., 2011, Gemert-Pijnen, 2011).

Legislative mandates are also potential and effective motivators to adapt eHealth (Anderson, 2007). For instance, the WHO (2018) presented a document "Harnessing E-Health for Improved Health Service Delivery in the Western Pacific" with the strategy to present incentives such as government-led investment or tax policy in order to foster the uptake of eHealth tools. These steps are supported by the clear value preposition. Melchiorre, Lamura and Barbabella (2018) stress the importance of clear and dedicated legislation framework. Otherwise, it would be taken as the barrier for eHealth adoption. What is interesting, a recent WHO (2016) questionnaire on eHealth demonstrated that 70% of European countries issued a national eHealth policy and 80% of them operate with legislation for privacy protection of electronic health records. However, 69% of these take care of legislation regarding its use.

The concluding remark of clear legislation framework importance is taken from the report "From Innovation to Implementation" (WHO, 2016):

> The importance of the development of legislation in accordance with technological and social developments is a crucial factor for the success of national eHealth implementation and further focus is needed to harmonize

legislation in the Region in support of cross-border health information exchange. (p.85)

eHealth promotion. Health promotion is the concept which is strongly linked with the national health initiatives incorporating healthcare system basing on the principles on community inclusions, coordination among the sectors, equitable distribution and suitable technology (Kumar & Preetha, 2012). The activity of health promotion per se can be diverted towards preferencial health conditions encompassing a major part of population and fostering diverse interventions. For instance, the significance of eHealth is proved by the idea of Neuhauser and Kreps, (2003) who state that "Many countries have set national population health goals that involve promoting healthier lifestyle behaviors" (p.9). The authors also propose the recommendations for eHealth promotion improvement:

1. Improving the theoretical foundation of health behaviour frameworks that lead health communication interventions;
2. Develop more personalized and contextual communication;
3. Establish communication for mass media attainment and the influence of interpersonal relationships;
4. Increasing communication interactivity.

Moreover, Hornik (2002) and Napoli (2001) propose that eHealth tools can benefit from the synergetic advantages of mass media that influence the changes on the institutional, individual and social levels. For instance, the communication of adjusted health information through websites has the probability to build the bridge between mass media and interpersonal relationships (Kreps, 2008, Neuhauser and Kreps, 2003). Kreps and Neuhauser (2010), note that interpersonal approaches, for instance, live-chats and customer support, are majorly more effective than mass media for modifying individual behaviour, but the drawback of this movement is due to its higher costs and limited population reachment.

Generalization of the first part of the thesis. The first part of the thesis is dedicated for a systematic and comparative analysis of the concept of eHealth, customer behaviour theories and factors influencing customer behaviour in eHealth. Hence, traditionally, e-health is defined as the usage of information and communication technology and mainly, the Internet, in order to improve health and healthcare. Moreover, eHealth is a dynamic concept and since the concept of eHealth is defined as multifaceted and illustrates a broad variation of potential conceptualisations, the first part of the thesis presents the eHealth constituents which include: short messaging service, electronic health records, wearable devices, mobile health apps, telehealth, and a web-based system.

Another significant issue that is analysed is the advantages and disadvantages of eHealth. Considering the benefits of eHealth these issues can be exemplified: digital technologies may delegate patients to enhance their sense of responsibility, help to increase their control over disease by supplying patients with attitudes, self-awareness, and understanding of how to improve their life quality; eHealth services can provide, via online support groups, the confidence in conducting partcipants' medical condition, simplify the doctor–patient communication, reduce travel costs for both sides, mitigate medical errors and encourage patients to play an active role in

taking care of their health. Regarding the disadvantages, after theoretical investigation it was found out that quality related with health information is questionable, and therefore, it can be misinterpreted or misleading and endanger health outcomes and conclude in inappropriate requests for clinical interventions. Some authors highlight that misleading information can result in morbidity, anxiety or even mortality. What is more, some socioeconomic groups can have limited access to the internet. In addition to this, health care professionals may be confronted with unfamiliar information from patients that can be contradictable from their recommendations or may offer treatment that is unavailable. Despite the disadvantages of eHealth, Barlow, Wright, Sheasby, Turner and Hainsworth (2002) Ouwens, van der Burg, Faber and van der Weijden (2017), Groenewegen, Tofighy, Ryvlin, Steinhoff and Dedeken (2014) believe that eHealth tools can support patients in such areas like self-management, symptoms monitoring, also help to adhere to the treatment and change heath behaviour.

Regarding the academic research of customer behaviour considering eHealth the attention was appointed to three main theories: health belief, innovation diffusion and technology acceptance. Generally, the health belief model states that individuals act to prevent the disease only if they consider it to have potentially serious consequences and if they believe that a particular action would mitigate the severity or stimulate positive outcomes. Hence, if the unwanted health consequence will not affect individual's life majorly, he/she will not be encouraged to keep away from it. While the diffusion of innovation theory aims to describe a process by which a novel idea or innovation disseminates over a social system over time. Generally, this theory puts empahasis on innovation as a representative of behaviour change. And the last theory that was chosen for analysis is the technology acceptance model which is initiated to expand the appropriate variables for better understanding of IT usage behaviour.

The last sections of the theoretical investigation discuss the factors influencing customer behaviour in choosing eHealth description. It is chosen to form groups of factors: technological, social, organizational, economic, health belief, eHealth policy, security, and behaviour of technology acceptance. Each factor group is distinguished with its peculiarities via past academic and practical researches and after this examination it was aimed to apply these factors for the empirical examination.

2. METHODOLOGICAL FRAMEWORK FOR EVALUATING FACTORS INFLUENCING CUSTOMER BEHAVIOUR IN eHEALTH USE FROM THE ECONOMIC POINT OF VIEW

Despite the fact that eHealth development has burgeoned since the XXI century, the recent years have stressed the significance of resolving the obstacles for its effective implementation. Karsh (2004), Pagliari (2007), and tBergmo (2015) note the fact that he process of eHealth implementation is considered as a complex incorporation but special attention should be appointed to the perception of factors related to individuals and organizations, for instance, the stakeholders' resistance to integrate new technologies into their daily lives. In this context, it is also worth mentioning that without understanding which factors stimulate eHealth adoption, this technology will proceed to be unwittingly complicit in the routines of individuals and organizations.

Hence, this particular section is dedicated to the dichotomic objective that composes of these constituents: firstly, to compose a research model for the examination of the factors that have an impact on customer behaviour in choosing eHealth use, and secondly, to prepare a methodological framework which evaluates the factors that have the biggest impact on customer behaviour in choosing eHealth use. Valuation is inherently a judgmental and human activity (Amidu, 2011).

What is interesting, behavioural economists who hinge on psychology more than principles of conventional economics in order to elucidate the customer behaviour have few theories. The major one is the belief that patients and medical practitioners are predictably irrational in the process of decision making (Ariely, 2008).While the adherents of conventional economics assume that individuals are rational actors. According to Hostetter and Klein (2019), "Without an acknowledgment of this irrationality, interventions designed to encourage patients to adopt healthy behaviours or incentivize physicians to adopt evidence-based guidelines or deliver better coordinated care will, at best, achieve suboptimal results, behavioural economists believe" (p.1). The same authors consent that the comprehension from behavioural economics have the probability to improve the attempts to capture the patients, doctors and providers to use eHealth.

As previously alluded in the theoretical section, the customers' behaviour in eHealth use is influenced by heterogeneous factors. Moreover, it appears that this field is highly unexplored. It seems a little incomprehensible that given such fundamental practical relevance of eHealth, academic publications come short in this field, especially of its implementation issue. Nevertheless, after the investigation of scarce academic approaches it has also emerged that a consensus for evaluation of factors impacting customer behaviour in eHealth use has not been reached. Therefore, this thesis aims to close the academic gap in this particular field.

2.1. Methodological framework for the evaluation of factors influencing customers' behaviour in eHealth use

As previously discussed, there is a wide spectrum of recent foreign academic and empirical studies on eHealth but it is interesting that the existing literature sheds

the light on scarce elaboration of the eHealth implementation process. Therefore, further examination is in demand.

A broader analysis would contribute to offering not only sophisticated but also applicable models and proposals which could serve as a tool to enhance the behaviour of eHealth use. Since there are a lot of avenues for future investigation of eHealth use behaviour, this particular study aims to propose a methodological framework for identifying the factors that have an impact on eHealth use. In this context, Figure 5 presents the main steps with the descriptions for an evaluation of factors influencing customer behaviour in eHealth use.

The first step is identification of the factors, the second step groups the 39 factors. In order to evaluate the factors influencing customer behaviour in eHealth use a methodological framework with two sections was chosen: experts survey and public survey. The third step presents the weight coefficients of the factors influencing customer behaviour in eHealth use incorporating the experts' group valuation. And since eHealth services are appointed for a public use, the opinion of direct users is significant to identify. The last step is dedicated for the public survey which attempts to collect individuals' opinion regarding the factors that have influence in their behaviour of eHealth use.

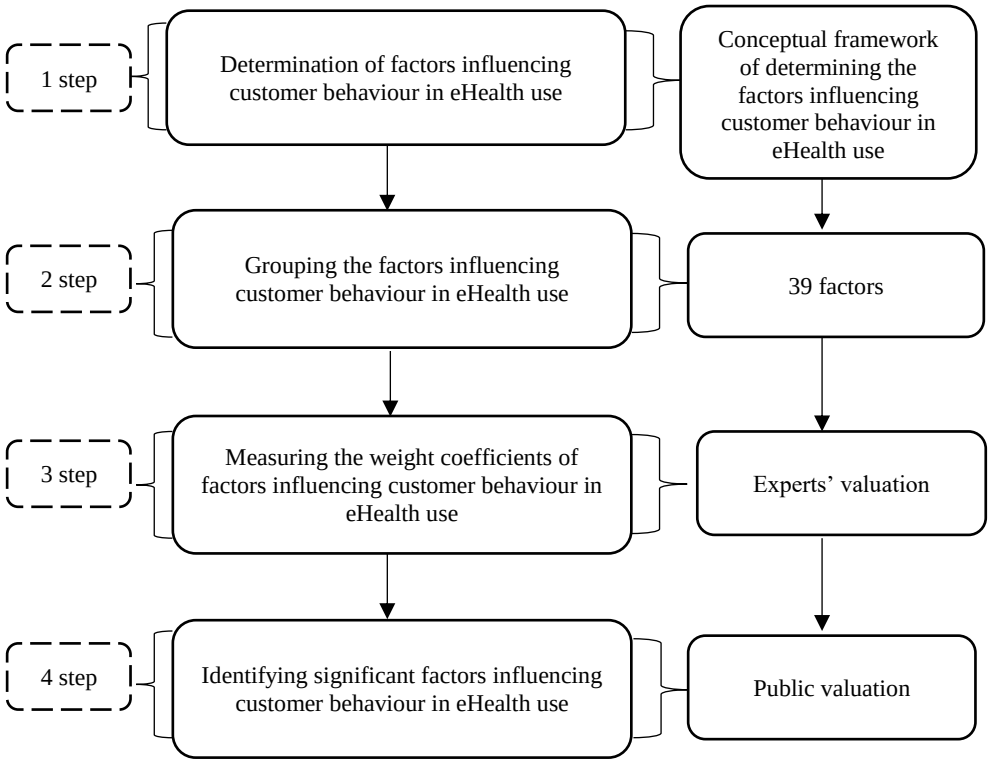

Fig. 5. Conceptual framework for evaluating the factors influencing customer behaviour in eHealth use

Fig. 6. Research model of factors influencing customer behaviour in eHealth use

The research model with the grouped factors in Figure 6 has been revised and modified with inclusions from previously announced works. This research study presents the framework (Figure 6) that stemmed from three basic models: Technology Acceptance Model, Health Belief Model and Diffusion Innovation Model, and factors from other past academic investigations. The origin and description of these models and factors are demonstrated in the theoretical part of the study work.

According to the research model, there are eight main sections distinguished that influence customer behaviour of eHealth use: technological factors, health belief factors, economic factors, security factors, behaviour of technology use factors, social factors, organizational factors, and eHealth policy factors. As it is visualized in the model above, each factor group consists of components (factors) originated after systemizing recent academic researches. Eight hypotheses are proposed for investigation.

Hypotheses

1. *Technological factors positively influence customer behaviour in eHealth use.*
2. *Social factors positively influence customer behaviour in eHealth use.*
3. *Behaviour of technology use factors positively influence customer behaviour in eHealth use.*
4. *Economic factors positively influence customer behaviour in eHealth use.*
5. *eHealth policy factors positively influence customer behaviour in eHealth use.*
6. *Security factors positively influence customer behaviour in eHealth use.*
7. *Health belief factors positively influence customer behaviour in eHealth use.*
8. *Organisational factors positively influence customer behaviour in eHealth use.*

In order to evaluate the factors influencing customer behaviour in eHealth use a methodological framework with two sections was chosen: experts survey and public survey (Figure 7). See the scheme of methodological framework below. For the expert survey personally addressed invitations were selected to collect the data. Experts were asked to fill in the pairwise comparison values survey with eight group factors: technological, social, behaviour of technology use, economic, eHealth policy, security, health belief and organizational.

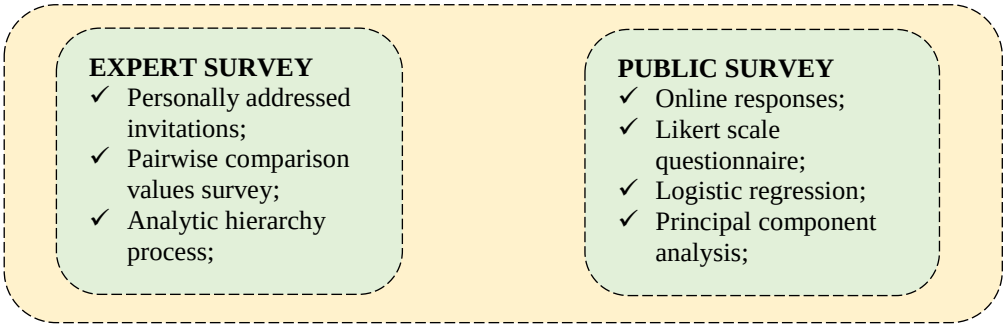

Fig. 7. Methods for model verification

A multidimensional method, particularly, analytic hierarchy process was incorporated into processing the experts' survey results. While the public survey was carried out via collecting online responses where respondents were asked to indicate their level of importance perception of closed ended questions which were rated on a 5-point Likert metric scale anchored by: 1 – not important, 2 – important, 3 – nor unimportant, nor important, 4 – important, 5 – very important. Logistic regression and principal component analysis were opted for the data processing.

2.2. Experts valuation of factors influencing customer behaviour in eHealth use

In mass surveys a large scale of information is gathered, but there is a doubt about the quality of the responses due to the fact that they lack information and motivation (Dorussen, Lenz and Blavoukos, 2005). The same authors admit that experts are more motivated and better informed.

The key principal of expert valuation method is that it enables the organization of problem with quantitative opinion assessment in a rational way and analysis of processing its results. The generalized expert opinion is taken as a solution to the problem, or a result. If a judgement is based on the expert evaluation method it is significant to evaluate the degree of opinions' compatibility. To do that, the multi-criteria evaluation method is usually applied.

Ramadurai and Becattini (2013) define experts thusly: "people with information about the technology of interest to the forecaster" (p.4). Generally, the technique of expert opinion considers that some individuals are more knowledgeable than others about a certain issue or topic. Hence, if you gather this information from the group of experts the results would surpass the outcomes gathered from a sole expert (Porter et al., 2011). According to Atkeson and Alvarez, (2018) experts are the individuals who predict information or describe the target issues. Hence, experts can be people who dispose long-term knowledge and specialized experience.Therefore, the more experts there are, the greater the economic, social, technical and other notions and perspectives acquired. It can be concluded that a single researcher would not be able to reach such results on his/her own. Hence, the reliability of evaluation depends on the competence, knowledge of experts and the number of experts. The competence of an expert is the level of qualification in a particular field.

The studies of Budge (2000) and Marks (2007) revealed the pros and cons of the expert survey method:

Strengths:

- ✓ Flexibility regarding topics and issues;
- ✓ Validity: experts enable a great variety of information sources in order to base their judgement;

Weaknesses:

- ✓ Asymmetric information among respondents;
- ✓ Subjectivity in judgement;

Another important aspect of expert surveys is sampling. According to Dahlberg (2007), it is significant to determine the experts and develop a personal contact in a relatively early stage of the overall procedure. Moreover, the studies proved the

personally addressed invitations to fill in the survey to be more effective than a basic letter with a link (Dorine, Nonnecke and Preece, 2003, Cook, Heath and Thompson, 2000). It stems from the fact that an individual believes that he/she is chosen regarding his/her experience and knowledge.

Moreover, building sufficient trust and credibility is also required for the active participation of respondents. "When it comes to the respondents' privacy it is, as always, important to be able to guarantee the anonymity of the respondents" (p.2) states Dahlberg (2007).

Logic sequence of expert data analysis. In order to maintain coherence in the expert data analysis, a logic sequence (see Figure 8) is presented.

The first step is to detect the expert number, which is important for data reliability. The second step is devoted to expert sample criteria. Expert sample criteria is composed of the experts' field, competence and work experience. The third step is to prepare the survey. The survey is consisted of 9 factor groups which were evaluated by the experts using pairwise comparison values. The fourth step is collecting and examining the experts' responses. The fifth step is to present the analytic hierarchy process. The sixth step is to calculate the experts' opinion agreement using the Kendall coefficient of concordance. Each stage is elaborated with clear explanations and formulas below.

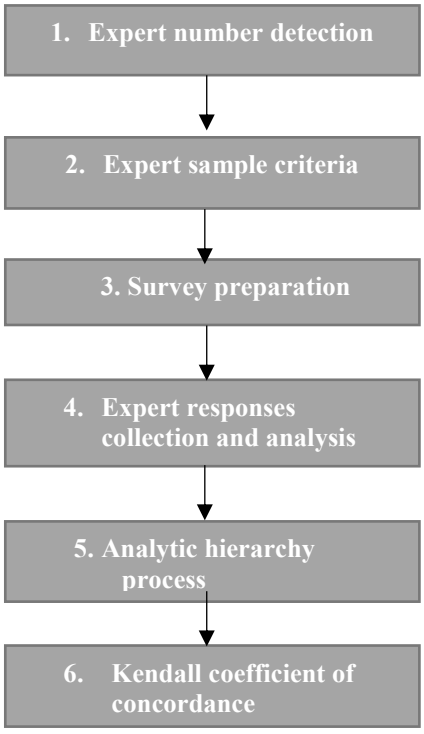

Fig. 8. Logic sequence of expert data analysis

Expert number. Selecting an approapriate number of experts is a significant task to consider since it resolves the reliability of the research. Traditional research methods present methodological solutions for a reasonable expert number. The theory notes that the number of experts and the reliability of aggregated opinions are characterized with quick extinct non-linear linkage. Figure 9 below presents the dependence on expert number and reliability of results. This reliability of results figure stemmed from Rudzkienė (2005).

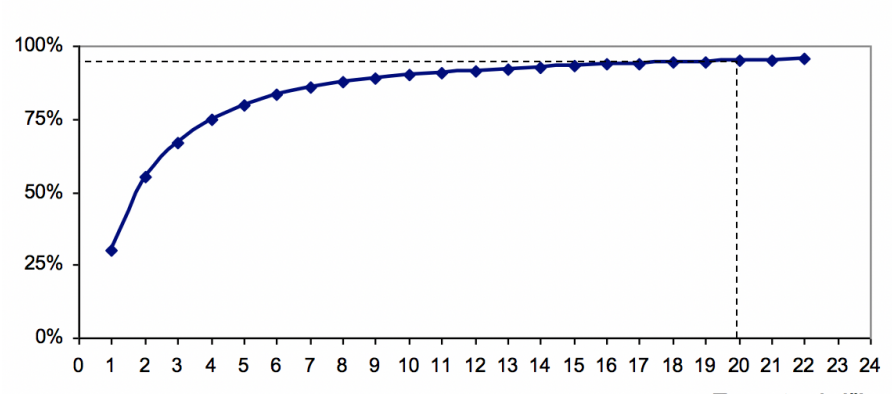

Fig. 9. Expert valuation standard deviation dependance on expert number
Source: Rudzkienė, (2005)

According to the upholders of this particular dependence, the number of experts should be selected from the interval (5–9). This idea is proved by Rudzkienė (2009), explaining that the highest results of reliability percentage is attained when the number of experts starts from 5 to 9. Moreover, it is seen from the graph that the reliability of results and the number of experts quickly diminishes. After setting a suitable number of experts, the second step is survey preparation process. An example of the questionnaire is presented in Appendix 1. The method for expert sample criteria is outlined below.

Expert sample criteria. Taking into consideration the expert valuation objectives it should be considered that the pool of experts for this research study should be chosen from the field of health. The greatest value stems from those who have knowledge in the research field. What is more, this study is conducted incorporating three conventional criteria adapted from Kardelis (2005). According to Kardelis (2005), the expert valuation method should be accomplished complying with ethical norms:

- ✓ Respondents' selection depends on their competence level;
- ✓ Respondents accept the participation in the questionnaire;
- ✓ Researcher does not influence the respondents.

Analytic hierarchy process. The Analytic Hierarchy Process (AHP) was introduced by professor Thomas Saaty in the 1970s. Since it is a multicriteria procedure, it is recommended to conform the priorities of the alternatives obtained from different criteria (Saaty, 2006). The AHP method demonstrates support towards pairwise comparisons of selected criteria that are assessed by the experts (Saaty, 2008). Regarding the pioneer of the AHP method Saaty (1980), the AHP method hinges on

the relative decision measurement on the comparison between the pairs. The essence of the method is to choose the most suitable criteria between the given ones.
The academic specialists also debate on the issue of pros and cons of AHP. Hence, the strengths and weaknesses are listed accordingly.

Advantages:

- ✓ Flexible, convenient, able to check for inconsistencies (Ramanathan 2001);
- ✓ Able to make a consensus of a group decision (Zahir, 1999);
- ✓ Method eliminates bias in decision forming (Kasperczyk and Knickel, 2004);
- ✓ A decision problem is decomposed into clear criterion parts (Macharis, Springael, De Brucker and Verbeke, 2004);

Disadvantages:

- ✓ In order the pairwise comparison method to be effective there should be an approapriate number of criteria to be presented, and sometimes it becomes overloaded (Macharis, Springael, De Brucker and Verbeke, 2004);
- ✓ The limitation of a 9-point scale because sometimes the respondent finds it difficult to distinguish among the importance, for instance 7 and 8;
- ✓ Aggregation procedure requires attention, time, thoroughness and precise inspection (Kasperczyk and Knickel, 2004, Karthikeyan, Venkatesan and Chandrasekar, 2019).

The algorithm of AHP comprises of 5 steps (Sorooshian, 2015):

1. Structural hierarchy projection;
2. Pairwise comparison matrices;
3. Weight determination;
4. Weight synthesis;
5. Consistency test.

Taking into consideration the method of pairwise comparison, experts compare the given alternatives $\{\theta 1, \dots, \theta n\}$ with each other.

$$A = (aij)n \times n; \quad (1)$$

where:
$aij = \omega i, \forall i,j=1,2,\dots,n, \omega j$
ωn $(n = 1, 2, \dots n)$ − priority vector,
$aij = a1, \forall i,j=1,2,\dots,n.$

The process of decision making depends on a numerical scale to evaluate the pairwise comparisons, which employs a numerical scale. The experts indicate how significant one factor is over another. The AHP scale starts from 1 to 9, where 1 indicates that factors are equal in comparison, and 9 signifies that one factor is much more important than the other (Saaty, 2008). When the respondent is not able to select between the given values, he/she can choose from the intermediate values which are: 2, 4, 6, 8. Table 9 outlines the numerical values with the explanations.

Table 9. The explanation of pairwise comparison values

Value	Explanation
1	two factors contribute equally to the objective
3	experience and judgement slightly favour one factor over another
5	experience and judgement strongly favour one factor over another
7	a factor is favoured very strongly over another
9	the influence of one factor over another is the highest
2, 4, 6, 8	sometimes one needs to interpolate a compromise judgement numerically because there is no good word to describe it

Source: according to Saaty (2008)

Salo and Hämäläinen (1997) affirm that the scale from 1 to 9 yield weights that are characterised to be uniquely dispersed. Therefore, a shortage of susceptibility comparing the criteria that are preferentially close to one another is seen. Basing on this observation, Salo and Hämäläinen, (1997) state that using a balanced scale the local weights are equivalently dispersed. In other words, equal distribution among local weights is obtained through a balanced scale.

Moreover, Franek and Kresta (2014) maintain the idea that in order to reach more confidence in the final results both should be incorporated – the linear and balanced judgment scales. Hence, the classical (linear) scale should be applied by default, while the balanced one for a higher degree of expert opinion consistency. Additionally, Goepel (2018) also proposes to accommodate the balanced scale along with the linear one since adapting balanced scales serves as a help to reduce experts' assessment inconsistencies. The table below concludes the specifications of linear and balanced scales.

Table 10. AHP scales adapted in the survey

Type of scale	Mathematical formula	Parameters	Approximate scale values
Linear (Saaty, 1980)	$s=x$	$x = \{1,2,...,9\}$	1; 2; 3; 4; 5; 6; 7; 8; 9
Balanced (Salo & Hamalainen, 1997)	$s = \frac{w}{1-w}$	$w = \{0.5; 0.55; 0.6; ... ; 9\}$	1; 1.22; 1.5; 1.86; 2.33; 3; 4; 5.67; 9

Source: Franek and Kresta, (2014).

The major benefit of AHP is that it enables to deal with inconsistencies explicitly (Hummel, Omta, van Rossum, Verkerke & Rakhorst, 2001). It provides the ratio of inconsistency which specifies the level to which each pairwise comparison is coherent with the remainder of the chosen comparisons. Hence, after the completion of experts comparison the form of standardised matrix has to be filled in and the arithmetic mean is computed for each line. After this procedure the major element is detected. But the important issue – consistency ratio (CR) should be taken into account. Hence, it should be reviewed whether the experts' assessments are

trustworthy and logical. Pairwise comparison matrix is regarded to be consistent if $a_{ik} = a_{ij}a_{jk}, \forall i,j,k$. In other words, there is a distinguished priority vector w=(ω_1,...,ω_n) that $a_{ij} = \omega_i\omega_j$, $\forall\ i,\ j$. Hence, the suitability of the AHP method hinges on the Consistency Ratio. Aksenov, Blaschuk and Chernuhin (2014) state that CR should be less than 0.2.

Consistency measurement depends on the eigenvector maximum (λ_{max}). The closer λ_{max} gains with n, the more consistent are the results (Setiawan, Sediyono and Moekoe, 2014). For instance, if expert pairwise comparison matrix A is consistent, then λ_{max} =n. Hence, there are three-fold steps to reach consistency ratio:

1. Firstly, the largest eigenvector is calculated. It is counted in each matrix column. The highest value of matrix eigenvalue will not be less than *n* value

$$\lambda_{\max} = \sum_{j=1}^{n} \frac{(A \cdot v)_j}{n \cdot v_j}; \quad (2)$$

where:

λ_{max} – the largest eigenvalue of matrix A,

n – number of independent rows in the matrix,

v_j – eigenvalue of the matrix.

2. Consistency index for each matrix calculation. The method of AHP calculates the consistency of each individual expert evaluation within the Consistency Index (CI) (Saaty, 2012).The formula is below.

$$CI = \frac{(\lambda_{\max} - 1)}{(n-1)}; \quad (3)$$

where:

CI – consistency index,

n – number of alternatives,

λ_{max} – largest eigenvector.

3. To determine the consistency ratio two elements are required – consistency index and random index (RI). A great variety of authors such as the AHP method introducer Saaty (1980), Lane and Verdini (1989), Forman (1990), Tumala and Wan (1994), Alonso and Lamata, (2006) computed and gained different indexes of RI but the differences stemmed from the different number of generated matrices that were involved in the procedure, as well as simulation methods. Hence, the RI value has been obtained through experiments using large sample quantities. Table 11 presents the RI values from the pioneer of AHP method Saaty (1980) and Alonso and Lamata (2006). The newer RI values resulted through estimating 500 000 matrices (Alonso and Lamata, 2004).

Table 11. Random index values

n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Saaty, 1977	0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.48	1.56	1.57	1.59
Alonso, Lamata, 2006	0	0	0.52	0.88	1.11	1.25	1.34	1.41	1.44	1.49	1.51	1.54	1.56	1.57	1.58

Generally, the formula below is applied to calculate CR:

$$CR = \frac{CI}{RI}; \tag{4}$$

where:
CR – consistency ratio,
CI – consistency index,
RI – random index (random index) for a matrix of order n.
Alonso and Lamata (2006) present the consistency ratio determination via a linear fit, with the formula below:

$$\mathrm{CR} = \frac{\lambda_{\max} - n}{2.7699n - 4.3513 - n}; \tag{5}$$

where:
λ_{max} – the largest eigenvalue of matrix A,
n – the number of independent rows in the matrix.

However, if the degree of inconsistency is higher than the determined limit, the matrix must be transformed into a consistent one. Obata, Shiraishi, Daigo and Nakajima (1999) named the method Method-S. The same authors and Davoodi (2009) propose the main steps for the application of Method-S:

1) Setting the priority weight vector $\omega = (\omega i)$ using the eigenvector method;
2) Comparing each value a_{ij} with the corresponding ratio of weights $\omega i / \omega j$;
3) Determining the most different element as inconsistent;
4) Replacing a_{ij} with $\omega i / \omega j$;
5) Estimating the priority weights from the modified matrix.

Firstly, the pairwise comparison matrices of experts that accomplish the consistency condition of CR< 0.2, the cumulative experts' evaluation is calculated. The aggregated experts' evaluations are figured out applying the geometric mean:

$$a_{ij}^{A} = \sqrt[n]{a_{ij}^{1} \times a_{ij}^{2} \times \ldots \times a_{ij}^{n}}; \tag{6}$$

where:
a^{A} – assessment of aggregated element that belongs to *i* row and *j* column. *ij*
n – number of pairwise comparison matrices composed by one expert.

To calculate the weight of *j* alternative it is recommended to implement the formula below:

$$\omega j = \frac{\sqrt[i]{\Pi_{j=1}^{i} a_{ij}^{A}}}{\sum_{j=1}^{i} \sqrt[i]{\Pi_{j=1}^{i} a_{ij}^{A}}}; \quad (7)$$

where: ωj – weight of *j* alternative

Moreover, Goepel (2013) suggests estimating the agreement on priorities between experts. This ratio is named as the consensus index. Traditionally, the ideal consensus is a unanimous agreement among all priorities of experts, but this type of consensus is a utopian one (Tapia Garc´ıa, del Moral, Martínez and Herrera-Viedma 2012). Such scholars like Choudhury, Shankar and Tiwari (2006), Ben-Arieh, Easton, Evans (2009), and Xu (2009) agree that consensus is an important aspect in group solutions. According to Dong, Hong and Xu (2010): "Classically, consensus is defined as the full and unanimous agreement of all the decision makers regarding all the possible alternatives" (p.281). But there are researchers who state that a complete agreement is not needed in real life cases. Therefore, regarding practical issues, the concept of "soft" consensus degree was introduced (Herrera-Viedma, Herrera, Chiclana, 2002, Alonso, Chiclana, Herrera, 2007). What is more, the consensus index shows the homogeneity or priorities among the experts and can be interpreted as the value of overlap between the preferences of the expert group (Goepel, 2017).

The values of consensus index vary from 0 to 100% and determine the degree among the participants. Hence, the consensus index is obtained using the formula below:

$$S^{*} = \frac{1/exp(H_{\beta}) - exp(H_{\alpha}min)/\exp(H_{\gamma}max)}{1 - exp(H_{\alpha}min)/exp(H_{\gamma}max)}; \quad (8)$$

where:

S^{*} – consensus index,

H_{α} – Shannon alpha diversity,

H_{β} – Shannon beta diversity,

H_{γ} – Shannon gamma diversity.

Notwithstanding the fact of shortages of the AHP it is considered to be an effective and instrumental method (Sorooshian, 2015). Moreover, it is developed for appropriate techniques in order to prioritize the issues of management problems (Cabola, 2010). Moreover, it is an appealing technique for major policy solutions therefore, it is applied by corporations and governments (Ramanathan, 2001).

AHP burgeoned for scrutinizing the diversity of decisions concerning the fields of economic, technology, and socio-politics (Hummel, Omta, Rossum, Verkerke & Rakhorst, 2001). Taking into consideration the aim of the study, the AHP method is

a well-suited method since it enables to derive collective judgements and stimulates the comparison of quantitative alternatives.

Kendall coefficient of concordance. The Kendall coefficient of concordance (W) is the index which measures the agreement among judges (experts) who evaluate the given set of objects (Legendre, 2005). The coefficient ranges from 0 to 1. The result of zero means that there is no agreement at all between raters, while a coefficient of 1 delivers perfect agreement. For instance, there can be one of these two given cases:

1. If the coefficient W equals to 0, this means everyone ranked the list differently.
2. If the coefficient W equals to 1, then each expert ranked the list in the same manner and order.

The algorithm for calculating the Kendall coefficient of concordance is presented below:

Firstly, the mean value of total ranks is calculated using the formula:

$$a = 0.5m\,(k + 1); \tag{9}$$

Where:
k – the total number of objects being ranked,
m – the number of experts.
Secondly, the sum of squared deviations, S, is defined using this calculation:

$$S^2 = \sum_{j=1}^{k} \left(\sum_{i=1}^{m} x_{ij} - a\right)^2; \tag{10}$$

Finally, the formula for Kendall coefficient of concordance is presented below:

$$W = \frac{12S}{m^2(k^3-k)} \quad ; \tag{11}$$

Where:
S – the sum of squared deviations,
m – the number of judges,
k – the total number of objects being ranked.

According to Legendre (2010), the term “judges” or “experts” is traditionally adapted in the social sciences where individuals are responsible for ranking and listing the items. Another important element of the Kendall coefficient of concordance is the Pearson chi-square which shows whether the experts’ opinion is compliant or not. And the formula is presented below:

$$\chi^2 = W \times m(k-1); \tag{12}$$

Where:
x^2 – Pearson chi-square,
W – Kendall coefficient of concordance,
m – experts number,
k – the total number of objects being ranked.

2.3. Public valuation of factors influencing customer behaviour in eHealth use

Being academically analytical, the global and deeper knowledge on the factors influencing customer behaviour in eHealth use is needed. Therefore, it is chosen to investigate the public opinion incorporating public survey.

The survey method is the prevalent approach for data collection. Surveys can be administered via a telephone, face-to-face, or e-mail. Technology, in particular, has revolutionized the approaches of how quoestionnaires are administered (Evans and Mathur, 2005). Hence, the most popular form of collecting survey data is online surveys. The authors Evans and Mathur (2005) highlight the major strengths of online surveys:

- ✓ Global reach. Since the majority of society has internet access, it is a simple and cheap method to reach respondents from different parts of the country.
- ✓ Flexibility. The ability to conduct surveys in several formats.
- ✓ Speed and timeliness. Data collection is characterized in a time-efficient manner. The speedy content transmission enables quick information downloads and enhances the information scope.
- ✓ Convenience. Individuals are enabled to choose a suitable time for answering the questions.
- ✓ Ease of data entry and analysis. The majority of templates provide real-time respondents' data for the analysis.
- ✓ Question diversity. Online surveys enable to prepare miscellaneous questions: open-ended, close-ended, multiple response, single response.
- ✓ Low administration costs. The costs are divided this way – administration and preparation. Today specialized questionnaire websites offer the service of automatic data transmition to a database in a coordinated manner that diminishes the costs.
- ✓ Ease of follow-up. It is the service of sending follow up reminders to a potential respondent.
- ✓ Required completion of answers. The questionnaires can be constructed in a way that the respondent must keep the survey sequence and cannot skip a question.

Logic sequence of public survey data analysis. In order to keep coherence in the public survey data analysis logic sequence is presented below (Figure 10).

The first step considers the sample size detection and presents the adapted formula (13). The second step is questionnaire preparation. The public survey contains 9 factor groups which were asked to evaluate by respondents using a 5-point Likert scale. The third step is logistic regression explanation and the final step is principal component analysis description.

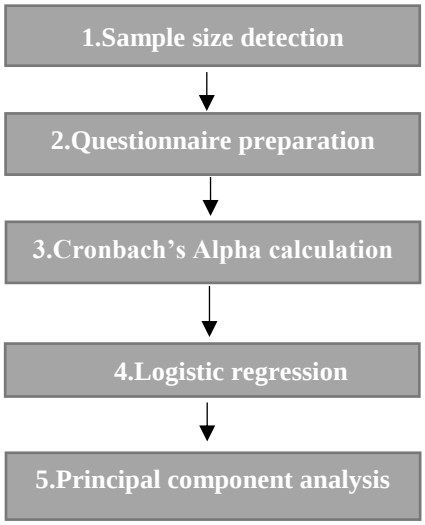

Fig. 10. Logic sequence of public survey data analysis

Sample size. Conducting a public survey requires the calculation of sample size. The following formula for the sample size is adapted from Daniel (1999):

$$n = N*X / (X + N - 1) ; \quad (13)$$

where:
X = Zα/22 *p*(1-p) / MOE2, and Zα/2 is the critical value of the Normal distribution at α/2 (e.g., for a confidence level of 95%, α is 0.05 and the critical value is 1.96),
MOE – the margin of error,
p – sample proportion,
N is the population size.

After identifying the sample size, the demographic profile of the respondents is required to obtain in order to have a clear overview of their characteristics. The adapted choices for the survey is presented in the table below.

Table 12. Sample of demographic characteristics

Characteristics	Choices
Gender	Male, Female
Education	Secondary School,Vocational Training School,College, not finished college, Bachelor, Master, Doctor, Other
Age	18–24, 25–30, 31–45, 46–55, 56+

What is more, administrating the surveys requires understandable and exact question formulation. After completing this specifiacation, reliable data can be collected. Respondents' opinion evaluation method is another important aspect to consider. A typical and clear method where respondents rate their agreement or

disagreement with the statements is called a Likert scale. Traditionally, a five-point scale is adapted but some people apply a 7-point scale which results in difficulties with descriptive terms (Tullis and Albert, 2013). A major benefit of the Likert scale is that it is a universal method and easy to understand for the respondent. Moreover, this method does not force the respondent to stand for a particular topic but enables the individual to show his/her degree of agreement (LaMarca, 2011). The same author highlights that, generally, respondents avoid selecting options of „extreme“ because of negative associations with the categorical aspect.

Hence, the chosen survey consisted of 9 groups factors which were rated by the respondents considering their importance degree towards eHealth use (Table 13).

Table 13. Factors included in the public survey

Group factors	Factors
TECHNOLOGICAL FACTORS	System quality
	Information quality
	Service quality
	Speed
SOCIAL FACTORS	E-readiness
	Social influence
	Perceived usefulness
	Speed
BEHAVIOUR OF TECHNOLOGY USE FACTORS	Actual digital technology use
	eHealth literacy
	Attitude to eHealth
ECONOMIC FACTORS (clients' perspective)	Reduced morbidity
	Increased earning (via increased employment time)
	Reduced waiting time
	Reduced consultation time
	Increased medication adherence
	Avoidance of travel expenditures
	Decreased risk of job loss (due to time spent in a health service institution)
	Faster diagnosis and treatment
ECONOMIC FACTORS (medical institutions' perspective)	Reduced length of hospital stay
	Reduced hospitalizations
	Reduced hospital readmissions
	Cost effective management of chronic diseases
	Decreased travel expenditures due to decreased home visits
	Reduced clinic visits
	Increased productivity of hospital staff
	Reduced public health spending
eHEALTH POLICY FACTORS	eHealth education for patients and medical workforce
	Financial incentives for patients and medical workforce using eHealth
	eHealth promotion
	Clear national legislative framework
ORGANISATIONAL FACTORS	Information culture in medical institutions
	Resources in medical institutions
	Management support
SECURITY FACTORS	Privacy
	Data security
HEALTH BELIEF FACTORS	Health consciousness
	Perceived benefit
	Perceived threat
	Health consciousness

The survey was administered in Lithuania, so all the measurement statements were presented in the local language. The respondents were asked to indicate their level of importance in closed-ended questions which were rated using a 5-point Likert metric scale anchored by: l = absolutely unimportant, 2 = unimportan, 3 = neither unimportant nor important, 4 = important and 5 = very important.

Cronbach's Alpha. Cronbach's alpha, α (or coefficient alpha) was introduced by Lee Cronbach in 1951. This coefficient measures reliability or the so-called internal consistency. Reliability shows how well a survey evaluates what it should (Tavakol and Dennick, 2011).

The formula below is used for Cronbach's alpha calculation (Tavakol and Dennick, 2011):

$$\alpha = \frac{N \times \bar{c}}{\bar{v}+(N-1)\times\bar{c}}; \quad (14)$$

where:

N – the number of items,

$\bar{c}$ – average covariance between item-pairs,

$\bar{v}$ – average variance.

A universally accepted rule is that when the Cronbach's alpha indicator is in the interval of 0.6–0.7, it specifies a suitable degree of reliability, and when it is equal or exceeds 0.8 it indicates a very good level of reliability (Ursachi, Horodnic and Zait, 2015). Some authors, like Tavakol and Dennick (2011) point out that if Cronbach's alpha is higher than 0.9, the reliability is excellent. But Hulin, Netemeyer and Cudeck (2001) contradict this point of view by stating that if values of Cronbach's alpha are higher that 0.95 they are not certainly good, since this might be a signal of redundancy.

In addition to this, Taber (2017) agrees with the fact that there is a great variety of academic observations with different interpretations of alpha values. Hence, the author was disposed to prepare a systemized report with these descriptors and their values (see Figure 11).

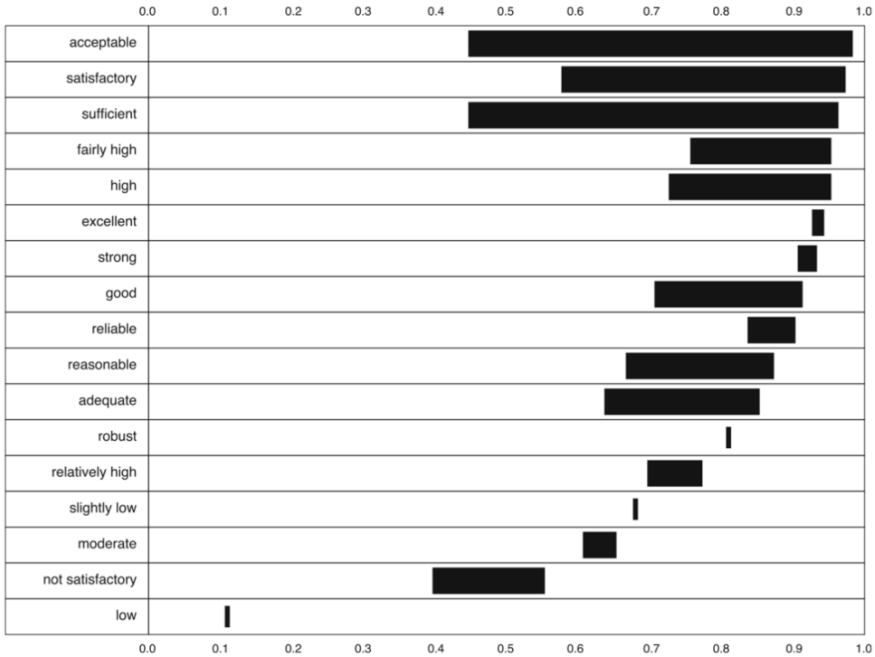

Fig. 11. Qualitative descriptors used for values/ranges of values of Cronbach's alpha reported in papers in leading science education journals

Source: Taber (2017)

Considering the picture with intervals, the alpha values can be interpreted as: excellent (0.93–0.94), strong (0.91–0.93), reliable (0.84–0.90), robust (0.81), fairly high (0.76–0.95), high (0.73–0.95), good (0.71–0.91), relatively high (0.70–0.77), slightly low (0.68), reasonable (0.67–0.87), adequate (0.64–0.85), moderate (0.61–0.65), satisfactory (0.58–0.97), acceptable (0.45–0.98), sufficient (0.45–0.96), not satisfactory (0.4–0.55) and finally low (0.11).

As it is seen from the visualization, there is no clear consensus regarding the most suitable index. Moreover, there is no exact hierarchy within the terms; for instance, such as not satisfactory, acceptable and so on. Therefore, it could be concluded that since scholars consider the explanations of Cronbach alpha differently, there is noticeable arbitrariness in the terminology of interpretation.

Logistic regression. Logistic regression was applied to analyse the public data survey. Logistic regression is a significant tool "allowing multiple explanatory variables being analyzed simultaneously, meanwhile reducing the effect of confounding factors" (Sperandei, 2014, p.18). Moreover, this analysis is useful for problem classification, when one is aiming to determine whether the sample conforms best into a category (Edgar and Manz, 2017).

Generally, binary logistic regression is a model that helps to solve the so-called binary classification problems. There are two types of logistic regression models. Generally, binary logistic regression analysis is adapted in cases to examine the dependent variable (Y) in dichotomies; for instance, when the given choices are yes or no (Liu, 2018). There is also another form of this particular type of regression

which is called multivariate logistic regression. The main characteristic of this regression is that the dependant variable can employ more than two values. Since this study analyses the case with two possible answer options for dependant variables, the binary logistic regression is implemented. The formula for binary logistic regression is introduced below (Čekanavičius & Murauskas, 2014):

$$ln = \frac{P(Y=1)}{P(Y=0)} = C + b_1x_1 + b_2x_2 \ldots + b_nx_n \; ; \tag{15}$$

where:
C – constant,
b_1 , b_2,.... b_n– coefficients of independent variables,
x_1 , x_2...x_n – independent variables.

The interpretation for binary logistic regression results starts from the coefficients of independent variables. If the coefficient is positive, the probability of dependent variable Y to get the value of 1 ($Y = 1$) is increasing. If the coefficient is negative, the increase of relevant variable will result in probability decrease of dependent variable Y to get the value of 1. Hence, the chance of a dependent variable to obtain 0 is growing (Čekanavičius & Murauskas, 2014). In summary:

If $b_1>0$, then with increasing X, the possibility P($Y= 1$) is also increasing.

If $b_1<0$, then with increasing X, the possibility P($Y= 0$) is also increasing.

For the description of logistic regression these characteristics are considered:

I. *The Case Processing Summary*. This output simply reviews how many cases are involved in the analysis.

II. *Classification table*. This table delivers the information about the model which includes explanatory variables.

III. *Variables in the Equation table.* This table introduces the regression coefficient B, statistical significance index – the Wald statistic, also significance rate – Sig. Those variables which conform to $p<0.05$ are suitable for further investigation.

IV. *Determination (pseudo) coefficient.* This coefficient shows the total suitability of the model for data description. The Nagelkerke's R^2 is one of the determination coefficients which mean the explanation capacity of the model (Nagelkerke, 1991). The data should not reflect this situation $R^2 <0.20$. If data conforms this condition, they are not suitable for analysis.

Principal component analysis. For a deeper public survey analysis the method of principal component analysis (PCA) was chosen. In 1873, an Italian geometer introduced the modern form of general square matrix into its singular value decomposition and this particular method stands for the base of principal component analysis (Preisendorfer and Mobley, 1988). Today PCA has risen to prominence in the academic field.

Generally, PCA enables scholars to summarize the information in settings containing observations that are depicted in multiple quantitative variables (Kassamabara, 2017). To be more precise, PCA is the mathematical process which

transforms the variables that are possibly correlated into a smaller group of uncorrelated variables named principal components. Hence, each variable is regarded as a different dimension. But the essential aim of this analysis is to extract the significant information from the multivariate data and present it in those new elements – principal components. Those new principal components conform with the linear combination of the originals. The information of total variation corresponds to those new elements. PCA is mainly used for multidimensional variables. According to Kassamabara (2017), PCA is the method which helps to mitigate the dimensionality of multivariate data.

From the practical point of view, principal component analysis enables to identify the most important dimensions for variance explanation. Jaadi (2019) presents the main steps of PCA:

1. *Standartization.* The aim of this step is to unify (standardize) the great variety of variables in order to contribute them to the analysis fully. Mathematically, it can be calculated by subtracting the mean and dividing by the index of standard deviation for the value of each variable.
2. *Covariance matrix computation.* The aim of this part is to check how variables are different from the mean with regard to each other. In other words, it verifies whether there are any linkages between the variables. Sometimes variables are highly correlated, therefore, they possess redundant information. Hence, the covariance matrix computation helps to determine those correlations.
3. *Compute the eigenvectors and eigenvalues of the covariance matrix to identify the principal components.* Principal components are the new elements that constructed as linear combinations. The new combinations are created in a way that they are uncorrelated. Additionally, the majority of information within those variables is compressed into the first elements (components). For instance, if there are 10 principal components, PCA attempts to assemble the majority of possible information in the first component, then the remaining information in the second one, etc.

Generalization of the second thesis part. The second part of the thesis presents the visualization of conceptual framework for the evaluation of factors influencing customer behaviour in eHealth use with the proposal of 8 hypotheses. The methodological part of the thesis consists of two main sections: experts data analysis and public survey examination.

1. For the experts data collection it was offered to adapt the survey using pairwise comparison values. After the survey administration, the analytic hierarchy process was offered to apply in the analysis of the experts' data.
2. The online survey method was proposed to collect the public responses. The logistic regression and principal component analysis were suggested to investigate the data.

3. THE EMPIRICAL EVALUATION OF FACTORS INFLUENCING CUSTOMER BEHAVIOUR IN eHEALTH USE

This section is dedicated for situation analysis and empirical evaluation of factors influencing customer behaviour in eHealth use. This part consists of two main surveys – expert and public, which employ the methodology described previously. Firstly, the experts' results incorporating the analytic hierarchy process are analyzed. Secondly, public survey responses with adapted logistic regression and principal component analysis are presented.

3.1. Current state of eHealth development in EU economic statistics

Nowadays eHealth can be stated as a symbol of healthcare democratization. Moreover, as previously alluded, eHealth is the opportunity to overcome such global challenges as rising healthcare costs, ageing society, and chronic diseases. Sometimes the appearance of eHealth in the healthcare system is called a paradigm shift. Since countries have different paces of economic and social evolution, the adaptability differs in the global landscape. One research study named "Polityka Insight" (2017) published the projection of eHealth benefits for each European country. The research authors state that eHealth solutions would force a dicrease in European countries' health expenditures on average by 0.31% GDP, or 5% less spent on health by the ratepayer. While the conventional assumption related with information and comunication technologies and ePrescriptions could decrease the costs by 0.13% of GDP. For instance, the authors also forecast that in Lithuania, public health spending would decrease by 0.25% after savings due to full implementation of eHealth.

But one thing is clear – there is no country system that can appeal all the patients' health needs, therefore, there is no perfect health system. What is interesting, health analysts from a Swedish company Health Consumer Powerhouse introduced European Health Consumer Index in 2016. After assessing 35 European countries with 48 different criteria, the Netherlands were ranked as the best health system supplier. While the second place was given to Sweden. However, Poland, Montenegro, Romania, and Albania were claimed to have the worst health systems (Figure 12). As it is seen from the scheme, Lithuania is also placed at the end of the list.

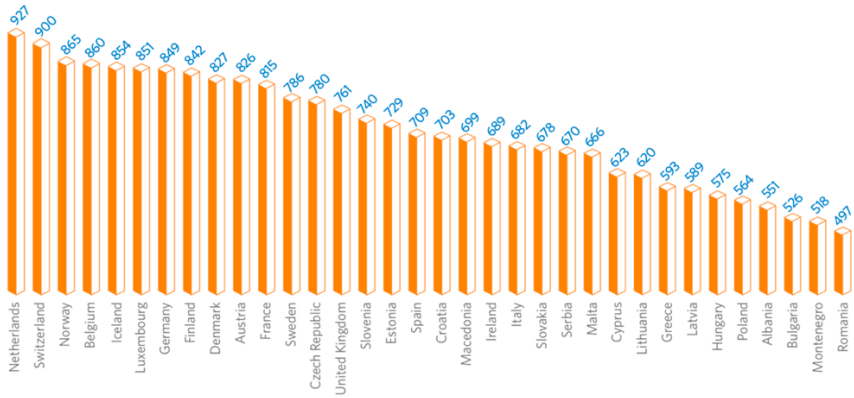

Fig.12. European Health Consumer Index, 2016
Source: Health Consumer Powerhouse (2016)

What is more, booking an appointment online is still found to be a novelty. For instance, in such European countries like Albania, Montenegro and Poland there is no opportunity to book a doctor's appointment online. While such countries like Macedonia, Estonia, and Iceland demonstrate a huge progress in this particular area since all patients have the ability for online appointment booking (Polityka Insight, 2017). Based on Eurostat data, the same report (Polityka Insight, 2017) declares that the EU average is 10% where people stated to have an opportunity to book an appointment online. Taking into consideration the seeking health-related information, it is published that 52% of the EU citizens regularly use search engines like Google (Eurostat, 2018). The data also reports that the highest percentage is found to be in the Netherlands 72%, Norway 66%, Sweden 62%, and Estonia 60%. Lithuania stands in the EU average with 54%. Basically, people search for information of how to improve their health, specific diseases, symptoms, medical treatments, advice for doctor's appointments, and emotional support (European Commission, 2014). 48% of Europe's citizens state that they have access to such services like telephone or web-based healthcare information which is available 24/7 and covers all parts of the country (Polityka Insight, 2017).

The progress of ePrescriptions is still very slow since only 37% of European citizens state that this service is in use (Health Consumer Powerhouse, 2016). Denmark, Sweden, Iceland, Estonia and Croatia are countries where ePriscription service is fully functioning (Figure 13). General Practitioners from Denmark, Estonia, Croatia, Iceland, Sweden, and the Netherlands claimed that about 95–100% of all prescriptions are being transferred electronically. While in Lithuania, only 5.6% people declare knowing that ePrescription is in use. It is also estimated that in Lithuania, 25% of total primary care appointments are dedicated for prescription renewals alone (Simenas, 2017). This shows the opportunity for reaching enourmous effectiveness within the doctors' workday. Moreover, looking from a broader perspective, active adaptation of ePrescription would enable regulatory institutions to

control and monitor the amount of drugs, which prescriptions were left unclaimed and cut the costs for eliminating excess workflow in the meantime.

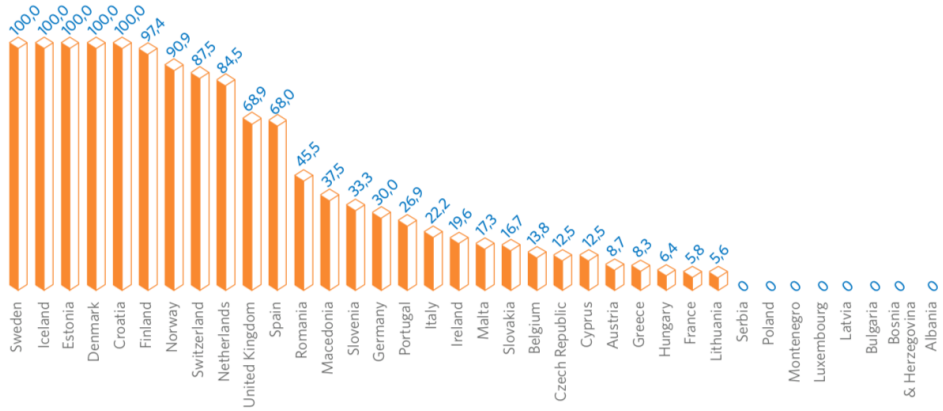

Fig.13. Patients who declare knowing that ePrescription is in use (%)
Source: Health Consumer Powerhouse (2016)

For instance, in Sweden it is estimated that doctors save 30 minutes daily, while in Estonia prescriptions renewal take 10–15 seconds (Polityka Insight, 2017). One of the profound advantages of ePrescription that Estonia was able to apply is that citizens with chronic diseases do not need to see the doctor physically for prescription renewal. Instead of travelling to a medical institution and waiting in a queue, the person has the ability to either phone or write an e-mail for his/her doctor. Moreover, the paperless system allows patients to save their money. Firstly, they do not need to travel physically, ask for a day off just for a doctor's appointment. Secondly, they are able to choose generic drugs or the cheapest available brand since it includes the main ingredients. And thirdly, the co-payments are computed automatically, therefore, they do not need to go from institution to institution just to carry documentation.

The report of Polityka Insight (2017) published the eHealth index in the European countries in 2016. The index depicted the average of attainment in five issues: the availability of 24/7 healthcare information service, ePrescription status, usage of ePrescription by General Practitioners, online appointment booking and usage of it. According to the data, Figure 14 shows that five countries were found to be very developed regarding eHealth and these are Denmark, Finaland, Iceland, Spain and Sweden. While poor results are found in Lithuania, Belgium, Latvia, and Germany. The very scarce situation within the eHealth is found to be in Poland, Cyprus, Bulgaria, and Montenegro. It is interesting that, for example, health and wellness-related apps are the sixth mostly downloaded in one EU member country – Poland (Polityka Insight, 2017).

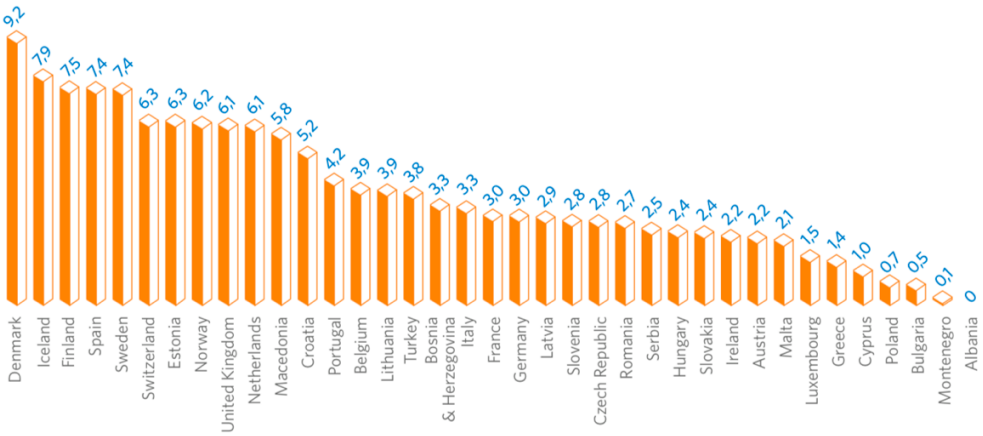

Fig.14. eHealth index in European countries 2016 (points)
Source: Polityka Insight (2017)

According to the WHO (2016), 58% of Member States declare having an eHealth strategy which is in relevance with universal health coverage, and 90% of countries with eHealth strategies report having the funding for their adaptation. The US Congress based on a great variety of literature referring to information and communication technologies evidence calculated that efficiency of eHealth could save up to 3% of total health expenditures (Congressional Budget Office, 2008). In addition to this, the same resource declares that electronic record systems would reduce the adverse drug cases and could save up to 1 billion US dollars per year. Moreover, it was estimated that mitigating the accidents with chronic deseases would save up to 147 billion dollars per year.

Unequal progress of eHealth solutions within all European Union countries have the same obstruction in adapting citizens with a good approach to healthcare service. Harmonizing the healthcare systems on the national level and among the countries is a huge challenge but raising awareness, promoting eHealth among all age groups in rural and urban locations, implementing good experience from foreign countries, adapting both private and public sectors, increasing the digital literacy are the reccomendations for building a digital society.

3.2. An empirical analysis experts' valuation of factors influencing customer behaviour in eHealth use

To ensure the success and completeness of the survey, an attentive process of expert selection was included. The aim of this analysis is to ensure a heterogeneous background of experts who represent the significant perspectives as well as their aggregated knowledge pool. The degree of their expertise was carefully evaluated taking into account their direct involvement in medicine of pharmacy field. The aim of expert evaluation was to gather qualified respondents' judgements regarding the factors which influence the customer behaviour in eHealth use.

Since pharmaceutical companies have markedly increased their investments in digital projects over the past years, it is clear that accumulated knowledge in digital

services field is large-scale. Therefore, the majority of experts are chosen from the pharmaceutical companies. Employees who have practical knowledge in patients' and doctors' interests can serve with their proficiency through identifying the factors that have impact on customer behaviour in eHealth use in the Lithuanian health sector. Experts from the pharmaceutical business field were selected from companies which are characterized as diversified businesses and operate in the prescribed and over-the-counter medicine field. Therefore, the study encompasses a great scope of opinions.

To determine the numer of experts, the dependence of expert valuation standard deviation on expert number presented by Rudzkienė (2005) is considered to be a reliable framework (Figure 9). According to the upholders of this particular dependence, the number of experts should be selected from the interval (5–9).

The respondents' profiles were compiled considering three basic criteria:

1. Education,
2. Work experience (no less than 3 years,
3. Work field (medicine, pharmacy) and position.

The core group of experts consisted of those who have the highest number of work experience (more than 15 years). The first experts were chosen regarding the sampling frame and were asked to recommend other experts in the related field. This particular elicitation task is sometimes called the "snowball sampling" (Heckathorn, 2011, p.355). The essential idea of this method is that the already existing experts recommend other members from their social network. Giupponi et al. (2006) state that this method is adapted for the completion of the first list of respondents and to reassure the soundness and reliability that suitable experts are invited in the survey.

Ten experts were selected for evaluation. One expert did not fill in the survey correctly therefore, the answers were eliminated. Hence, Table 14 concludes the profiles of 9 selected experts who filled in the survey properly according to the explanation of pairwise comparison value survey. An example of the questionnaire is in Appendix 1, while the valuations of each expert is submitted in Appendices 2–10. Detailed characteristics of experts are presented below.

Table 14. Characteristics of experts

Expert	Gender	Age	Education	Work experience	Work field, position
Exp.1	Male	41–55	Doctor	More than 15 years	Pharmacy, Country Manager
Exp.2	Male	41–55	Doctor	More than 15 years	Medicine, pharmacy, Medical Marketing Manager
Exp.3	Female	31–40	Master	Up to (including) 15 years	Pharmacy, Product Manager
Exp.4	Male	24–30	Master	Up to (including) 5 years	Pharmacy, Sales Administration Specialist
Exp.5	Male	31–40	Master	Up to (including) 10 years	Pharmacy, Regional Sales Manager

Table 14. (continued)

Expert	Gender	Age	Education	Work experience	Work field, position
Exp.6	Female	41–55	Master	More than 15 years	Pharmacy, Field Force Trainer
Exp.7	Male	31–40	Doctor	Up to (including) 5 years	Pharmacy, Stockholder of pharmaceutical company
Exp.8	Male	31–40	Doctor	Up to (including) 15 years	Medicine, Plastic Surgeon, owner of clinic
Exp.9	Female	41–55	Master	More than 15 years	Pharmacy, Product Manager

Considering the experts' work experience, it is seen that 4 out of 9 experts have more than 15 years of work experience. The level of education is no less than a master's degree. The youngest respondent but not the one with lowest work experience belongs to the age interval of 24–30. The work positions involve all levels of management.

Further, Kendall's coefficient of concordance and consensus index are calculated.

Kendall's coefficient of concordance and consensus index. Before ranking the experts' evaluations it is significant to identify whether the assessments comply with one another. The Kendall's coefficient of concordance shows if there is an agreement among the experts. Two hypotheses stem from the methodological section description of Kendall's coefficient of concordance :

H_0: there is no agreement among the experts, W=0

H_1: there is an agreement among the experts, W≠0

After calculations using IBM SPSS Statistics 25, the total Kendall's coefficient of concordance is 0.367. The model is significant, since the calculated significance level is p=0.000. To check the importance of W, Pearson chi-square is used, where the statistical significance level is α = 0.05 or 5%. Hence, adapting formula 12:

$$\chi^2 = 0.367 \times 9(47-1) = 151.938$$

The result of Pearson chi-square is compared with $x^2_{crit.}(0.05; k-1)$. The result is calculated using MS Excel function CHIINV(0.05;46). Hence, the $x^2 > x^2_{crit.}$, 151.938>62.83. Hence, the null hypothesis is rejected and it is assumed that there is a good evaluation compliance among the experts. Experts understand the significance of the given factors that influence customer behaviour in choosing eHealth.

In order to have reliable calculations, another item was taken into consideration. In cases where there is more than one decision maker, AHP consensus index is recommended to consider. The consensus coefficient ranges from 0 to 100%. 0 means that there is no consensus among judges, while 100% stands for full consensus. Hence, the consensus indexes for all group factors were obtained through applying formula (8). The results are given in Table 15.

Table 15. Consensus indexes

Factors	Consensus index
1. Health belief	58.9%
2. Technological	59.1%
3. Security	64.1%
4. Organisational	53.7%
5. Behaviour of technology use	64.6%
6. Economic (from the client perspective)	48.2%
7. Economic (from the provider perspective)	47.7%
8. Social	54%
9. Health policy	56.8%
10. Group factors	53.6%

According to the output it can be assumed that experts reached not full but moderate agreements in valuating the factors that influence customer behaviour in eHealth use. The consensus percentages indicate that judges hold quite divergent points of view.

Another important thing to note is that the consistency ratio for each expert's valuation was also calculated. The threshold for acceptance of inconsistency was selected as the recommended α=0.2 (Aksenov, Blaschuk and Chernuhin, 2014). After reviewing the first respondents' valuations, there were some inconsistencies, so participants were asked to modify the highlighted judgmental places in order to improve consistency. The total consistency within the determined limit α=0.2 was obtained through the algorithm of Method-S and the consistency ratios among the experts distributed in this manner (Table 16). Security group consists of two factors, therefore, all consistency ratios are equal to 0%. Considering the output of CR it can be concluded that none of the coefficients exceeds the set limit (α=0.2). Hence, all results are prepared for further analysis. The total CR of each group is delivered in the analysis of each factor group separately.

Table 16. Consistency ratios

Consistency Ratio (CR),%	Exp.1	Exp.2	Exp.3	Exp.4	Exp.5	Exp.6	Exp.7	Exp.8	Exp.9
Health belief	14	14	12	9	14	0	10	6	12
Technological	18	6	7	16	15	18	7	5	8
Organisational	14	14	14	17	14	1	14	14	17
Behaviour of technology use	6	2	19	19	14	14	6	14	4
Economic (from the client's perspective)	5	15	11	20	9	14	19	17	11
Economic (from the provider's perspective)	7	15	8	19	10	14	14	19	10
Social	8	8	15	9	11	7	17	10	7
Group factors	18	13	7	16	12	12	10	19	12

Evaluation of factors. This section is dedicated for the examination of how experts assessed the group factors which influence customers' behaviour in choosing eHealth. The output displays the main calculated values: total weights, total ranks, group Kendall's coefficient of concordance (W), lambda (λ) and consistency ratio

(CR). The output is placed in Appendices 11–20. Three factor groups with the highest evaluations will be stated as the most influential ones for customer behaviour in eHealth use.

The behaviour of technology use factors is firstly selected for the output investigation. The Kendall's coefficient of concordance satisfies the condition of $0<W<1$, which postulates the fact that the decision makers – experts had an agreement regarding the evaluation of behaviour of technology use factors. Moreover, the consistency ratio is acceptable for the reliable analysis. And the coefficient of lambda meets the condition that the consistent matrix upholds the specification to be close to the objects being evaluated.

According to Table 17, almost half of the highest weights were given to eHealth literacy. While, the remaining factors' actual digital technology use and attitude to eHealth are distributed accordingly 2.2% and 22.9%. Broadly, eHealth literacy reflects how an individual is enabled to search for suitable information, employ his/her navigation skills, evaluate the reliability and apply the knowledge. What is interesting, the European Commission carried out the survey in 2014 among all Member States and it was found that 48% of Lithuanians within the last 12 months used the internet to search for health information and it presented the lowest percentage per item (European citizens' digital health literacy, 2014). The same report notes that similar patterns for low Lithuanian percentages was expressed in evaluating the easiness to find information and satisfaction with the information level. Moreover, the European health literacy survey showed that every second individual has a low level of health literacy.

It is worth noting that individuals feel empowered when they are able to use eHealth technologies with confidence. Adults who have low eHealth literacy level may encounter anxiety and concern trying to obtain the information. Therefore, there is a noticeable demand for education, especially, for social members who are vulnerable. Hence, it is important to take into account the social processes, specific individual circumstances, and institutional surroundings in order to shape individuals' internet use and capability to be up to date with the online knowledge.

Table 17. Summary of behaviour of technology use factors evaluation

Factors	**Actual digital technology use**		**eHealth literacy**		**Attitude to eHealth**	
Expert	**Weight %**	**Rank**	**Weight %**	**Rank**	**Weight %**	**Rank**
Exp.1	14	3	33.2	2	52.8	1
Exp.2	16.9	3	44.4	1	38.7	2
Exp.3	21.8	2	71.5	1	6.7	3
Exp.4	60.9	1	31.1	2	8	3

Table 17 (continued)

Factors	Actual digital technology use		eHealth literacy		Attitude to eHealth	
Exp.5	13.5	3	58.4	1	28.1	2
Exp.6	63.3	1	30.4	2	6.3	3
Exp.7	14.9	3	47.5	1	37.6	2
Exp.8	19	3	26.3	2	54.7	1
Exp.9	25.8	2	63.7	1	10.5	3
Total weight	**27.2**		**49.9**		**22.9**	
Total rank	**2**		**1**		**3**	
W	**0.235**					
CR	**0.20%**					
λ	**3.002**					

The second output for the analysis is chosen to be organizational factors. In the theoretical part of the thesis there were three distinguished factors in this particular group: information culture in medical institutions, resources in medical institutions and management support. The main aggregated indexes satisfy the raised conditions (Table 18). Consistency ratio possesses the score of CR<0,2, while lambda (λ) is assumed to be suitable.Despite the fact that the Kendall's coefficient of concordance provides low agreement among the experts it still supports the basic condition 0<W<1. Therefore, it can be concluded that aggregated results can be interpreted.

According to the total weights, the highest evaluations are dedicated for the information culture in the medical institutions. The second place is appointed for management support, while the last factor according to the assessment is resources in medical institutions. Information culture comprises of organisation's values, regulations, end-users' practices in the use of information and technology (Aqil, Lippeveld & Hozumi, 2009). In traditional medicine, the perception that there is no patient involvement in the decision-making process and disease management is widely prevalent. Hence, patients are completely dependent on healthcare professionals. Some studies indicate that the major reason that medicine specialists are reluctant to implement eHealth is traced back to a fear of the shift in their traditional healthcare practices (Colliver, 2001; Baldwin, 2002). Moreover, healthcare professionals feel a threat to their professional autonomy and this perception is closely linked with their reluctance to use eHealth (Esmaeilzadeh and Sambasivan, 2012).

But the strict hierarchy of such conventional medicine has been disrupted by modern patients who are armed with new digital technologies and require the healthcare system to be up to date. Instead of being the authorities, the ones who are responsible for making the decisions, doctors should become collaborators with all possible stakeholders.

Table 18. A summary of organisational factors evaluation

Factors	**Information culture in medical institutions**		**Resources in medical institutions**		**Management support**	
Expert	Weight %	Rank	Weight %	Rank	Weight %	Rank
Exp.1	29.7	2	8.6	3	61.8	1
Exp.2	23.5	2	11.3	3	65.2	1
Exp.3	28.1	2	58.4	1	13.5	3
Exp.4	67.3	1	25.1	2	7.5	3
Exp.5	20.2	2	9.7	3	70.1	1
Exp.6	74.7	1	11.9	3	13.4	2
Exp.7	11.3	3	23.5	2	65.2	1
Exp.8	22.1	3	31.9	2	46	1
Exp.9	50.8	1	37.9	2	11.3	3
Total weight	**38.90%**		**25%**		**36.10%**	
Total rank	**1**		**3**		**2**	
W	**0.083**					
CR	**0.0350**					
$\boldsymbol{\lambda}$	**4.034**					

In order to close the gap between the digital technologies and healthcare and make it functioning properly, there is a need to shape the attitude and foster knowledge in medical institutions. Therefore, one of the crucial aims of the top medical institutions management is to assist both caregivers and patients in implementing eHealth into daily medical practice. It is important that medical institutions take care of the provision of resources, but also encourage the attitudes of changes and innovations, insulate the internal and external focus which fosters the attention to a wider community goodness compared with internal organizational issues.

The third factor group for the analysis is selected to be the technological factors. This group comprises of four factors described in the theoretical part of the thesis: system quality, information quality, service quality, and speed. The Kendall's coefficient of concordance of $0<0.259<1$ conforms with the required conditions and lambda (λ) is close to the valuated objects number (Table 19). The aggregated consistency ratio (CR) is lower than 0.2. Since all major requirements coincide it can be considered that the results can be discussed further.

The evaluation of technological factors indicates that speed and information quality gathered the major proportion of expert's weights. Most of the experts

corroborate that speed is a relevant element regarding the technological characteristics of eHealth. Electronic patient data is exchanged in a standardized way. Hence, doctors, nurses and patients need not only a correct but also an urgent and efficient information exchange process. In turn, it benefits the patients' safety (Wouters et al. 2017).

As previously alluded, information quality reflects the relevance, completeness, accuracy, timeline, and consistency of the data saved in eHealth database (Gorla, Somers, & Wong, 2010). Moreover, it stimulates the understanding of perceived ease of eHealth use. Hence, it fosters the behavioural intention if information quality is presented in an understandable manner. In addition to this, if information quality is poor, it may compromise the patients' health status. Traditionally, the person seeks for health information for themselves in cases of illness or on behalf of another person. There have been cases when people have been harmed after following online health advice (Fox and Jones, 2009). Therefore, it is a significant issue to assure that, for instance, health websites would provide highly qualitative information.

Table 19. A summary of technological factors evaluation

Factor	**System quality**		**Information quality**		**Service quality**		**Speed**	
Expert	**Weight %**	**Rank**	**Weight %**	**Rank**	**Weight %**	**Rank**	**Weight %**	**Rank**
Exp.1	13.7	3	43.2	1	8.4	4	35	2
Exp.2	5.4	4	11.3	3	41.3	2	42	1
Exp.3	8.4	4	62.9	1	13.8	3	15	2
Exp.4	5.6	4	22.6	2	12	3	60	1
Exp.5	11.1	3	55.4	1	7.7	4	26	2
Exp.6	17.4	3	36.2	1	16.2	4	30	2
Exp.7	62.4	1	7.1	4	16.6	2	14	3
Exp.8	28	3	8.6	4	28.4	2	35	1
Exp.9	7	4	41.9	1	27	2	24	3
Total weight	**15.40%**		**30.50%**		**19.90%**		**34.20%**	
Total rank	**4**		**2**		**3**		**1**	
W	**0.259**							
CR	**0.013**							
$\boldsymbol{\lambda}$	**4.034**							

What is more, healthcare specialists, firstly, have to acknowledge that patients strive to obtain knowledge using the internet. Hence, health professionals should offer and guide the patients to adapt reliable eHealth tools in their daily lives. Hence, governmental, healthcare and educational institutions with the concerted efforts

should stimulate the significance of qualitative, reliable, modern and accurate medical information on the internet, so that the users could maximally benefit from it.

Service quality is evaluated as the third element considering the importance of influencing customer behaviour in eHealth use. Mainly, it refers to the timely technical support, responsiveness, updating the system. This general support should meet the end-users needs. System quality which ensures the functionality, according to the experts, is the least significant issue in eHealth use. Such understanding brings the conclusion that the system quality as a factor per se for the decision makers from medicine and pharmacy fields requires specific and narrow knowledge and it is, of course, the responsibility of information technologies specialists.

The forth factor group is health belief factors. There are three main elements that are singled out: health consciousness, perceived benefit and perceived threat. The Kendall's coefficient of concordance $0<0.289<1$ meets the given conditions. Lambda (λ) indicates the reliability since it is close to the valuated objects number (Table 20). The consistency ratio also coincides with the condition of $CR<0.2$. Therefore, there is an indication that evaluations of aggregated decision makers can be adapted for gaining the general conclusions of health belief factor group.

Table 20. A summary of health belief factors evaluation

Factor	**Health consciousness**		**Perceived benefit**		**Perceived threat**	
Expert	Weight %	Rank	Weight %	Rank	Weight %	Rank
Exp.1	26.3	2	55	1	19	3
Exp.2	13.5	3	58	1	28.1	2
Exp.3	73.5	1	21	2	5.8	3
Exp.4	62.7	1	28	2	9.3	3
Exp.5	28.1	2	58	1	13.5	3
Exp.6	8.4	3	47	1	44.4	2
Exp.7	36.7	2	50	1	13.5	3
Exp.8	26	3	41	1	32.7	2
Exp.9	20.7	2	5.8	3	73.5	1
Total weight	**33.20%**		**41.90%**		**24.90%**	
Total rank	**2**		**1**		**3**	
CR	**0.005**					
W	**0.289**					
$\boldsymbol{\lambda}$	**3.005**					

Experts' answers demonstrate that the first position in this particular factor group is set for perceived benefit. Majorly, the perceived benefit is coupled with a behaviour which is considered to be effective in alleviating the threat of getting the illness. Thus, since it is set as a vital factor, it is recommended to raise the importance of value personal assessment adapting the health-promoting activities. The stressed benefit of eHealth serves as a motive in implementing digital technologies in their daily lives. This empowerment enables them to control their health and be active in making decisions regarding their selfcare.

While health consciousness is selected as the second factor according to the importance since patients' readiness to adapt healthy actions is a vital element in implementing eHealth. Health conscious individuals engage in searching for healthy choices, care about their health and value proposals that relate with a healthy lifestyle. This finding has accentuated that people with a preventive attitude in their health would tend to use eHealth more frequently. Hence, taking into account this belief it should be emphasized that people who are health conscious integrate in healthy behaviour more actively since they are more responsible about their health (Hong, 2009). The third element is selected to be perceived threat. Mainly, it reflects a person's evaluation of his/her opportunities to get the illness. All in all, considering the evaluation of these factors, professional healthcare and education system should generally practice and increase the interest and knowledge in the consequences of an unhealthy lifestyle, preventive measures and shift the peoples' attention to take personal responsibility of their own health.

The fifth factor group for the investigation is selected to be economic client factors (Table 21). This group consists of eight factors that were elucidated in the theoretical part of the thesis and these include: reduced morbidity, increased earning (via increased employment time), reduced waiting time, reduced consultation time, increased medication adherence, avoidance of travel expenditures, decreased risk of job loss (due to time spent in health service institution), as well as a faster diagnosis and treatment. The Kendall's coefficient of concordance shows that there is not high agreement among experts regarding this factor group, but the ratio W=0.116, but still conforms with the required conditions $0<W<1$. And lambda (λ) is close to the valuated objects number.The aggregated consistency ratio (CR) is 0.019 and it is lower than 0.2. Since all major requirements coincide it can be concluded that the results can be investigated further.

The answers demonstrate the fact that the highest rated factor in this group is faster diagnosis and treatment. The experts also corroborate the fact that reduced consultation time would influence the customers' behaviour in eHealth use. While the third position, according to the experts is set for reduced waiting time in the medical institutions. Hence, the decision makers have a consensus that customers are sensitive to time issues. And when there is a solution for saving time – it can serve as a motive for customers to implement eHealth tools. In addition to this, the factor of faster diagnosis and treatment does not only consider the time saving issue but also an effective and faster identification of the disease. Hence, faster diagnosis may result in saving time and money.

Table 21. Summary of economic (from client perspective) factors evaluation

Factor	Reduced morbidity		Increased earning		Reduced waiting time		Reduced consultation time		Increased medication adherence		Avoidance of travel expenditures		Decreased risk of job loss		Faster diagnosis and treatment	
Expert	Weight %	Rank	Weight %	Rank	Weight %	Rank	Weight %	Rank	Weight %	Rank	Weight %	Rank	Weight %	Rank	Weight %	Rank
Exp.1	9	**4**	7.9	**6**	21	**2**	15	**3**	8.4	**5**	4	**8**	5.7	**7**	29	**1**
Exp.2	4	**7**	4	**8**	21	**2**	9	**5**	19.2	**3**	11.1	**4**	7.4	**6**	24	**1**
Exp.3	3	**7**	2.7	**8**	9.9	**4**	18	**3**	7.9	**5**	18.1	**2**	5.6	**6**	35	**1**
Exp.4	10	**4**	34	**1**	4.3	**7**	21	**2**	2.6	**8**	5.5	**6**	6	**5**	16.4	**3**
Exp.5	3	**7**	2.5	**8**	28	**1**	28	**2**	11.4	**4**	8.4	**5**	4.9	**6**	13.7	**3**
Exp.6	2	**8**	3.1	**7**	26	**1**	18	**4**	22	**2**	5.3	**5**	3.4	**6**	19.9	**3**
Exp.7	41	**1**	20	**3**	4.4	**5**	3,7	**7**	4.6	**4**	1.9	**8**	21	**2**	3.8	**6**
Exp.8	3	**8**	19	**3**	24	**2**	11	**4**	7.2	**6**	3	**7**	26	**1**	7.9	**5**
Exp.9	32	**1**	22	**2**	4.3	**8**	9.2	**4**	5.3	**6**	8.4	**5**	14	**3**	4.9	**7**
Total weight	**8.4%**		**11.1%**		**16.3%**		**17.2%**		**10.1%**		**7.7%**		**10.6%**		**18.6%**	
Total rank	**7**		**4**		**3**		**2**		**6**		**8**		**5**		**1**	
W	**0.116**															
CR	**1.90%**															
λ	**8.187**															

Other vital factors that were distinguished by the experts and rated as fourth and fifth regarding the importance were increased earnings due to increased employment time and decreased risk of job loss. The loss of work hours due to the traveling or waiting time in medical institutions is a huge damage not only for a sole individual but also for the country's economy. Patients can stay at work and retain their socioeconomic status while being equipped with the sensors that can enable them to send real-time data to their doctor. Another alternative is the 24/7 call centres or apps for particular medical institution that would decrease the demand for in-person consultations. Traditionally, remote eHealth options involve distant consultations or monitoring specific patients' conditions. Hence, eHealth tools can enable an improvement of online communication, decrease the absence days and help to stay socially and economically active for the patients. According to the experts, the least influential factors for customer behaviour in choosing eHealth use are reduced morbidity, increased medication adherence and avoidance of travel expenditures.

The sixth factor group is a summary of economic factors from the providers' perspective. This group consists of eight factors: reduced length of hospital stay, reduced hospitalizations, reduced hospital readmissions, cost effective management

of chronic diseases, decreased travel for home visits expenditures, increased productivity and reduced public health spending. The main aggregated indexes satisfy the raised conditions (Table 22). The consistency ratio possesses the score of CR<0.2, while lambda (λ) is assumed to be suitable. Despite the fact that the Kendall's coefficient of concordance provides low agreement among the experts it still supports the basic condition 0<W<1. Therefore, it can be concluded that aggregated results can be interpreted further.

Experts set the first three positions accordingly: reduced clinic visits, reduced length of hospital stay and cost effective management of chronic diseases. eHealth surely provides the opportunity of healthcare delivery adapting virtual care. Lithuania, for instance, is not a geographically large country but medical professionals are distributed disproportionally mainly within the urban settings.

Table 22. A summary of economic (from the provider's perspective) factors evaluation

Factor	**Reduced length of hospital stay**		**Reduced hospitalizations**		**Reduced hospital readmissions**		**Cost effective management of chronic diseases**		**Decreased travel expenditures**		**Reduced clinic visits**		**Increased productivity**		**Reduced public health spending**	
Expert	Weight %	Rank	Weight %	Rank	Weight %	Rank	Weight %	Rank	Weight %	Rank	Weight %	Rank	Weight %	Rank	Weight %	Rank
Exp.1	31	**1**	5.6	**7**	14	**3**	17	**2**	4.7	**8**	13	**4**	8.9	**5**	5.9	**6**
Exp.2	9.7	**4**	8.4	**5**	8	**6**	15	**3**	5.7	**8**	27	**1**	20	**2**	6.2	**7**
Exp.3	5.1	**8**	5.8	**6**	11	**4**	20	**2**	19	**3**	25	**1**	5.4	**7**	9.2	**5**
Exp.4	37	**1**	3.5	**8**	4	**7**	22	**2**	14	**3**	8.9	**4**	5.4	**5**	5	**6**
Exp.5	2.4	**7**	2	**8**	4	**6**	9.4	**5**	11	**4**	21	**2**	32	**1**	18.1	**3**
Exp.6	8.8	**4**	36	**1**	30	**2**	11	**3**	3,3	**6**	5.8	**5**	2.8	**7**	2.7	**8**
Exp.7	7.2	**5**	20	**2**	6	**7**	3.6	**8**	10.5	**4**	6.4	**6**	17	**3**	30	**1**
Exp.8	34	**1**	13	**3**	22	**2**	5.7	**6**	2.4	**8**	9.8	**5**	10	**4**	3	**7**
Exp.9	13	**3**	27	**1**	21	**2**	13	**4**	8.1	**5**	7	**7**	7.5	**6**	4	**8**
Total weight	**14.70%**		**11.90%**		**13%**		**14.30%**		**9.30%**		**15%**		**12.90%**		**8.90%**	
Total rank	**2**		**6**		**4**		**3**		**7**		**1**		**5**		**8**	
W	**0.085**															
CR	**0.017**															
λ	**8.162**															

The problem of primary care is also raised in rural areas. Due to limited access to general practitioners the remote areas residents are not able to have in-person appointments. Hence, eHealth option such as a virtual visit can be a potential method to tackle the issue of accessibility. Moreover, such a method would enable people who

have mobility problems and those who have difficulties in moving to have at least primary healthcare. Reduced clinic visits is understood as a benefit for those who are reluctant to stay in long queues and feel the responsibility of their surplus value creation at work.

Another vital factor in the economic factor group from the provider's perspective according to the experts is the reduced length of hospital stay. Since eHealth definitely provides greater access to healthcare and increase its accessibility scope as well as overcomes the distance barriers through remote consultation, disease management and continuous monitoring. Health data can be effectively transmitted through the mobile phone and alert the patient if the case is serious. This reassures that vacant beds in the hospital are used only for those patients who are the emergency cases. Using eHealth tools, working people are not restricted with time and avoid the absent days, which also reassures that medical institutions are not overcrowded. Moreover, health-care organizations provide patient-centered care which is based on comprehensive and longitudinal health information for that client. With this in mind, it could be noted that generally, the improved accuracy of diagnosis and treatment, improved provision of healthcare help to increase productivity in the medical institutions.

In addition to this, experts posit that cost-effective management of chronic diseases also amplify the influence on customers' behaviour in choosing eHealth. Health is no longer described as a static situation but as an opportunity of self-management. Hence, dealing with chronic diseases requires an active shift in lifestyle which involves maintaining, controlling and also creating meaningful behaviours. One notes that self-management does not reach success unless the patient takes the responsibility of his/her actions (Lorig et. al., 2001). The relationship between the patient and the health care professional plays an important role. Today the conventional thinking about healthcare professionals has changed dramatically. Their role has expanded to a professional supervisor. One way of guiding the patient is to help adapting eHealth use which serves as a help for patients for controlling their disease (Talboom-Kamp, Verdijk, Harmans, Numans & Chavannes, 2016). The academic literature has proved that eHealth provides not only high-quality care but also stimulates the mitigation of healthcare costs (Ganesh, 2004, González, Quesada, Urrutia and Gavidia, 2006, Van Gemert-Pijnen, Peters, Ossebaard, 2013). Therefore this factor should be taken into account as influencing customers in eHealth use.

The seventh factor group is security factors which consists of two components: privacy and data security (Table 23). The summary of aggregated output shows that the agreement among experts is rather high regarding the security issues resulting in the Kendall's coefficient of concordance with the ratio of 0.605. This number can be based on the fact that the group of security factors is comprised of two elements. Lambda (λ) is assumed to be suitable since it is close to the valuated objects number.

Table 23. A summary of security factors evaluation

Factors	**Privacy**		**Data security**	
Expert	Weight %	Rank	Weight %	Rank
Exp.1	75	1	25	2
Exp.2	87.5	1	12.5	2
Exp.3	83.3	1	16.7	2
Exp.4	85.7	1	14.3	2
Exp.5	83.3	1	16.7	2
Exp.6	87.5	1	12.5	2
Exp.7	14.3	2	85.7	1
Exp.8	87.5	1	12.5	2
Exp.9	83.3	1	16.7	2
Total weight	**78.70%**		**21.30%**	
Total rank	**1**		**2**	
W	**0.605**			
$\boldsymbol{\lambda}$	**2.000**			

The experts have a unified agreement that privacy is much more important in influencing customer behaviour in choosing eHealth use. The answers demonstrate the fact that privacy highly outweighs the factor of data security. Privacy plays an important role in healthcare sphere since the process involves the gathering, surveillance, usage and disclosure of personal data. Since operating such sensitive information makes it easy to identify any individual, it should be taken in mind that accumulating such data may cause risks as well. Personal data protection is of utmost significance not only for a sole individual, but also for thr medical institution and looking from the broader perspective – to the European Union as well. Hence, today cloud computing challenges healthcare institutions to maintaining sensitive health data privacy.

The last but not least factor group evaluated by the experts is social factors (Table 24). It is formed by four factors: e-readiness, social influence, perceived usefulness, perceived ease of use. The Kendall's coefficient of concordance satisfies the condition $0<W<1$, which postulates the fact that the decision makers, i.e. experts, had an agreement regarding the evaluation of social factors. Moreover, the consistency ratio is acceptable for the reliable analysis, and the coefficient of lambda meets the condition that the consistent matrix upholds the specification to be close to the objects being evaluated. Considering these coefficients it can be noted that further examination procedure is available.

The experts corroborate that a vital factor of the social group factor is the percieved ease of use which is set to be the primary factor. Sun, Wang, Guo and ve

Peng, (2013), Gücin and Berk, (2015) came up with the same conclusion that the understanding of ease-of-use is a strong element for eHealth adoption for patients. With this in mind, it can be noted that percieved ease of use highly influences customer behaviour in eHealth use. It can be stated that if the person believes that using a particular eHealth tool would be effortless he/she would tend to implement that system more likely. Hence, the effort expectancy of use easiness forecasts the degree of technology acceptance. Moreover, authors suggest that presenting the technology usage results impacts the understanding for ease of use (Ji, Jackson, Park, & Probst, 2006).

Table 24. A summary of social factors evaluation

Factors	**e-readiness**		**Social influence**		**Perceived usefulness**		**Perceived ease of use**	
Expert	Weight %	Rank	Weight %	Rank	Weight %	Rank	Weight %	Rank
Exp.1	35.4	1	9.3	4	30.3	2	25	3
Exp.2	7.6	4	56	1	17.2	3	19	2
Exp.3	9.4	3	4.2	4	31.6	2	54.8	1
Exp.4	49.7	1	6	4	11.4	3	32.9	2
Exp.5	6.1	4	9.4	3	28.7	2	55.8	1
Exp.6	24	3	4.3	4	41.6	1	30.1	2
Exp.7	65.7	1	20	2	5.8	4	8.2	3
Exp.8	24.2	2	6.3	4	49.7	1	19.8	3
Exp.9	35.8	2	6	4	15.2	3	43	1
Total weight	**25.40%**		**11.90%**		**28.50%**		**34.20%**	
Total rank	**3**		**4**		**2**		**1**	
W	**0.2**							
CR	**1.20%**							
λ	**4.034**							

Another key factor that experts found to be influential on customers' behaviour in choosing eHealth tools is perceived usefulness. Generally, it is the belief that utilizing technology would serve as a help to finish the task in a faster manner. If the patient believes that adapting eHealth in his/her daily life would provide an effective treatment or diagnosis in a time saving and accurate manner he/she would be more likely to be involved in eHealth use.

The third factor according to the experts is e-readiness. Regarding this assessment, it could be noted that if a person has the inclination to use and encompass digital technologies in daily life, he/she would tend to utilize eHealth tools as well. Since e-readiness is regarded as one of the crucial factors of any country's development, it indicates the transformation of society involving the transfer from traditional methods and relations to modern ways of thinking and practicing it in pivotal fields: education, health and production. Hence, this particular factor should be taken into account and stimulated.

And finally, the last group is the health policy factors. This group consists of four elements: eHealth education for patients and medical workforce, financial

incentives for patients and medical workforce using eHealth, eHealth promotion, and clear national legislative framework. The aggregated summary of experts' evaluation shows that Kendall's coefficient of concordance shows that there is no high agreement reached among experts regarding this factor group, but the ratio of W=0.101 conforms with the required conditions 0<W<1 and lambda (λ) is close to the valuated objects number (Table 25). The aggregated consistency ratio (CR) is 0.002 and it is lower than 0.2. Since all major requirements coincide it can be concluded that the results can be investigated further.

As it is seen from the table below, experts set the highest position for eHealth promotion. First of all, it is recommended to improve the theoretical background of health behaviour frameworks that stimulates health communication interventions. Secondly, there should be more personalized communication considering the benefits of eHealth. And mostly, accentuate the more frequent communication interactivity.

Table 25. A summary of eHealth policy factors evaluation

Factor	**eHealth education for patients and medical workforce**		**Financial incentives for patients and medical workforce using eHealth**		**eHealth promotion**		**Clear national legislative framework**	
Expert	Weight %	Rank	Weight %	Rank	Weight %	Rank	Weight %	Rank
Exp. 1	46.4	1	16.6	3	13.4	4	23.5	2
Exp. 2	39.2	2	10.7	3	41.2	1	9	4
Exp. 3	47.4	1	10.2	4	31.4	2	10.9	3
Exp. 4	6.9	4	12	3	20.8	2	60.2	1
Exp. 5	23.3	2	9.6	4	21.7	3	45.5	1
Exp. 6	49.3	1	6.9	3	37.7	2	6.2	4
Exp. 7	10.3	3	58.7	1	22.7	2	8.3	4
Exp. 8	17.1	3	9.5	4	20.3	2	53.2	1
Exp. 9	15.9	3	21	2	52.3	1	10.8	4
Total weight	**28.40%**		**16.60%**		**32.60%**		**22.30%**	
Total rank	**2**		**4**		**1**		**3**	
W	0.101							
CR	0.20%							
$\boldsymbol{\lambda}$	4.004							

Hornik (2002) and Napoli (2001) convince that eHealth tools can benefit from the synergetic advantages of mass media that influence the changes on institutional, individual and social levels. For instance, the communication of adjusted health information through websites has the probability to build a bridge between mass media and interpersonal relationships. Such interpersonal linkages like patients' support and live-chats are even more advantageous promotion alternative than mass media since it modifies the individual's behaviour. Overall, public health efforts can be also geared towards such initiatives like information sessions on eating habits and stressing the importance on a healthy lifestyle.

Another important element selected by the experts is eHealth education for patients and medical workforce. It is recommended to cultivate the need for patients to take responsibility for their own health and foster self-management. Moreover, it

is significant to stimulate the competencies which enable patients to use the possible online resources. Of course, the training of e-literacy for both sides – health professionals and patients is also required. In addition to this, the support of collaboration between individuals and healthcare professionals play a key role as well. Strengthening the relationships between patients and medical specialists, fostering user-friendly culture, investing in eHealth infrastructure ensure stakeholders with equitable access to qualitative and comprehensive health care.

Clear national legislative framework was rated as the third factor that influences customer's behaviour in eHealth use. Of course, healthcare quality strengthening starts from the policies that initiate the changes. Higher quality assurance architecture can be supplemented with the incentives to utilize eHealth. Moreover, policies should take into account the result measuring process and hold the stakeholders who are accountable for the attainment of results. Hence, the legislation system should strengthen its positions in setting up the system which encourages the shift from traditional medicine to modern one and ensure the compliance monitoring with the raised guidelines.

The last position was set for financial incentives for patients and medical workforce who use eHealth. The experts find this factor as the least influential for customer behaviour in eHealth use. This conclusion contradicts other academic researches which signify that financial injections from the government to digital projects foster their utilization (Fontaine, Ross, Zink and Schilling, 2010, Police, Foster and Wong, 2010, Lluch, 2011, Benavides-Vaello, Strode and Sheeran, 2013, Ross, Stevenson, Lau and Murray, 2016). These scholars note that financial incentives can comprise of pay-for-performance/results initiatives, free access to devices or services, reimbursements for use. Lithuanian research case showed the experts' objection considering this incentive. This can be explained by the fact that there is a huge avenue for refinement in the healthcare system starting from the digital health infrastructure, eHealth literacy, education and overall society perception of taking responsibility of their own health. Considering the public health funding it is important but health investment should be based more on the rational spending which may result in future beneficial outcomes.

The last expert evaluation analysis is dedicated for the groups' factors ranking. The factor group consists of all main factors' base that influence customer behaviour in eHealth use: social, health belief, behaviour of technology use, economic, organizational, security, eHealth policy, technological. Three highest weights collected factor groups are interpreted as mostly influencing the customer behaviour in eHealth use according to the experts. The main aggregated indexes satisfy the raised conditions (Table 26). The consistency ratio possesses the score of 0.018 which is lower than the raised condition of CR<0,2, while lambda (λ) is assumed to be suitable. Although the Kendall's coefficient of concordance provides a not so high agreement among the experts it fulfills the basic condition $0<W<1$. Therefore, it can be concluded that the aggregated results can be interpreted further.

The experts set security as the most vital factor group. Hence, the supportive approach is attained for the hypothesis H6. Privacy plays an important role in the healthcare sphere since the process involves the gathering, surveillance, usage and

disclosure of personal data. Since operating such sensitive information like individual's health makes it easy to identify any individual, it should be taken in mind that accumulating such data may cause risks. Regarding the privacy issues, it is important to distinguish the lifestyle, well-being apps and wearable medical devices. The latter ones are closely related with health data and collects very personal and precise health data. Hence, health considered data is much more sensitive and requires higher levels of protection. Under the auspices of Staff Working Document on the existing EU legal framework applicable to lifestyle and well-being apps, the Privacy Code of Conduct for mHealth apps was launched. This document involves such practical issues for app developers concerning transperancy, data minimization, consent, purpose limitation, privacy by design, limits to data protection such as for marketing purposes. Shortly, it is a guide for an mHealth app industry for compliance with the General Data Protection Regulation.

The second highest rated factor group is eHealth policy according to the experts evaluations and this conclusion supports hypothesis H5. European governments encounter an increasing number of health challenges that cause an unprecedented burden on the public health system. Based on the principle of social solidarity, they are responsible for reassuring healthcare financing and identification of policy proposals in this and non-health sectors in order to best address those challenges. Despite the fact that national policies are the major enforcing strength, the European Union also has influence in propagating the cooperation between the member states, stimulating internal market rules and investing in health programs. But the vital issues that policymakers face concern:

1. Controlling heathcare costs,
2. Retaining healthcare access,
3. Ensuring qualitative healthcare,
4. Awareness that personal health is more than a medical issue.

And one of the solutions for these challenges should concern employing the technological development products in order to treat an increasing number of patients utilizing the same financial and human resources.

Health belief was selected as the third factor group which has an impact on customer behaviour in eHealth use; this conclusion supports hypothesis H7. Since health consciousness is rated as the most significant element in this factor group, it should be taken into consideration that education plays an important role in this case. For instance, Hoque, Alam, & Nahid (2018) manifested that health consciousness is positively related with an individual's knowledge and this hypothesis is accepted after the empirical investigation. Therefore, potential eHealth users should know the the applicability of those tools, the nature of how technological mechanisms assist humans in making the decisions, understand their capabilities, implementation process, interaction, and adaptation of the privacy issues. The education system should generally foster the interest and knowledge in the consequences of an unhealthy lifestyle, preventive measures and shift the people's attention to take personal responsibility of their own health.

Table 26. A summary of group factors evaluation

Factors	Technological		Social		Behaviour to technology use		Economic		Organisational		Security		Health belief		eHealth policy	
Expert	Weight %	Rank	Weight %	Rank	Weight %	Rank	Weight %	Rank	Weight %	Rank	Weight %	Rank	Weight %	Rank	Weight %	Rank
Exp.1	2.6	8	7.4	6	12	4	16.9	3	18	2	7	7	7.9	5	28	1
Exp.2	7.2	5	3.5	8	4.6	7	9.4	3	9.2	4	37	1	23	2	5.5	6
Exp.3	6	8	11	4	28	1	7.2	6	15.8	3	7	7	17	2	8	5
Exp.4	3.4	7	3.2	8	12	4	10.4	5	13.8	3	32	1	4.9	6	20	2
Exp.5	2.9	8	8.9	5	3.7	7	6	6	10.6	4	14	3	24	2	30	1
Exp.6	29.9	2	4.1	8	33	1	4.7	6	4.2	7	6	5	8.3	4	9.1	3
Exp.7	8	6	15	2	7.1	7	33.9	1	10.5	4	13	3	8.9	5	4.3	8
Exp.8	11.2	5	14	3	5.1	8	8.6	6	18	2	5	7	24	1	13	4
Exp.9	9.5	5	12	3	23	2	3.7	8	6.9	6	30	1	4.7	7	10	4
Total weight	**8.30%**		**9.30%**		**13.50%**		**11.00%**		**13.60%**		**16.00%**		**14.20 %**		**14.30%**	
Total rank	**8**		**7**		**5**		**6**		**4**		**1**		**3**		**2**	
W	**0.112**															
CR	**0.018**															
λ	**8.179**															

The fourth group to be influential for customer behaviour in eHealth use is organizational factors according to the experts. Together with the national-level regulations, digital technologies and information culture define medical institutions' ability to process patients' health data in a safe and responsible manner (Marchand, Kettinger and Rollings, 2002; Choo, 2013). Inside this factor group, information culture is set as the most impactful element according to the experts. Westrum (2004) states that information culture is positively linked with activities which result in successful performance of an organization. Moreover, Jylhä, Mikkonen, Saranto, & Bates (2017) posit that information culture is associated with patient safety outcomes. In this context, disseminating knowledge about eHealth is an activity which requires a very responsible overview since otherwise it can generate errors in the process of treatment. Hence, the culture of medical institutions creates the conditions for cultivating patient information. The appropriate culture might help to avoid adverse events and serve as a help to utilize more eHealth tools.

The fifth group is chosen to be behaviour of technology use. Since the level of e-literacy in Lithuania is published to be low according to the report of "European Citizens' Digital Health Literacy" (2014) there is a noticeable demand for education, especially, for social members who are in risk and vulnerable groups . Moreover, it is worth noting that to strengthen e-society where both citizens and businesses, also in rural and urban areas need to obtain the necessary skills and competencies for such e-

services like eHealth, eTransport, and eGovernment. Hence, it is important to consider the social processes, specific individual circumstances, as well as institutional surroundings in order to shape individuals' internet use and capability to be up to date with the online knowledge.

Groups of economic as well as social and technological factors were acknowledged to be the least influential factors for customer behaviour in to eHealth use according to the experts' evaluation. Economic factors most importantly appraise the value for time and money of digital health technologies. The rationale for the choice of time frames which definitely refers to the financial part are the frequent elements that affect people. But the decision makers (experts) declare that economic factors are not the stimulating elements for customers to implement eHealth. Consistent across the studies, Sanyal, Stolee, Juzwishin & Husereau (2018) corroborate that there is a shortage of empirical and academic evidence to prove the fact that economic factors are feasible motivators to adopt eHealth. In addition to this, social factors which consist of e-readiness, social influence, perceived ease of use, perceived usefulness, are also stated to have less impact comparing to security factor group. The elements of perceived ease of use and perceived usefulness play an important role in this case. It can be stated that if a person believes that using a particular eHealth tool would be effortless he/she would tend to implement that system more likely. Therefore, the customer-friendly tools should be applied for utilization. Additionally, if a patient believes that adapting eHealth in his/her daily life would provide effective treatment or diagnosis in a time saving and accurate manner he/she would be more likely to be involved in eHealth use. Overall, the perception of easy eHealth implementation and its usefulness stem from the necessary skills to utilize such tools.

The findings also reveal that technological factors influence customer behaviour in eHealth on the most minor level. Based on these results, it can be concluded that, first of all, customers have to be motivated by their inner stimulations not by technology itself. People need to be assured about their data protection, clarified about their rights, supporting their the advancement of their digital skills.

In summary, after the empirical analysis of experts' valuation, three hypotheses were accepted: H5, H6, H7,while others – H1, H2, H3, H4, H8 were rejected. Although today healthcare systems encounter tremendous hardships such as an ageing society and increasing health care costs, one solution to these raised challenges lies with adapting the technological development products (eHealth) in order to treat an increasing number of patients utilizing the same financial and human resources.

3.3. An empirical analysis of public valuation of factors influencing customer behaviour in eHealth use

eHealth services are appointed for public use, therefore, the opinion of direct users is important to identify. Public survey attempts to collect individuals' opinion regarding the factors that have influence in their behaviour of eHealth use in Lithuania. A web survey was selected as a data-gathering method for public survey. Due to the most distinctive features such as flexibility, speed, timeliness, convenience, low administration costs comparing to the traditional surveys as well as

a wide access of population, the internet survey method was incorporated. Additionally, Web surveys dismiss the time-consuming procedure and errors (Dahlberg, 2007).

The sample of demographic characteristics is displayed in Table 12 in the second part of the thesis. As previously alluded, the survey was administered in Lithuania, so, all questions were presented in the local language. The respondents were asked to indicate the level of importance, in their personal opinion, of the technological, behaviour of technology use, social, economic, health belief, organizational, security, health policy factors to customer behaviour in eHealth use, which were rated using a 5-point Likert metric scale anchored by: l = absolutely unimportant, 2 = unimportant, 3 = neither unimportant nor important, 4 = important and 5 = very important.

Sample size. In order to conduct an online survey it is necessary to calculate the sample size. Formula 13 was adapted to identify the sample size. It is also crucial to identify such numbers like population, margin of error and confidence level since they are required. The margin of error is also called the "confidence interval" or "degree of precision" (Mathers, Fox and Hunn, 2007, p.18). It is the measurement of evaluation which reflects the researcher's toleration of the error. The lower level of margin error is opted, the bigger sample is recommended (Fox, Hunn and Mathers, 2009). While, the higher the confidence level is, the bigger sample is needed since it assures the researcher of the expression of percatages.

The online survey was available through www.manoapklausa.lt/apklausa/1097852147. Before the survey, respondents were briefly instructed on the questionnaire and their confidentiality was assured. The completion of the questionnaire took 5–8 minutes of respondents' time. The Lithuanian Department of Statistics released the population number at the beginning of 2019 and 2 793 986 people were recorded in the Republic of Lithuania. With this announced population number, the coeffients of 95% confidence level and acceptance of 5% margin of error, the recommended sample size for the empirical study was 385. The online survey was conducted during the period of April–May 2019 (see survey certificate, Appendix 21) and 388 valid respondents' answers were gathered.

Demographic profile of the respondents. According to the statistics published by Internet World Stats (2019) there were 2 599 678 registered Internet users on March 31, 2018, 90.8% penetration. Since the prevalence of internet users in Lithuania is high, it can be stated that the results can be applicable for the generalization of factors influencing cutomer behaviour in eHealth use. The descriptive sample is systemized and presented in figures below. The data revealed that women were more active which could be explained by the assumption that women are more responsible for their own and their family members' health. Hence, according to the data, women are a significant category in the health management process. Out of 388 respondents, the age group varied thusly (Figure 15): the majority (29%) of subjects fell in the interval of 31–35, 25–30 and 56 and more shared the same range of the activity with 22%, and the minority of the sample with 9% represented the range of 18–24.

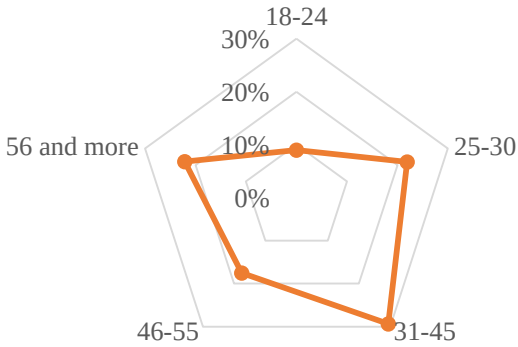

Fig. 15. Respondents' distribution regarding age groups

While considering the academic qualificaction (Figure 16), 44% of the respondents held a Master's degree, 25% attained a Bachelor's education, and only 4% attained a secondary school degree.

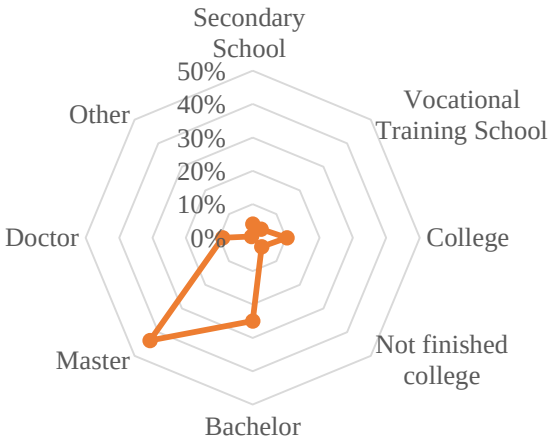

Fig. 16. Respondents' distribution regarding education level

Logistic regression. Prior to the analysis, a reliability test with the calculation of Cronbach's alpha coefficient was carried out. The reliability test was administered using the IBM SPSS Statistics 25 and the outcome of Cronbach's alpha coefficient was 0.937. Since the reliability index is interpreted to be excellent according to the qualitative descriptors used for values/ranges of values of Cronbach's alpha reported in papers in leading science education journals (Taber, 2017) it means that the scales were adapted in an acceptable and reliable way for the process of measurement.

Another stage of analysis for the identification of factors influencing customer behaviour in eHealth is logistic analysis. The output is displayed in Table 27. The results provide information whether the nine factors groups of social, technological,

health belief, economic from the provider perspective, economic from the client perspective, security, eHealth policy, behaviour to technology use, and organisational have any impact on customer behaviour towards eHealth. The constructs that exceed the threshold of significance level (p=0.05) are considered as having no effect on the dependant variable of eHealth use.

For the implementation of the first logistic regression all 39 factors were included in the model. The outcome displayed is in Tables 27 and 28. The coefficient which is worth noting is Nagelkerke Pseudo R-Square. The Nagelkerke Pseudo R-Square indicates the power of explanation of the model. It should be no less or equal to 0.2. As noted in the first model summary, Nagelkerke Pseudo R-Square equals to 0.308 which means the model is acceptable for further analysis (Appendix 24).

Another important outcome stemmed from the logistic regression adaptation is the classification table (see table 27). According to the results, it can be concluded that this particular model would operate correctly for 274 times. The accuracy of the model equals to 71.1% and it means that it classifies the outcome correctly for 71.1%.

Table 27. Classification outcome

Observed		**Predicted**	
		Do you use eHealth?	
		Yes	**No**
Do you use eHealth?	**Yes**	129	56
	No	56	147
Overall percentage		71.1%	
Nagelkerke R-Square		0.308	

Table 28 presents the outcome of the coefficient B values and information about their statistical significance (p values). Surprisingly, only 5 factors were found to have positive influence on customer behaviour in eHealth: speed, eHealth literacy, eHealth education for patients and medical workforce, cost-effective management of chronic diseases, and resources in medical institutions. Although the element of cost-effective management of chronic diseases exceeds the threshold of p=0.05 in a very little difference with the significance value of 0.053, it is considered to be an influential construct. The situation with the element of education is also interesting. The education element was not included in the factor groups as a sole factor but the logistic regression model manifested that it has significant power in customer behaviour.

What is more, it is important to cover the unstandardized coefficients B. If this coefficient is positive, it means that in the case of increase by one unit of independent variable, the dependant variable would increase within the B value. Hence, if the significant variable of speed increases in one unit, it means that the customer behaviour in of eHealth will increase by 0.498. As for another significant variable, eHealth literacy, an increment by one unit will result in the rise of the customer behaviour in of eHealth by 0.573. While an enlargement of resources in medical institutions by one unit will augment the customer behaviour in eHealth by 0.480. If the cost-effective management of chronic diseases rises by one unit, the customer

behaviour in eHealth will increase by 0.445. Finally, if eHealth education increases by one unit, the customer behaviour towards eHealth will increase by 0.552.

$$ln\frac{P(Y=1)}{P(Y=0)} = 20.583 + 0.498x_1 + 0.445x_2 + 0.552x_3 + 0.573x_4 + 0.480x_5$$

Where:

x_1 – speed,

x_2 – cost-effective management of chronic diseases,

x_3 – eHealth education for patients and medical workforce,

x_4 – eHealth literacy,

x_5 – resources in medical institutions.

Testing of empirical results revealed a supportive approach for five factors: speed, eHealth literacy, eHealth education for patients and medical workforce, cost-effective management of chronic diseases, and resources in medical institutions. Due to academic curiosity, a deeper logistic regression analysis is initiated. It is decided to run separate models eliminating one factor with the highest significance parameter at a time. After eliminating the most insignificant factor, each model is reviewed and examined with such dualistic approach: coefficient of Nagelkerke R Square and significance level. Tables 29–36 present the summaries after running the 35 models.

Table 28. Variables in the equation

Group factors	Factors	B	Significance
TECHNOLOGICAL FACTORS	System quality	0.341	0.116
	Information quality	-0.116	0.641
	Service quality	-0.345	0.121
	Speed	0.498	0.026
SOCIAL FACTORS	e-readiness	-0.024	0.909
	Social influence	0.171	0.311
	Perceived usefulness	-0.178	0.484
	Perceived ease of use	-0.064	0.777
BEHAVIOUR OF TECHNOLOGY USE FACTORS	Actual digital technology use	-0.322	0.114
	eHealth literacy	0.573	0.036
	Attitude to eHealth	-0.084	0.688
ECONOMIC FACTORS (clients' perspective)	Reduced morbidity	0.277	0.120
	Increased earning	0.025	0.884
	Reduced waiting time	-0.155	0.557
	Reduced consultation time	0.094	0.573
	Increased medication adherence	-0.149	0.421
	Avoidance of travel expenditures	0.199	0.250
	Decreased risk of job loss	-0.243	0.115
	Faster diagnosis and treatment	-0.305	0.224

Table 28. (continued)

Group factors	Factors	B	Significance
ECONOMIC FACTORS (medical institutions' perspective)	Reduced length of hospital stay	0.070	0.740
	Reduced hospitalizations	0.076	0,759
	Reduced hospital readmissions	-0.199	0.432
	Cost-effective management of chronic diseases	0.445	0.053
	Decreased travel expenditures due to decreased home visits	0.219	0.258
	Reduced clinic visits	0.137	0.556
	Increased productivity of hospital staff	-0.087	0.735
	Reduced public health spending	-0.164	0.468
eHEALTH POLICY FACTORS	eHealth education for patients and medical workforce	0.552	0.012
	Financial incentives for patients and medical workforce using eHealth	0.081	0.630
	eHealth promotion	0.339	0.149
	Clear national legislative framework	0.033	0.893
ORGANISATIONAL FACTORS	Information culture in medical institutions	-0.075	0.747
	Resources in medical institutions	0.480	0.046
	Management support	0.197	0.356
SECURITY FACTORS	Privacy	-0.291	0.371
	Data security	0.534	0.116
HEALTH BELIEF FACTORS	Health consciousness	0.056	0.836
	Perceived benefit	0.074	0.771
	Perceived threat	-0.071	0.765

The analysis is divided into three sections – from model 1 to 10, from model 11 to 20, models 21–30 and 31–35. After computing the tenth model, it is concluded in the model summary that Nagelkerke Pseudo R-Square equals to 0.306 which means that the model is acceptable for further analysis. Another important outcome stemmed from the logistic regression adaptation is the classification table (Table 29). According to the results, it can be concluded that this model would operate correctly for 270 times. The accuracy of the model equals to 69.6%. This means that it classifies the outcome correctly for 69.6%.

Table 29. Classification outcome

Observed		Predicted	
		Do you use eHealth?	
		Yes	No
Do you use eHealth?	Yes	127	58
	No	60	143
Overall percentage		69.6%	
Nagelkerke R-Square		0.306	

As it is seen from the outcome (Table 30) of the first section, the significant factors are speed, eHealth literacy, cost-effective management of chronic diseases, eHealth education for patients and medical workforce and resources in medical institutions. The detailed information about each model with the significance levels is presented in the Appendixes 25–34.

Table 30. Output after eliminating one insignificant factor in each step

Steps	Eliminated factors	Significant factors after elimination	Appendices
1–10	1. e-readiness 2. clear national legislative framework 3. increased earning 4. health consciousness 5. perceived threat 6. perceived ease of use 7. information culture in medical institutions 8. reduced length of hospital stay 9. increased productivity of hospital staff 10. perceived usefulness	1. speed 2. eHealth literacy 3. cost effective management of chronic diseases 4. eHealth education for patients and medical workforce 5. resources in medical institutions	25–34

The logistic regression formula is presented below. According to the unstandardized coefficients B it can be concluded that if the significant variable of speed increases in one unit, it means that the customer behaviour in eHealth will increase by 0.492. As for other significant variable, eHealth literacy, an increment in one unit will result in the rise of the customer behaviour in eHealth by 0.522. While the increase of resources in medical institutions by one unit will augment the customer behaviour in eHealth by 0.472. Moreover, if the cost effective management of chronic diseases rises by one unit, the customer behaviour in eHealth will increase by 0.456. Finally, if eHealth education increases by one unit, the customer behaviour in eHealth will increase by 0.540.

$$ln\frac{P(Y=1)}{P(Y=0)} = 20.589 + 0.492x_1 + 0.456x_2 + 0.540x_3 + 0.522x_4 + 0.472x_5$$

Where:
x_1 – speed,
x_2 – cost effective management of chronic diseases,
x_3 – eHealth education for patients and medical workforce,
x_4 – eHealth literacy,
x_5 – resources in medical institutions.

After computing the twentieth model it can be stated that the Nagelkerke Pseudo R-Square equals to 0.306 which means that the model is acceptable for further analysis (Table 31). According to the results, this model would operate correctly for 270 times. The accuracy of the model equals to 69.6%. This means that it classifies the outcome correctly for 69.6%.

Table 31. Classification outcome

Observed		**Predicted**	
		Do you use eHealth?	
		Yes	**No**
Do you use eHealth?	**Yes**	128	57
	No	61	142
Overall percentage		69.6%	
Nagelkerke R-Square		0.306	

As it is seen from the outcome (Table 32) of the second section, the significant factors are speed, faster diagnosis and treatment, cost-effective management of chronic diseases, eHealth education for patients and medical workforce and resources in medical institutions. After running these models and eliminating insignificant coefficients one at a time, eHealth literacy factor became insignificant but after the final stage in this section it was not eliminated since it did not operate with the highest significance level. Instead of eHealth literacy, faster diagnosis and treatment became significant factors. The detailed information about each model with the significance levels is presented in Appendices 35–44.

Table 32. Output after eliminating one insignificant factor in each step

Steps	**Eliminated factors**	**Significant factors after elimination**	**Appendices**
11–20	1. attitude to eHealth 2. financial incentives for patients and medical workforce using eHealth, 3. reduced consultation time, 4. reduced clinic visits, 5. reduced waiting time 6. information quality 7. increased medication adherence 8. management support 9. reduced public health spending 10. perceived benefit	1. speed 2. faster diagnosis and treatment 3. cost effective management of chronic diseases, 4. eHealth education for patients and medical workforce 5. resources in medical institutions	35–44

The logistic regression formula is presented below. According to the unstandardized coefficients B it can be concluded that if the significant variable of speed increases by one unit, the customer behaviour in eHealth will increase by 0.497. If another significant variable, that of faster diagnosis and treatment increases by one unit, the increase of the customer behaviour in eHealth is 0.475. While the increment of resources in medical institutions by one unit will increase the customer behaviour in eHealth by 0.523. Moreover, if the cost-effective management of chronic diseases rises by one unit, the customer behaviour in eHealth will increase by 0.441. Finally, if eHealth education increases by one unit, the customer behaviour in eHealth will increase by 0.532.

$$ln\frac{P(Y=1)}{P(Y=0)} = 20.589 + 0.497x_1 + 0.441x_2 + 0.532x_3 + 0.475x_4 + 0.523x_5$$

Where:
x_1 – speed
x_2 – cost effective management of chronic diseases
x_3 – eHealth education for patients and medical workforce
x_4 – faster diagnosis and treatment
x_5 – resources in medical institutions

Since after running 20 models there are insignificant factors, another section of models 21–30 is proceeded. First of all, the attention should be appointed to the Nagelkerke Pseudo R-Square which is equal to 0.260 (Table 33). The coefficient does not operate with the high value but it satisfies the condition to be higher then 0.2. Considering the results, it can be concluded that this model would operate correctly for 261 times. The accuracy of the model equals to 67.3%. This means that it classifies the outcome for 67.3% correctly.

Table 33. Classification outcome

Observed		**Predicted**	
		Do you use eHealth?	
		Yes	**No**
Do you use eHealth?	**Yes**	124	61
	No	66	137
Overall percentage		67.3%	
Nagelkerke R-Square		0.260	

The output displayed in Table 34 reveals the fact that eliminating 10 insignificant factors regarding their significance value, one factor with the highest significance calculation at a time, it can be concluded that the same factors remain in the formula: speed, faster diagnosis and treatment, cost effective management of chronic diseases, eHealth education for patients and medical workforce and resources in medical institutions.

Table 34. Output after eliminating one insignificant factor in each step

Steps	Eliminated factors	Significant factors after elimination	Appendices
21–30	1. reduced hospitalizations 2. reduced hospital readmissions 3. privacy 4. data security 5. social influence 6. decreased travel expenditures due to decreased home visits 7. actual digital technology use 8. decreased risk of job loss 9. avoidance of travel expenditures 10. reduced morbidity	1. speed 2. faster diagnosis and treatment 3. cost effective management of chronic diseases, 4. eHealth education for patients and medical workforce 5. resources in medical institutions	45–54

The logistic regression formula is presented below. According to the unstandardized coefficients B it can be concluded that if the significant variable of speed increases by one unit, customer behaviour in eHealth will increase by 0.467. If the variable of faster diagnosis and treatment rises by one unit, the increase of the customer behaviour in eHealth will be 0.419. While the enlargement of the resources in medical institutions by one unit will augment the customer behaviour in eHealth by 0.598. If the cost-effective management of chronic diseases rises by one unit, the customer behaviour in eHealth will increase by 0.449. Finally, if eHealth education increases by one unit, the customer behaviour in eHealth will increase by 0.532.

$$ln\frac{P(Y=1)}{P(Y=0)} = 20.589 + 0.467x_1 + 0.449x_2 + 0.532x_3 + 0.419x_4 + 0.598x_5$$

Where:
x_1 – speed,
x_2 – cost-effective management of chronic diseases,
x_3 – eHealth education for patients and medical workforce,
x_4 – faster diagnosis and treatment,
x_5 – resources in medical institutions.

After running 30 models it appeared that there are still insignificant factors. Hence, another section of 31–35 model is proceeded. The last (35^{th}) model presents the Nagelkerke Pseudo R-Square with the value of 0.231 (Table 35). The coefficient does not operate with the high value but it satisfies the condition to be higher than 0.2. According to the results, it can be concluded that this model would operate correctly for 257 times. The accuracy of the model equals to 66.2%. This means that it classifies the outcome for 66.2% correctly.

Table 35. Classification outcome

Observed		**Predicted**	
		Do you use eHealth?	
		Yes	**No**
Do you use eHealth?	**Yes**	123	62
	No	69	134
Overall percentage		66.2%	
Nagelkerke R-Square		0.231	

The output displayed in Table 36 reveals the fact that eliminating 5 insignificant factors regarding their significance value, one factor with the highest significance calculation at a time, it can be concluded that these factors remain in the formula: speed, faster diagnosis and treatment, eHealth education for patients and medical workforce, and resources in medical institutions. It appears that in the last stage of analysis one factor – cost effective management of chronic diseases was eliminated since the significance level 0.098 (see Appendices 55–59) exceeded the threshold of $p<0.05$.

Table 36. Output after eliminating one insignificant factor in each step

Steps	**Eliminated factors**	**Significant factors after elimination**	**Appendices**
31–35	1. eHealth promotion 2. system quality 3. service quality 4. eHealth literacy 5. cost effective management of chronic diseases	1. speed 2. faster diagnosis and treatment 3. eHealth education for patients and medical workforce 4. resources in medical institutions	55–59

The logistic regression formula is presented below. According to the unstandardized coefficients B it can be concluded that if the significant variable of speed increases by one unit, the customer behaviour in eHealth will increase by 0.462. As for another significant variable, faster diagnosis and treatment, an increment by one unit will result in the increase of the customer behaviour in eHealth by 0.378. While the enlargement of resources in medical institutions by one unit will increase the customer behaviour in eHealth by 0.507. Moreover, if the eHealth education for patients and medical workforce rises by one unit, the customer behaviour in eHealth will increase by 0.308. Finally, if eHealth education increases by one unit, the customer behaviour in eHealth will increase by 0.532.

$$ln\frac{P(Y=1)}{P(Y=0)} = 20.589 + 0.462x_1 + 0.507x_2 + 0.308x_3 + 0.378x_4$$

Where:

x_1 – speed,

x_2 – resources in medical institutions,
x_3 – eHealth education for patients and medical workforce,
x_4 – faster diagnosis and treatment.

In conclusion, implementing all variables in the model shows that customers found these factors to be influential for customer behaviour in choosing eHealth: speed, cost-effective management of chronic diseases, eHealth education for patients and medical workforce, eHealth literacy and resources in medical institutions. After initiating detailed 35 logistic regression models eliminating one factor with the highest significance at each step it was found that four factors positively influence customer behaviour in choosing eHealth: speed, faster diagnosis and treatment, eHealth education for patients and medical workforce, and resources in medical institutions. While the inclusion of all factors at a time resulted also in these two significant factors: cost-effective management of chronic diseases and eHealth literacy.

Concerning these results further explanation is needed. Speed is the element which belongs to the technological factor group. Nowadays people live at a hectic pace. Hence, customers are very picky and they expect to obtain information very quickly without any time and effort constraints. Moreover, in the case of eHealth implementation patients are stimulated to transform their traditional habits in healthcare in digital technologies, so they need to obtain faster appointments, receive faster treatment, get prompt requests and health information.

Cost-effective management of chronic diseases was also found to be an influential factor in customer behaviour in choosing eHealth. It belongs to the economic group (from the medical institutions' perspective). In this particular research study, patients are stated to be socially responsible, since each individual is involved in the healthcare system. People who suffer from chronic diseases incur not only emotional severity but also barriers in their daily life. For instance, eHealth technologies, such as mobile apps can serve as a help to manage the morbidity and provide the support of communication without experiencing any travel costs and herewith saving time. The provision of healthcare services at a distance is a huge advantage for a nowadays' customer. Moreover, implementing digital contextual medical devices results in more accurate diagnosis and control. Looking from the broader perspective, the expenditures for management of chronic diseases would be also mitigated. In addition to this, individuals are enabled to self-management and self-care. For instance, adapting such biomedical innovation like the stethoscope which can be attached to the patient's mobile phone enables her/him to monitor the lung health without any need to go to the healthcare professional. Hence, such remote monitoring is necessary for patients who have issues with a lack of mobility.

The third factor which was selected by the respondents of the public survey is eHealth education for patients and medical workforce. Surprisingly, respondents show responsibility and are eager to cultivate competencies which help to adapt and implement eHealth tools properly. What is more, eHealth integrates not only patients but also healthcare specialists. According to the public service, practitioners need knowledge and skills to obtain the best results from digital technologies. In addition to this, only those healthcare specialists who are characterized as modern and

professionally competent are able to communicate the advantages of eHealth technologies and serve for the prevalence of digitally-enabled customers. Since, according to the traditional medicine, doctors are deemed to be the reliable information resources and decision makers, respondents demonstrated the significance of healthcare specialists' education. Such scholars like Edirippulige and Armfield (2016), Kampmeijer, Pavlova, Tambor, Golinowska and Groot (2016), Marschang (2014) highlight the fact that the lack of digital health education for healthcare professionals can be interpreted as an impediment to adapt eHealth in daily life. Hence, training both users, health professionals and patients, is the approach for ensuring a qualitative healthcare process and the public perception that personal health is more than a medical issue. Moreover, education put strong practical foundations and constantly exposes the health professional to new perception and development.

After the examining the public survey it was also revealed that respondents found the factor of eHealth literacy as an influential element for customer behaviour in choosing eHealth. The prevalence of information considering health issues on the internet is tremendous. Some scholars even propose that this information should be adapted to the favour of the target groups with different health issues (Heiman, Keinki and Huebner, 2018). It is clear that the internet will obtain more and more significance in the future, but without promoting eHealth literacy in the population, only a few can take the advantage from the abundance of information. Moreover, the internet provides a great variety of poor data which may lead to wrong health-related decisions. In most cases, people who retrieve information from the internet do not understand it properly, which requires an urgent demand for a dualistic approach: qualitative information which could present safe and clear information for the patients and eHealth literacy. When the patient has proper skills of eHealth literacy, healthcare professionals should not be worried before recommending some kind of eHealth tool. Hence, the education system and medical institutions should take the responsibility for the individuals' critical thinking regarding the information on the websites and eHealth tools which stems from eHealth literacy and reassure trustworthy and easy methods to find reliable information resources. Since respondents showed that this particular factor is important, it should not be left asside but taken into consideration.

Another key factor rated by the respondents is the resources in medical institutions. This factor belongs to organisational factors. Of course, human resources are vital. Undoubtedly, educated and trained health workers, as well as fixed assets consist a part of the health system. But this is not the case about questioning the medical educational system, since in this particular research study resources reflect the physical assets – eHealth tools. In this context, it is important to highlight the fact that technological progress makes a huge impact on the medical institutions' capital and old gadgets become outdated when the new and improved technologies emerge. Corresponding this fact and the prevalence of eHealth tools, medical institutions should shift not only the traditional medicine thinking but also the technologocial boundaries. Revoliutionary advances in medical insitutions should go hand in hand. Modern technological infrastructure ensures the continuous development of healthcare providers' competence as well as better and more accurate treatment.

The last factor that was singled out by the respondents is faster diagnosis and treatment. Faster diagnosis and treatment would not be available without a modern terchnological infrastructure. For instance, telehealth tools provide the ability to serve patients immediately without a physical appointment. People feel stress when they cannot physicaly reach the healthcare specialists and get advice about the symptoms, hence a video call or mobile app would serve as help for communication. This solution trims the costs of the process during acute-care admission. What is more, implementing electronic health records helps to track patients' information in the cases when the patient moves from one location to another in a continuum of healthcare. In addition to this, the enhancing popularity of electronic devices such as tablets, smartphones, laptops are benficial not only for more effective information administration since paper-based data gathering and document filling requires time, but also for the environment. In conclusion, it can be stated that respondents demonstrated the significance for the administrative operations to become faster and it is a signal for the support of technological changes.

Principal component analysis. Principal component analysis (PCA) is the mathematical process which converts the variables that are possibly correlated into a smaller group of uncorrelated variables named principal components. Generally, PCA is used for multidimensional variables. Since distinguished factor groups are comprised of a great variety of elements they are considered to be multidimensional. So, first of all, the factor groups are transformed into different dimensions. The aim of this analysis is to extract the significant information from the multivariate data and present it in those new elements – principal components. Those new principal components conform with the linear combination of the originals.

Before starting to run the model with PCA, the inclusive variables have to be obtained. Hence, within 9 factor groups new components are transformed. When all 9 components are calculated, then PCA is used to model a new framework (Appendix 60). Hence, testing the results of public survey through PCA has revealed that Nagelkerke Pseudo R-Square coefficient does not operate with the high value which is equal 0.206 (Table 37). Nevertheless, it satisfies the basic condition to exceed the threshold of 0.2. Taking into consideration the results, it can be concluded that this particular model would operate correctly for 256 times with 132 mistakes. The accuracy of the model equals to 66%. This means that it classifies the outcome for 66% correctly.

Table 37. Classification outcome

Observed		**Predicted**	
		Do you use eHealth?	
		Yes	**No**
Do you use eHealth?	**Yes**	123	62
	No	70	133
Overall percentage		66%	
Nagelkerke R-Square		0.206	

The statistical test supports only one factor group – organizational factors (Table 38) which is comprised of information culture in medical institutions, resources in medical institutions and management support. According to the component matrix output (Appendix 60), it is indicated that the highest weight is dedicated for the factor of resources in medical institutions with the value of 0.856, while management support is rated by 0.846 and information culture in medical institutions operates with the weight of 0.816. To be more precise, the most impactful factor in the organizational factor group is resources in medical institutions since it is the sole factor with the initial eigenvector which exceeds the threshold of 1 with the obtained value of 2.116>1. Moreover, it explains 70.53% of the whole variance.

Table 38. Results after principal component analysis

Factor	**Significance**
Technological	0.280
Social	0.969
Behaviour of technology use	0.601
Economic from client	0.482
Economic from provider	0.122
Organisational	0.022
Health belief	0.975
Security	0.752
Policy	0.662

Considering the PCA results it can be noted that there is one consensus with the previously alluded logistic regression conclusion. After the examination of PCA results it was found that only one factor group is influential for customer behaviour in choosing eHealth – organizational factors. What is interesting, according to the component matrix output it was indicated that the highest weight is dedicated to the factor of resources in medical institutions with the highest component value. While after running logistic regressions in both ways there was also distinguished one organizational factor – resources in medical institutions. Hence, the public survey shows that the organisational factor group plays a significant role in influencing customer behaviour in choosing eHealth. This conclusion results supports the approach of hypothesis 8, while the other ones H1, H2, H3, H4, H5, H6, H7 are rejected.

Generally, eHealth unifies the public interests of healthcare quality, affordability and accessibility (Gaddi, Capello & Manca, 2014). From the patients' perspective, a technologically modern healthcare institution provides more reliability and higher reputation. Customers who are technologically modern pay special attention to the infrastructure of healthcare institutions. This patients' experience and overview starts from the front line – administrative operations and provision with abilities to incorporate more effective solutions for health management. Below (Table 39) there is a list of economic benefits to increase efficiency and reduce costs.

Table 39. Economic benefits of eHealth options

eHealth option	Economic benefits
Remote diagnostics	Clinic visits reduction, time saving, lower costs, better treatment, skilled health workers' effective time use
Electronic health records	Information consistency, improved speed, better administration use, faster reimbursement, mitigating costs, paperless work, better management of individual wellness, lower claims.
ePresriptions	Paperless work, saving time and money, co-payments calculated automatically, doctors' availability to monitor the patient, more doctors' consultations, lower costs.
Remote monitoring	Emergency reduction, hospitalization decrease, cutting down costs, time and money saving for patients and healthcare system, lower costs
Telecare	Productivity improvement, burden reduction of healthcare resources, mitigating costs, hospitalization and readmission decrease.
mHealth applications	Saving patients time and money, skilled health workers' effective time use, targeted and proactive care, treatment.

It can be concluded that bringing more efficiency via implementing eHealth is the translation of economic eHealth benefit. Based on a great variety of literature referring to information and communication technologies evidence, the Congressional Budget Office (2008) forecasted that eHealth efficiency could mitigate the up to 3% of total US health expenditures. The academic literature (Jung and Loria 2010, Commission of the European Communities 2004, Ganesh 2004, González, Quesada, Urrutia and Gavidia 2006, Ross and Lin 2003) highlights the significance of eHealth implementation in reducing costs. The good examples with efficiency in resource allocation stem from Estonia and Sweden with ePrescriptions that were alluded to previously, prove the fact that eHealth addresses the issue of mitigating costs.

Moreover, eHealth mitigates travel costs by incorporating communication technologies (Schaafsma, Pantazi, Moehr, Anglin & Grimm, 2007, Harper, 2006). Seeking for the diagnosis and treatment requires refusal of leisure time, worktime and reduces the wages. In this context, eHealth enables to avoid the waiting time for consultations (Baldwin, Clarke, Hands, Knott, & Jones, 2003). Looking from the broader economic perspective, it should be noted that adapting eHealth productivity increases due to increased employement time.

Moreover, the academic studies accept the fact that eHealth stimulates the reduction of hospital stay duration (Benatar, Bondmass, Ghitelman, & Avitall, 2003), the length of consultations (Daucourt, Petitjean, Chateil, & Michel, 2005), home visits (Myers, Grant, Lugn, Holbert, & Kvedar, 2006), the number of hospitalizations (Myers, Grant, Lugn, Holbert, & Kvedar, 2006), and emergency department visits (Lehmann, Mintz, & Giacini, 2006, Malasanos, Burlingame, Youngblade, Patel, & Muir, 2005).

Another important economic benefit that brings eHealth implementation for a healthcare system is transperency. EHealth tools enable to track financial expenditures and resources, and they can play an important role in holding the health

institutions accountable for how money is spent. The process of following up would enable to monitor the financial expenditures of healthcare institutions. Moreover, shadow tenders where one participant is attracted mostly would be mitigated and polluted economic relationships would be avoided. At the same time, the country's investment climate would be improved.

Moreover, it is declared that eHealth tools would mitigate adverse drug reactions (Congressional Budget Office, 2008). The European Medicine Agency (2014) announced that adverse drug reactions are the 5th most prevalent cause of hospital death which conditions an estimated 197 000 deaths per year in the EU. It is a huge loss of socioeconomic active members of the labour market. What is more, it is calculated that the total expenditures to society of adverse drug reactions in the EU compounds of 79 billion Euros. Hence, eHealth adaptation would serve as a help to solve the problems with increasing healthcare costs and improve the quality of people's lives.

Concerning the economic benefits of eHealth, e-readiness should be considered as one of the essential issues. E-readiness is basically described as the level to which society is ready to use information technologies. Generally, it is the country's capability to benefit from ICT. Additionaly, e-readiness is reffered to as a competitive advantage in the networked economy (Molla et al., 2008). The implementation of eHealth tools would foster the traditional economy to a digital one. It stimulates the global market via producing individuals with capabilities to take part in a new economy, and, foster human capabilities and economic performance. Additionally, such authors like Potnis and Pardo (2011) notice that the quality of peoples' lives can be seen through the perspective of e-readiness. Therefore, it is important to adapt eHealth technologies in order to hinder the lag within other economies. Since e-readiness is regarded as one of the crucial factors of any country's development, it indicates the transformation of society involving the transfer from traditional methods and relations to modern ways of thinking and practising it in pivotal fields: education, health and production.

But "eHealth is the use of ICT in health products, services and processes combined with organisational change in healthcare systems and new skills, in order to improve health of citizens, efficiency and productivity in healthcare delivery, and the economic and social value of health " (European Commission, 2012, p.3). Hence, without management support, resources and information culture, convincing people to shift their daily practices is a huge challenge.

Generalization of the third part of the thesis.The third part of this research study is dedicated to a dualistic approach to the empirical study which firstly aims to identify the experts' opinion about the most influential factors for customer behaviour in eHealth and strives to understand the opinion about the same issue incorporating a public survey.

1. To determine the expert number, Rudzkiene (2005) presented a dependence of expert valuation standard deviation on expert number which was considered as a reliable framework. According to the upholders of this dependence, the number of experts should be selected from the interval (5–9). After determining the number of experts, the procedure of forming the questionnaire was initiated incorporating the

pairwise comparison method. When all surveys were collected firstly, the consistency ratio was evaluated. The majority of the questionnaires exceeded the threshold of CR, therefore, the surveys were sent to the experts for additional overview. However, in some cases the degree of inconsistency was still higher than the determined limit, so the matrices were transformed into consisted ones. The method called Method-S was applied for this task. When all matrices were reconciled, the Kendall's coefficient of concordance was calculated to check the agreement among the decision makers – experts. After calculations using the IBM SPSS Statistics 25, the total Kendall's coefficient of concordance is 0.367. To check the importance of W, the Pearson chi-square is used, where statistic significance level is $\alpha = 0.05$ or 5%. The result of Pearson chi-square is compared with $x^2_{crit.}(0.05; k–1)$. The calculated Pearson chi-square satisfied the basic condition $x^2 > x^2_{crit.}$, 151.938>62.83. Hence, the null hypothesis is rejected and it is assumed that there is a good evaluation compliance among the experts. considering the experts ratings, the highest values were given to eHealth literacy from the behaviour of technology use group, information culture in the medical institutions from the organisational factors group, speed from the technological factors group, perceived benefit from the health belief factors group, faster diagnosis and treatment from the economic from the client's perspective group, eHealth promotion from the health policy factors group, perceived ease of use from the social factors group, privacy from the security factors group and reduced clinic visits from economic from the medical institution factors group. As for the evaluation of the whole group, the highest importance was set for three factor groups: privacy, eHealth policy and health belief. This conclusion supports hypotheses H5, H6, H7.

2. In order obtain public opinions, a web survey was selected as a data-gathering method. Due to the most distinctive features, such as flexibility, speed, timeliness, convenience, low administration costs comparing to the traditional surveys and also a wide access of population internet survey method was incorporated. The Lithuanian Department of Statistics released the population number at the beginning of 2019 which recorded 2 793 986 people in the Republic of Lithuania. With this population number and coefficients of 95% confidence level and acceptance of 5% margin of error, the recommended sample size for the empirical study was 385. During the online survey 388 valid answers were gathered. Since the reliability index Cronbach's alpha was interpreted to be excellent with the value of 0.937 according to qualitative descriptors used for values/ranges of values of Cronbach's alpha reported in papers in leading science education journals (Taber, 2017) it means that the scales were adapted in an acceptable and reliable way for the process of measurement. After implementing logistic regression, empirical results revealed supportive for five factors: speed, eHealth education for patients and medical workforce, cost-effective management of chronic diseases, and resources in medical institutions. Principal component analysis proved the influential role of organizational factors for customer behaviour in choosing eHealth. And this conclusion supports hypothesis 8.

CONCLUSIONS

1. Behavioural economists consent that the comprehension from behavioural economics have the probability to improve the attempts to capture the patients, doctors and providers to use eHealth. But the academic literature highlights the fact that the eHealth implementation process is considered as a complex incorporation and special attention should be appointed for the perception of factors that would stimulate the adoption of eHealth, where such technology proceeds to be unwittingly complicit in the routines of individuals and organizations. However, it seems a little incomprehensible that giving such fundamental practical relevance of eHealth, academic publications come short in the field of eHealth, especially the issue of its implementation. Nevertheless, after investigating the scarce academic approaches it appears that a consensus for evaluating the factors impacting customer behaviour in eHealth use has not been reached.

Traditionally scholars define eHealth as the usage of information and communication technology and mainly, the Internet, in order to improve health and healthcare. eHealth is a dynamic concept, and since it is defined as multifaceted and illustrates a broad variation of potential conceptualisations, the first part of the thesis characterised it as a tool to reach positive results for the healthcare sytem. This research study presents these health constituents: short messaging service, electronic health records, wearable devices, mobile health apps, telehealth, web-based system.

Regarding the academic research of customer behaviour considering eHealth, particular attention was devoted to three main theories: health belief, innovation diffusion and technology acceptance. The health belief model states that individuals act to prevent a disease only when they consider the evaluation of cost and benefit proportion. While the diffusion of innovation theory aims to describe a process by which a novel idea or innovation disseminates over a social system over time. The last theory that was chosen for analysis is the technology acceptance model which is initiated to expand the appropriate variables for better understanding of information technologies use behaviour.

After the theoretical investigation 39 factors influencing customer behaviour in choosing eHealth description were selected. It is chosen to form such factor groups: technological, social, organizational, economic, health belief, eHealth policy, security, behaviour of technology acceptance. Each factor group is very important from the economic point of view.

2. The methodological part of the research study presents the research model which has been revised and modified with inclusions from previously announced works in the theoretical discussion; it also proposes 8 hypotheses. This methodology consists of two main sections: experts data analysis and public survey examination. For the expert survey personally addressed invitations were selected to collect the data. A multidimensional method of analytic hierarchy process was used to process the experts' survey results. While the public survey was carried out via collecting online responses where respondents were asked to indicate their perceived level of importance in closed-ended questions. Logistic regression and principal component analysis were opted for the data processing.

Considering the evaluation of factors by the experts group, the highest weights were set for these factors: eHealth literacy, information culture in medical institutions, speed, faster diagnosis and treatment, reduced clinic visits, privacy, perceived ease of use, eHealth promotion. The last expert evaluation analysis ranked the groups' factors; these were identified as most influential for customer behaviour: privacy, eHealth policy and health belief. Therefore, hypotheses H5, H6, H7 attained the support after experts' evaluation.

The experts set security as the most vital factor group. Privacy is the significant factor regarding the usage, gathering and discloser of personal health information. Disposing person's health data simplifies the ability to identify the personality and in this particular case, it should be considered that accumulating such sensitive information may induce risk. Privacy plays an important role in the healthcare sphere since the process involves the gathering, surveillance, usage and disclosure of personal data. Since operating such sensitive information like an individual's health makes it easy to identify any individual, therefore, it should be taken in mind that accumulating such data may cause risks. Regarding the privacy issues, it is important to distinguish the wearable medical devices, ePrescriptions, eRecords. The latter ones are closely related with health data and collects very personal and precise health data. Health related data is much more sensitive and requires higher levels of protection, therefore, the medical data manager must reassure that information is disposed only for professional purposes using high security levels.

The second highest rated factor group is eHealth policy according to the experts evaluations and this conclusion supports hypothesis H5. European governments encounter an increasing number of economic health challenges that cause an unprecedented burden on the public health system. Based on the principle of social solidarity, they are responsible for the reassurance of healthcare financing and identification of policy proposals in this and non-health sectors in order to best address those challenges. Despite the fact that national policies are the major enforcing strength, the European Union also has some influence in propagating the cooperation between the member states, stimulating internal market rules and investing in health programs. The solution of raised challenges should be concerned about employing the technological development products in order to treat an increasing number of patients utilizing the same financial and human resources. While realizing the educational communication which stress the attention on the economic eHealth benefits would play an important role as well.

Health belief was selected as the third factor group which has an impact on customer behaviour in eHealth use; this conclusion supports hypothesis H7. Since health consciousness is rated as the most significant element in this factor group, it should be taken into consideration that education plays an important role. Scholars manifested that health consciousness is positively related with an individual's knowledge and this hypothesis was accepted after the empirical investigation. Therefore, the potential eHealth users should know how to apply those gadgets, what is the nature of those technological mechanisms, how they can assist them, what are their features and privacy issues.The education system should foster the interest and

knowledge in the consequences of an unhealthy lifestyle, preventive measures and shift the peoples' attention to take personal responsibility of their own health.

3. Since eHealth services and products are for public use, the opinion of direct users was important to identify. The public survey attempted to collect individuals' opinion regarding the factors that have influence on their behaviour of eHealth use. Since the prevalence of internet users in Lithuania is high the results can generalize the factors influencing customer behaviour in eHealth use. After collecting and analysing the data, it appeared that women were more active in the survey which could be explained by the assumption that women are more responsible for their own and their family members' health. Hence, women are a significant category in health management process.

Logistic regression and principal component analysis were used to examine the results of the public survey. After initiating 35 detailed logistic regression models and eliminating one factor with the highest significance level at each step it was found out that four factors positively influence customer behaviour in choosing eHealth and these consider: speed, faster diagnosis and treatment, eHealth education for patients and medical workforce and resources in medical institutions.

After the adaptation of principal component analysis it was revealed that only one factor group is stated to be influential for customer behaviour in choosing eHealth – organizational factors group. Therefore, hypothesis 8 is also supported. The component matrix output indicated that the highest weight is dedicated for the factor of resources in medical institutions with the highest component value. After running logistic regressions in both ways one organizational factor was also distinguished – resources in medical institutions. Modern technological infrastructure ensures the continuous development of healthcare providers' competence, as well as better and more accurate treatment. From the patients' perspective, a technologically modern healthcare institution provides more reliability and a higher reputation.

The public survey results differ from the experts survey outcome. And these differences appear from the fact that citizens cannot fully evaluate the factors influencing customer behaviour in eHealth use since they do not dispose specialized and comprehensive information.

4. Generally, eHealth unifies public interests of healthcare quality, affordability and accessibility. The academic studies accept the fact that eHealth stimulates the reduction of hospital stay duration, the length of consultations, home visits, the number of hospitalizations, and emergency department visits. Bringing more efficiency via implementing eHealth is the translation of economic eHealth benefit. Based on the great variety of literature referring to information and communication technologies evidence forecasted that eHealth efficiency could mitigate the up to 3% of total health expenditures.

Another important economic benefit of eHealth implementation in a healthcare system is transperency. EHealth tools enable to track the financial expenditures and resources. Moreover, they can play an important role in holding the health institutions accountable for how money is spent. The process of following up would enable to monitor the financial expenditures of healthcare institutions, and shadow tenders

where one participant is attracted mostly would be mitigated and the polluted economic relationships would be avoided.

Moreover, it is declared that eHealth tools would mitigate adverse drug reactions. It is announced that adverse drug reactions are the 5th most prevalent cause of hospital death which conditions an estimated 197 000 deaths per year in the EU. It is a huge loss of socioeconomic active members of the labour market. Hence, the adaptation of eHealth would help to solve the problems with increasing healthcare costs and improve the quality of people's lives.

Concerning the economic benefits of eHealth, e-readiness should be considered as an essential issue. E-readiness is reffered to as a competitive advantage in the networked economy. The implementation of eHealth tools would foster the traditional economy to a digital one. It stimulates the global market via producing individuals with capabilities to take part in a new economy, and, foster human capabilities and economic performance. Additionally, literature states that societies' life quality is tested through the perspective of e-readiness.

5. This thesis presented a model which enabled to identify the factors that influence customer behaviour in eHealth use. Moreover, the research study contributes with a comprehensive analysis, unified methodology and eHealth use perspectives improvement. And finally, the conducted research supplements other academic investigations and proposes important economic implications of eHealth system development.

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APPENDICES

Appendices (2-10; 23-60) are available on the link below:
https://drive.google.com/drive/folders/14FLotznqfaIYRH42bLx2uhDRfuH5tv0t?usp=sharing

Appendix 1. Experts survey example

Dear Sir/Madam,

I am the PhD student of KTU Economics program. Currently I am working on the research "**Evaluation of factors influencing customer behaviour in eHealth use"** which aims **to identify the factors that have the biggest impact on customer behaviour in choosing eHealth.**

Filling this questionnaire you will contribute to my final thesis heavily. Confidentiality is guaranteed.

Questionnaire Guide

The explanation of pairwise comparison values

Value	**Explanation**
1	two factors contribute **equally** to the objective
3	experience and judgement **slightly favour** one factor over another
5	experience and judgement **strongly favour** one factor over another
7	a factor is favored **very strongly** over another
9	the influence of one factor over another is the **highest**
2, 4, 6, 8	sometimes one needs to interpolate a compromise judgement numerically because there is no good word to describe it

The method of paired comparison is explained by an example below. For instance, there are two factors given for comparison: factor **A** and factor **B.** You should decide which factor influences **customer behaviour in choosing eHealth use more and what is the level of its influence** compared to another given factor. **Look at the example below where the relative scale for comparison of the influence of factor A with the influence of factor B is visualised.**

For instance, if:

1) **you mark 7 on the left, it means that factor A has a very strong favour over factor B.**
2) **you mark 3 on the right side, it means that factor B has a slight favour in comparison with factor A.**

	Extremely favours		Very strongly favours		Strongly favours		Slightly favours		Equal		Slightly favours		Strongly favours		Very strongly favours		Extremely favours	
	9	8	**7**	6	**5**	4	**3**	2	**1**	2	**3**	4	**5**	6	**7**	8	**9**	
A	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	**B**

Demographic profile of respondent

Gender

☐ Male
☐ Female

Age

☐ 24-30
☐ 31-40
☐ 41- 55
☐ 56 and more

How long are you working in medicine/pharmacy business field?

☐ Up to (including) 5 years
☐ Up to (including) 10 years
☐ Up to (including) 15 years
☐ More than 15 years

Education

☐ Bachelor
☐ Master
☐ Doctor

Work field

☐ Pharmacy
☐ Medicine

Please fill in the questionnaire regarding your professional expertise and competence.

TECHNOLOGICAL FACTORS

Which of the technological factors: A or B influences the customer behaviour in choosing eHealth services more?

A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	B
System quality	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Information quality
System quality	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Service quality
System quality	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Speed
Information quality	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Service quality
Information quality	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Speed
Service quality	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Speed

SOCIAL FACTORS

Which of the social factors: A or B influences the customer behaviour in choosing eHealth services more?

A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	B
E-readiness*	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Social influence
E-readiness*	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Perceived usefulness**
E-readiness*	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Perceived ease of use***
Social influence	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Perceived usefulness**
Social influence	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Perceived ease of use***
Perceived usefulness**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Perceived ease of use***

* *individual's inclination to encompass and use new technologies in order to accomplish tasks in daily life and at work*

***subjective probability explaining that utilizing technology would help the particular individual to complete the task in a faster manner*
****the degree to which a person believes that using a particular system would be free of effort*

BEHAVIOUR OF TECHNOLOGY USE FACTORS
Which of the behaviour of technology use factors: A or B influences the customer behaviour in choosing eHealth services more?

A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	B
Actual digital technology use	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	eHealth literacy*
Actual digital technology use	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Attitude to eHealth
eHealth literacy*	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Attitude to eHealth

***the ability to seek, find, understand, and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem*

ECONOMIC FACTORS
Which of the economic factors (from the clients' perspective): A or B influences the customer behaviour in choosing eHealth services more?

A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	B
Reduced morbidity	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Increased earning (via increased employment time)
Reduced morbidity	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reduced waiting time
Reduced morbidity	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reduced consultation time
Reduced morbidity	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Increased medication adherence
Reduced morbidity	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Avoidance of travel expenditures
Reduced morbidity	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Decreased risk of job loss (due to time spent in health service institution)
Reduced morbidity	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Faster diagnosis and treatment
A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	**B**
Increased earning (via increased employment time)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reduced waiting time
Increased earning (via increased employment time)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reduced consultation time
Increased earning (via increased employment time)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Increased medication adherence
Increased earning (via increased employment time)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Avoidance of travel expenditures
Increased earning (via increased employment time)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Decreased risk of job loss (due to time spent in health service institution)

Increased earning (via increased employment time)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Faster diagnosis and treatment
A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	**B**
Reduced waiting time	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reduced consultation time
Reduced waiting time	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Increased medication adherence
Reduced waiting time	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Avoidance of travel expenditures
Reduced waiting time	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Decreased risk of job loss (due to time spent in health service institution)
Reduced waiting time	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Faster diagnosis and treatment

Which of the economic factors (from the clients' perspective): A or B influences the customer behaviour in choosing eHealth services more?

A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	**B**
Reduced consultation time	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Increased medication adherence
Reduced consultation time	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Avoidance of travel expenditures
Reduced consultation time	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Decreased risk of job loss (due to time spent in health service institution)
Reduced consultation time	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Faster diagnosis and treatment
Increased medication adherence	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Avoidance of travel expenditures

Increased medication adherence	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Decreased risk of job loss (due to time spent in health service institution)
Increased medication adherence	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Faster diagnosis and treatment
Avoidance of travel expenditures	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Decreased risk of job loss (due to time spent in health service institution
Avoidance of travel expenditures	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Faster diagnosis and treatment
Decreased risk of job loss (due to tim spent in health service institution	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Faster diagnosis and treatment

ECONOMIC FACTORS

Which of the economic factors (from the medical institution perspective): A or B influences the customer behaviour in choosing eHealth services more?

A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	B
Reduced length of hospital stay	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reduced hospitalizations
Reduced length of hospital stay	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reduced hospital readmissions
Reduced length of hospital stay	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Cost effective management of chronic diseases
Reduced length of hospital stay	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Decreased travel expenditures due to decreased home visits
Reduced length of hospital stay	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reduced clinic visits
Reduced length of hospital stay	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Increased productivity of hospital staff
Reduced length of hospital stay	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reduced public health spending

Which of the economic factors (from the medical institution perspective): A or B influences the customer behaviour in choosing eHealth services more?

A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	B
Reduced hospitalizations	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reduced hospital readmissions
Reduced hospitalizations	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Cost effective management of chronic diseases
Reduced hospitalizations	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Decreased travel expenditures due to decreased home visits
Reduced hospitalizations	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reduced clinic visits
Reduced hospitalizations	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Increased productivity of hospital staff
Reduced hospitalizations	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reduced public health spending
Reduced hospital readmissions	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Cost effective management of chronic diseases
Reduced hospital readmissions	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Decreased travel expenditures due to decreased home visits
Reduced hospital readmissions	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reduced clinic visits
Reduced hospital readmissions	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Increased productivity of hospital staff
Reduced hospital readmissions	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reduced public health spending

A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	B
Cost effective management of chronic diseases	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reduced clinic visits
Cost effective management of chronic diseases	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Increased productivity of hospital staff
Cost effective management of chronic diseases	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reduced public health spending

Which of the economic factors (from the medical institution perspective): A or B influences the customer behaviour in choosing eHealth services more?

A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	B
Decreased travel expenditures due to decreased home visits	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reduced clinic visits
Decreased travel expenditures due to decreased home visits	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Increased productivity of hospital staff
Decreased travel expenditures due to decreased home visits	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reduced public health spending
A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	**B**
Reduced clinic visits	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Increased productivity of hospital staff
Reduced clinic visits	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reduced public health spending
Increased productivity of hospital staff	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reduced public health spending

ORGANISATIONAL FACTORS

Which of the organisational factors: A or B influences the customer behaviour in choosing eHealth services more?

A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	B
Information culture in medical institutions	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Resources in medical institutions
Information culture in medical institutions	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Management support
Resources in medical institutions	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Management support

HEALTH BELIEF FACTORS

Which of the health belief factors: A or B influences the customer behaviour in choosing eHealth services more?

A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	B
Health consciousness*	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Perceived benefit**
Health consciousness*	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Perceived threat***
Perceived benefit**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Perceived threat***

** patient's readiness to implement health behaviours or undertake healthy actions*

*** individual's assessment of the value or efficacy of engaging in a health-promoting behaviour to decrease risk of disease*

****individual's assessment of his/her chances of getting the disease and judgement as to severity of the disease*

SECURITY FACTORS

Which of the security factors: A or B influences the customer behaviour in choosing eHealth services more?

A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	B
Privacy	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Data security

eHEALTH POLICY FACTORS

Which of the eHealth policy factors: A or B influences the customer behaviour in choosing eHealth services more?

A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	B
eHealth education for patients and medical workforce	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Financial incentives for patients and medical workforce using eHealth
eHealth education for patients and medical workforce	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	eHealth promotion
eHealth education for patients and medical workforce	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Clear national legislative framework
Financial incentives for patients and medical workforce using eHealth	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	eHealth promotion
Financial incentives for patients and medical workforce using eHealth	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Clear national legislative framework
eHealth promotion	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Clear national legislative framework

Which of the group factors A or B influences the customer behaviour in choosing eHealth services more?

A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	B
Technological	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Social
Technological	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Behaviour of technology use
Technological	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Economic
Technological	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Organisational
Technological	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Security
Technological	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Health belief
Technological	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	eHealth policy
A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	B
Social	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Behaviour of technology use
Social	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Economic
Social	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Organisational
Social	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Security
Social	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Health belief
Social	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	eHealth policy

Which of the group factors A or B influences the customer behaviour in choosing eHealth services more

A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	B
Behaviour of technology use	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Economic
Behaviour of technology use	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Organisational
Behaviour of technology use	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Security
Behaviour of technology use	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Health belief
Behaviour of technology use	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	eHealth policy
A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	B
Economic	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Organisational
Economic	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Security
Economic	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Health belief
Economic	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	eHealth policy
Organisational	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Security
Organisational	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Health belief
Organisational	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	eHealth policy
Security	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Health belief
Security	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	eHealth policy
eHealth policy	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Health belief

Appendix 11. Behaviour of technology use factors group

Table

	Criterion		Weights
1	Actual digital technology use		27,2%
2	eHealth literacy		49,9%
3	Attitude to eHealth		22,9%
4			0,0%
5			0,0%
6			0,0%
7			0,0%
8			0,0%
9			0,0%
10			0,0%

Result

Lambda: 3,002

0,0% CR: 0,2%

Matrix

	Actual digital technology use 1	eHealth literacy 2	Attitude to eHealth 3	4	5	6	7	8	9	10	normalized principal Eigenvector
Actual digital technology 1	1	1/2	1 1/4	-	-	-	-	-	-	-	27,21%
eHealth literacy 2	2	1	2	-	-	-	-	-	-	-	49,92%
Attitude to eHealth 3	4/5	1/2	1	-	-	-	-	-	-	-	22,87%

Appendix 12. Organizational factors group

Table		Criterion	Comment	Weights
	1	Information culture in medical instituti		38,9%
	2	Resources in medical institutions		25,0%
	3	Management support		36,1%
	4			0,0%
	5			0,0%
	6			0,0%
	7			0,0%
	8			0,0%
	9			0,0%
	10			0,0%

Result		
	Lambda:	3,034
	CR:	3,5%

Matrix	Information culture in medical	Resources in medical institutions	Management support	0	0	0	normalized principal Eigenvector
	1	2	3	4	8	9	
Information culture in	1	1	1 7/8	8/9	-	-	-	38,90%
Resources in medical	2	1/2	1	5/6	-	-	-	24,98%
Management support	3	1 1/9	1 1/5	1	-	-	-	36,12%

Appendix 13. Technological factors group

Table

	Criterion	Comment	Weights
1	System quality		15,4%
2	Information quality		30,5%
3	Service quality		19,9%
4	Speed		34,2%
5			0,0%
6			0,0%
7			0,0%
8			0,0%
9			0,0%
#			0,0%

Result

4,034

CR: 1,3%

Matrix

		System quality 1	Information quality 2	Service quality 3	Speed 4	0 5	0 6	0 7	0 8	0 9	0 10	normalized principal Eigenvector
System quality	1	1	1/2	1	3/8	-	-	-	-	-	-	15,38%
Information quality	2	2 1/9	1	1 1/2	1	-	-	-	-	-	-	30,49%
Service quality	3	1	2/3	1	2/3	-	-	-	-	-	-	19,90%
Speed	4	2 5/7	1 1/9	1 3/7	1	-	-	-	-	-	-	34,24%

Appendix 14. Health belief factors group

Table

	Criterion	Comment	Weights
1	Health consciousness		33,2%
2	Perceived benefit		41,9%
3	Perceived threat		24,9%
4			0,0%
5			0,0%
6			0,0%
7			0,0%
8			0,0%
9			0,0%
10			0,0%

Result

Lambda: 3,005

CR: #

Matrix

	Health consciousness 1	Perceived benefit 2	Perceived threat 3	4	5	6	7	8	9	10	normalized principal Eigenvector
Health consciousnes 1	1	6/7	1 1/4	-	-	-	-	-	-	-	33,22%
Perceived benefit 2	1 1/6	1	1 4/5	-	-	-	-	-	-	-	41,88%
Perceived threat 3	4/5	5/9	1	-	-	-	-	-	-	-	24,90%

Appendix 15. Economic (client perspective) factors group

Table

	Criterion	Comment	Weights
1	Reduced morbidity		8,4%
2	Increased earning (via increased emplo		11,1%
3	Reduced waiting time		16,3%
4	Reduced consultation time		17,2%
5	Increased medication adherence		10,1%
6	Avoidance of travel expenditures		7,7%
7	Decreased risk of job loss (due to time		10,6%
8	Faster diagnosis and treatment		18,6%
9			0,0%
#			0,0%

Result

Lambda: 8,187

1,9%

Matrix

	Reduced morbidity 1	Increased earning (via increased 2	Reduced waiting time 3	Reduced consultation time 4	Increased medication adherence 5	Avoidance of travel expenditures 6	Decreased risk of job loss (due to time spent in 7	Faster diagnosis and treatment 8	0 9	0 10	normalized principal Eigenvector
Reduced morbidity	1	1	5/6	1/2	1/2	8/9	1	1	1/2	-	-	8,40%
Increased earning (via	2	1 1/5	1	5/7	6/7	1	1 1/5	5/7	1	-	-	11,14%
Reduced waiting time	3	2 1/6	1 2/5	1	1 1/3	1 3/7	1 7/9	1 1/3	1	-	-	16,32%
Reduced consultation	4	2 1/9	1 1/6	3/4	1	1 2/7	3 1/3	1 1/2	1 2/5	-	-	17,17%
Increased medication	5	1 1/8	1	2/3	7/9	1	1	1	3/8	-	-	10,07%
Avoidance of travel	6	1	5/6	5/9	1/3	1	1	3/4	2/7	-	-	7,68%
Decreased risk of job loss (due	7	1	1 3/8	3/4	2/3	1	1 1/3	1	1/2	-	-	10,61%
Faster diagnosis and	8	2 1/9	1	1	5/7	2 5/8	3 1/2	2	1	-	-	18,59%

Appendix 16. Economic (provider perspective) factors group

Table	Criterion	Comment	Weights
1	Reduced length of hospital stay		14,7%
2	Reduced hospitalizations		11,9%
3	Reduced hospital readmissions		13,0%
4	Cost effective management of chronic		14,3%
5	Decreased travel expenditures due to		9,3%
6	Reduced clinic visits		15,0%
7	Increased productivity of hospital staff		12,9%
8	Reduced public health spending		8,9%
9			0,0%
10			0,0%

Result

Lambda: 8,162

CR: 1,7%

Matrix

	Reduced length of hospital stay 1	Reduced hospitalizations 2	Reduced hospital readmissions 3	Cost effective management of chronic 4	Decreased travel expenditures 5	Reduced clinic visits 6	Increased productivity of hospital staff 7	Reduced public health spending 8	0 9	0 10	normalized principal Eigenvector
Reduced length of	1	1	1 1/9	4/5	1	1 5/6	1 1/3	1 1/3	1 3/7	-	-	14,66%
Reduced hospitalization	2	8/9	1	5/6	1	1 2/3	1	3/4	6/7	-	-	11,87%
Reduced hospital	3	1 1/4	1 1/5	1	5/6	1 1/7	6/7	1	1 1/4	-	-	13,04%
Cost effective management	4	1	1	1 2/9	1	2 1/3	2/3	1	1 2/3	-	-	14,33%
Decreased travel	5	1/2	3/5	7/8	3/7	1	2/3	3/4	1 1/2	-	-	9,29%
Reduced clinic visits	6	3/4	1	1 1/6	1 1/2	1 3/7	1	1 1/4	2	-	-	15,00%
Increased productivity of	7	3/4	1 1/3	1	1	1 1/3	4/5	1	1 3/4	-	-	12,90%
Reduced public health	8	5/7	1 1/6	4/5	3/5	2/3	1/2	4/7	1	-	-	8,92%

Appendix 17. Security factors group

Table

	Criterion	Comment	Weights
1	Privacy		78,7%
2	Data security		21,3%
3			0,0%
4			0,0%
5			0,0%
6			0,0%
7			0,0%
8			0,0%
9			0,0%
10			0,0%

Result

Lambda: 2,000

CR: 0,0%

Matrix

		Privacy	Data security	0	0	0	0	0	0	0	0	normalized principal Eigenvector
		1	2	3	4	5	6	7	8	9	10	
Privacy	1	1	3 2/3	-	-	-	-	-	-	-	-	78,70%
Data security	2	1/4	1	-	-	-	-	-	-	-	-	21,30%

Appendix 18. Social factors group

Table	Criterion	Comment	Weights
1	E-readiness		25,4%
2	Social influence		11,9%
3	Perceived usefulness		28,5%
4	Perceived ease of use		34,2%
5			0,0%
6			0,0%
7			0,0%
8			0,0%
9			0,0%
10			0,0%

Result

Lambda: 4,034 MRE:

CR: 1,2%

Matrix

		E-readiness 1	Social influence 2	Perceived usefulness 3	Perceived ease of use 4	5	6	7	8	9	10	normalized principal Eigenvector
E-readiness	1	1	2 3/5	5/7	3/4	-	-	-	-	-	-	25,36%
Social influence	2	3/8	1	4/9	2/5	-	-	-	-	-	-	11,93%
Perceived usefulness	3	1 3/8	2 2/7	1	5/7	-	-	-	-	-	-	28,53%
Perceived ease of use	4	1 1/3	2 4/9	1 2/5	1	-	-	-	-	-	-	34,18%

Appendix 19. eHealth factors group

Table

	Criterion	Comment	Weights
1	eHealth education f		28,4%
2	Financial incentives		16,6%
3	eHealth promotion		32,6%
4	Clear national legisl		22,3%
5			0,0%
6			0,0%
7			0,0%
8			0,0%
9			0,0%
10			0,0%

Result

Lambda: 4,004

CR: 0,2%

Matrix

	eHealth education for patients and 1	Financial incentives for patients and 2	eHealth promotion 3	Clear national legislative framework 4	0 5	0 6	0 7	0 8	0 9	0 10	normalized principal Eigenvector
eHealth education for 1	1	1 5/6	8/9	1 1/6	-	-	-	-	-	-	28,43%
Financial incentives for 2	5/9	1	1/2	3/4	-	-	-	-	-	-	16,62%
eHealth promotion 3	1 1/8	1 7/8	1	1 5/9	-	-	-	-	-	-	32,60%
Clear national legislative 4	6/7	1 1/3	2/3	1	-	-	-	-	-	-	22,35%

Appendix 20. Factors group

Table	Criterion	Comment	Weights
1	Technological		8,3%
2	Social		9,3%
3	Behaviour of technology use		13,5%
4	Economic		11,0%
5	Organisational		13,6%
6	Security		16,0%
7	Health belief		14,2%
8	eHealth policy		14,3%
9			0,0%
10			0,0%

Result

Lambda: 8,179

CR: 1,8%

Matrix

		Technological 1	Social 2	Behaviour of technology use 3	Economic 4	Organisational 5	Security 6	Health belief 7	eHealth policy 8	0 9	0 10	normalized principal Eigenvector
Technological	1	1	2/3	7/9	1/2	1/2	1/2	5/8	1	-	-	8,30%
Social	2	1 3/7	1	5/6	1	3/5	1/2	2/3	1/2	-	-	9,28%
Behaviour of technology	3	1 2/7	1 2/9	1	1	4/5	1	1 2/7	1 1/3	-	-	13,47%
Economic	4	1 6/7	1	1	1	5/6	5/7	5/7	4/7	-	-	10,96%
Organisational	5	2 1/6	1 5/8	1 1/4	1 2/9	1	7/9	5/8	7/8	-	-	13,57%
Security	6	2	2	1	1 2/5	1 2/7	1	1	1 2/5	-	-	15,95%
Health belief	7	1 4/7	1 1/2	7/9	1 2/5	1 4/7	1	1	3/4	-	-	14,18%
eHealth policy	8	1	2	3/4	1 3/4	1 1/7	5/7	1 3/8	1	-	-	14,30%

Appendix 21. Certificate of Public survey

ManoApklausa

Apklausos atlikimo sertifikatas

1097852147

Šiuo sertifikatu patvirtinama, kad

atliko apklausą

Veiksnių, darančių įtaką vartotojų elgsenai, renkantis e-Sveikatos produktus ir paslaugas, vertinimas

Apklausos atlikimo periodas: 2019-04-18 - 2019-05-14

Dalyvavusių respondentų kiekis: 388

Iveta Balode

ManoApklausa.lt direktorius

Appendix 22. Public survey example

Sveiki,

Esu KTU Ekonomikos programos doktorantė ir atlieku apklausą "Veiksnių, darančių įtaką vartotojų elgsenai, renkantis e-Sveikatos produktus ir paslaugas, vertinimas".
e-Sveikata apima tokias skaitmenines technologijas kaip:
-mobilios programėlės pvz. ligai stebėti,
-registracija į gydymo įstaigas internetu,
-sveikatos svetainės,
-išmaniosios apyrankės, laikrodžiai ir kt.
Prašau skirkite 5-8min.šios anketos užpildymui ir prisidėkite savo vertingu indėliu prie akademinės veiklos.
Konfidencialumas garantuotas.

Nuoširdžiai,
Aida Navikaitė-Varanavičienė

1. Amžius
18-24
25-30
31-45
46-55
56 ir daugiau

2. Pažymėkite, kiek svarbūs yra žemiau pateikti technologiniai veiksniai, renkantis eSveikatos produktus ar paslaugas ?

	Visiškai nesvarbus	Nesvarbus	Nei svarbus, nei nesvarbus	Svarbus	Labai svarbus
Informacijos kokybė					
Serviso kokybė					
Sistemos kokybė					

3. Pažymėkite, kiek svarbūs yra žemiau pateikti socialiniai veiksniai, renkantis eSveikatos produktus ar paslaugas?

	Visiškai nesvarbus	Nesvarbus	Nei svarbus, nei nesvarbus	Svarbus	Labai svarbus
Skaitmeninis pasiruošimas (polinkis naudotis skaitmeninėnimis technologijomis kasdieniame gyvenime)					
Socialinė aplinka					
Suvokiama nauda (skaitmeninių technologijų suvokiama nauda greičiau atlikti užduotis)					
Suvokiamas lengvas naudojimas (suvokimas, jog skaitmeninių technologijų naudojimas yra paprastas)					

4. Pažymėkite, kiek svarbūs yra žemiau pateikti elgsenos su technologijomis veiksniai, renkantis eSveikatos produktus ar paslaugas?

	Visiškai nesvarbus	Nesvarbus	Nei svarbus, nei nesvarbus	Svarbus	Labai svarbus
Skaitmeninių technologijų naudojimas kasdieniame gyvenime					
e-Sveikatos raštingumas (gebėjimas ieškoti, suprasti informaciją, susijusią su sveikata, naudojant skaitmeninius išteklius)					
Požiūris į e-Sveikatą					

5. Pažymėkite, kiek svarbūs yra žemiau pateikti ekonominiai (iš kliento/paciento perspektyvos) veiksniai, rankantis eSveikatos produktus ar paslaugas?

	Visiškai nesvarbus	Nesvarbus	Nei svarbus, nei nesvarbus	Svarbus	Labai svarbus
Sumažėjęs sergamumas					
Padidėjęs atlygis (dėl neprarasto laiko gydymo įstaigoje)					
Trumpesnė laukimo trukmė gydymo įstaigoje					
Trumpesnis konsultacijų laikas gydymo įstaigoje					
Išaugęs tinkamas vaistų vartojimas					
Išvengiamos kelionės į medicinos įstaigas išlaidos					
Sumažėjusi rizika prarasti darbą (dėl laiko, praleidžiamo gydymo įstaigoje)					
Greitesnė diagnozė ir gydymas					

6. Pažymėkite, kiek svarbūs yra žemiau pateikti ekonominiai (iš gydymo įstaigos perspektyvos) veiksniai, renkantis eSveikatos produktus ar paslaugas?

	Visiškai nesvarbus	Nesvarbus	Nei svarbus, nei nesvarbus	Svarbus	Labai svarbus
Trumpesnė gulėjimo ligoninėje trukmė					
Sumažėjęs paguldymų į ligoninę skaičius					

Sumažėjęs pakartotinių vizitų į medicinos įstaigą skaičius					
Efektyvi lėtinių ligų kaštų vadyba					
Sumažėjusios kelionių į pacientų namus išlaidos					
Sumažėjęs vizitų į gydymo įstaigas skaičius					
Padidėjęs gydymo įstaigų personalo produktyvumas					
Sumažėjusios visuomenės sveikatos priežiūros išlaidos					

7. Pažymėkite, kiek svarbūs yra žemiau pateikti organizaciniai veiksniai, renkantis eSveikatos produktus ar paslaugas?

	Visiškai nesvarbus	Nesvarbus	Nei svarbus, nei nesvarbus	Svarbus	Labai svarbus
Informacijos perdavimo kultūra gydymo įstaigoje					
Ištekliai gydymo įstaigoje					
Gydymo įstaigos administracijos palaikymas					

8. Pažymėkite, kiek svarbūs yra žemiau pateikti sveikatos naudos suvokimo veiksniai, renkantis eSveikatos produktus ar paslaugas?

	Visiškai nesvarbus	Nesvarbus	Nei svarbus, nei nesvarbus	Svarbus	Labai svarbus
Sąmoningas požiūris į sveikatą					
Suvokiama nauda, įsitraukiant į veiklą, kuri padeda sumažinti ligos tikimybę					
Suvokiama grėsmė susirgti					

9. Pažymėkite, kiek svarbūs yra žemiau pateikti duomenų apsaugos veiksniai, renkantis eSveikatos produktus ar paslaugas?

	Visiškai nesvarbus	Nesvarbus	Nei svarbus, nei nesvarbus	Svarbus	Labai svarbus
Privatumas					
Duomenų apsauga					

10. Pažymėkite, kiek svarbūs yra žemiau pateikti eSveikatos politikos veiksniai, renkantis eSveikatos produktus ar paslaugas?

	Visiškai nesvarbus	Nesvarbus	Nei svarbus, nei nesvarbus	Svarbus	Labai svarbus
e-Sveikatos edukacija medicinos įstaigų personalui bei pacientams					
Finansinė paskata pacientams ir gydymo įstaigų darbuotojams, kurie naudoja e-Sveikatos paslaugas					
Aiški įstatyminė bazė					
e-Sveikatos viešinimas ir sklaida					

11. Ar naudojate eSveikatos produktus ar paslaugas?

Taip

Ne

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Išleido Kauno technologijos universitetas, K. Donelaičio g. 73, 44249 Kaunas
Spausdino leidyklos „Technologija“ spaustuvė, Studentų g. 54, 51424 Kaunas