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Factors influencing intention to use massive open online-course  
on German market

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## ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

Я, Хан Екатерина Михайловна, студентка второго курса магистратуры направления «Менеджмент», заявляю, что в моей магистерской диссертации на тему «Факторы, влияющие на намерение потребителя использовать он-лайн курсы: изучение рынка Германии», представленной в службу обеспечения программ магистратуры для последующей передачи в государственную аттестационную комиссию для публичной защиты, не содержится элементов плагиата.

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## ABSTRACT

Master Student's Name	Ekaterina M. Khan
Master Thesis Title	Factors influencing intention to use massive open online-course on German market
Faculty	Graduate School of Management
Major subject	International Management
Year	2016
Academic Advisor's Name	Sergey A. Starov
Description of the goal, tasks and main results	<p>The goal of current study is to identify what are the main factors affecting the intention to use massive open online-course.</p> <p>In order to achieve the main goal the author analyses the e-learning market, MOOCs particularly, the theoretical background of technology adoption and the models widely used by scholars. For the study the author uses and modifies UTAUT model of technology adoption, which serves as a foundation for the hypothesis development.</p> <p>To tests the hypothesis the survey was created and 500 respondents from Germany interviewed. The collected data was used for quantitative analysis.</p> <p>Based on the empirical results of the study it was identified that such UTAUT moderators such as age, gender, and internet experience do not influence an intention to use MOOC.</p> <p>Among the core determinants simplicity of MOOC usage was also proven insignificant variables, whereas the perceived usefulness, independence of usage and social influence have positive relationship with the intention to use MOOC.</p>
Keywords	e-learning, MOOC, technology adoption, UTAUT

## АННОТАЦИЯ

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Описание цели, задач и основных результатов	<p>Цель данного исследования – идентификация и изучение факторов, влияющих на намерение использовать онлайн-курс.</p> <p>В ходе работы был проведен анализ рынка электронного обучения, в особенности онлайн-курсов, был проведен анализ теоретических моделей принятия и использования технологий. На основании анализа была отобрана единая теория принятия и использования технологии, как основная модель для разработки эмпирической части исследования.</p> <p>Также была разработана регрессионная модель для тестирования сформулированных гипотез.</p> <p>Был проведен опрос респондентов в Германии, которые были использованы в эмпирическом исследовании.</p> <p>Полученные результаты были проанализированы, и использованы как основание для разработки практических рекомендаций.</p> <p>В результате исследования были получены следующие результаты:</p> <ul style="list-style-type: none"> <li>- контрольные переменные: возраст, пол, опыт не взаимосвязаны с намерением использовать онлайн-курсы;</li> <li>- ключевые переменные: ожидаемая эффективность, влияние социального окружения и ожидаемое независимое использование системы позитивно взаимосвязаны с намерением пользователя использовать онлайн-курсы; ожидаемая простота использования не взаимосвязана с намерением пользователя.</li> </ul>
Ключевые слова	Онлайн-курсы, единая теория принятия и использования технологии, принятие технологий

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## INTRODUCTION

Emerging technologies are technologies that create new industries and transform existing ones (Day, Schoemaker, & Gunther, 2004). E-learning is an emerging technology that makes an impact and reshapes the relationship between students and teachers, employees and organizations. The rise of e-learning for the last decades was huge. The European commission describes e-learning as the use of the Internet and new multimedia technologies to advance the quality of learning by providing access to resources and services, as well as enabling remote exchange and collaboration (Dominici & Palumbo, 2013). E-learning offers the online delivery of information, communication, education and training (Sloman, 2001). Main advantages like cost and time saving, independence from physical space limitation made it popular and important. Additionally it is mentioned that effectiveness and usefulness of education can be enhanced by content customization in accordance to the learners needs.

To sum up we can say that the main change occurred in education in the information age is the shift from teacher centered to a learner – centered educational process (B. C. Lee, Yoon, & Lee, 2009).

According to Androulla Vassiliou (2014) - European Commissioner for Education, Culture, Multilingualism and Youth “the online and open education world is changing how education is resourced, delivered and taken up. Over the next 10 years, E-learning is projected to grow fifteen-fold, accounting for 30% of all educational provision” (European Commission, 2014). Among the instruments of e-learning, online courses are considered as a subsector with particularly strong growth. The dream of the democratization of knowledge might soon be fulfilled.

As e-learning becomes more and more pervasive in institutions, it is imperative to research learners acceptance of such technology as it is a critical factor to success in the implementation (Roca, Chiu, & Martinez, 2006). As at the end of 2015 more than 140 universities worldwide are offering online-degree programs, expanding without time and geographical limits, as well as combining and completing traditional offline classes with online components. Both for-profit and non-for-profit organizations are increasingly replacing/combining traditional offline office job training with online trainings. Total flow of investments to e-learning market amounted to \$ 6,000 million for the last five years. E-learning market is driven by start-up dot-com entrepreneurs as well as by big corporations. Thus the company management should address the questions of the service adoption from both business and technological perspectives.

The success of e-learning depends on several factors such as implementation, the educational model, the way of distribution and the degree of technology adoption of the targeted segments. There are many of studies examining success and motivational factors, but there is still a lack of empirical studies that explore and explain the interrelation of technology adoption and behavioral intention of a potential learner (B. C. Lee et al., 2009).

### ***The research goal and objectives***

The issue of e-learning adoption is not studied deeply because of its relative novelty. Current studies are usually very fragmented and focused on a specific subject and usually are aimed to investigate if there is an interrelation between e-learning presence/absence during the study process and a rate of student's success, drop rates (Levy, 2007), motivation (Hew & Cheung, 2014) and satisfaction (Name et al., 2014). Additionally some researchers studied a separate factors interrelation with e-learning successful outcomes such as readiness factor, technology acceptance stage and others (Sun, Tsai, Finger, Chen, & Yeh, 2008). Mainly researches do not take into consideration the level of technology adoption on the market of a particular country; the process of adoption and factors interrelated with the intention to use e-learning instruments in future.

It has been a great number of studies and great number of papers published which confirmed an intention as a good predictor of actual behavior. Actually an intention is often called as a starting point of an action ((Bird, 1988; Locke & Latham, 2002; Ramayah, Lee, & Mohamad, 2010). Social psychology scholars refer to an intention as a cognitive state of mind, which usually precedes to a decision and to an act (Ajzen, 1991; Ajzen and Fishbein, 1980). Moreover among a wide range of different behavior the behavioral intention was confirmed as the "most immediate predictor of actual behavior" (Ramayah et al., 2010).

Still not all intentions are transformed into actual behavior. Empirical studies of intention – behavior relationship have identified that the gap between an intention and the potentially consequent action is mainly attributed to the person intending to perform an action, but are not successful in realizing their intentions into actions (Orbell & Sheeran, 1998; Ramayah et al., 2010) Additionally the actual behavior is influenced by the perceived level of efforts necessary to conduct the behavior (Bagozzi, Yi, & Baumgartner, 1990). The degree of efforts needed was also incorporated into the attitudinal measure of individual behavioral consequences (Sidique, Lupi, & Joshi, 2010).

Nevertheless there is a solid evidence confirmed by many scholars in several research fields of the high level of intention – behavior correlation (Ajzen, Czasch, & Flood, 2009).

Thus the general *research question* can be stated as following:

“What are the main factors affecting the intention to use an online-course?”

The main objective is to understand what factors influence an intention of a new student to select an online-course. In order to achieve the main goal the following objectives should be fulfilled:

1. To define special characteristics of an online-course as a subcategory of e-learning instruments;
2. To provide current market overview and the last years trends;
3. To give an overview of the technology adoption theoretical frameworks with an emphasis on the online-course peculiarities;
4. To analyze general factors influencing adoption;
5. To derive recommendations for the strategic management of the online-course providers;

### **Study and thesis structure**

In order to ensure in research quality and efficiency the design of the study if focusing on systematic, integrated process as follows:

- Literature review – the main goal of the stage is to explore existing studies, do define the research gap and to construct the theoretical foundation;
- Theoretical modeling – after thoughtful and detailed analysis of the existing models, the most efficient and applicable is selected and then adopted. The model should correspond the key requirements of the study and help to highlight the main concepts and implications. All hypothesis proposed will be validated by the experts of the e-learning sector;
- Development of questionnaire – for the purpose of the study widely accepted, recognized survey questionnaire will be reviewed, analyzed, adapted and integrated into the survey. The questionnaire will be reviewed by the experts to ensure the quality and feasibility of the survey;
- Statistical Analysis – the data gathered with the survey will be analyzed statistically with the help of the recognized statistical tool such as IBM SPSS.

The thesis is structured in the following way: an introduction, two chapters, conclusion, references and appendixes.



In the introduction the relevance of the research is explained, research goal, objectives, purposes and strategies are presented.

In the first chapter, author present the literature review of historical overview of e-learning emerge and expansion, overview of different e-learning instruments and detailed description of online-courses as a on of the most spread, analysis of current trends in the market, description of current technology acceptance models taking into account the specific of online-course as a service.

In the second chapter the empirical study is conducted, based on the results the authors made recommendations with managerial implications.

In the conclusion the recommendations are summarized, and limitation of the study and the scope for further research are defined.

# 1. THEORETICAL FOUNDATION OF E-LEARNING TOOLS

## 1.1 E-Learning: development overview and modern trends

Welsh et al. (2003) define e-learning as “usage of computer network technology to deliver information and instruction to individuals”. Similarly, an e-learning system is defined as “an information system that can integrate a wide variety of instructional material (via audio, video, and text mediums) conveyed through e-mail, live chat sessions, online discussions, forums, quizzes and assignments”(Abdullah & Ward, 2016). E-learning got significant attention from various stakeholders last decades, such as educational institutions, business organizations, program software developers and current and potential customers.

Many practitioners and researchers agree that technological progress significantly changed education, training and development landscape. Particularly increasing share of usage of Internet technologies has been named as “e-learning revolution” (Welsh, Wanberg, Brown, & Simmering, 2003). E-learning market started developing shortly after the Internet disrupted the education industry in the late of 90s’.

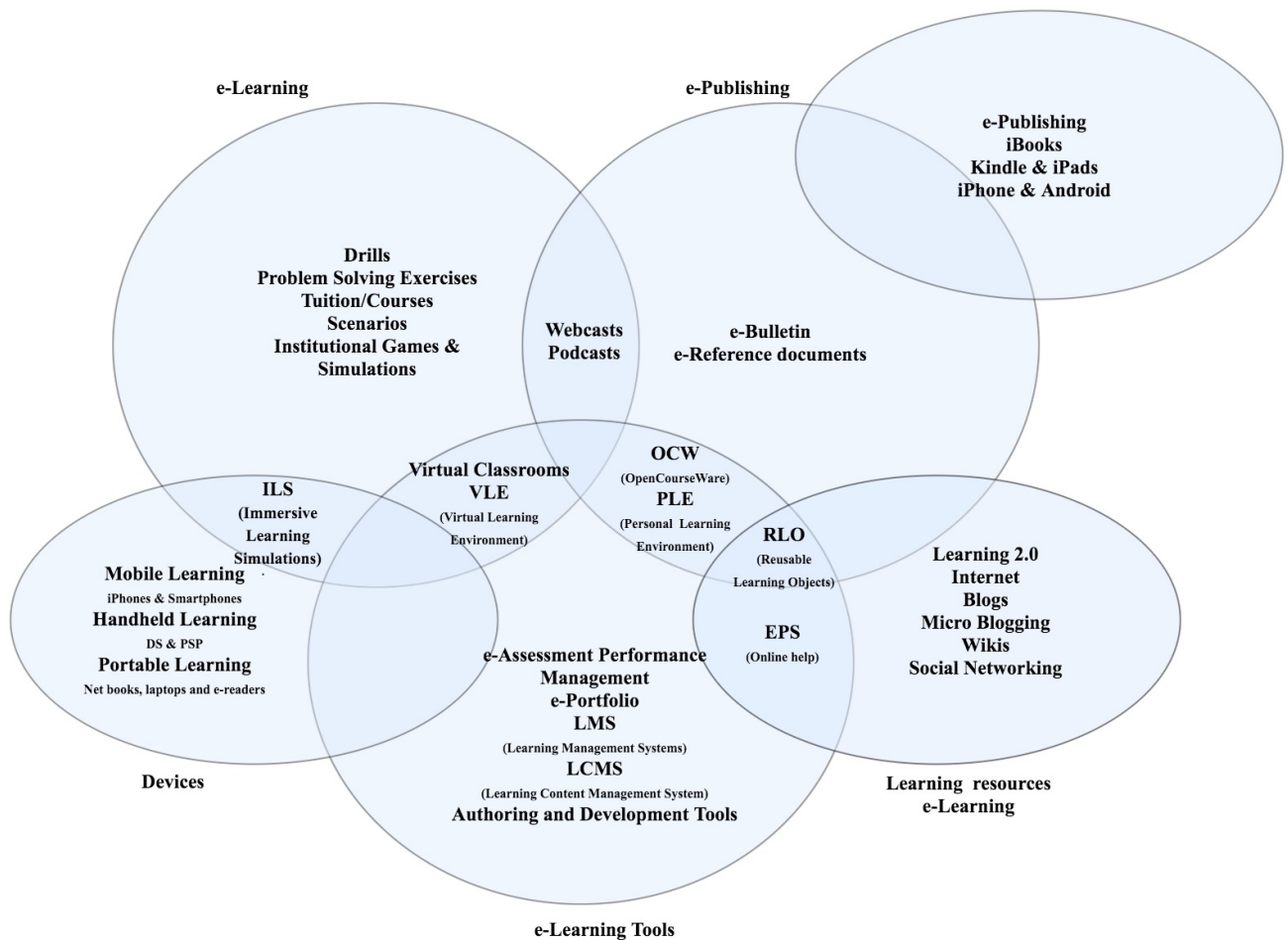


Figure 1. The Technology Environment Allows e-Learning to Flourish//IBIS Capital, Learning Light,

The market is still growing actively: e-learning expenditure is projected to grow to \$255.5bln by 2017 with CAGR of 23%. North America is the biggest market, followed by Europe and Asia. However, growth rates in Asia and Eastern Europe (42-45%) are three times higher than ones in Western Europe and the USA (12-15%) (Other, 2014).

According to several studies e-learning education is continuously increasing its share in total education expenditures around the world. Average projected CAGR of 23% for e-learning subsector is 15.5 p.p. higher than projected growth rate of educational expenditures on average for all the subsectors.

No wonder that geographical structure of e-learning market resembles structure of global education market. At the same time some distinctions need to be mentioned, e.g., it is projected that by 2017 USA will occupy 52% of the market, meanwhile Europe and Asia (combined) will have 20% and 22.23% share of the market respectively. Not necessary to say that the USA and Europe are the biggest markets, but projected growth rates are comparatively slow – 13% and 15% correspondingly. Meanwhile projected growth rate for Asian market is expected to be equal 45% per annum and by the end of 2017 the market can become the second largest(Other, 2014).

It is not considered as possible to define similar patterns and trends and value drivers common for the whole world, mainly because of differences of the cultures and of stages of developments of the regions. The only trend can be identified is a trend of huge investments into digitization. In particular digitization of the education system is not only driven by market but also actively supported by governmental and non-profit organizations.

Table 1. Regional trends on e-learning market (Docebo, 2014)

Region	Market share	AGR	Drivers	Countries
Asia	22,33%	4,29%	Government initiative, growing adoptions of new technologies, shortage of quality education	India, Vietnam, Malaysia
Middle East	1,09%	0,99%	Mass Digitalization process	Oman, Lebanon, Turkey, Kuwait, Qatar
Western Europe	15,73%	4,85%	Focus on SME and outsource of e-learning content	No data
Eastern Europe	4,27%	3,26%	Government, start-ups	Russia
North America	52,43%	2,8%	Leverage internal knowledge in order to make LMS a revenue generating system aimed at target audience	No data
Africa	0,99%	9,42%	UNESCO	

Latin America	4,27%	7,38%	Schools, corporations, consumers Government	Brazil, Argentina, Chile Colombia, Mexico, Venezuela
<b>Total</b>	<b>\$255.5bn</b>	<b>3%</b>		

### **E-learning in Germany**

Germany has a reputation of economically stable and developed country. Currently it is the largest consumer market in Western Europe and is also characterized by low unemployment rate and economic overperformance over its peers.

If to talk about e-learning and its development in the country for the last years, it is necessary to say that the state outperforms the neighbors once again. Revenue in the e-learning sector amounted to €582m in 2013, demonstrating 13% increase in comparison with the previous year. Bitkom published these findings basing a recent nation wide study performed by MBB Institute. Necessary to mention that e-learning sector employes more than 9,000 people, showing a significant increase by 700 employees from 2012.

The abovementioned facts and numbers are also supplemented by a survey results (Bitcom, 2014) that more than 67% of German IT companies are actively using e-learning, the rest of the companies are intending to implement e-learning systems and tools in the near future.

Moreover more than 50% of Germans, aged from 14 till 44 have e-learning experience at least once, and approximately 33% of these people had an education application installed to their device. In accordance with the Docebo report (2014) Germany constant growth of the e-learning revenue exceeded the average growth of Western European countries by 7,2%.

It is necessary to mention that the German government recognized the trend from the beginning and launched the first German comprehensive website aggregating e-learning opportunities in July 2000. The initiative was supported by Bund-Länder Commission for Educational Planning and Research Promotion.

### **Investments and M&A**

Current situation on the market of e-learning is highly favorable for investors and software developers. E-learning is driven not only universities and dot-com startups, but also more and more big corporations, venture capitalists enters the market.

There are three major types of investments in e-learning business:

- venture capital;

- mergers & acquisitions (M&A);
- government investments.

The USA is leading in venture deals, presenting more than 60% of the global venture investments made since 2007 in e-learning. For comparison, Europe represents only 6% for the same period. Top US deals are on average 8x times greater than the deals in Europe(Other, 2014).

As the market is still actively developing an increase in venture investment is expected. The venture market in the US is significantly larger than in Europe; \$48.5bn in the US in 2014 compared to \$7.1bn in Europe. It is the most active global fundraising market for e-learning, accounting for 59.7% of total deals. High-growth markets (India and China) trail with 11.3% and 8.4% respectively(Other, 2014).

### **E-learning types**

In most of the cases e-learning is asynchronous, which is represented by e-learning pre-recorded before and which usually available for a learner at any moment and from any location. This type of e-learning can vary from very simple like slides uploaded to Internet site to very complex and sophisticated programs and applications which require more engagement, involvement and efforts from a learner. It is evident that learners prefer more interactive tools and instruments in order to make training, educational and developing process more entertaining and easier.

Synchronous e-learning or “live” e-learning requires learners to be present in front of their computers at the same time. There are also various types of e-learning in that group: from simple live chat which enables communication between trainer/teacher and learners to more sophisticated type which allow learners and teachers communicate using slides, white board and video streaming services. The main advantage of synchronous e-learning is an opportunity to communicate personally, to collaborate with real person and to get support and feedback very quickly.

Blended e-learning combines both asynchronous and asynchronous e-learning. Different mixes of asynchronous, synchronous and classroom learning present blended e-learning. As an example class room trainings with supporting materials for home works (asynchronous) and live chat for communication and educational support (synchronous) can be named.

## 1.2 MOOC as a sub-segment of e-learning

Since the first times technologies were introduced into humans' life academics started sharing content (Lane & McAndrew, 2010). That so called tradition was a foundation of open educational resources (OER). Mainly OER related to higher education, in years it became a very important knowledge base for teachers and trainers as well for students and learners. In the beginning of 2001 Massachusetts Institute of Technology (MIT) the project called as OpenCourseWare (OCW) in order to make available all the published materials on a permanent basis on the Web. Actually, many researchers name OER as a foundation for MOOCs development.

“Massive Open Online Courses” (MOOCs) are the online courses with scientific, business or any other content with a large number of participants – in some cases tens of thousands. Most typical MOOC includes digital lectures with interactive elements such as discussion at forums, video clips with lectures, mind maps, special tasks and assignments with open or multiple-choice questions.

A MOOC is usually “massive, with theoretically no limit to enrollment; open, allowing anyone to participate, usually at no cost; online, with learning activities typically taking place over the web; and a course, structured around a set of learning goals in a defined area of study” (Educause, 2013).

MOOCs stepped beyond the geographical borders several years ago, using famous and prestigious university brands as main instrument for global expansion. Such partnership as Coursera ([www.coursera.org](http://www.coursera.org)), a specifically purposed coalition of 78 world class universities (as of April 11, 2014) led by Stanford University, and edX ([www.edx.org](http://www.edx.org)) which includes the Massachusetts Institute of Technology (MIT), École Polytechnique Fédérale de Lausanne, The Hong Kong University of Science and Technology and other members can be considered as a pioneers of international cooperation in MOOCs distribution. In December 2014 the number of universities offering MOOCs has exceeded 400, and the cumulative number of courses offered has reached 2400 to more than 18 million registered students worldwide (M. Zhou, 2016).

Venture capital firms, non-for-profit organizations, often sponsor MOOCs' production (Holdaway, 2015).

One of the main reasons of MOOCs' popularity is a video component. By now video is present in 4,5 out of 5 MOOCs released. The trend corresponds with growing interest in video format. The average upload of videos to YouTube per minute, boosted from 8 hours in 2007 to 300 hours in 2014 (Statista, 2014).

E-learning formed firstly in academic field, but currently it has been playing a

significant role in other areas. It has a great advantage of substantial scalability, which is not limited in comparison with traditional classes. The scalability provides the opportunity to offer courses on various topics to a broad range of learners at low price or even for free. During the last 3 years “... MOOCs have largely moved from pedagogy to promotion and are now more used to advance institutional reputation than any serious drive to reinvent the institution” (Stewart, Khare & Schatz, 2015).

The main features that make MOOCs unique are scalability, flexibility, distance availability and international or nation wide learning communities. Many researchers consider MOOCs as a solution to solve certain problems in education using competitive advantage of the format.

### **1.3 Technology acceptance theories**

User acceptance of new technology is often described as one of the most mature research areas. Mainly studies aiming to explore innovativeness of the population apply ownership surveys with cross-sectional samples (Ganglmair-Wooliscroft & Wooliscroft, 2014; Im, Bayus, & Mason, 2003). The respondents are usually asked by the researchers to indicate which items they are using at the moment within an existing list of the products. Comparison of level of product ownership across the population is now the most reliable way to investigate the consumers' innovativeness and many researchers use the approach in the various context and different fields.

Rogers (1976, 1995) used an S-curve to illustrate the cumulative adoption process of innovation over time. The cumulative distribution in S-shape is agreed with the normal distribution curve, defining the percentage/share of the population adopting innovations in a certain time period, see Fig. 2 below.

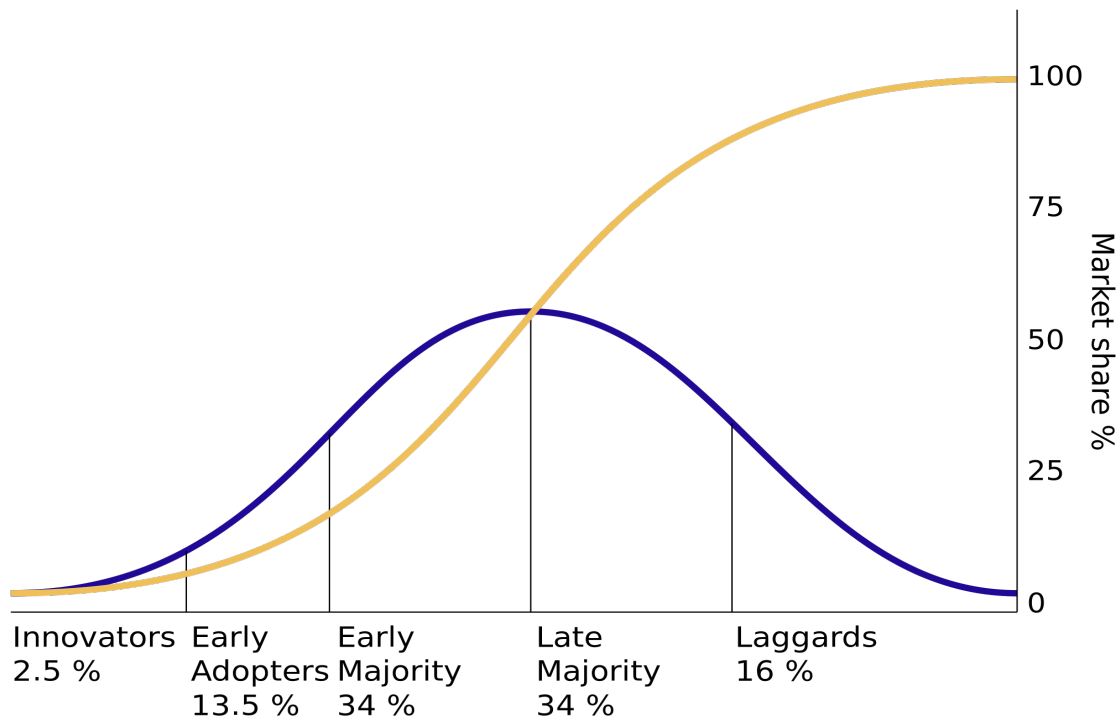


Figure 2. The diffusion of innovations (Rogers, 1995)

As can be seen from the Figure 2 the population can be divided into several groups in accordance with the time element and relative view indexes:

- innovators – 2,5% - represent the very first group to adopt an innovation;
- early adopters – 13.5% - go second;
- early majority – 34%;
- late majority – 34%;
- laggards – 16% - the group of people who adopt very slowly and in many cases have to adopt more then want to (Rogers, 1995).

There are number of characteristics which influence the speed of adoption of innovation such as: perceived relative advantage (in both economic and social prestige context), the convenience of innovation and the future satisfaction to get, innovations' observability and exciting values (which are strongly influenced by social norms) and innovations' trialability. If the actual and perceived complexity of use is increasing, it reduce the adoption rates (Ganglmair-Wooliscroft & Wooliscroft, 2014).

As results of many studies in the field several technology acceptance models were introduced. Further a brief overview of the main theoretical models is described (Vankatesh, Morris, Davis, & Davis, 2003). Later the selected model for the empirical data analysis is presented in details with additional explanation of model modification in accordance with the specific of researched topics.



### **1.3.1 Theory of Reasoned Action**

The Theory of Reasoned Action (TRA) developed by M. Fishbein and I. Ajzen and is one of the most influential and fundamental theories of human behavior connected to the determinants of consciously intended behavior (Ajzen, 1991, Ajzen and Fishbein, 1980 and Fishbein and Ajzen, 1975). In accordance with the TRA a behavioral intention of a person to perform a specific behavior and performance of it are jointly determined by an attitude of the person towards the behavior and social influence associated with the behavior in question.

An attitude is defined as “an individual's positive or negative feelings (evaluative affect) about performing the target behavior” (Fishbein & Ajzen, 1975, p. 216).

Social influence is defined as “the person's perception that most people who are important to him think he should or should not perform the behavior in question” (Fishbein & Ajzen, 1975, p. 302).

In scientific research practice there are two main rationales to use the TRA in order to establish extended and modified theoretical framework aiming to explain and to predict user innovation.

First, an innovation model developed based on a reasoned action perspective is perceived as having high potential mainly because it provides coherent and solid theoretical foundation to unite both the cost – benefit framework and the community perspective of user innovation (Bin, 2013). There are two most critical aspects of user's attitude towards user innovation: expected benefit and perceived cost (Mishra, Akman, & Mishra, 2014). Users tend to evaluate an expected benefit from innovative activities versus perceived costs. At the same time there are several studies discuss the influence of social communication and interaction on user innovation (Franke and Shah, 2003, Füller et al., 2007 and Jeppesen and Frederiksen, 2006). In most of the cases users are rarely innovative in isolation but they are in interaction with the close circle of friends, relatives, colleagues and acquaintances. These interactions usually motivate users to search for new ideas, knowledge and skills to implement and realize their ideas (Bin, 2013). Based on the studies the intentional and behavioral aspects are significantly affected by social influence (Franke and Shah, 2003, Füller et al., 2007).

Second, the studies on social behavior consider the TRA as an excellently applicable in the context of voluntary behavior (Bin, 2013). Within the context the TRA got significant attention in consumer behavior field as it allows to predict consumer intentions and behavior and as well provide a basis for identification of how and where to target consumers' behavior attempts to change. Generally user innovations are characterized by voluntary basis. User

innovators are able to decide themselves whether to get involved into improvement, development or modification of a product or not using their own judgment (Bin, 2013).

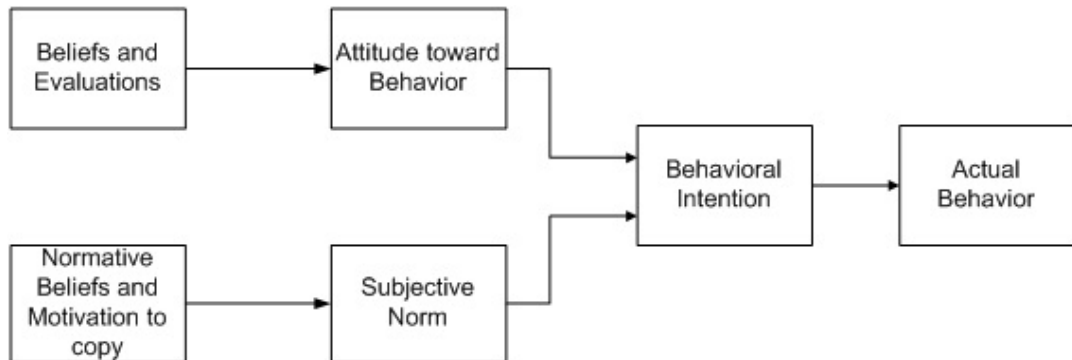


Figure 3 Theory of Reasoned Actions (Ajzen, 1991)

### 1.3.2 Technology Acceptance model

Technology Acceptance Model, see Figure 3 below, was developed from the TRA (Fishbein & Ajzen, 1975) in 1986 by Davis. The main purpose of the theory is to explain technology adoption behavior. In accordance with TAM there are two main perception of user: perceived ease of use (PEOU) and perceived usefulness (PU).

PEOU is defined as "the degree to which a person believes that using a particular system would be free of physical and mental effort" and directly influences PU, which is "the degree to which a person believes that using a particular system would enhance his/her job performance"(Davis, 1989).

These two main perceptions influence and define users attitude towards using technology. Attitude in most of the cases defines and affects behavioral intention (BI) to use the technology. In it's turn the intention to use technology determines an actual use (Abdullah & Ward, 2016).

The TAM was widely used in many studies related to e-learning acceptance and use (Al-Gahtani, 2014; T. G. Kim, Lee, & Law, 2008; Motaghian, Hassanzadeh, & Moghadam, 2013; Padilla-Melendez, Del Aguila-Obra, & Garrido-Moreno, 2013; Wu & Zhang, 2014).

The TAM is widely applied to a great range of technological systems. Last years it is been actively used in studies devoted to e-commerce and Internet technologies. The main goal of the early researches was to replicate the study to test scales validity (Ha & Stoel, 2009; Polancic, Hericko, & Rozman, 2010; Yi, Liao, Huang, & Hwang, 2009). There are more than 100 studies applying and validating the TAM (Ma & Liu, 2009). Most of these studies proved the reliability and validity of OU and PEOU in predicting BI to use technology, although it is necessary to say that some conflicting evidence still exist. Šumak et al. (2011) systematically

reviewed 42 e-learning acceptance studies, it showed that the TAM is the most commonly used theory. More than 86% of the studies used TAM as a ground theory (Šumak et al. 2011).

In addition to that many pervious e-learning studies showed that extended TAM provides good explanatory power, with total variance ranging from 53% to 70% (including Ifinedo, 2006, p.12; Lee et al., 2014, p.572; Lee et al., 2013, p.182; Liu, Li, & Carlsson, 2010, p.1217; Shen & Chuang, 2010, p.205).

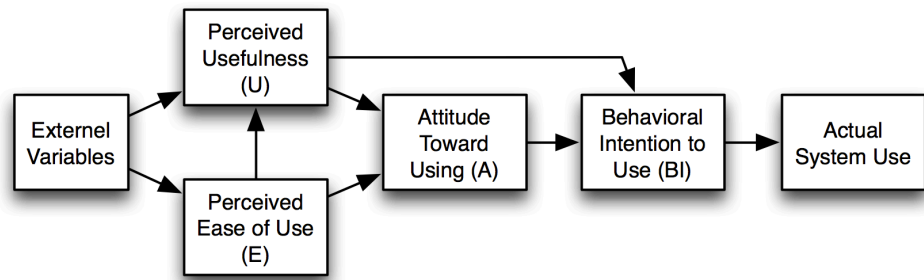


Figure 4 Technology Acceptance Model (Davis, 1986)

### 1.3.3 Theory of Planned Behavior

The Theory of Planned Behavior (TPB) allows to map the process of forming intentions to conduct the behavior consistent with their self-determined motivation (Sicilia, Saenz-Alvarez, Gonzalez-Cutre, & Ferriz, 2015).

The main assumption of the theory is than an intention of an individual's intention to conduct a behavior is a key determinant of its execution (Ajzen & Madden, 1986). In accordance with the theory can be determined by three sets of beliefs:

1. Beliefs about the most likely outcomes of the behavior;
2. Beliefs about expectations other people have and motivation to fulfill these expectations. Than can lead to perceived social pressure (subjective norms) to conduct specific behavior or nor;
3. Beliefs about factors which can facilitate/impede behavior to be conducted and the perceived power of those factors (M. Zhou, 2016).

These three sets of beliefs together affect an intention to carry out specific behavior.

An attitude of technology user towards the behavior can be defined as ““degree to which a person has a favorable or unfavorable evaluation of the behavior in question” (Ajzen, 1991). Additionally, the attitude includes judgment whether the behavior under consideration is good or bad and whether technology user wants to carry out the behavior (Leonard, Graham,

& Bonacum, 2004). In further studies Ramayah et al. (2010) highlighted that an attitude includes with the judgement also potential consequences following the behavior.

In accordance with studies of Kotchen and Reiling (2000) an attitude is the most important determinant of behavioral intention. The TPB uses subjective norm as the second most important determinant of behavioral intention. The subjective norm is defined as “the perceived social pressure to perform or not to perform the behavior ” (Han, Hsu, & Sheu, 2010). In most of the cases the users are influenced by those who are close to them e.g. family members, close friends, colleagues and business partners. Sometimes people who are not close to a potential user, but have a professional reputation and credibility in a specific industry may influence on the attitude and consequently on an intention. Subjective norm captures persons’ feelings about social norms and pressure. Also the studies confirmed that consumers who have positive subjective norm towards given behavior in most of the cases are more likely to have positive intentions (Paul, Modi, & Patel, 2016). Several studies in the marketing and consumer behavior fields confirmed subjective norm to be an important determinant of participation intention (M. J. Lee, 2005) and intention to use technology (White Baker, Al - Gahtani, & Hubona, 2007). The studies documented a positive interrelation between intention and subjective norm.

It’s necessary to mention that PBC becomes the most influential and important when behaviors are partially conducted under volitional control. The term “perceived behavioral control” refers to “the perceived ease or difficulty of performing the behavior” (Ajzen, 1991) and is closely connected to user’s past experience and anticipated obstacles on his way.

The TPB was proven valid and reliable by a number of reviews and experimental studies in such fields as physical activity (Luszczynska, Schwarzer, Lippke, & Mazurkiewicz, 2011), e-learning in higher education using mobile applications (Cheon, Lee, Crooks, & Song, 2012), internet banking (Nasri, 2011) proving its validity and reliability in explaining technology users’ intention and behavior. On the other side there are much variances that still remain unexplained in the TPB variables (Hagger, Chatzisarantis, & Biddle, 2002).

The relationship between attitude and intention, in accordance with the TPB, defines that attitude serves as “an evaluative predisposition to behavior” (Ajzen, 1985).

The great scope of researches has repeatedly confirmed that attitude is the most powerful predictor of intention to use technology (e.g., Park et al., 2012, Teo and Noyes, 2011 and Teo and Zhou, 2014).

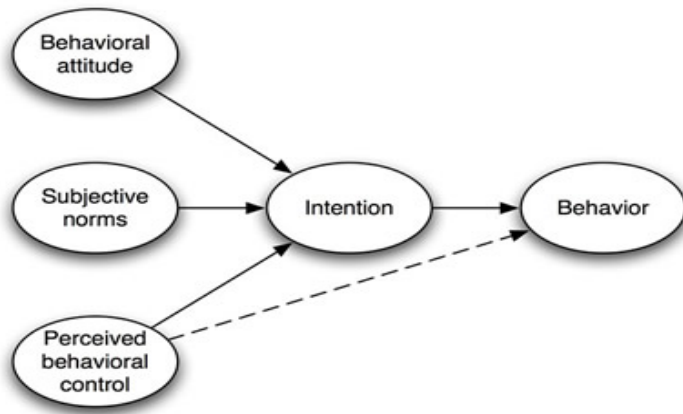


Figure 5 Theory of Planned Behavior (M. Zhou, 2016)

### 1.3.4 Triandis model

In 1980 Triandis proposed a theoretical model presupposed the attitude - behavior relationship with the following constructs: culture, genetic or biological factors and social situation. In accordance with the framework the constructs can potentially influence the behavior, see Figure 6 below.

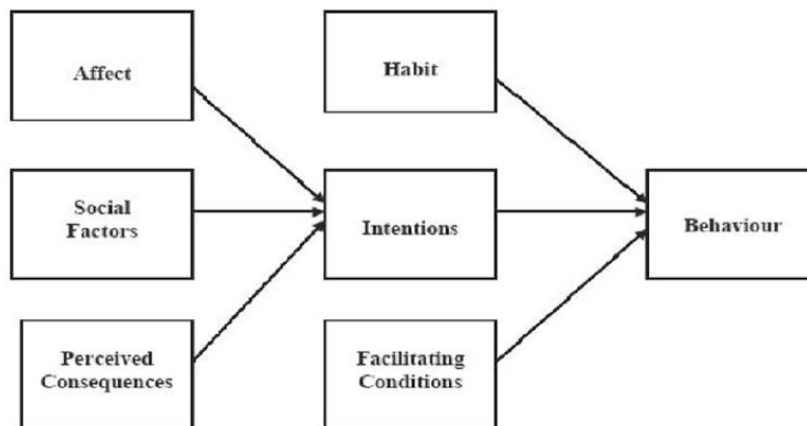


Figure 6. Triandis model (Chang and Cheung, 2001)

The Triandis model, often referred to as the theory of interpersonal behavior, complements TRA and provide norms, with the help of which human social behavior can be explained and understood. The Triandis models assumes an “attitude – intention – behavior” relationship as well as TRA and TPB do (T. (Terry) Kim & Lee, 2012).

Nevertheless the Triandis model additionally takes into account such relevant variables as habits, social factors (close to subjective norms), affect, the consequence perceived

and facilitating conditions (the term is similar to perceived behavioral control) in order to understand behavioral intention and actual behavior.

In accordance with the Triandis framework behavior can be defined as a function of the habit strength (1) in conducting the behavior, an intention to conduct the behavior (2) and facilitating conditions (3). Additionally it is stated that an intention depends on such factors as social factors (1), affect towards conducting certain behavior (2) and the perceived consequences and a desire to conduct the behavior.

Triandis (1980) named geographic and resource limitations as facilitating conditions. The importance of these two factors is supported by the argument that the behavior can not be conducted if the environmental conditions prevent it or make it difficult. The statement is valid even in case the intention to perform the behavior is strong and habit is already established (T. (Terry) Kim & Lee, 2012; Bergeron, Raymond, Rivard, & Gara, 1995).

The Triandis model differs from TRA, TAM, TPB and IDT as it uses different determinants to explain human behavior. Still all these theories have something in common, e.g. the TRA, TAM, TPB, IDT and Triandis model all assume an “attitude-intention-behavior” relationship. To break the concept into details it’s assumed that normative and cognitive beliefs are forming an attitude, consequently it has an influence on intention to behave a certain way and on actual behavior later on. Also the PE in TAM is similar to the definition of relative advantage used in the IDT and to a certain extent to the perceived consequences in the Triandis model. Scholars also say that facilitating conditions in the Triandis model is closely related to the perceived behavioral controls in the TPB (T. (Terry) Kim & Lee, 2012). The main different in the constructs is as follows: the facilitating conditions in the Triandis framework influence only on actual behavior, when the perceived behavior makes an impact on both an intention and an actual behavior.

The Triandis model was successfully adopted in various researches after the author had introduced the framework. It was applied in such contexts as consumer behavior by Domarchi et al. (2008) and Lee (2000); as social and health behavior by Lulseged and D’Este (2002), Milhausen et al. (2006) and Yuldirim et al. (2009). Lately the model is widely applied in the studies related to usage behaviors of PC (T. (Terry) Kim & Lee, 2012), the users’ behavior in the Internet (e.g. Chang & Cheung, 2001; Cheung, Chang, & Lai, 2000; Ramayah, Ahmad, Chin, & Lo, 2009).

### 1.3.5 Diffusion of Innovation

Diffusion of Innovation is now one of the most influential theories in marketing communications, thus the main focus of the theory is on the means by which the information about innovations are spread within the population (H. C. Chang, 2010).

Rogers defines an innovation as “an idea, practice, object that is perceived as new by an individual or a group of individuals or any other unit of adoption” (Değerli, Aytakin, & Değerli, 2015). It is much less important if an object or idea is actually new or it is just the unit of adoption only perceives it as new.

The newness perceived determines the reaction following the moment of “discovery”, so if the idea is new to an individual, so he perceives it as an innovation (Rogers, 1995). Diffusion is defined as a spread of the innovation, the way or the process the innovation is communicated to society or target audience, it is also determines the channels of communication (Değerli et al., 2015; Rogers, 1995).

Rogers assumes that a decision about innovation is a process which occurs over time and includes a consequent series of actions, see Figure 7 below.

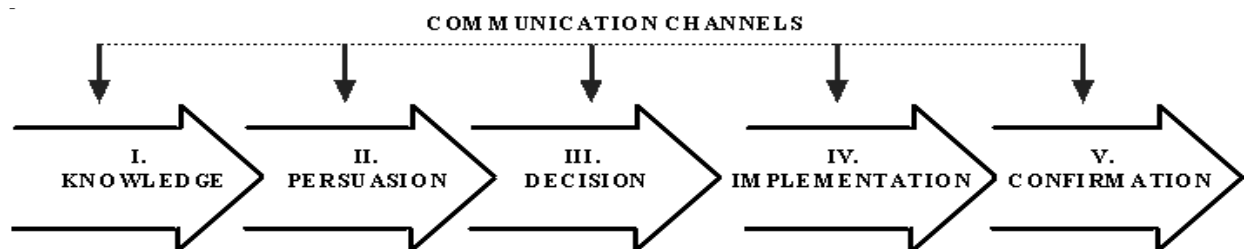


Figure 7. Innovation-decision process phases

This Innovation – decision process includes five stages or actions such as knowledge, persuasion, decision, implementation and confirmation. The process starting point is knowledge phase, which is considered by Rogers as decision-making unit exposed to innovation existence and is oriented to gain some information and understanding about it.

The knowledge stage is followed by a persuasion stage where and when favorable or unfavorable attitude towards innovation is formed. The decision is the stage where a decision-making unit involved into some activities that lead to choice of adoption or rejection of the innovation considered during the process. The next stage is an implementation which occurs only if the user selected an adoption of innovation on the previous stage. The overall process ends with the confirmation which is aimed to reinforcement of the decision already made. Nevertheless a user can change his decision in case he or she is exposed to conflicting and confusing messages about the innovation (Değerli et al., 2015; Rogers, 1995).

Usually the diffusion process includes mass media and interpersonal communication channels of informational spread. In current conditions social networks united these two channels together, e.g. Facebook represents mass media as well as an interpersonal channel of communication (Robinson, 2009). The dynamics of the process resulted in new norms, institutions and a great variety of social technological ways of innovation spread within the population. Using networks an individual may interact independently of their geographical location and physical proximity (Montanari & Saberi, 2010).

Besides the innovation decision process and Rogers defined attributes of innovation that influence the innovation adoption process. He pointed out that scholar in the past treated all innovations as equivalent and equal from the study and analysis point of view. The simplification could be dangerous. At least the fact that some innovations fail and some succeed proves that not all the innovations are the same. He defines five main attributes of an innovation:

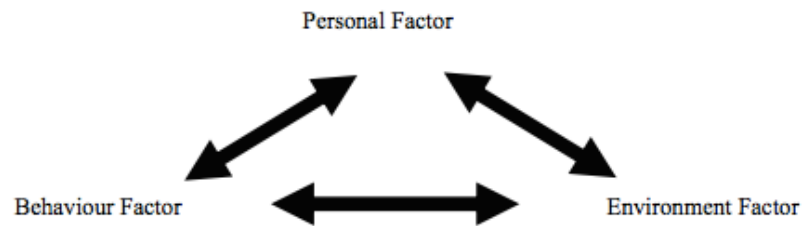
- Compatibility – the innovation should be compatible with skills, values and practices of potential users;
- Complexity – the innovation is relatively difficult to understand and use;
- Observability – the benefits of usage should be easily found out and observed;
- Relative advantage – an innovation should be or at least should be perceived as technically superior than the its predecessors;
- Trialability – the trial use of the innovation can be experimented without excessive efforts and expenses.

These five attributes can be considered as one of the main contributions of the theory of Diffusion of Innovations (Aizstrauta, Ginters, & Pjera Eroles, 2015).

### **1.3.6 Social cognitive theory**

Bandura proposed a social cognitive theory (SCT), which discusses changes in social behavior based on the interaction concept of reciprocal determinism (Bandura, 2005). He defines three main factors, which have reciprocal relationship to name all three: behavior, environment and personal, see Figure 8. These factors operate as determinants and influence each other.





*Figure. 8. Albert Bandura's Social Cognitive Theory Reciprocal Model*

In accordance with Bandura (1986) behavior is formed through the reinforcement of social context. It is assumed that people may think and perform certain behavior without being influenced by the social environment. The factors surrounding a person do not cause any changes in behavioral patterns and trends just because there is proven interrelation between the factors.

In 2001 Bandura explains and describes personal factors as ones that cover cognition, emotions, perceptions and internal knowledge. All these influence self-efficacy by intervening behavior.

Environment factors, according to Bandura (1986, 2001), are forming an interaction with the involvement of the source of model representation and social norms, which can influence people operating within.

The behavior factors include the variety of actions, choices, decisions and verbal expressions of a person through his/her experience, skills and practice (Bandura, 2001; Antley, 2010).

SCT assumes that a person acquires knowledge and accumulates experience and develops skills through role models. The concept of role models provides a human who become an example and learning process is executed through looking at someone and imitating his/her actions and behavior (Severin & Tankard, 2010).

The theory is widely used in such fields of research as communications, education, business and health.

### **1.3.7 Unified theory of user acceptance of technology**

The Unified Theory of User Acceptance of technology was developed in 2003 by Venkatesh, Morris, Davis and Davis based on TAM. The model is used to predict an acceptance of information technology by a person, which means both an intention and actual behavior.

The UTAUT has four main constructs:

- Performance expectancy (PE) – perceived usefulness of an innovative technology;
- Effort expectancy (EE) – perceived ease of use of the technology;
- Social influence (SE) – an indicator of the influence of social members;
- Facilitating conditions (FC) – relates to technological support, see Figure 9 below.

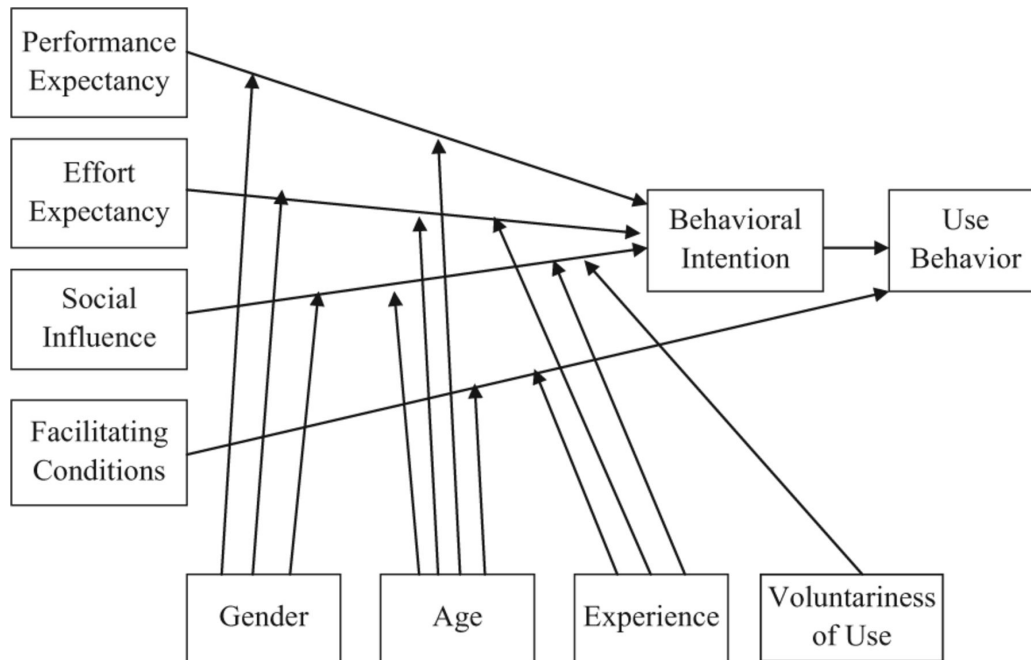


Figure 9. Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003)

As it can be concluded from the framework illustration the three main constructs are anticipated to influence the behavioral intention directly (with approximately 70% of variance in intention) and one construct determines an actual behavior.

Venkatesh (2003) assumes that the higher are the values of the four constructs the higher is the value of behavioral intention, and consequently the higher is the level of acceptance of the technology of a person. So behavioral intention of individual defines and determines the acceptance of technology.

In addition previous studies allow to highlight the role of age, gender and technology usage experience, as these factors were not taken into account in TRA, TPB, TAM and others (Min, Ji, & Qu, 2008).

UTAUT was originally developed in order to define and explain the factors affecting technology acceptance and use of ICT by employees. Since then various studies applied the model in the consumer context e.g. an adoption by users the following technologies: mobile phone technologies (Lu, Yao, & Yu, 2005; Park, Yang, & Lehto, 2007; Wang & Wang, 2010); internet banking (AbuShanab, 2007; Martins, Oliveira, & Popovi??, 2014; Riffai, Grant, &

Edgar, 2012), mobile banking (T. Zhou, Lu, & Wang, 2010), e-learning (Chiu & Wang, 2008). The UTAUT represents a synthesis of eight theoretical models taken from sociological and psychological theories, for details see the Table 2 below.

Table 2. Similarity of constructs with those of the UTAUT (Escobar-Rodriguez & Carvajal-Trujillo, 2014)

<b>Theory/model</b>	<b>Core constructs</b>	<b>Similar UTAUT constructs</b>
Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975)	Attitude towards behavior Subjective norm	SI
Technology acceptance model (TAM) (Davis, 1989 and Davis et al., 1989)	Perceived usefulness Perceived ease of use Subjective norm	PE EE SI
Motivational model (MM) (Davis, Bagozzi, & Warshaw, 1992)	Extrinsic motivation Intrinsic motivation	PE
Theory of planned behavior (TPB) (Ajzen, 1991 and Schifter and Ajzen, 1985)	Attitude towards behavior Subjective norm Perceived behavioral control	SI FC
Decomposed theory of planned Behavior (DTPB) (Taylor & Todd, 1995)	Attitude towards behavior Subjective norm Perceived behavioral control Perceived usefulness	SI FC PE
Model of PC utilization (MPCU) (Thompson, Higgins, & Howell, 1991)	Job fit Complexity Long-term consequences Affect towards use Social factors Facilitating conditions	PE EE SI FC
Innovation diffusion theory (IDT) (Moore & Benbasat, 1991)	Relative advantage Ease of use Image Visibility Compatibility Results demonstrability Voluntariness of use	PE EE SI FC
Socio-cognitive theory (SCT) (Compeau & Higgins, 1995)	Outcome expectations–performance Outcome expectations–personal Affect Anxiety	PE

The model has been tested empirically in numerous studies and has outperformed all eight separate models, which were used to construct the UTAUT, including TAM.

### 1.3.8 Summary of the adoption of technology theoretical frameworks

In order to summarize the overview of the main theoretical models of adoption of technology and to provide the arguments for the UTAUT application for the study we prepared a brief table where the evaluation of applicability is conducted.

As far as the main focus of the study is the behavioral intention to use the technology the TPB was selected for the research. The application of UTAUT was approved by two experts in e-learning sector (Udemy.com business analyst and Simpleshow Gmbh market researcher) who were left anonymous.

The UTAUT is considered as the most suitable model for current study because of the following reasons:

- The model proved to outperform all the models applicable to technology adoption field of research in 70% of the cases;
- The model takes into account demographic factors such as age and gender, which were previously ignored in other models. We consider inclusion of these factors as helpful for the segmentation and developing more precise recommendations for managers;
- It allows to identify whether the Internet Experience affect the intention to use MOOCs, which was proven influential in previous studies of PayPal system (2014);
- The core constructs of the models are comprehensive for the main goal of the research about MOOCs and further can be broken into several subconstructs to test.

*Table 3. Analysis of applicability of theoretical models*

<b>Theory/model</b>	<b>Core constructs</b>	<b>Applicability to the study</b>
Theory of Reasoned Action	Attitude towards behavior	Not applicable. Personal characteristics are not taken into account
	Subjective norm	Applicable, similar to social influence
Technology acceptance model (TAM)	Perceived usefulness	Applicable as similar to performance expectancy
	Perceived ease of use	Applicable as similar to efforts expectancy
	Subjective norm	Applicable, similar to social influence
Theory of planned behavior (TPB)	Attitude towards behavior	Not applicable
	Subjective norm	Applicable, similar to social influence
	Perceived behavioral control	Not applicable
Innovation diffusion	Relative advantage	Applicable as similar to performance expectancy

theory (IDT)	Ease of use	Applicable as similar to efforts expectancy
	Image	Not applicable
	Visibility	Applicable
	Compatibility	Applicable as similar to efforts expectancy
	Results demonstrability	Applicable
Socio-cognitive theory (SCT)	Outcome expectations–performance	Applicable under performance expectancy
	Outcome expectations–personal	Applicable under performance expectancy
	Affect	Not applicable
	Anxiety	Not applicable
Triandis model	Affect	Not applicable
	Social Factors	Applicable, similar to social influence
	Facilitating conditions	Not applicable
	Habit	Applicable as similar to user previous experience
	Perceived consequences	Applicable as similar to Performance expectancy
UTAUT model	<b>Performance expectancy</b>	<b>Applicable</b>
	<b>Effort expectancy</b>	<b>Applicable</b>
	<b>Social Influence</b>	<b>Applicable</b>
	<b>Facilitating conditions</b>	<b>Not applicable</b>
	<b>Age</b>	<b>Applicable but was not the focus of the study</b>
	<b>Gender</b>	<b>Applicable but was not the focus of the study</b>
	<b>Experience</b>	<b>Applicable but was not the focus of the study</b>
<b>Voluntariness of use</b>	<b>Not applicable as usage of MOOC is voluntary for learners</b>	

## 2. EMPIRICAL PART: DEFINITION AND EVALUATION OF FACTORS INFLUENCING ADOPTION OF THE ONLINE-COURSES

### 2.1 Research methodology and framework

The current study has two main purposes: exploratory and explanatory.

An exploratory study is aimed to find out “what is happening; to seek new insights; to ask questions and to assess phenomena in a new light” (Robson, 2002).

And an explanatory study in its turn is aimed to “studying a situation or a problem in order to explain the relationships between variables” (Robson, 2002, p. 140).

A research strategy is the way the researcher achieves the main goal of the study and answer a key question. In other words the strategy is the way of collecting and examining empirical evidence. There is no single unified and widely accepted strategy to be used by every scholar. Each research strategy has both advantages and disadvantages, which makes it more or less applicable depending on the research goal, the questions, and data availability and time limitations.

*Table 4. Relevant situations for different research strategies (Yin, 1994)*

Strategy	Form of research question	Requires control over behavioral events	Focus on contemporary event
<b>Archival analysis</b>	Who, What, Where, How many, How much	No	Yes/No
<b>Case study</b>	How, Why	No	Yes
<b>Experiment</b>	How, Why	Yes	Yes
<b>History</b>	How, Why	No	No
<b>Survey</b>	Who, What, Where, How many, How much	No	Yes

The correct strategy selection defines the success of the research and therefore the selection process should be conducted with consideration of not only the set of the objectives and the key research questions, but also of the information and time available and the existing knowledge.

The research strategy selected for the current Master Thesis is a survey strategy. It’s widely used for business and management researches and it is traditionally used for exploratory and explanatory search. The main argument for survey strategy is the collection of a large data amount in a short period and at low cost. In addition to that is easy to explain and to understand because of being widely used.

Beside these two factors the survey allows a researcher to collect quantitative data for consecutive quantitative analysis such as descriptive statistics. The data collected with the help

of the survey can be also used to suggest particular relationship between variables (Saunders, Lewis, & Thornhill, 2009).

The deductive approach will be used for the current master study. It was selected as it allows to derive a particular conclusions based on existing theories. It provides an opportunity to analyze the results both quantitatively and qualitatively, and to give an interpretation of relationship between variables.

Data analysis is mainly presented by a quantitative analysis. It is planned to use the method for factors' analysis and deriving recommendations. Quantitative data is to be collected by using a questionnaire and analyzed using IBM SPSS statistical package.

It was previously mentioned that the basic theoretical model of the research is the UTAUT model. Still we would like to modify the model for the specific purpose of the study and in accordance with the needs determined by the research subject.

First of all we would like to simplify the model by excluding the constructs and units irrelevant for the study.

First of all we eliminated "Use behavior" as an actual behavior is not the subject of the study, as far as the main focus is on behavioral intention. Nevertheless, current research can be then used as a foundation for further studies devoted to interrelation between an intention and behavior. Consequently, "Facilitating conditions (FC)" construct should also be excluded from the UTAUT, as it influences the actual behavior and not the behavioral intentions. Moreover in 2003 Venkatesh et al. defined FC as "degree to which organizational and technical infrastructure exists to support the system", which is not relevant for MOOCs topic, as the very technological development of educational platforms made MOOCs existent.

The third unit to be eliminated is "Voluntariness of use" moderator. In most of the cases MOOCs use is not obligatory, it is not a pre-installed software and the basis of the MOOCs itself assumes some willing to learn and acquire knowledge without an order or conditions to do so.

After the exclusion of the three units off the model we have:

- three determinants left: Performance Expectancy, Efforts Expectancy, Social Influence;
- three moderatos: Gender, Age and Experience.

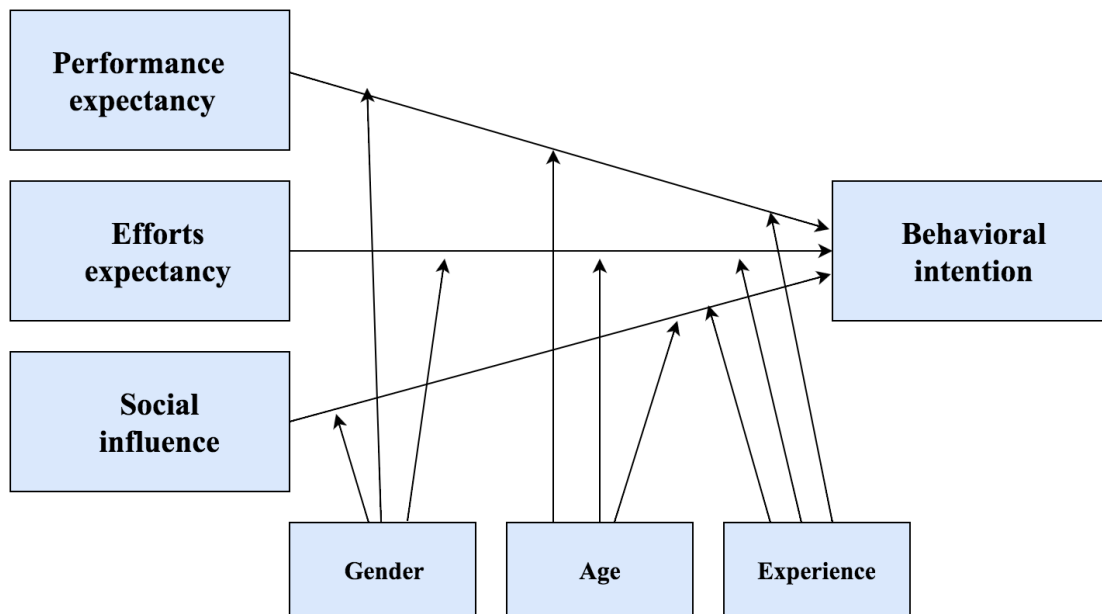


Figure 10. Modified Unified Theory of Acceptance and Use of Technology

## 2.2 Research hypothesis

### *Performance expectancy*

Performance acceptance was defined as a certain extent to which a persons believes that using a specific technology will benefit him/her in terms of job performance. Venkatesh et al. (2003) defined five constructs derived from previous models that can be referred to performance acceptance:

- Perceived usefulness (TAM/TAM2, C-TAM-TPB);
- Extrinsic motivation (MM);
- Job-fit (MPCU);
- Relative advantage (IDT);
- Outcome expectations (SCT).

Additionally it is indicated that performance expectancy is the strongest predictor of behavioral intention to use technology. In 1989 Davis proved that perceived usefulness was the most frequent factor used to decide a higher or lower rate of adoption of technology.

The assumption to use usefulness expected (perceived) was also supported by two experts engaged to the current study, this the following hypothesis was developed:

*Hypothesis 1: Usefulness expected has a positive relationship with users' intentions to use MOOCs.*



## ***Effort expectancy***

Effort expectancy was defined as “degree of ease that individuals think they will have when using an information system” (Venkatesh et al., 2003). There are three main constructs derived from previous frameworks that relate to the effort expectancy concept: perceived ease of use (TAM, TAM2), complexity (MPCU) and ease of use (IDT). Wu et al. (2008) defined an ease of use as one of the key factors of technology acceptance. Previous researches suggested an idea that individuals' expectation may vary depending on gender, age and experience. Moreover several studies proved the effort expectations will be more influential determinant of an intention for female users (Venkatesh & Morris, 2000; Venkatesh, Morris, & Ackerman, 2000; Venkatesh et al., 2003), especially for those ones who are older (Morris & Venkatesh, 2000) and have little experience (Venkatesh et al., 2003). The effort expectancy usually is broken down to simpler construct such as simplicity of use, independence of use (Venkatesh et al., 2003). As far as these constructs are easier to understand by the respondents of the survey, it was decided to break the effort expectancy based hypothesis into two:

*Hypothesis 2.1: Simplicity of usage expected has a positive relationship with users' intentions to use MOOCs.*

*Hypothesis 2.2: Independence of usage expected has a positive relationship with users' intentions to use MOOCs.*

## ***Social influence***

Social influence is defined as “the extent to which a person perceives it is important that other believes he/she should use the new information system” (Venkatesh et al., 2003). In accordance to the results of previous studies social influence is a direct determinant of behavioral intention to use new technology (Thompson, Higgins, & Howell, 1991; Mathieson, 1991; Moore & Benbasat, 1991; Harrison, Mykytyn, & Riemenschneider, 1997; Venkatesh & Davis, 2000). Social influence is usually divided for two constructs: influence of superior people and influence of the peers. For the purposes of this study these two constructs were incorporated into one group “of people who influence individual's behavior”.

*Hypothesis 3: Social influence has a positive relationship with users' intentions to use MOOCs.*

## ***Demographic factors and experience***

Additionally we would like to test of the demographic factors and previous experience influence the intention to use MOOCs:

*Hypothesis 4: There is a positive relationship between age and users' intentions to use MOOCs.*

*Hypothesis 5: There is a positive relationship between gender and users' intentions to use MOOCs.*

*Hypothesis 6: There is a positive relationship between previous Internet experience and users' intentions to use MOOCs.*

## **2.3 Research design**

### ***Survey design and submission of sample size***

The modified UTAUT model was used as basis for the questions development to be used in the survey. Setting the right questions for each of the determinant and the moderator is critical for the research success and results objectivity.

In order to investigate the moderators the following questions were asked:

1. Gender;
2. Age;
3. Years of active Internet usage;

In order to gather knowledge about the key determinants of the behavioral intention to use MOOCs the following questions were developed:

<b>Construct</b>	<b>Item code</b>	<b>Item</b>
Performance Expectancy	PE	MOOCs would improve my knowledge in the areas interesting to me.
Effort Expectancy	EE1	MOOCs are easy and flexible to use.
	EE2	Using MOOCs is beneficial because of the absence of physical and time limitations
Social Influence	SI	People who influence my behaviour think that I should use MOOCs.

In order to measure adoption readiness variables 5-level Likert – type scale level of agreement was used:

1. Strongly Agree.

2. Agree;
3. Neither Disagree Nor Agree;
4. Disagree;
5. Strongly disagree.

We also included the most important question about behavioral intention into the survey, and it is ranked by 1-5 scale from “I do not consider using MOOCs in the future” to “Yes, definitely I intend to”:

*“Do you plan to use MOOCs in next 12 month?”*

The questionnaire was designed as a result of theoretical research during summer internship of the author at Simpleshow GmbH, Germany. As the company was considering the launch of MOOCs production the analysis of technology adoption was actual for primary market research. With the help of external marketing agency the survey was distributed widely across Germany in order to gather representative primary data for analysis.

Venkatesh et al. (2003) proposed the UTAUT theoretical framework, which was tested by the researchers on three samples, all the samples consisted of 215 respondents. Thus for the purpose of current Master Thesis we needed to obtain a sample no less than 215. With the help of agency in relation of survey distribution the sample size of the study consist of 491 respondents. The questionnaire was designed to be short (5 minutes to complete) in order to get more honest and sincere responses and not making respondents tired and inattentive. The survey was distributed via Survey Monkey online survey tools.

## **2.4 Data analysis**

### **2.4.1 Descriptive statistics**

At first we would like to perform analysis of the results of descriptive statistics for dependent variables covering demographic factors and previous Internet experience.

Firstly we analyzed the sample by gender, as it can be seen from the Figure 11, the genders are equally presented in the sample. The sample distribution by gender is considered as representative Germany, as in accordance with the official statistics there were 51% females and 49% males living in Germany as at 30.09.2015. (Destatis, 2016).

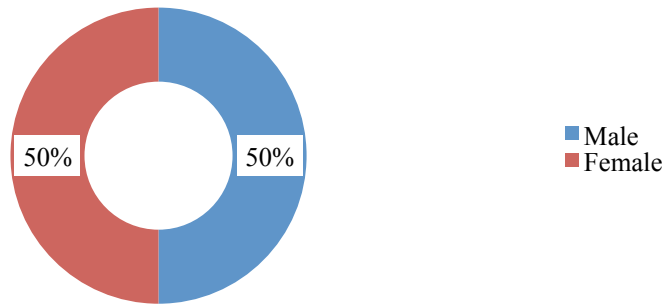


Figure 11. Distribution of sample by gender

Next we have Figure 12 illustrating sample distribution by age groups. As can be seen from the illustration respondents aged 60 years and older present the biggest share equal to 27%. As the main purpose of the study was to get the representative data for analysis we consider that the sample corresponds with the age distribution within the population of Germany, as the share of population over 60 years equals to 30% of total population of the country.

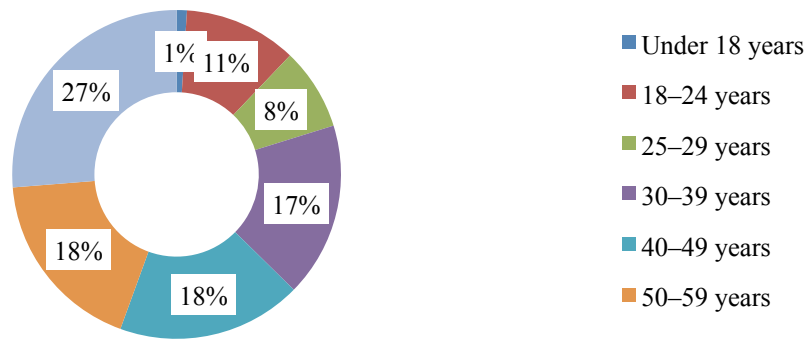


Figure 12. Distribution of sample by age

The results of the Internet experience distribution across the sample correspond to the age distribution presented above. As far as only 12% of the respondents are 24 years old or younger, the proportion of the respondents with Internet usage experience less than 3 years equals to 11%. Most of respondents – 89% - have been using Internet actively for more than 3 years.

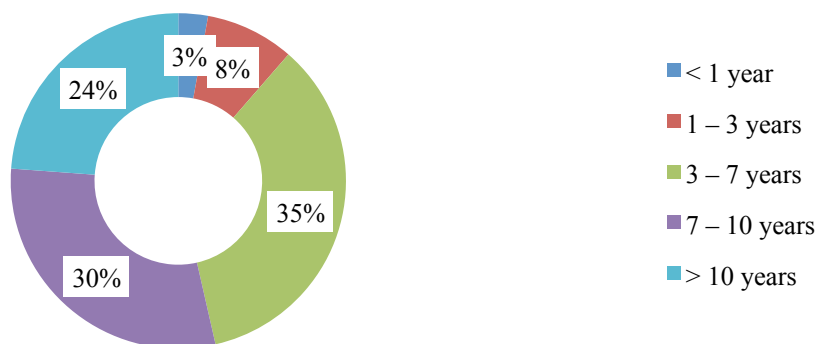


Figure 13. Distribution of sample by Internet experience

Additionally we have studied the means of the core constructs, on average the mean index is allocated closer to 1-2 points, which can be a sign of positive attitude to MOOCs as to an educational tool.

Table 5. Summary statistics (n=491)

Model item	Mean	Std. Deviation	Min	Max
PE1	2,15	1,034	1	5
SI1	2,04	1,147	1	5
EE1	2,54	1,161	1	5
EE2	2,09	0,975	1	5
Age	4,99	1,713	1	7
Gender	1,5	0,501	1	2
Internet experience	4,3	1,376	1	5

#### 2.4.2 Reliability analysis

To ensure and to measure the internal consistency reliability of the data we conducted Cronbach's Alpha reliability tests. Cronbach's Alpha index varies from 0 (no similarities) to 1 (maximum similarities). As the result (see Table 6 below) all the coefficients exceed 0,70 which is recommended minimum level for confirmatory research (Churchill Jr, 1979).

Table 6. Reliability analysis (n=491)

Model item	Number of items	Cronbach's Alpha
PE	1	<b>0,843</b>
EE1	1	
EE2	1	
SI	1	

#### 2.4.3 Correlation analysis

Correlation analysis was performed in order to investigate whether the independent variable in the model are interrelated. As it can be seen from the Table 7 variables presenting demographic factors and Internet usage experience are not interrelated with any others. All the correlation coefficients of the variables are significantly less than 0,05.

Meanwhile the variables related to the core construct of the modified UTAUT model are positively interrelated, having correlation indexes equal or close to the benchmark – 0,5.

Table 7. Correlation analysis

	Age	Gender	Internet experience	PE	SI	EE1	EE2
Age	1						
Gender	0,162	1					
Internet experience	-0,181	0,029	1				
PE	0,072	0,009	-0,031	1			
SI	-0,016	0,013	-0,013	0,647***	1		
EE1	0,095	0,08	-0,108	0,584***	0,564***	1	
EE2	0,198	-0,023	-0,117	0,469**	0,479**	0,652***	1

\*\*\* $p > 0,5$ ; \*\* $p \approx 0,5$

Along with correlation analysis we performed collinearity analysis, see the result in the Table 8 below. As VIF index for all variables is significantly less than 5, there is no indication of multicollinearity in the model used.

Table 8. Collinearity analysis

Variable	VIF
PE	2,012
SI	1,352
EE1	1,415
EE2	1,954
Age	1,134
Gender	1,074
Internet experience	1,065

#### 2.4.4 Hypothesis testing and results interpretation

The next stage after reliability, correlation and collinearity tests is the test of hypotheses proposed. In order to conduct the test of hypotheses we used Multiple Linear Regression method. The stage is the most important of the research as it allows investigating and identifying whether performance expectancy, effort expectancy and social influence significantly affect an intention to use the MOOCs.

We also included three moderators selected into regression analysis in order to answer the question if the demographic factors such as age and gender, and previous internet experience have any influence on the behavioral intention to use the MOOCs.

The regression analysis was conducted three times for three various models testing:

- PE, EE and SI and the effect on the BI;
  - Three moderators: Age, Gender, Internet Experience and the effect on the BI;
  - Three core constructs + three moderators and their effect on the BI,
- the results of the tests are presented below.

### Test of Model 1

R-squared of the tested model is equal to 0,464 which falls into the initial UTAUT model testing interval from 0,4 to 0,51 conducted by Venkatesh et al. in 2003.

The model is significant and it can be concluded that all variables except the simplicity of MOOCs usage affect the behavioral intention (see Table 9.1).

*Table 9.1 Results of models' testing*

Model	Independent variables	Prob >F	R-squared	Beta	Std. error	P >  t
<b>Determinants</b>	Usefulness	<b>0,000</b>	<b>0,464</b>	0,291	0,061	0,000
	Simplicity			0,032	0,054	0,555
	Independence			0,106	0,051	0,039
	Social influence			0,106	0,051	0,039

### Test of model 2

R-squared of the tested model is equal to 0,021 which does not fall into the initial UTAUT model testing interval from 0,4 to 0,51 conducted by Venkatesh et al. in 2003.

The model is not significant and it can be concluded that age, gender and previous Internet experience do not affect the behavioral intention (see Table 9.2).

*Table 9.2 Results of models' testing*

Model	Independent variables	Prob >F	R-squared	Beta	Std. error	P >  t
<b>Moderators</b>	Age	<b>0,021</b>	<b>0,001</b>	0,043	0,037	0,248
	Gender			0,008	0,124	0,947
	Internet experience			-0,04	0,045	0,377

### Test of Model 3

R-squared of the tested model is equal to 0,462 which falls into the initial UTAUT model testing interval from 0,4 to 0,51 conducted by Venkatesh et al. in 2003.

The model is significant and usefulness, independence and social influence affect the behavioral intention to use the MOOCS, while the simplicity, age, gender and internet experience do not, see the Table 9.3.

Table 9.3 Results of models' testing

Model	Independent variables	Prob >F	R-squared	Beta	Std. error	P >  t
<b>Determinants + Moderators</b>	Usefulness	<b>0,000</b>	<b>0,462</b>	0,286	0,061	0,000
	Simplicity			0,034	0,055	0,530
	Independence			0,102	0,053	0,054
	Social influence			0,198	0,04	0,000
	Age			0,007	0,028	0,793
	Gender			0,038	0,093	0,684
	Internet experience			-0,031	0,034	0,355

To get into details after the tests of the three models were conducted we analyzed if the hypothesis proposed was supported or not and how we should interpret the result of the test. The short summary is presented in the Table 10 below, additionally each hypothesis was also analyzed and results were explained.

Table 10. Testing of hypotheses

Hypothesis	Coefficient	t-statistics	P>t	Validity
<b>H1</b>	0,286		0,000	Supported
<b>H2.1</b>	0,034		0,530	Not supported
<b>H2.1</b>	0,102		0,050	Supported
<b>H3</b>	0,198		0,000	Supported
<b>H4</b>	0,007		0,793	Not supported
<b>H5</b>	0,038		0,684	Not supported
<b>H6</b>	-0,031		0,355	Not supported

*Hypothesis 1: Usefulness expected has a positive relationship with users' intentions to use MOOCs.* The results showed that a core construct "Performance Expectancy", measured for the purpose of the study via "Usefulness expected" positively affects behavioral intention of a user to use MOOCs ( $\beta=0,286$ ,  $p<0,001$ ). Therefore H1 is supported. That means that when a potential learner expects using MOOCs is useful for him he/she increases the intention to use it.

The core construct "Effort expectancy" was broken down to two units: "Simplicity" and "Independence", therefore it is correct to analyze the hypotheses separately. Moreover it is necessary to mention that the construct was proven significant partly, thus the divided analysis allows identifying the relevant determinant out of two.



*Hypothesis 2.1: Simplicity of usage expected has a positive relationship with users' intentions to use MOOCs.* The results showed that simplicity does not positively affect an intention of a user to use MOOCs ( $\beta=0,034$ ,  $p>0,5$ ). Therefore H2.1 is not supported. That means that when a potential user expects using MOOCs to be a simple process it does not positively affect his/her intention to use it.

*Hypothesis 2.2: Independence of usage expected has a positive relationship with users' intentions to use MOOCs.* The results showed that independent usage of MOOCs positively affects an intention of a potential user to use MOOCs ( $\beta=0,102$ ,  $p\leq 0,05$ ). Therefore, H2.2 is supported. That means when a potential user expects using MOOCs independently without any external help and support he/she increases the intention to use it.

*Hypothesis 3: Social influence has a positive relationship with users' intentions to use MOOCs.* The results showed that social influence positively affects user's intention to use MOOCs ( $\beta=0,198$ ,  $p<0,001$ ). Therefore H3 is supported. That means when user's peers, friends, colleagues or someone important to him/her suggest that they use MOOCs, the user increase the intention to use it.

*Hypothesis 4: There is a positive relationship between age and users' intentions to use MOOCs.* The results showed that age does not affect an intention of a potential user to use MOOCs ( $\beta=0,007$ ,  $p>0,7$ ). Therefore H4 is not supported. That means that age of a potential user does not interrelate with the intention to use MOOCs.

*Hypothesis 5: There is a positive relationship between gender and users' intentions to use MOOCs.* The results showed that gender does not affect an intention of a potential user to use MOOCs ( $\beta=0,038$ ,  $p>0,6$ ). Therefore H5 is not supported. That means that gender of a potential user does not interrelate with the intention to use MOOCs.

*Hypothesis 6: There is a positive relationship between previous Internet experience and users' intentions to use MOOCs.* The results showed that previous Internet experience does not affect an intention of a potential user to use MOOCs ( $\beta=-0,031$ ,  $p>0,3$ ). Therefore, H6 is not supported. That means that there is not positive interrelation between user Internet experience and his/her intention to use MOOCs.

## **2.5 Analysis of the obtained results**

### **2.5.1 Interpretation Of Moderators**

The results of hypotheses testing showed that an intention to use MOOCs is not affected by age, gender and Internet experience of a potential user. Which means that people of different ages, sexes and previous Internet experience can easily adopt such e-learning tools as MOOCs.

The sample population was proved to be representative comparing with the structure of the whole Germany population in by age and gender; therefore the conclusion can be extrapolated.

Both companies' representatives expected interdependence between age and behavioral intention to use MOOCs, but the data did not validate the results expected. The results strongly contradict the expectation, thus also should be take into account. Therefore it is not possible to identify the behavioral pattern for the company to target a specific age group customers basing of the findings of the research. Still others demographic factors can be taken into consideration for testing such as education level, profession and occupation, income level etc.

### **2.5.2 Interpretation of determinants**

As the results of the study showed 3 out of 4 proposed hypotheses related to core determinants were supported, thus 3 determinants are significant and should be analyzed separately each by each.

Performance expectancy is proved to be significant ( $\beta = 0,286$ ) and is considered as one of the most important factors of adoption of technology such as MOOCs. Performance expectancy is closely related to the perceived usefulness an individual would get using the technology, therefore it can be concluded that individuals consider MOOCs usage as an instrument of development and improvement in terms of knowledge, skills, qualification etc.

Simplicity as a part of effort expectancy was expected to be significant factor influencing the intention. Nevertheless the results showed that it does not affect an intention to use MOOCs ( $\beta=0,034$ ). In accordance to several studies simplicity does not play a significant role in an educational process, as individuals perceive a process of acquiring knowledge and developing skills as a complex and challenging (Tan, 2013).

At the same time the second part of the effort expectancy construct, which is independence of use technology, is significant ( $\beta = 0,102$ ). As far as all e-learning tools are designed to ease the limitations such as time, geographical location and costs of education, the users perceive almost all e-learning tools as a tool for individual work (V. Chang, 2016). Thus the independence is now considered as one of the key attribute of MOOCs and significantly influences individuals' behavioral intention to use the technology.

As the analysis results showed social influence construct significantly influences the intention to use MOOCs ( $\beta=0,198$ ). So the adoption level of the peers and superior means a lot for individuals, and stimulate them to adopt the technology. It is necessary to say that MOOCs are usually advertised via social network using so called recommendation features, making the MOOCs visible by the individuals.

## CONCLUSION

Current study is devoted to the research and analysis of the factors influencing users' intention to use such tool of e-learning as MOOCs in Germany. As the e-learning becomes more and more important and wide spread in Europe it is vital for companies providing MOOCs and other stakeholders interested in the segment to accumulate and to analyze information related to user's intentions and the factors influencing their intention. Commonly accepted approach to study an intention to use technology is based on the technology adoption models, which allow to measure and interpret the factors affecting the degree of acceptance of technology, readiness to use it. We performed detailed theoretical analysis of theoretical frameworks currently existing and based on this UTAU model was selected for foundation of empirical part of the research. The model allowed the author to test whether such core constructs as performance expectancy, effort expectancy and social influence affect the intention to use MOOCs. Additionally the model included such moderators as age, gender and Internet experience, which gives opportunity to test the impact of these attributes on the intention.

Based on the quantitative analysis we it was identified that age, gender, Internet experience in the past and perceived simplicity do not influence user's intention to use MOOC as a learning instrument. At the same time usefulness expected, independence of usage and social influence have significant relationship with the intention. The significance of the variable allowed us to accept the hypotheses about the positive relationship with the intention. The results of the current study enable to draw several important conclusions important for the companies and entrepreneurs and other stakeholders involved into MOOC development and expansion.

The results prove the age to be irrelevant in terms of intention to use or not MOOC. It is still widely discussed issue as there are studies confirmed the age as a significant variable affecting technology adoption process of such technologies as mobile banking (Yu, 2012), electronic medical record systems (Venkatesh, Sykes, & Zhang, 2011), e-government services (Alshehri & Drew, 2012), social media (Salim, 2012) and others. It is necessary to mention that one of the mostly used customer segmentation practice is based mainly on the age segmentation, which is proven to be ineffective for the case of MOOC. It does not mean that the age should be excluded for the analysis and segmentation, but clearly confirms that the age is not solid and sufficient foundation for the primary market segmentation.

Also it was concluded that the simplicity of using MOOC expected does not correlate with the intention. The result is considered as significant because it contradicts the last main trend in IT, which has simplicity of use as a main goal (H. Lee et al., 2008; Madni, 2012; Maeda, 2006; Mayer, 2008). Mainly that finding can be explained by studies made in consumer behavior

in education as the educational process itself is not perceived as simple one, in most of the cases it is expected to be challenging and complex at some level. As now many MOOC developers invest time, funds and human resources into design and system simplification the results of the study can be useful for further projects budget allocation, and can also cause deeper researches in order to identify correctly users expectations and preferences.

At the same time based on the respondents' answers we can confirm that independence expected in MOOC usage positively affects users' intention. Which also proves some benchmark in technical and design attributes of the MOOCs and the system, which provides them. Mainly the studies in this field proved that user friendly interface, system sufficiency and low rate of system bugs are three main dimensions an average user measures the degree of his/her independence (Bai, Lin, Huang, Fei, & Floeter, 2010; Bonino, Corno, & De Russis, 2011; Kurdi, Hamad, & Khalifa, 2014).

As far as perceived usefulness is confirmed as the most significant variable in the study performed we consider it as the main point to focus on for the MOOC developers. The finding was partly expected as it presents actually the basis of the e-learning as a whole (Davis, 1989; Ha & Stoel, 2009; T. G. Kim et al., 2008; Motaghian et al., 2013; Sun et al., 2008). For practical implementation the content and its usefulness for the user can be used as a key point of promotion, it also can define the partnerships with the most trusted educational organizations, trainers and tutors. As an example we can name successful business models of the leading universities launching MOOCs on external or own platforms (Adams, 2012; Anderson, 2012; Bates, 2012; Educause, 2013; Severance, 2012) . The names standing behind the MOOCs usually imply high quality and great perceived usefulness in terms of theoretical knowledge or special skills offered as well as brand recognition by others.

In addition to the last two points social influence also has positive relationship with the intention to use MOOCs. As far as many MOOCs' current and potential users have several years of Internet experience in the past the social medias now represent one of the main channels of promotion (H. C. Chang, 2010; Koutropoulos et al., 2014; Salim, 2012; Shen & Kuo, 2015; Ternauciuc & Mihaescu, 2014). Still the main type of promotion and advertising of MOOC is a context ad banners, whereas the results of the study proves that its is more important for potential user to be aware that a person who is an opinion leader for him (friend, colleague, family members, celebrity, businessman etc.) uses MOOC. Motivation by examples here works the most effectively. The MOOC developers for promotion and brand awareness actions also can use this finding. Just as an examples we can mention that there is not connecting links to Facebook on courser.org. Usually that technical solution are not costly but as the author assumes are effective in terms of promotion, users' attraction and consequent revenue generation.

Discussing theoretical input and managerial implications of the current master thesis study it's necessary to outline several limitations applicable to the research.

Firstly, the focus of the study is the population of Germany, thus geographical limitation is applicable.

Second, the main advantage and at the same time great disadvantage of the current study is its sample size and structure. As far as the main goal was to make conclusions applicable to the great part of the population, the sample size represents variety age groups and Internet experience groups. That fact made it impossible to include very specific questions, as the sample is not homogenous. Thus the main conclusions are perceived as common and to be used for further researches as a foundation, a starting point. Beside that despite the size of the sample group the study is limited as the survey was distributed through the Internet, thus the key conclusions are applicable mainly for frequent Internet users.

Additionally among the various e-learning tools only MOOCs were studied, thus the results of the study are strictly limited in practical application to e-learning.

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