Szent István University

Doctoral School of Management and Business Administration

A COMPARATIVE STUDY OF THE BEHAVIOURAL INTENTION TOWARDS SMARTPHONE IN THE CASE OF AZERBAIJANI AND HUNGARIAN STUDENTS

DOCTORAL DISSERTATION

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Abbreviations

1G	The First Generation
2G	The Second Generation
3G	The Third Generation
4G	The Fourth Generation
4P	Product, Price, Place, Promotion
5G	The Fifth Generation
5GCN	5G Core Network
AGFI	Adjusted Goodness of Fit Index
AMA	American Marketing Association
ASV	Average Shared Variance
AVE	Average Variance Extracted
BA	Brand Awareness
BI	Behavioural Intention
CA / α	Cronbach's Alpha
CDMA	Code-Division Multiple Access
CFI	Comparative Fit Index
CR	Construct/Composite Reliability
EDGE	Enhanced Data rates for Global Evolution
EFA	Exploratory Factor Analysis
FC	Facilitating Conditions
GFI	Goodness-of-fit
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
HM	Hedonic Motivation
HSPA	High-Speed Packet Access
HT	Habit
I/E	The Interactive - Economic Schools
I/N	The Interactive - Noneconomic Schools
ICT	Information and Communication Technologies
IEEE	The Institute of Electrical and Electronics Engineers
in.	inch
iOS	Operating System designed by Apple
ITU	International Telecommunication Union
KMO	Kaiser-Meyer-Olkin measurement of sampling adequacy
LCD	Liquid-Crystal Display
LTE	Long-Term Evolution
ML	Maximum Likelihood
MSV	Maximum Shared Variance
N/E	The Noninteractive - Economic Schools
N/N	The Noninteractive-Noneconomic Schools
NR	New Radio access technology
OHA	Open Handset Alliance

OS	Operating System
PCA	Principal Component Analysis
PLC	Partial Least Squares
PV	Price Value
R&D	Research and Development
RM	Relationship Marketing
RMSEA	Root Mean Square Error of Approximation
SA	Satisfaction
SBI	Symbolic Brand Image
SEM	Structural Equation Modelling
SI	Social Influence
SMS	Short Message Service
SRMR	Standardized Root Mean Residual
TAM	Technology Acceptance Model
TAM2	Extended Technology Acceptance Model
TVE	Total Variance Explained
TLI	Tucker-Lewis Index
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UMTS	Universal Mobile Telecommunications System
UTAUT	Unified Theory of Acceptance and Use of Technology
UTAUT2	The Extension of Unified Theory of Acceptance and Use of Technology
WAP	Wireless Application Protocol
W-CDMA	Wideband Code Division Multiple Access

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1 INTRODUCTION

1.1 Relevance of Topic

The rapid development of information and communication technologies (ICT) and the so-called ICT Revolution (Baldwin, 2016, p. 84) has changed the face of the world. The penetration rate of the Internet and telephone users, as well as Internet providers, began to rise in the mid-1980s (Baldwin, 2016, p. 85). For example, starting in 1986, the annual growth of the telecommunication sector was 28%. The growth (Giachetti, 2013, p. 53) also reasoned by customer/user interest to adopt new technologies and apply the novelties in practice. The development of ICT, especially its theory and implementation, influenced national economies (Abdel-Wahab and El-Masry, 2011, p. 161). These mentioned changes caused quantitative and qualitative progress in different economic domains, and during this period the transformations influenced the mobile phone industry too. The first generation of mobile phones (from 1983 until 1990) was produced during the mentioned period. The disadvantages of the handsets were their big size, weak batteries, and very expensive price (Zheng and Ni, 2006; Donner, 2009). In addition to the mentioned disadvantages, mobile phones mainly were installed into cars (Donner and Jonathan, 2009), and the main buyers of handsets were consumers with a high income.

Favourable economic conditions, the development of communication technologies, and manufacturers' desire to sell more handsets influenced the products' look, technical parameters, and price. In the current work, the terms "handset" and "device" used as the synonyms of smartphone/mobile phone depending on the context. During this period, handset vendors made the transition to the target group and the companies began to design phones for a wider audience (Donner, 2009). In the mid-1990s, the manufacturing of handsets was highly profitable for the vendors (Giachetti and Marchi, 2010) and new companies tried to enter the field. Technological development caused the improvement of devices and the inclusion of additional features to handsets. The popularity of handsets was increasing gradually, and mobile phones became one of the most-used high-tech devices in the world (GSMA, 2018a).

The introduction of the new iPhone in 2007 changed the development direction of the industry (Donner and Jonathan, 2009). Some authors (Park and Lee, 2015) named it the starting point of the "smartphone era". Using social media, and other apps in smartphones and/or other handheld devices changed users' lifestyles (Liu and Li, 2010). It became easy to gain information, track everyday changes, and much more. Nowadays, almost anything can be done by using a smartphone, from buying a train ticket, to making purchases and calling a taxi. The affordability of handsets is a reason for discussion. The prices of smartphones has gradually decreased since the beginning of 2010 (GSMA, 2017, p. 32). However, the low-income level of the population in developing countries created additional barriers (Jamalova and M. G. Constantinovits, 2020) in the purchase and use of smartphones (Lechman, 2015).

1.1.1 Technology Adoption: Situation Worldwide

Mobile phone subscriptions and smartphone penetration have gradually increased all over the world. According to the report of the GSMA, more than five billion individuals had mobile phone subscriptions at the end of 2017 and the number is higher than owning any other high-tech device (GSMA, 2018a). Statistical data from the International Telecommunication Union (ITU) show that "Mobile-cellular telephone subscription" in 2018 had increased fivefold since 2001. The indicators for "Fixed-broadband subscriptions" and "Fixed-telephone subscriptions" decreased over the same period. In other words, individuals all over the world prefer to use handsets to landline phones. Starting from 2007, "Active mobile-broadband subscription" also showed a significant increase and in 2018, 69 out of 100 individuals have this type of subscription all over the world (Figure 1). It means that more and more individuals prefer using

mobile wireless access to have the Internet in smartphones, tablets, or laptops. For example, in 2018 “Mobile-cellular telephone subscription” was estimated to be 107 subscriptions per 100 inhabitants, meaning each person had at least one mobile-cellular telephone subscription, and some had more than one. “Mobile-cellular telephone subscription”, “Active mobile-broadband subscription” and “Individuals using the Internet” had changed radically in comparison with other indicators.

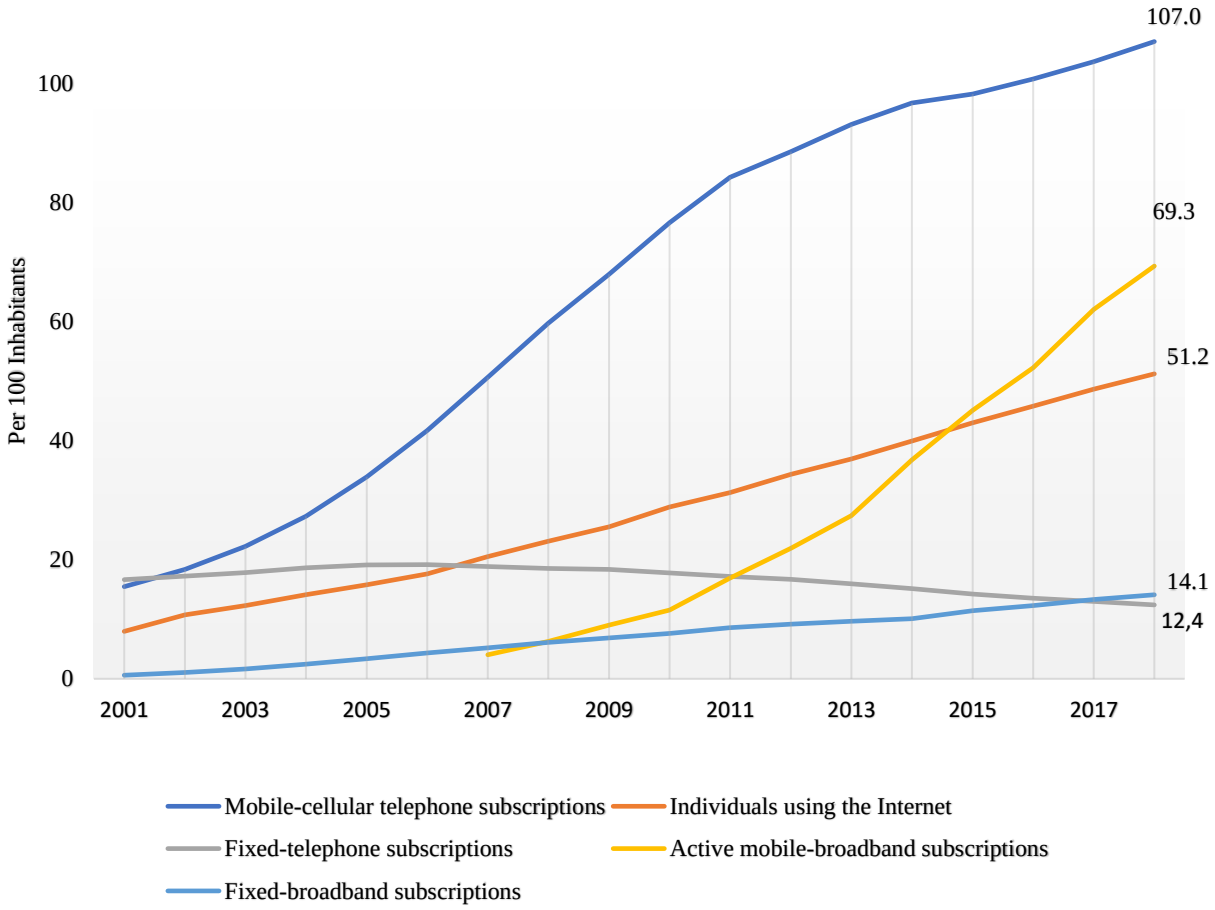


Figure 1. Global ICT developments, 2001-2018.

Source: ITU World Telecommunication /ICT Indicators database

It is impossible to deny the smartphone diffusion gap in developing countries. Nowadays, increasing demand in developing countries supports growth in smartphone penetration. As a result, it might decrease inequalities in smartphone adoption (Jamalova and M. G. Constantinovits, 2020). Figure 2 illustrates detailed information about the number of mobile phone subscribers, showing regional differences. Surprisingly, the Commonwealth of Independent States (CIS) are in third place after Europe and The Americas, and are above the world average. The illustrated figure is essential not only for following and identifying worldwide trends but also for gathering information about mobile-broadband subscriptions in Azerbaijan and Hungary. At the end of 2017, the penetration rate in 30 % of the world (including well developed European Countries, US, Russia, and Japan) reached 85% (GSMA, 2018a). The number of mobile phone subscriptions reached 5.2 billion according to the GSMA web site, until the end of 2020 (GSMA, 2020) 5G has already been launched in South Korea and the US and some countries will introduce it by the end of 2019 (GSMA Intelligence, 2019). Moreover, the sales of smartphone-supporting 5G networks was to begin in October or November of 2019.

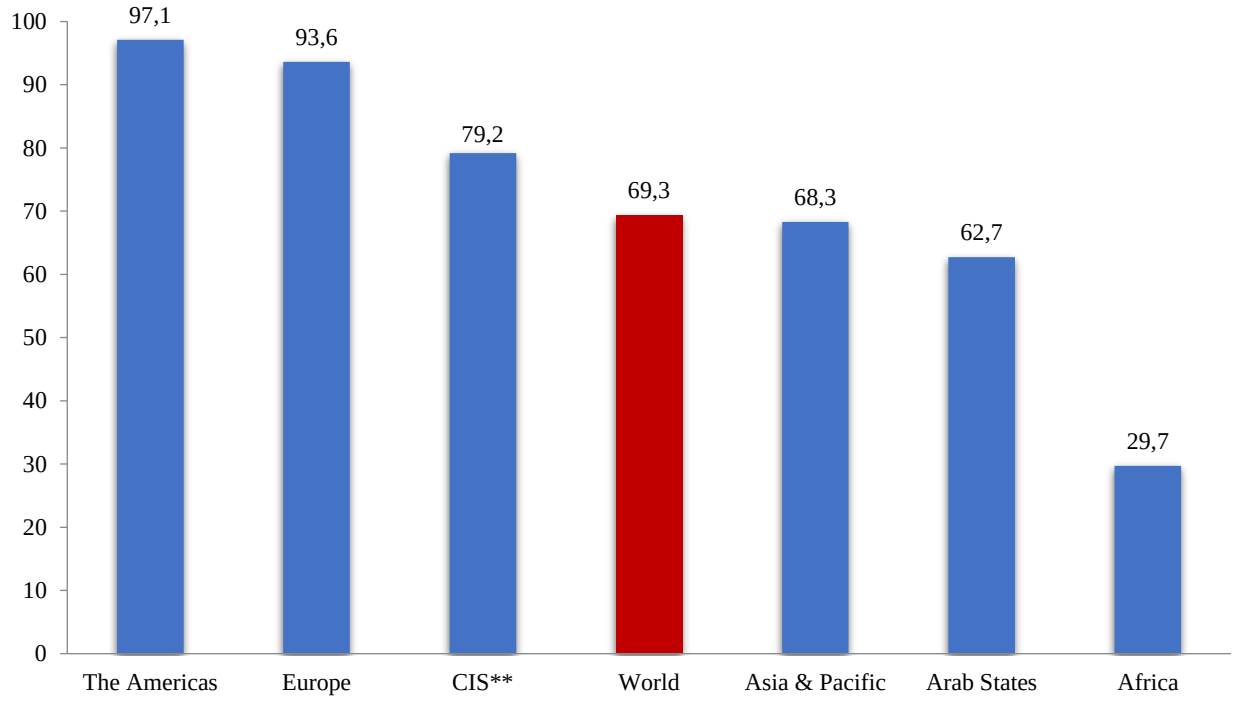


Figure 2. Active Mobile-Broadband Subscriptions Per 100 Inhabitants, 2018*.

Source: ITU World Telecommunication /ICT Indicators database;
Note 1: * Estimate.
Note 2: ** The Commonwealth of Independent States

1.1.2 Smartphone Market Players

The operation of smartphones is not so simple. It is the result of collaborations between network operators and handset vendors (Wakefield *et al.*, 2007, p. 314), as well as the acceptance of results by end-users (Figure 3). All of them are part of the smartphone market.

Network/mobile operators are the companies that offer end-users a platform with plenty of services (Koivukoski and Räisänen, 2005, p. 88) such as short message service, an Internet connection, and so on. These companies are mainly focused on the quality and price of the offered services, however, the handsets' prices are also very important for them (Wakefield *et al.*, 2007). In Hungary and Azerbaijan, the smartphone's price is partially subsidised by mobile operators and some part of the handsets' costs are covered with their participation. Handset vendors (Wakefield *et al.*, 2007) are smartphone manufacturing companies that have to design the final device according to the mobile operators' requirements and end-users' desires.

In the current study, the author focused on the factors formulating students' behavioural intention toward smartphones, illustrated in Figure 3 as the end user's expectations and satisfaction. Two different countries (i.e. Azerbaijan and Hungary) with a special segment of customers – university students from Szent István and Baku Engineering Universities participated in the study. The author aimed to define how the same model would operate in countries with different religions, cultures, lifestyles, income levels, political situations, and so on.

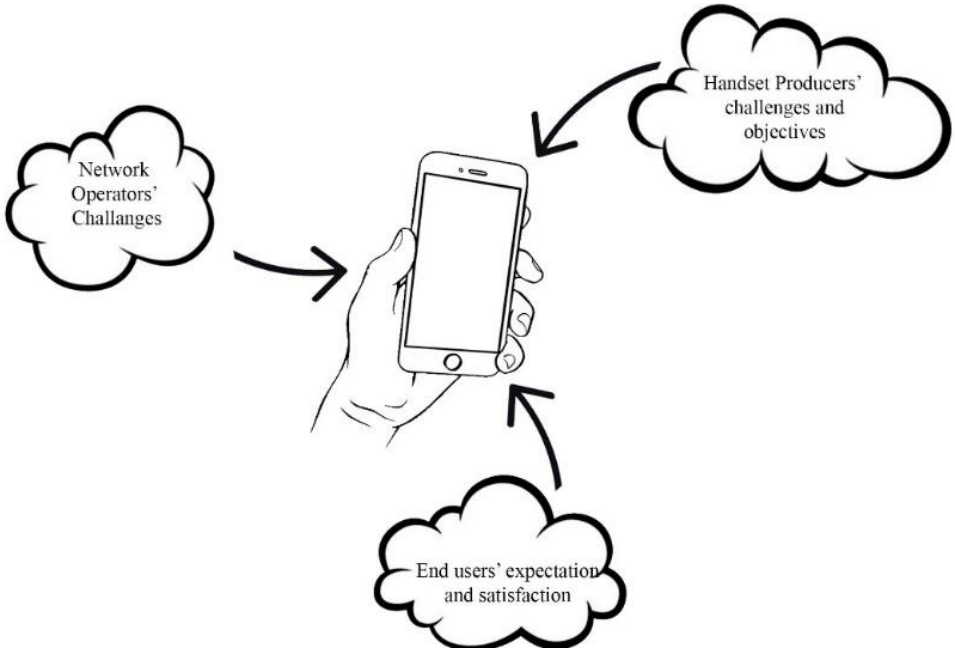


Figure 3. Handset requirements.

Source: own editing based on Wakefield et al. (2007, p. 314)

1.1.3 The Situation in the Global Smartphone Market

According to data presented by StatCounter (2020), Samsung and Apple are the main competitors in the smartphone market (Figure 4). Nokia started to lose its strong position in the market in 2014, and Huawei and Xiaomi have increased their respective numbers of smartphones sold. A slight fluctuation in Samsung and Apple market shares was observed between 2014 and 2019; nevertheless, many smartphone users prefer Samsung to the other brands.

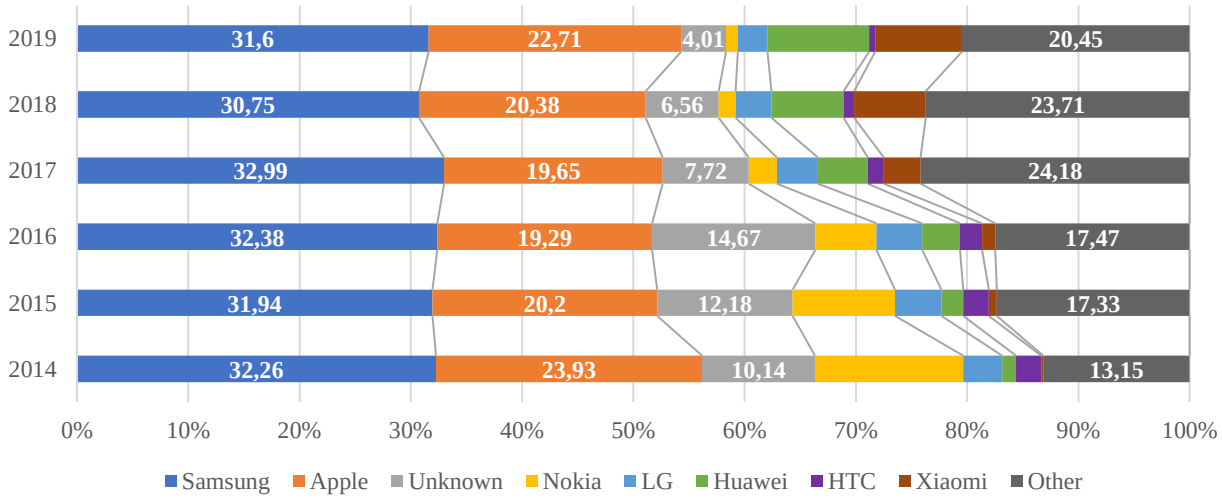


Figure 4. The Market Share of Mobile Phone Producers in The World, 2014-2019.

Source: Own editing based on https://www.statcounter.com accessed on the 5th of may
Note 1 : country selection: Worldwide; Device vendor: Mobile;

1.2 Situational Analysis: Azerbaijan and Hungary

1.2.1 Macroeconomic Overview: Azerbaijan and Hungary

The involvement of basic macroeconomic and mobile phone market indicators in Azerbaijan and Hungary aimed to create a better imagination about the situation in the smartphone market (Table 1). The territories of the countries and their respective populations could be considered roughly equal. However, the Azerbaijani population is younger in comparison with the Hungarian population (We Are Social & Hootsuite, 2019b, 2019a). Until January 2019, 72% of Hungarians lived in urban areas while only 56% of Azerbaijanis were city dwellers. Hungary's per capita GDP was significantly higher, explaining a higher number of subscriptions and mobile Internet users among Hungarians.

Table 1. The Comparison of Basic Socio-Economic and Mobile Phone Market Indicators.

Indicators	Azerbaijan	Hungary
Total population (January 2019)	9.97 million	9.67 million
Median age (January 2019)	32.4 years	43.4 years
Population living in urban areas (January 2019)	56%	72%
Per Capita GDP (PPP in January 2019)*	17.398*	28.108*
Unemployment (% of labour force; estimate for 2018)	5.1%	4%
Employment in agriculture (% of employed; estimate for 2018)	37.5	4.8
Employment in industry (% of employed; estimate for 2018)	13.8	29.9
Employment in services (% of employed; estimate for 2018)	48.7	65.4
CPI: Consumer Price Index (2010=100, 2017)	149	114
Political situation	War situation	Political stability
Area	86 600	93 030
Internet users (January 2019)	80%	89%
Mobile subscriptions as a percentage of the total population (January 2019)	108%	117%
Mobile Internet users as a percentage of the total population (January 2019)	52%	78%
Mobile Network Infrastructure (January 2019) **	44.66	70.48
Consumer Readiness (January 2019) **	74.62	82.27
Affordability of devices and services (January 2019) **	72.09	82.16

Source: Own editing.
Note 1: Information was collected from the following sources: United Nations (2020b, 2020a); Data Reportal (2019b, 2019a).
Note 2: * - "International Dollars" are national measures that provide a consistent basis for comparison.
Note 3: ** - out of a maximum total score 100.

1.2.2 Cross-cultural Comparison: Azerbaijan and Hungary

Based on the comparative characteristics of the current study, it was necessary to create a picture related not only to the macroeconomic situation but also to cross-cultural differences. As a rule, it was very hard to involve any dimension of culture regarding Azerbaijan. However, the situation was easier in the case of Hungary. The only study that involved the mentioned countries and used the same tools for measuring cross-cultural variation was the World Value Survey (Inglehart *et al.*, 2014). It was designed based on the findings of the European Value study. Like previous studies, the World Value Survey analyses democracy, culture, the influence of religion, gender equality, and other values on the citizens of different countries. Based on the mentioned values among others, the authors' cultural map (Inglehart *et al.*, 2014) offered 2 main dimensions as illustrated in Figure 5. These dimensions are 'Traditional/Secular-rational values' and 'Survival/Self-expression values' (Inglehart and Welzel, 2005).

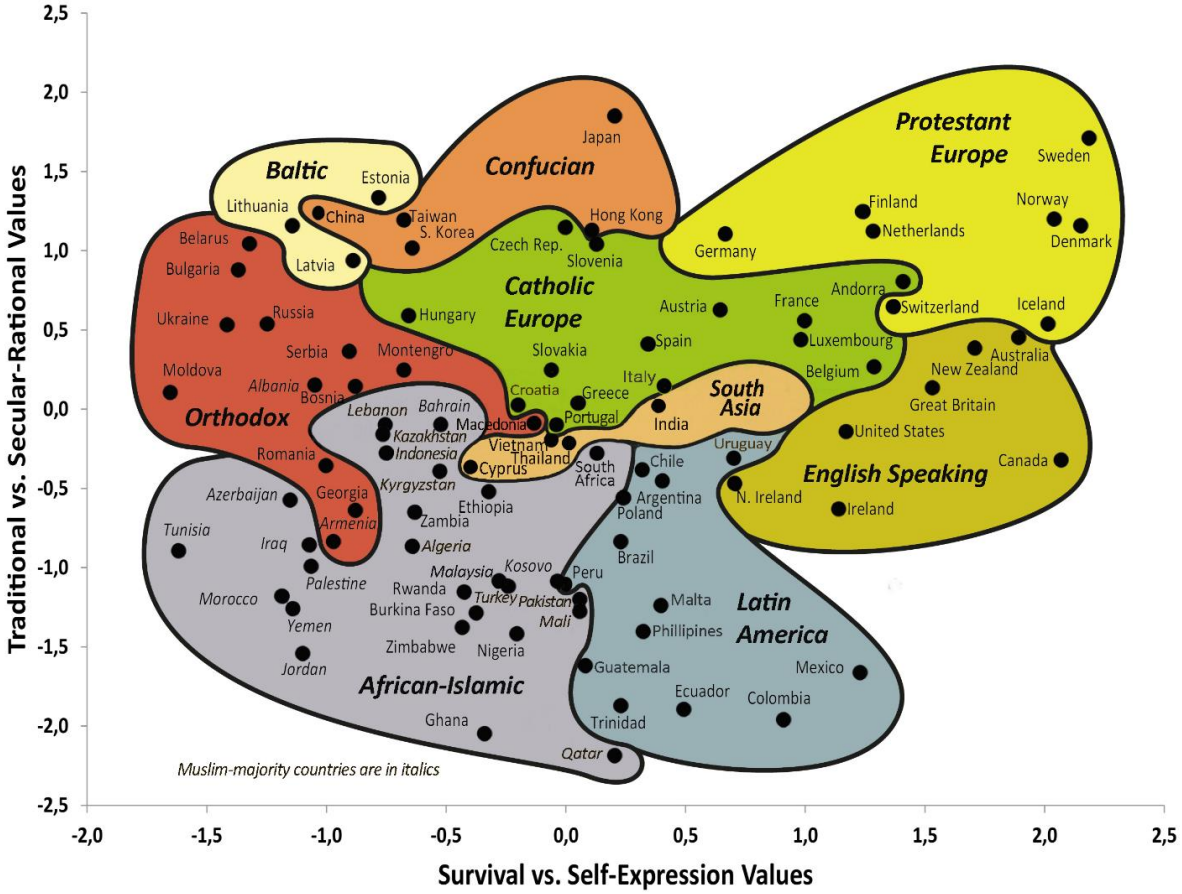


Figure 5. Inglehart and Welzel cultural map.

Source: Inglehart et al. (2014)

Traditional/Secular-rational values are shown in the vertical axis and aim to illustrate the differences among countries. The traditional pole of the dimension is based on the central place of religion, fatherland, family, and parenthood. These countries have a higher level of national pride and defined traditional gender roles. Abortion, divorce, and some other personal decisions (e.g. euthanasia or suicide) are not supported by traditional societies. However, the Secular-rational pole illustrates the insignificance of the mentioned values. The authors (Inglehart and Welzel, 2005) explain that secular-rational values are linked to the industrialisation of the national economy (i.e. a shift from the agrarian to the industrial sector) and involve a higher level of individual autonomy.

Survival/Self-expression values are shown in the vertical axis and higher numbers express more self-expression opportunities on the right side of the map. A higher level of survival values (on the left side of the map) means societies prioritize economic and physical security. Entrepreneurs from these countries prefer not to be involved in international agreements (such as foreign trade, environmental protection) and politics (Inglehart and Welzel, 2005). The dimension explains the shift from the mentioned values to patience, individual well-being, and active participation in political life, which are generalized as self-expression values. Survival/Self-expression values are mostly influenced by the development of the service economy and post-industrial societies.

The authors of the cultural map also hypothesized and proved that cultural changes are highly influenced by socioeconomic development. The statement was proven based on the location of the countries on the map. Interestingly, low-income countries (African-Islamic and Orthodox) are concentrated on the left side of the map (Inglehart and Welzel, 2005) which means that countries are under the influence of survival and traditional values. Azerbaijan is included in this group. Middle-income countries (based on the definition of Inglehart and Welzel, 2005) including Hungary are situated in the middle. Finally, high-income countries have a higher level of self-expression and secular-rational values.

Azerbaijan is a Muslim country and even though its citizens lived as atheists for 70 years under the Soviet Union, it only took several years to return to traditional beliefs. In Inglehart and Welzel's cultural map (Inglehart *et al.*, 2014), Azerbaijan was shown as one of the countries in the African-Islamic group with high level of traditional and survival values. Hungary, on the other hand, is a Christian country with a high number of Catholics (Hungarian Central Statistical Office, 2011). The country was included as a part of Catholic Europe in the Inglehart and Welzel cultural map (Inglehart *et al.*, 2014). Secular-rational values are quite high in the case of Hungary (in comparison with Azerbaijan); and in what concerns survival versus self-expression, Hungary is still at the border of survival values.

1.3 Problem Statement

1.3.1 Smartphone Price Comparisons between The Azeri and the Hungarian Markets

In order to have better understanding of the topic itself and the situation in the smartphone market, the author decided to make a simple survey by checking the price of the same smartphone model in the different countries including Azerbaijan and Hungary. The overview of the situation in the smartphone market including price comparisons enables the author to make the right assumptions about differences that Azerbaijani and Hungarian smartphone buyers encounter. It was interesting to check the prices of the same models with the same features in neighbouring countries and to define how expensive smartphones are in Azerbaijan/Hungary compared to other countries. For this purpose, the comparison of the prices of the cheapest Samsung smartphone and different versions of the iPhone were made in various countries. Smartphone vendor choices were based on the market share of the mentioned vendors.

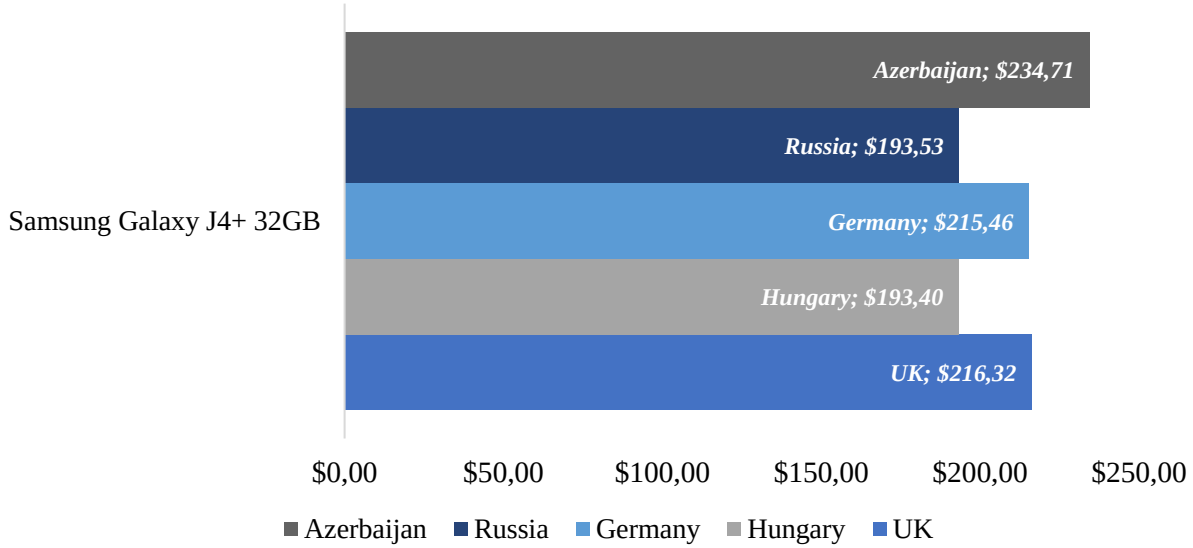


Figure 6. The Price of Samsung Galaxy J4+ in Different Countries.

Source: https://www.samsung.com (different country selection) collected the 6th of December 2018.
Note 1: The model sold in Azerbaijan is manufactured in 2018 and internal memory is 16 GB.
Note 2: Exchange rates: 1USD= 0.78 UK pound; 1 USD=284.33 HUF; 1 USD=0.88 EUR; 1 USD=67.12RR; 1 USD=1.70 AZN.

Consumers belonging to different social groups might choose among the wide range of Samsung smartphones. According to the survey, the Samsung Galaxy J4 was the cheapest marketed smartphone model in the UK, Russia, and Germany (Figure 6). In contrast, it was not the cheapest smartphone in Azerbaijan, costing around $234. The Samsung J1 mini (price – 159 AZN) was lower-priced compared to the J4+, costing less than $100. The cheapest Samsung smartphone in Hungary was the Samsung Galaxy J3 with 16GB of internal memory, the price of the 2017 version was around $158. Germans paid $226.86 for the same model with 32 GB of internal memory.

The first iPhone was manufactured in 2007. According to Apple's 2018 financial report, more than 217 million smartphones were sold and net iPhone sales were over USD 166 million (Apple Inc., 2018). Nowadays the Apple Inc. smartphone line includes not only the newly-introduced iPhone X, iPhone XS, XS Max, and XR but also the iPhone 7, 7 Plus, 8 and 8 Plus (Apple Inc., 2018). The price differences between iPhone models are illustrated in Figure 7.

It is a well-known fact that iPhones are manufactured in mainly China as well as some other countries, while according to the Apple web site, the cheapest iPhone can be bought in the USA. China had the second-most affordable prices for smartphones after the USA. The cost of the different models of the iPhone in Russia and Germany was almost the same. The highest-priced handsets were sold in Azerbaijan and Hungary. In the case of Hungary, the price differed slightly from prices in Russia and Germany. However, the price difference between Azerbaijan and the other mentioned countries was more than 100 USD. Unfortunately, the same handsets are more expensive in Azerbaijan, which made the iPhones less affordable for buyers.

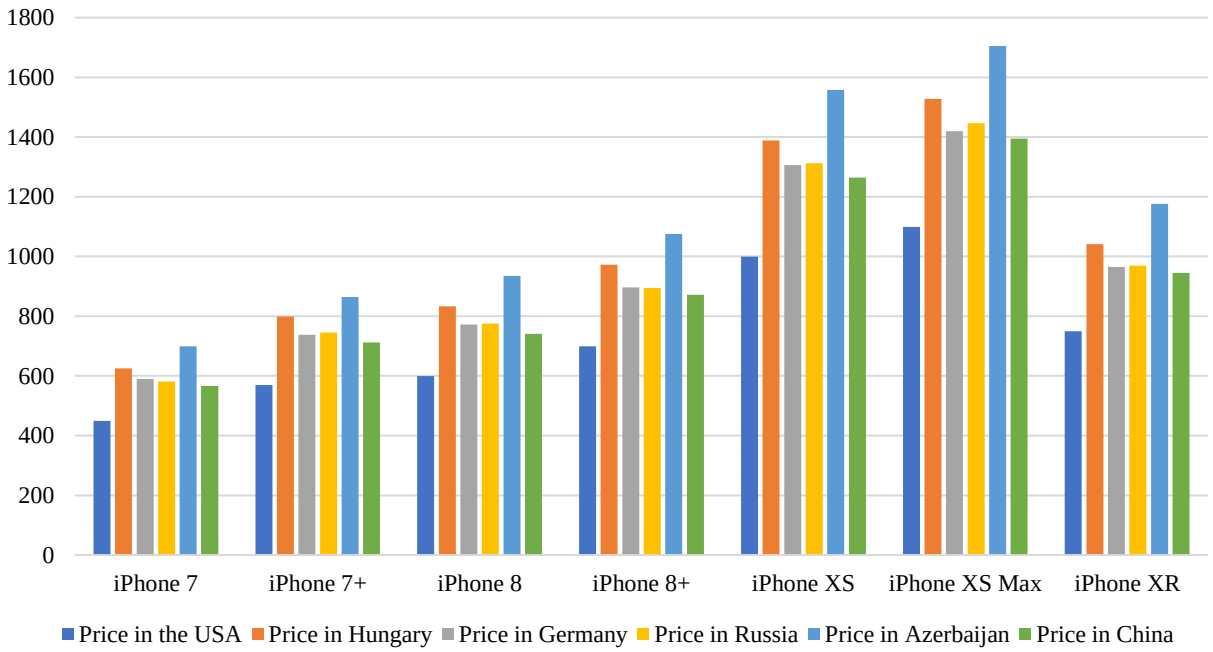


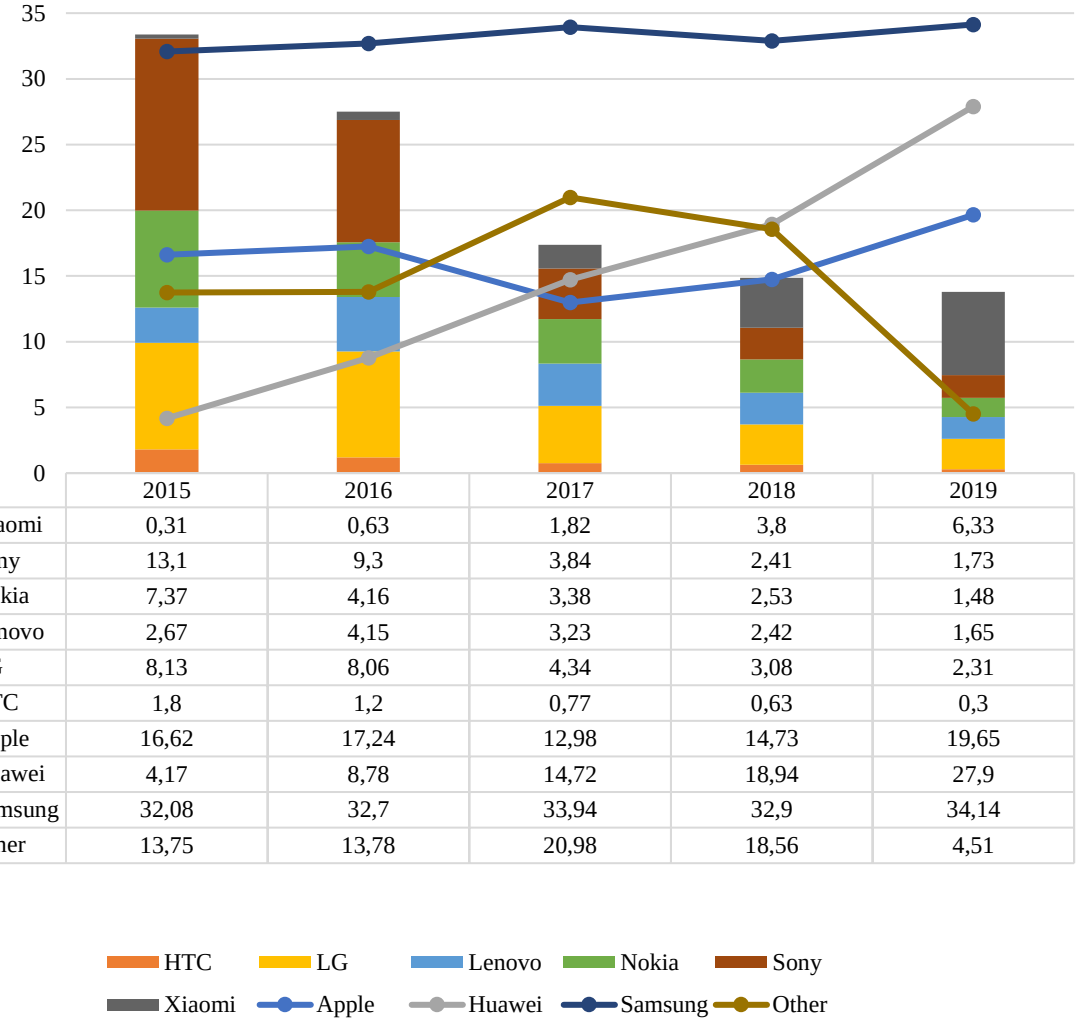
Figure 7. The Prices of iPhone in Different Countries Listed from Apple's Web Site (in USD).

Source: Own editing based on https://www.apple.com (different country selection) collected on the 6th of December, 2018.
Note 1: The model sold in Azerbaijan was manufactured in 2018 and internal memory was 16 GB.
Note 2: Exchange rates: 1 USD=288HUF; 1 USD=0.88EUR; 1 USD=67,06RUB; 1 USD=1.70AZN; 1USD=6.88 yuan.
Note 3: https://almastore.az for collecting about Azerbaijan.

1.3.2 The Hungarian Smartphone Market

Based on the data dating back to 2015, Samsung is the leader in the Hungarian mobile phone market. Around one third of buyers chose Samsung over any other smartphone brand. Moreover, previous price comparisons (Figure 6) also showed that price of phones was similar to other countries (i.e. Azerbaijan, Russia). Moreover, Xiaomi and Huawei also strengthened their positions in the Hungarian smartphone market, while the market shares of Sony, LG, Nokia, and HTC significantly decreased. Moreover, the reader should consider that, numbers regarding the smartphone market might be confusing as the same market vendors also produce simple mobile phones and the proportion of smartphones is not easy to define based on statistical data.

During this period, Apple's market share fluctuated between 15 and 20 per cent. Previously illustrated comparison of the iPhone's price (Figure 7) in Hungary proves that the price of handsets was higher compared to the other countries (e.g. Russia, China, USA). Logically, it must decrease the number of buyers and weaken its position in the market. Even in this case, based on statistical data, the market share of Apple smartphones slightly increased from 2017. It proves the popularity of the brand among Hungarian smartphone users. Literature regarding iPhone usage shows that the handsets might be used as an illustration of social status (Jamalova and Constantinovits, 2019) and the American lifestyle (Hjorth, 2009). During this period, Samsung's market share (Figure 8) fluctuated around 32-34%, while Huawei's market share was significantly strengthened. In 2015, more than 4 % of Smartphone buyers chose Huawei and the number increased to almost 28% in 2019. Xiaomi also increased its number of sales during this period, from 0.3% to 6.3%. Sony, Nokia, LG, and HTC faced a huge loss of market share between 2015-2019.



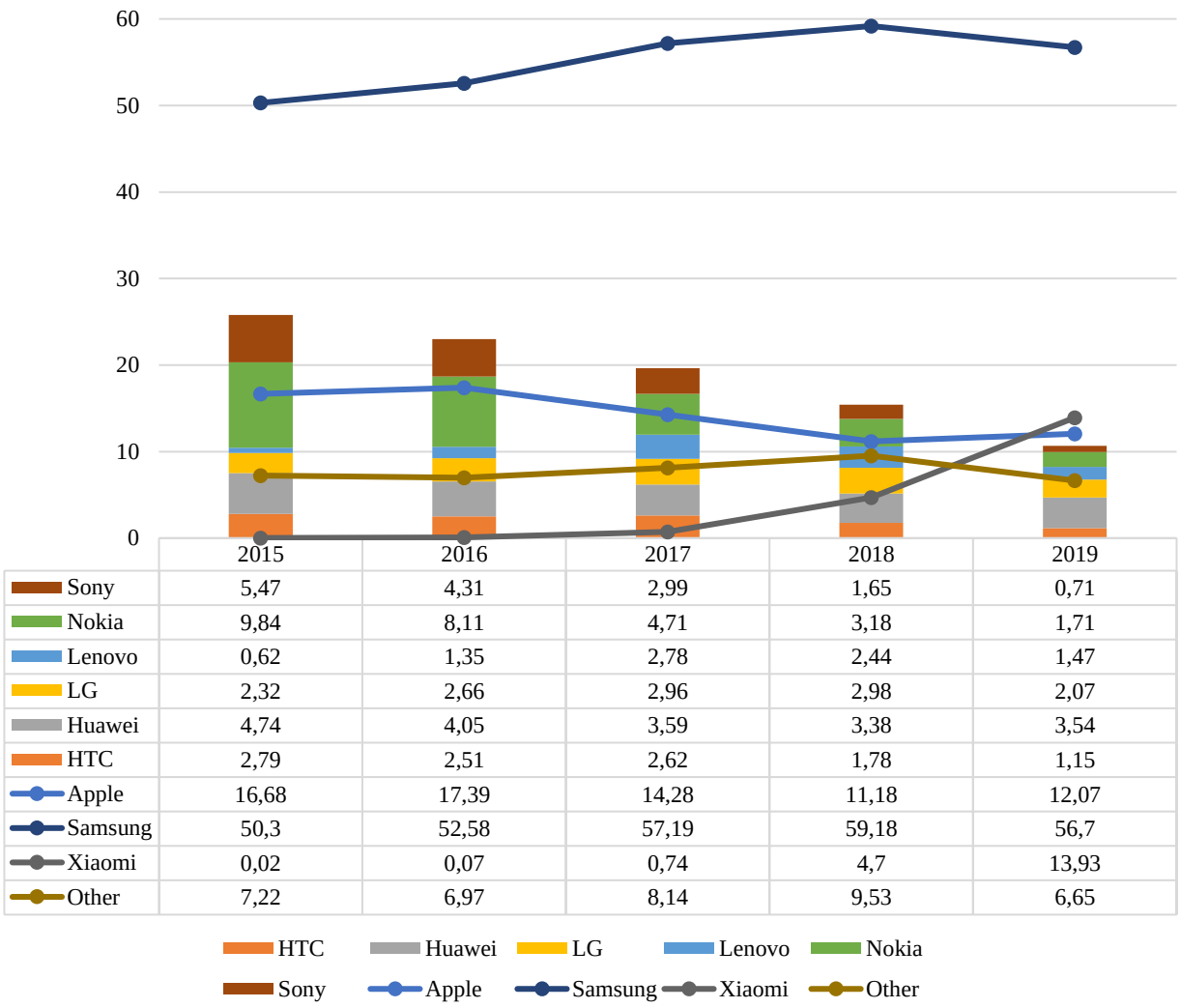
	2015	2016	2017	2018	2019
Xiaomi	0,31	0,63	1,82	3,8	6,33
Sony	13,1	9,3	3,84	2,41	1,73
Nokia	7,37	4,16	3,38	2,53	1,48
Lenovo	2,67	4,15	3,23	2,42	1,65
LG	8,13	8,06	4,34	3,08	2,31
HTC	1,8	1,2	0,77	0,63	0,3
Apple	16,62	17,24	12,98	14,73	19,65
Huawei	4,17	8,78	14,72	18,94	27,9
Samsung	32,08	32,7	33,94	32,9	34,14
Other	13,75	13,78	20,98	18,56	4,51

Figure 8. The Market Share of Mobile Phone Producers in Hungary, 2015-2019.

Source: Own editing based on https://www.statcounter.com accessed on the 5th of May, 2020
Note 1: country selection: Hungary; Device vendor: Mobile.

1.3.3 Azerbaijani (Azeri) Smartphone Market

Based on the 2015 data, Samsung is the leader in the Azeri mobile phone market. Around 50% of buyers chose Samsung over any other handset brand. Moreover, previous price comparisons (Figure 6) also showed that the price of phones was suitable in comparison with other countries (i.e. Azerbaijan, Russia). Over the last five years, Apple lost its dominant position in the Hungarian smartphone market. The percentage of sales decreased significantly from almost 17% to roughly 11% in 2018. The 2019 results show that the number of smartphones sold slightly increased compared to sales in 2018 (Figure 9). The iPhone price comparison (Figure 7) proves that the price of handsets in Azerbaijan was higher in comparison to the other countries. Logically, it decreases the number of buyers and weakens the position of the iPhone in the Azeri market. In contrast, Samsung's position was extraordinarily strong in the market (Figure 9). More than half of smartphone owners prefer Samsung to any other brand. During this period, Xiaomi's market share rose steadily to almost 14% in 2019. Shares of Sony, Nokia, Huawei, LG and HTC decreased significantly while Lenovo saw some fluctuations.



	2015	2016	2017	2018	2019
Sony	5,47	4,31	2,99	1,65	0,71
Nokia	9,84	8,11	4,71	3,18	1,71
Lenovo	0,62	1,35	2,78	2,44	1,47
LG	2,32	2,66	2,96	2,98	2,07
Huawei	4,74	4,05	3,59	3,38	3,54
HTC	2,79	2,51	2,62	1,78	1,15
Apple	16,68	17,39	14,28	11,18	12,07
Samsung	50,3	52,58	57,19	59,18	56,7
Xiaomi	0,02	0,07	0,74	4,7	13,93
Other	7,22	6,97	8,14	9,53	6,65

Figure 9. The Market Share of Mobile Phone Producers in Azerbaijan, 2015-2019.

Source: Own editing based on https://www.statcounter.com accessed on the 5th of may, 2020
Note 1: country selection: Azerbaijan; Device vendor: Mobile.

1.4 Purpose of Research

Based on the author's opinion, the most appropriate model (Rondan-Cataluña, Arenas-Gaitán and Ramírez-Correa, 2015; Venkatesh, 2015) for analysing behavioural intention in the smartphone market nowadays is the Extension of Unified Theory of Acceptance and Use of Technology (also known as the UTAUT2). An extensive review of studies employing this model allowed for the exclusion of two variables from the proposed model, performance and effort expectancy. Moreover, as a result of the pilot study, the mentioned model was modified by the inclusion of several indicators.

The main objective of the current research is to determine factors influencing the behavioural intention of university students, by offering a model that explains behaviour in Azerbaijan and Hungary. The survey has cross-cultural characteristics and provides the opportunity to compare countries with different religions, cultures, historical developments, economic situations, and locations. The secondary purpose of the study was to define whether there was a positive relationship between the given variables in Azerbaijan and Hungary. The third and final purpose of the study was to see how well the model measures the behaviour of students towards smartphones.

1.4.1 Research Gap

The author would like to highlight the lack of studies analysing behavioural intention in Hungary and Azerbaijan. The unpopularity of the topic among scientists might derive from the smaller market size and the lower purchasing power of Azeri and Hungarian people. As a result, there is a scarcity of information regarding the smartphone markets of the mentioned countries and the formulation of users' behavioural intentions towards handsets had not been analysed previously. By conducting this study, the author decreases the gap in the literature regarding behavioural intention towards smartphones in Azerbaijan and Hungary using the Extension of Unified Theory of Acceptance and Use of Technology (Venkatesh, Thong and Xu, 2012).

1.5 Research Questions and Hypotheses

Research questions create a structure of study (Figure 10) and build the framework for the formulation of hypotheses (Babbie, 2016). The author of this research was interested in a cross-cultural comparison of differences influencing behavioural intention toward handsets. Research questions and hypotheses were illustrated below.

The main part of the offered model was involved from the UTAUT2 (Figure 10), it was extended by including several new variables. For understanding students' behavioural intentions toward smartphones, the author first focused on the identification of the relationships between 'Behavioural Intention' and the UTAUT2-related variables, as well as evaluated marketing variables (i.e. brand knowledge and satisfaction). Secondly, this research aimed to measure the fit of the proposed model with the data from Azerbaijan and Hungary.

1.5.1 The Definitions of Indicators Used in The Study

To give a clear explanation of the author's idea and reasons for implementation, it was necessary to clarify definitions of the indicators involved in the study. The definitions of the latent variables are illustrated in Table 2. However, some of them (such as 'Facilitating Conditions' and 'Social Influence') were not included in the final model.

Table 2. Definitions of main indicators involved in the study.

Indicator	Definition
Symbolic Brand Image	"… the set of (symbolic) associations linked to the brand that consumers hold in the memory (Keller, 1993, p. 2)"
Brand Awareness	"… brand recall and recognition performance by consumers" (Keller, 1993, p. 2).
Satisfaction	''… personal feeling of pleasure resulting from comparing a product's pursued performance in relation to his/her expectations" (Kotler and Keller, 2012, p. 128).
Social Influence	"… as the degree to which an individual perceives that important others used the technology" (Venkatesh *et al.*, 2003, p. 451)
Facilitating Conditions	"… as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh *et al.*, 2003, p. 453)
Price Per Value	"…. consumers' cognitive trade-off between the perceived benefits of the applications and the monetary cost for using them". (Venkatesh, Thong and Xu, 2012, p. 161)
Hedonistic Motivation	"… the fun or pleasure derived from using a technology" (Venkatesh, Thong and Xu, 2012, p. 161)
Habit	"… the extent to which people tend to perform behaviours automatically because of learning"(Venkatesh, Thong and Xu, 2012)
Behavioural Intention	The definition of Ajzen and Fishbein (1975a, p. 288) that states "behavioural intention is a measure of the strength of one's intention to perform a specified behaviour" (as cited in Davis, Bagozzi and Warshaw, 1989b, p. 984) is appropriate for explanation of the indicator..

Source: own editing based on literature review.

1.5.2 Formulation of Research Questions and Hypotheses

The first research question is closely linked to the results of the pilot study conducted in Azerbaijan and Hungary. The author involved the above-mentioned variables as the result of Principal Component Analysis (PCA) for identifying factors influencing the behaviour of smartphone users. Even if the variables were involved as the result of the pilot study, there are numerous examples (Hamann, Robert and Omar, 2007; Wu and Ho, 2014; Huang and Shih, 2017) that prove the influence of brand knowledge-related indicators on behaviour towards high-tech products. According to the results of the PCA and literature review, external variables related to brand knowledge - Symbolic Brand Image and Brand Awareness - were included in the model. Many definitions were used to explain brand awareness; the essence of the definitions is linked to a variety of associations maintained in buyers' memories (Wu and Ho, 2014) and the level of brand recognition (Huang and Shih, 2017). It is the author's opinion that the definitions of the symbolic brand image and brand awareness offered by K. Keller (1993) in the paper called "Conceptualizing, Measuring, and Managing Customer-Based Brand Equity" are the most appropriate for explaining students' attitude towards smartphones.

Research Question 1. What are the relationships between Brand-related Indicators involved in the study and Behavioural Intention in the examined countries?

Hypothesis 1. Brand Knowledge-related indicators that developed as the result of the pilot study have a significantly positive influence on students' Behavioural Intention toward smartphones in examined countries.

- Hypothesis 1.1 Symbolic Brand Image has a significantly positive influence on the Behavioural Intention of students toward smartphones in examined countries.

- Hypothesis 1.2 Brand Awareness has a significant positive influence on the Behavioural Intention of students toward smartphones in the examined countries.

The second research question was based on measuring the relationship between Satisfaction of Purchase and Behavioural Intention.

Research Question 2. What is the relationship between the Satisfaction of Purchase involved in the study and Behavioural Intention in the examined countries?

Hypothesis 2 Satisfaction of Purchase has a significant positive influence on the Behavioural Intention of students toward smartphones in the examined countries.

Research Question 3. What is the relationship between Hedonistic Motivation and Behavioural Intention examined countries?

Hypothesis 3. Hedonistic Motivation has a significant positive influence on the Behavioural Intentions of students toward smartphones in the examined countries.

Research Question 4. What is the relationship between Price per value and Behavioural Intention in the examined countries?

Hypothesis 4. Price per value has a significant positive influence on Behavioural Intention of students toward smartphones in examined countries.

Research Question 5. What is the relationship between Habit and Behavioural Intention in the examined countries?

Hypothesis 5. Habit has a significant positive influence on Behavioural Intention of students toward smartphones in examined countries.

The last research question (Figure 10) is closely linked to the applied family of analysis – Structural Equation Modelling (SEM). This technique allows us to propose, test, and validate models in social science and is widely used in marketing (Brian S. Everitt, 2005). A detailed explanation of SEM is given in the materials and methods chapter.

Research Question 6. Is the proposed model measuring Behavioural Intention toward university students valid for the examined countries?

Hypothesis 6. The proposed models are valid and can be applied for measuring Behavioural Intention of students toward smartphones in examined countries.

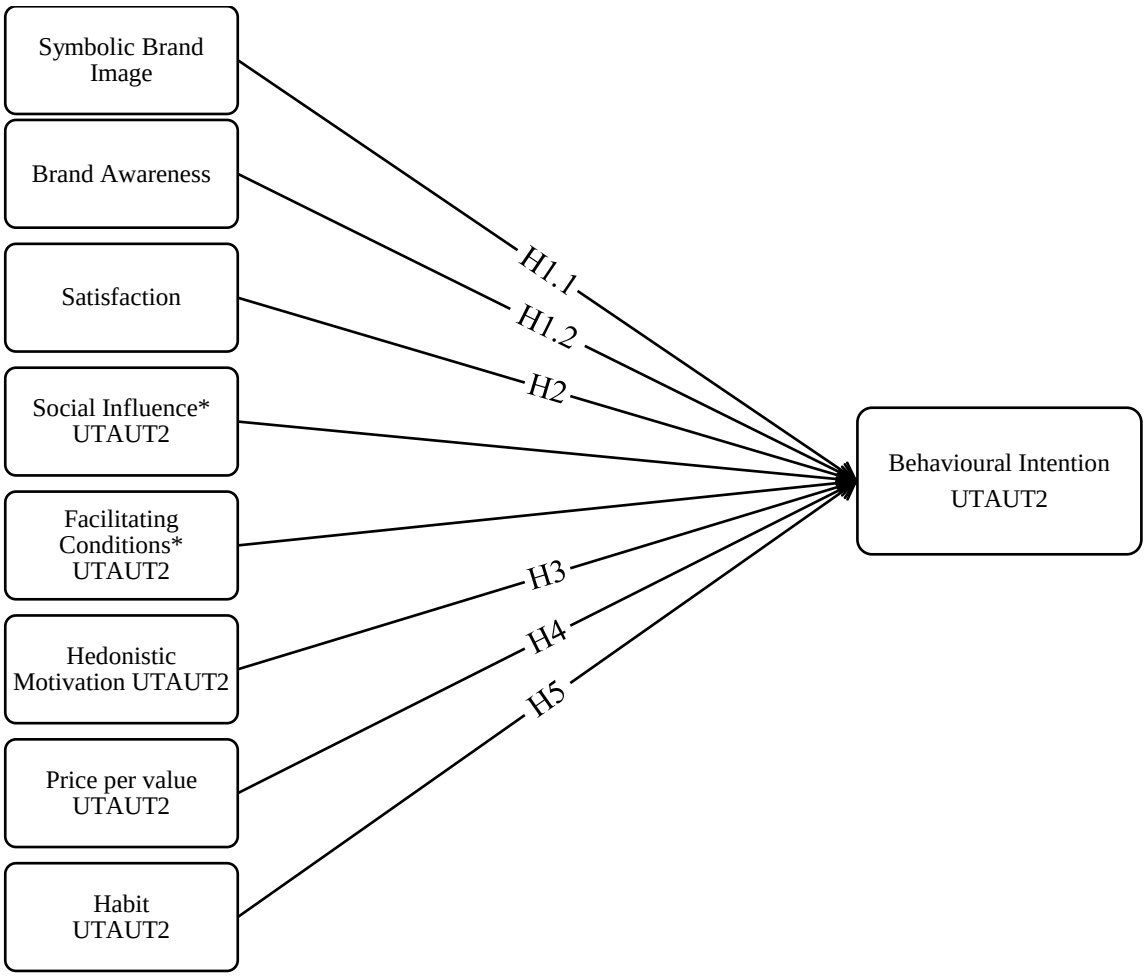


Figure 10. Proposed Research Model.

Source: Own editing

Note 1: *Originally the author planned to have the hypotheses measure the relationship between Social Influence/Facilitating Conditions and Behavioural Intention. Due to low numbers in the reliability tests, this was impossible to implement.

1.6 Research Design

In the current work, university students are the units of analysis (Babbie, 2016, p. 97). The study was based on cross-cultural comparisons and designed to identify differences in the formulation of behavioural intentions among Azeri and Hungarian students. In order to achieve the purpose of the study, the author followed the steps mentioned in the research design (Figure 11). From the outset, the author aimed to propose a model that would have significant model fit indices for at least one of the countries. All necessary steps taken in the study were illustrated in the research design. In the doctoral thesis, the information mentioned was separated into the following sections: Introduction, Literature Review, Materials and Methods, Results and Discussion, Conclusion, and Recommendations.

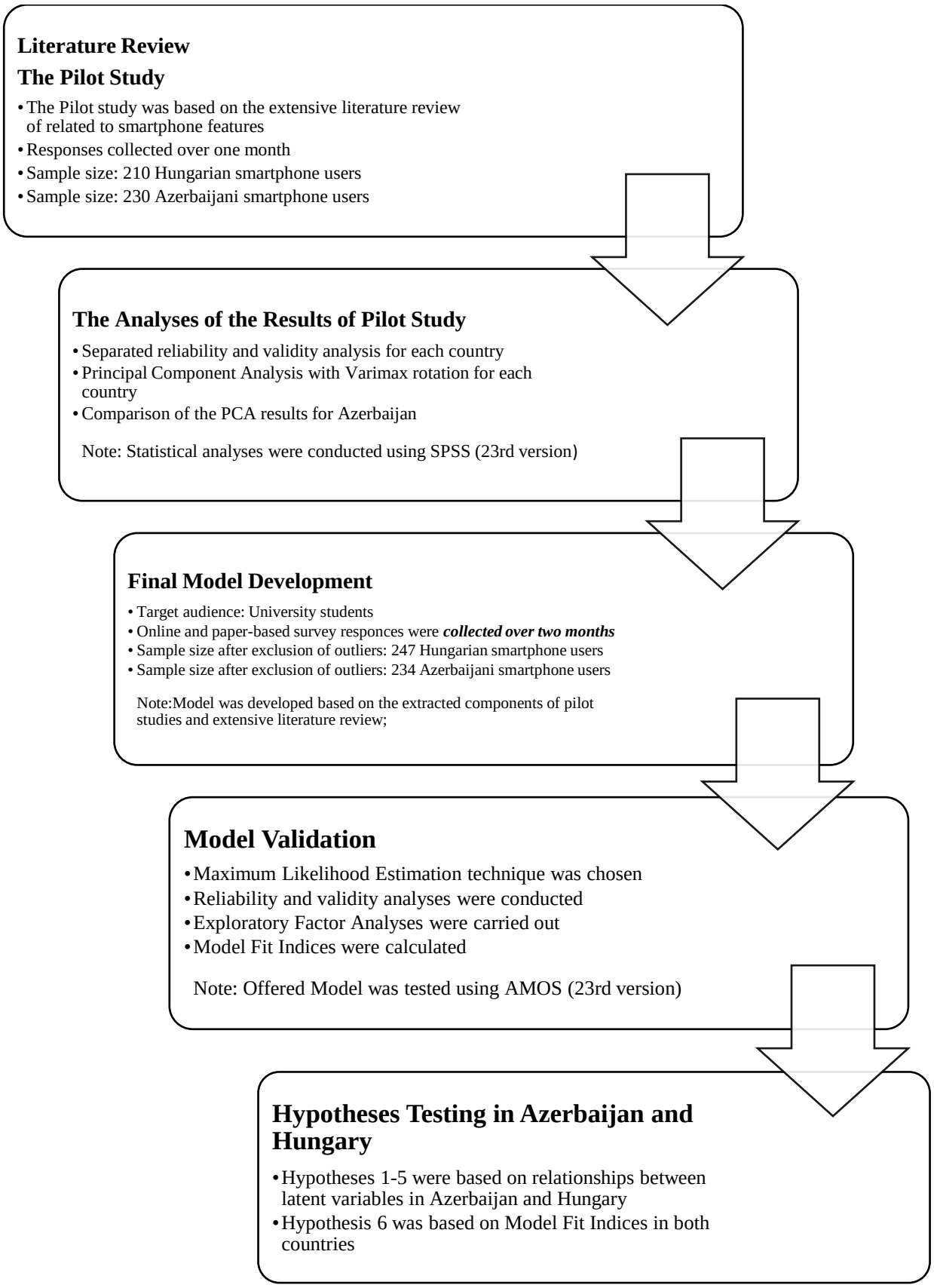


Figure 11. Research Design; Source: Own editing.

2 LITERATURE REVIEW

2.1 Introduction to Consumer Behaviour

Consumer Behaviour is a field of marketing that focuses on analysing the purchase, usage, and disposal of goods and services. Numerous definitions (Hawkins and Mothersbaugh, 2010; Kotler and Keller, 2012; Solomon, Russell-Bennett and Previte, 2012; Hoyer, MacInnis and Pieters, 2013) have been offered to understand this complex term – consumer behaviour- which seems simple at first glance. Many different factors influence the buyer before their purchase, and some of them might be strong enough to change their attitudes about a product/service and their behavioural intention. As a result, the purchase/acquisition decision can be modified (Graves, 2010).

Consumer Behaviour is considered to be a multidisciplinary field of marketing (Henry, 1991; MacInnis and Folkes, 2010) which deals with various different theories in social sciences. Various fields of psychology such as Freudian, Pavlovian, Cognitive, Social (Shaw and Jones, 2005; Shaw, 2009) and Clinical Psychology, as well as Organizational Behaviour (Sheth, Gardner and Garrett, 1988, p. 113), affect Consumer Behaviour. Solomon et al. in their "Consumer Behaviour" (2012) book, categorised the fields of science influencing consumer behaviour according to individual and social focus. On the individual-level, consumer behaviour is the object of various fields of psychology and microeconomics while at the macro-level, it is influenced by sociology, demography, macroeconomics, etc (Solomon, Russell-Bennett and Previte, 2012, p. 24). This notion contradicts Shaw and Jones (2005)'s argument in their paper titled "A history of Schools of Marketing Thought". The authors of the paper considered consumer behaviour as a concept developed at the micro-level. At the same time, the final result of consumer behaviour – purchase - is based not only on economic and sociological (Foxall, 1974) reasons but also complex processes in the buyers' brains (Graves, 2010, p. 27). The author of the current work agrees with the position of Shaw and Jones (2005) and considers consumer behaviour as a concept which developed at the micro-level, however the consumer's decision is built on personality and influenced by changes in social, economic, political spheres among others.

2.1.1 What is Consumer Behaviour?

Consumer behaviour is one of the most interesting and complex fields of marketing. It is an irreplaceable part of marketing as it attempts to analyse and predict the reasons for behaviour. Consumer behaviour combines the set of methodologies and techniques for analysing information regarding a product's purchase, usage, and disposal.

Scholars analysing the historical development of marketing have offered different classifications (Sheth and Gardner, 1982; Sheth, Gardner and Garrett, 1988; Shaw and Jones, 2005) regarding the schools of marketing thought. Consumer behaviour kept its essential place (Sheth and Gross, 1987) in marketing and it was shown as a separate school of thought in all of the reviewed classifications (Sheth and Gardner, 1982; Sheth, Gardner and Garrett, 1988; Shaw and Jones, 2005; Shaw, 2009). It is based on the central point of consumer behaviour (sometimes referred to as buyer behaviour for example by Sheth et. al. (1988)) in marketing science.

Purchase – is one of the means of acquisition (i.e. buying, renting or leasing, sharing, bartering). The acquisition means "the process of getting something" according to the Cambridge Dictionary. Acquisition behaviour includes not only buying a product but also bartering or sharing it with someone else. However, some products (i.e. smartphones) are used in symbolical ways for expressing the social status (Liao and Hsieh, 2013) and personality (Walsh and White, 2007) of an owner/buyer. A smartphone is an expensive technological/innovative device which

includes many functions and features (Woyke, 2014, p. 2), purchase decisions toward smartphones therefore require more IT-related knowledge (Woyke, 2014, p. 146) and differ from the purchase of other products (Hamann, Robert and Omar, 2007).

Usage – is the main reason for purchasing the product/service. Different models of consumer behaviour prove that an acquired product (e.g. smartphone) and used service are connected with the personality, beliefs, motives, and values of the owner (Kotler and Keller, 2012; Solomon, Russell-Bennett and Previte, 2012). In the case of smartphones, education, income and other macroeconomic variables (Jamalova and Constantinovits, 2019) have a huge impact on the handset adoption rate all over the world. It identifies that the diffusion and the use of the device are not simple to analyse (e.g. Woyke, 2014, p. 191). Moreover, the lifespan of handsets is not very long (Suh, Kim and Seol, 2017), making the switching cost of smartphones (Kim *et al.*, 2016; Ruiz Díaz, 2017) an important topic.

Disposition – What does the consumer do with a product after using it for a long time? Jacoby et al. (1977, p. 22) offered three options: leaving/dropping the product; or disposing of the product partially or fully.

Purchasing the item as a gift also might be considered a type of acquisition. The gifted product should fit the personality of the individual which is sometimes hard to identify. What will happen if the owner does not like the gift? Sometimes, s/he tries to sell it and to buy the more desired product. The development of technologies creates easier ways to resell the product. It also proves that individuals try to express themselves with each used product and the individual characteristics have a high impact on the method of disposal. Moreover, the disposal of the product might happen after purchase sometimes even before the usage of the product.

2.2 Development of Marketing Thought and Consumer Behaviour

Consumer behaviour occupies a special place in the formulation and development of marketing thought. Even if the researchers made different periodizations of the development of marketing thought according to personal opinion (Sheth and Gross, 1987; Shaw and Jones, 2005), consumer behaviour was always the center of attention. One of the most famous works of Wilkie and Moore (2003) compared to the study of Shaw and Jones (2005) is detailed below. Both of the works have almost a common periodization of the development of marketing schools'(Wilkie and Moore, 2003; Shaw and Jones, 2005). The mentioned periodization gives the reader a better understanding of consumer behaviour and its place in marketing.

"Pre-Marketing" (until 1900) – marketing was not accepted as a field of science; it was only considered a part of economics. As stated by authors Wilkie and Moore (2003) and Shaw and Jones (2005)this period did not count as one of the eras marketing thought.

Era I "Founding the Field" (1900-1920) – During this period marketing courses were established, and the borders of the marketing activities were identified. At that time, economic theory was concentrated on production. The period was characterized by migration to urban areas, which required development in storage and distribution systems. Logically, the changes and progress of the mentioned systems influenced each field of economy. As a result, marketing science focused on the distribution sector. Era I is characterized by the emergence of commodity, functional, institutional (Shaw and Jones, 2005) and regional (Sheth, Gardner and Garrett, 1988) approaches/schools in marketing thought.

Era II "Formalizing the Field" (1920-1950) – During this period gross output increased and innovative technologies operating on electricity were invented. The principles of marketing were created; infrastructure for development and knowledge exchange was developed. The beginning

of the Great Depression in 1929 decreased the speed of economic development. However, the first supermarkets appeared in 1930. It was the starting point for meetings between scholars, which brought discussions regarding terms and definitions and they formulated the general language of marketing as a result. Three approaches in marketing dominated over the period; distribution, advertisement and cost policies were the main points of interest. According to Shaw and Jones the above-mentioned two eras (excluding Pre-Marketing) could be merged into one era called "Traditional Approaches to Marketing Thought" (Shaw and Jones, 2005, p. 241).

Era III "A Paradigm Shift" (1950-1980) –The time frame coincides with the period of mass production in the USA. The number of undergraduate and postgraduates as well as the members of AMA increased significantly. Logically, the number of consumer behaviour professionals also grew during this period (MacInnis and Folkes, 2010). Historical marketing research was one of the most interesting topics (hot topics) among members of AMA (Shaw and Jones, 2005) which resulted in the emergence of a managerial approach. Era III was characterized not only by the emergence of managerial ideas, but also by the development of behavioural, and quantitative approaches. Knowledge infrastructure was amplified, and applied statistics/mathematics became an essential part of business studies. The expansion of mass production required a more detailed understanding of consumers, their needs and wants. The emergence of the consumer behaviour (i.e. called buyer behaviour at the time) school/approach was a natural response to the mentioned changes in the market (Shaw and Jones, 2005) and economic education (MacInnis and Folkes, 2010). During this period, scholars analysed consumers only from the buyer's perspective.

Moreover, the development of computers and information communication technologies enabled the analysis of a large amount of data. Scientific journals had an impact on the development of marketing thought during the period. In the 1970s, a lot of high-quality papers were published in the Journal of Marketing Management. Some scientists' interest in consumer behaviour was far from the main idea of AMA, however this increased the necessity of founding the Association of Consumer Research (ACS) in 1970. The association was the foundation for publishing a new journal that would deal with studies related to consumers' behaviours, expectations, and so on. The first Journal of Consumer Research was published in 1974. Interestingly, Shaw and Jones (2005) also used the same phrase for the naming of roughly the same time period (from 1955 to 1975). Moreover, they mentioned Wroe Alderson as an influential scholar of the third era (Shaw and Jones, 2005, p. 243).

Era IV "The Shift Intensifies—A Fragmentation of the Mainstream" (1980–present) – This period is characterized by the transition of post-soviet countries from a single command economy to several market economies. The transition created new markets for Western companies and generated new difficulties and opportunities (such as globalisation, re-engineering, etc.). The new situation required special attention from company leaders and added significant information and theories to science. During this period, different positivist assumptions related to consumer behaviour sparked scientific debates (Wilkie and Moore, 2003). Based on the area of interest, knowledge infrastructure was diversified. According to Shaw and Jones, the last era should be named "Paradigm Broadening". This time frame is more important for research as it includes elements of some other fields of science (for example psychology) into consumer behaviour (Sheth, 1992) and widens the multidisciplinary stream in consumer behaviour.

2.2.1 Consumer Behaviour and Other Schools of Marketing Thought

Beckman (1973) was the first scholar to offer the organisation of marketing subject independently from traditional concepts and he named it "schools of marketing thought" (as cited in Shaw, 2009). Table 3 illustrates different classifications of schools of marketing thought (Sheth and Gardner, 1982; Sheth, Gardner and Garrett, 1988; Shaw and Jones, 2005; Shaw, 2009). Later, Sheth et al. (1988) illustrated two main characteristics of the schools of marketing

thought that should be highlighted. The first characteristic was answering the question "*Who?"* Here the authors focused on the object that (seller or buyer) makes a profit from marketing activity. The second characteristic was the answer to the question of "*Why?"* The answer sought to explain the reason for activities carried out by stakeholders.

Beckman et al. (1973, p. 16) as cited in (Shaw, 2009, p. 333)	1. Interdisciplinary 2. Psychological 3. Sociological 4. Empirical 5. Quantitative	6. Marketing process 7. Decision theory 8. Negativistic 9. Marketing management 10. Historical
Sheth and Gardner (1982)	1. Micromarketing; 2. Consumption; 3. System Approach;	4. **Buyer Behaviour;** 5. Behavioural Organization 6. Strategic Planning;
Sheth, Gardner, and Garrett (1988, p. 20)	1. Commodity; (N/E)* 2. Functional; (N/E) 3. Regional; (N/E) 4. Institutional; (I/E)* 5. Functionalist; (I/E) 6. Managerial; (I/E)	7. **Buyer Behaviour;** (N/N)* 8. Activist; (N/N) 9. Macro-marketing; (N/N) 10. Organizational Dynamics; (I/N)* 11. Systems; (I/N) 12. Social Exchange. (I/N)
Shaw and Jones (2005)	1. Commodities; 2. Functions; 3. International Trade, 4. Institutional; 5. Marketing Management,	6. **Consumer Behaviour;** 7. Macro-Marketing; 8. Systems; 9. Exchange; 10. Marketing History

Table 3. The Classification of the Schools of Marketing Thought Based on Literature Review

Source: Own editing based on the literature review (Sheth and Gardner, 1982; Sheth, Gardner and Garrett, 1988; Shaw and Jones, 2005; Shaw, 2009)

Note: The Noninteractive - Economic schools – N/E; The Interactive - Economic Schools – I/E; The Noninteractive-Noneconomic Schools – N/N; The Interactive - Noneconomic Schools – I/N

Based on the characteristics mentioned (i.e. Who? And Why?), Sheth et. al. (1988) offered a framework based on two dimensions: 'Interactive/Non-interactive' and 'Economic/Non-economic'. Using these dimensions, the authors separated schools of marketing thought into four groups. Interactive/Noninteractive was employed to define which part of the marketing process (seller/producer, buyer, or both) had an influence on the marketplace, thus answering the question "*Who?"* Economic/Noneconomic term was used to identify the characteristics of different marketing/non-marketing methods and techniques (in marketing) for securing marketing goals. Noneconomic schools (including consumer behaviour) of marketing thought attempted to apply multidisciplinary approaches to understand certain marketing concepts.

2.2.2 The Development of Consumer/Buyer Behaviour School

The importance of the 'Consumer/Buyer Behaviour' school was discussed by scientists long before the school emerged (H.Taylor as cited in Jones and Monieson, 1990, p. 105). In the beginning, the school was named 'Buyer Behaviour' and focused on customers' purchase reasons in the marketplace. Moreover, the supporters of the school had attempted to analyse the personality (Sheth and Gross, 1987) of the buyer. Table 4 illustrates the parallel between marketing and consumer behaviour offered by Sheth and Gross in 1987.

Table 4. Focus of Marketing on Consumer Behaviour

	Aggregate Market Behaviour	*Individual Behaviour*
Social Science	Era One: Classical Marketing (1900-1940s) - Commodity School; - Functional School; - Institutional School; - Regional School; Parallel Consumer Behaviour - Consumption Economics; - Retail Patronage;	Era Two: Managerial Marketing (the 1950s) - Managerial School; - Social Exchange School; Parallel Consumer Behaviour - Brand Loyalty; - Opinion Leadership; - Family Life Cycle; - Demographics and Economics;
Behavioural Science	Era Four: Adaptive Marketing (from the 1980s) - Macromarketing School; - Strategic Planning School Parallel Consumer Behaviour - Global Consumer Behaviour; - Retaining Existing Customers; - Consumer Perception of Competition; - Behaviour Modification and Focus on Behaviour;	Era Three: Behavioural Marketing (the 1960s) - Organizational Dynamics School; - Consumerism School; - Buyer Behaviour School; Parallel Consumer Behaviour - Consumer Buying Behaviour; - Organizational Buying Behaviour; - Motivational Research; - Personality and Psychographics; - Attitude Research; - Information Processing; - Involvement;

Source: Sheth and Gross (1987, p. 39).

Starting in the 1950s, numerous studies in marketing (including consumer/buyer behaviour school) were conducted by using casual models, sensitivity analysis, multidimensional scaling, time-series analysis, analysis of variance, etc. (Wilkie and Moore, 2003). The focus of the analyses in the consumer behaviour school concentrated on micro-level circumstances as business purchases, consumer purchases, individual/household consumption and so on (Shaw and Jones, 2005). Marketing begins to use (i.e. consumer behaviour) behavioural science methodologies such as focus groups, interviews as well as some mathematical techniques (Sheth, Gardner and Garrett, 1988, p. 113).

Buyer behaviour became a popular topic of scientific discussions in the 1960s. Purchase (i.e. searching and selecting goods) and consumption (i.e. use and disposal of the product) were the main research interests (Shaw and Jones, 2005) of scholars in the school. Also, concepts such as loyalty, perceived risk, intentions among others (see Table 4) were raised during this period (Sheth and Gross, 1987; Sheth, Gardner and Garrett, 1988). To analyse the main driver of the market economy – the consumer (sometimes, customer, buyer, in specific terms user) - the School of the Buyer Behaviour mainly focused on a micro-level analysis such as personality, psychographics, attitudes, involvement and so on (Sheth and Gross, 1987; Sheth, Gardner and Garrett, 1988; Wilkie and Moore, 2003).

The 1960s were also significant for the school because of the creation of the first models for analysing consumer behaviour and by publishing a lot of books on the topic (Wilkie and Moore, 2003). The first model of consumer behaviour was given in 1966 by Nicosia (as cited in Shaw and Jones, 2005). Moreover, it is essential to mention the contributions of W. Alderson to the buyer behaviour school (Shaw, Lazer and Pirog III, 2007). Households were the centre of his attention not only from a purchase perspective but also from usage and disposal perspectives (Tamilia, 2007). However, in the early stages, consumers were analysed only from a microeconomic point of view (Sheth and Gross, 1987) which did not create a clear picture of pre-purchase and after purchase behaviour. Sheth and Gross (1987) examined the development of consumer behaviour and compared it with mainstreams in marketing science. Table 4 illustrates the parallels between marketing and consumer behaviour in relation to the other schools of marketing thought (Sheth and Gross, 1987).

Many new research directions (e.g. industrial and organizational buyer behaviour, behaviour towards social and public services, cross-cultural behaviour, family purchase behaviour, and attitude-behaviour relationship) emerged during the 1970s and made the time frame essential for the buyer behaviour field (Sheth, Gardner and Garrett, 1988). The 1980s were considered as the beginning of the emergence of the consumer behaviour concept (Sheth, Gardner and Garrett, 1988, p. 123). It means that coverage of the field was extended from buyer to consumer by involving new indicators (see Table 4.). According to Sheth et al. (1987, p. 3), consumer behaviour was a "dominant perspective" of marketing which later gave rise to strategic marketing. However, the scholars (Sheth, Gardner and Garrett, 1988) agreed that consumer behaviour is an essential concept even from the strategic marketing perspective. Years later, some authors (Hawkins and Mothersbaugh, 2010; Peter and Olson, 2010) attempted to combine these two concepts.

2.3 Modern Concepts of Consumer Behaviour

As mentioned before, the **modern concept of consumer behaviour** includes not only buyer behaviour but also a lot of new elements for a more detailed prediction and understanding of the individuals and their final decisions, mainly consumer behaviour affected by cultural, social, psychological, and personal factors (Jamalova and Fehér, 2018).

Modern analysis of consumer behaviour cannot be finished after the purchase. Social media, TV programmes, the user reviews, the opinions of friends and relatives, lifestyles, religions, beliefs, etc. impact consumers (Solomon, Russell-Bennett and Previte, 2012, p. 7). Consumer behaviour has a main significant difference: scholars involved in consumer research are practically analysing themselves. Nowadays, scientists offer a lot of different models and concepts of consumer behaviour (Hawkins and Mothersbaugh, 2010; Hoyer, MacInnis and Pieters, 2013; Sheth and Gross, 1987; Hawkins and Mothersbaugh, 2010; Solomon, Russell-Bennett and Previte, 2012; Kotler and Keller, 2016). While in the end, all concepts include almost the same elements as a culture, reference group, motivation personality, and so on. The mentioned concepts of consumer behaviour explain behaviour at large, used mainly for educational purposes and the categorisation of influential elements/factors of consumer behaviour in an understandable way. The most popular models for measuring consumer behaviour in practice as well as technology adoption models are explained in the "Basic Models of Consumer Behaviour Analysing Behavioural Intention Towards Smartphones" paragraph.

2.4 Development of Communication Technologies and Mobile Devices

2.4.1 The Classification of the Mobile Devices

The rapid development of digital technologies had a huge impact on the classification of the devices in the mobile phone market. Considering different dimensions of handsets they can be classified in various ways. For example, some scientists (Wakefield *et al.*, 2007, p. 230) differentiate the groups of products within the mobile phone industry as basic mobile phones, smartphones, devices connected computing devices, PDAs and pocket PCs.

Classifications from before 2007/2008 differ from the newest ones. The author is of the opinion that it is better to focus attention on the classifications of the last eight or ten years in the current study. Scientific literature from recent years (Verma and Verma, 2014, p. 3) distinguish mobile devices into three categories (Figure 12): PDAs, mobile phones, and tablets (sometimes called wireless notebook computers (Meng, Kim and Hwang, 2015, p. 1103)).

- Mobile phone

A mobile phone is a portable handheld device aimed to give/receive analogue/digital (later broadband) signals (Wakefield *et al.*, 2007, p. 56) which enable its user to make/receive phone calls and text messages. In information technology and other scientific fields, terms like *cell /cellular /mobile /wireless phone* (Zheng and Ni, 2006, p. 32) are used to refer to the same device. Also, in the current work, the handset can be used as a synonym of the above-mentioned expressions while sometimes it used to illustrate the first or the second generation of mobile phones (Zheng and Ni, 2006, p. 32). Product improvement/development in the mobile phone industry later caused the emergence of smartphones, to be explained later.

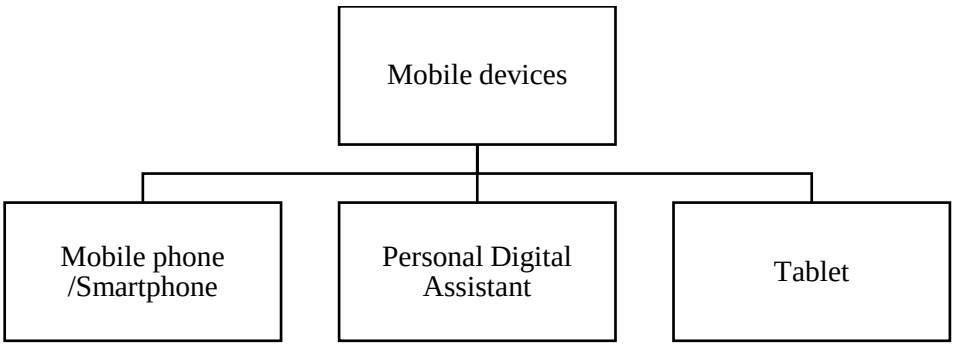


Figure 12. The Classification of Mobile Devices.

Source: own editing based on a literature review (Verma and Verma, 2014; Meng, Kim and Hwang, 2015).

- Personal Digital Assistant

The Personal Digital Assistant (PDA) was a new product (Trott, 2017, p. 37) introduced by Apple in 1993. Newton Message Pad (i.e. Apple's PDA) was a device combining an address book, a calendar, an application for personal notes, and e-mail/fax. The difference with the PDA was the inclusion of a pen-based interface and installed software that allowed use of handwriting. The PDAs were mainly used by employees (Donner and Jonathan, 2009, p. 23) to plan everyday tasks and answer e-mails. In the case of PDAs, a lot of users later complained about device handwriting recognition abilities and in the end, the product could not fulfil the users' requirements and failed, subsequently leaving market (Schilling, 2010, p. 241).

- Tablet

The Tablet is a portable device operating on the same/modified software application (i.e. Operating System) as the smartphone (Schilling, 2010, p. 61) with a bigger screen size (from 7 in.) and the ability to connect to the Internet through wireless/mobile networks. Nowadays, users prefer to use smartphones and tablets instead of laptops and big computers. The devices are popular in developed countries (Verma and Verma, 2014, pp. 22, 174) and nowadays, tablets have the same functional background as computers (Schilling, 2010, p. 61).

2.4.2 Classification of Mobile Phones

There are two main streams in the classification of mobile handsets. The first group (Groß, 2015; Scientiamobile, 2018) classifies mobile phones into three categories such as the basic mobile phone, the feature phone, and the smartphone. The other group of authors separates mobile phones into two different groups. They tend to generalize basic mobile phones and feature phones into one group (Persaud and Azhar, 2012; Liao and Hsieh, 2013; Park and Lee, 2015; Yeh, Wang and Yieh, 2016). The two main groups are feature phones and smartphones. Both of the mentioned classifications are widely used to analyse consumer behaviour towards handsets. According to the author of this study, based on a product and price perspective it is better to divide mobile phones into three groups; it creates a better picture of handset adoption. However, classification into two groups makes analysis and measurements simpler.

The first two generations of mobile phones (so-called analogue and digital/GSM) are combined into one group called "Basic Mobile Phones" (Wakefield *et al.*, 2007; Scientiamobile, 2018). Basic mobile phones were the first marketed handsets with a simple operating system (Figure 13). The early versions of mobile phones had a small screen, the bar, or the brick-shaped design with a 12-button keypad. Basic mobile phones were based on a voice-centric user interface offering several simple functions (Wakefield *et al.*, 2007, p. 319). Furthermore, the devices did not have access to the Internet which means that social media applications could not used on these devices (Baah and Naghavi, 2018, p. 7). Nowadays, these handsets are regarded as low-end/budget phones without any advanced features or low-feature phones with only some advanced features (Wakefield *et al.*, 2007, p. 331). The emergence and development of smartphones and the reasons for their success will be analysed separately. The main aim of this sub-sub-section was to provide more detailed information about handset classification.

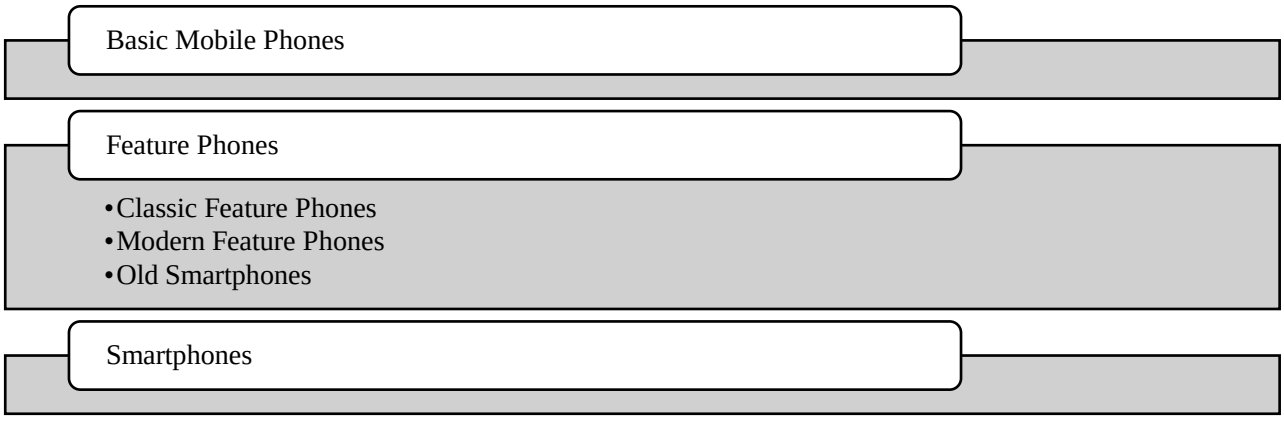


Figure 13. The Classification of Mobile Phones from The Users' Perspective.

Source: Own editing based on a literature review (Groß, 2015; ScientiaMobile, 2018b).

The next level of product improvement was 'Feature Phones' (Figure 13). The handsets had better technological capabilities compared to basic mobile phones (Earnshaw and Vince, 2008, p. 274). For example, feature phones were a wireless handset, which had limited access to the Internet and social media sites (Baah and Naghavi, 2018). The handsets were data-centric (Wakefield *et al.*, 2007, p. 319) devices that were costly in comparison with basic phones. The mentioned devices supported the applications developed by Java which made them a better choice for the majority of users (Earnshaw and Vince, 2008, p. 274). The high amount of sales and adoption of feature phones took place between 2001 and 2010. Some authors called the period "the era of the feature phones" (Klingebiel and Joseph, 2016). The specialists from Scientia Mobile (ScientiaMobile, 2018a) grouped feature phones in the following way:

- Classic Feature Phones – bar/slide/clamshell-shaped handsets with capacity constraints. For instance, Nokia S30 or more developed S40 series based on Nokia Operating System.
- Modern Feature Phones – So-called "Smartphone like" (because of the handset or screen size and look) devices at a cheap price. The handset may have a smartphone OS. Main target market was underdeveloped countries (GSMA, 2017). For example, Samsung Galaxy Pocket series and so on.
- Old Smartphones – The handsets of different manufacturers based on Symbian OS. Earlier versions of Android/iOS/Windows phones, and classic Blackberry devices were included in this category.

2.4.3 History of Mobile Communication Technologies

It is important to note that the mobile phone generations (the first/1G, the second/2G, and the third/3G) were named according to the generation of communication technologies developed and employed during a certain period (Ling and Pedersen, 2005, p. 357). The development of mobile communication technologies is illustrated in Figure 14.

The first generation/1G of communication technologies was based on analogue signals and aimed to allow the user to have a conversation on the run (Wakefield *et al.*, 2007, p. 54). In the beginning (in the 1980s and beginning of the 1990s), a lot of countries had their own domestic mobile communication standards (Funk, 2002, p. 12) and handsets were designed according to the communication standards of each country. Moreover, the first generation of communication technologies had a very limited capacity (Zheng and Ni, 2006, p. 25).

The second generation/2G of communication technologies was based on digital techniques and supported services such as mobile phone calls, fax/Short Message Service (Wakefield *et al.*, 2007, p. 56). The quality of the mentioned services was very low however user demand was increasing. The second-generation technologies thus needed to be improved and the Global System for Mobile Communications (GSM) made by the European Telecommunications Standards Institute was the most famous and successful standard. In the same period, the Code-Division Multiple Access (CDMA) standard was operating in the US and the maximum speed of connection (CDMA 2000 1x) was 144kbps. Moreover, base stations were considered to be the main element of 2G and forthcoming generations (Curwen and Whalley, 2009, p. 32). The number of base stations, their density (Donner and Jonathan, 2009, p. 42) and network coverage (Funk, 2002, p. 108) also increased after 1991.

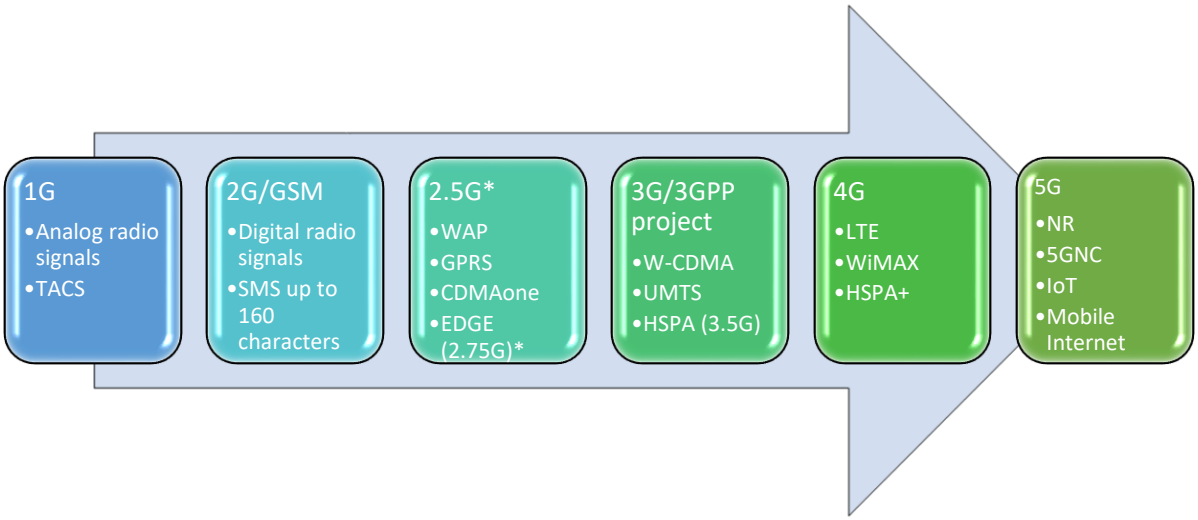


Figure 14. The Categorization of Communication Technologies.

Source: Own editing based on the literature review (Zheng and Ni, 2006; Wakefield *et al.*, 2007; Curwen and Whalley, 2009; Tripathi and Reed, 2014; Akaiwa, 2015).

2.5G communication technologies – these technologies had improved technology capabilities based on 2G. Generally, 2.5G was treated as a packet-based data transfer system (Wakefield *et al.*, 2007, p. 225), and was named the General Packet Radio Service (GPRS). 2.5G was also a part of the GSM family and provided an opportunity for sending multimedia files and using the Internet.

2.75G communication technologies- EDGE (Enhanced Data rates for Global Evolution) was considered as an extension of GSM/GPRS. EDGE increased the speed of data transfers which was the main determinant of 2.75G (Wakefield *et al.*, 2007, p. 60). Moreover, from the consumer/user point of view, the difference of 2G from advanced GSM family technologies (2.5G/2.75G) was only in the speed of the connection (Curwen & Whalley, 2009, p. 30).

The third generation/3G of communication technologies entailed the use of modern technologies that encourage device owners to make not only phone calls but also video calls, messaging applications, and data/information exchange (Bannister, Mather and Coope, 2004, p. 25). The Universal Mobile Telecommunications System (UMTS) was founded in Europe as the third generation (3G) of mobile technology (Curwen and Whalley, 2009; Verma and Verma, 2014). 3GGP (3rd Generation Partnership Project) was founded in late 1998 (Bannister, Mather and Coope, 2004; Wakefield *et al.*, 2007). The project aimed to build partnerships with organizational bodies for providing compatible services all over the world. CDMA2000 and UMTS were leading standards applied during this period.

3.5G communication technologies considered being faster than 3G however it did not reach the speed of 4G (Verma and Verma, 2014, p. 60). Wideband Code Division Multiple Access (W-CDMA), and later High-Speed Packet Access (HSPA) were the main benchmarks of 3.5G (Curwen and Whalley, 2009, p. 45). Global W-CDMA combined the majority of cellular networks all over the world (Verma and Verma, 2014, p. 60). The world average speed fluctuated between 550 kbps and 1.1 Mbps (Curwen and Whalley, 2009, p. 45).

The fourth generation/4G of communication technologies was based on the working plan that was named Long-Term Evolution (LTE). It was developed for transition, continuous progress, and the improvement of communication technologies by the 3GPP (Fotheringham and Sharma, 2008, p. 25). LTE was the result of development GSM/UMTS and it increased the speed and amount of data transferred by using advanced digital signal processing tools. Additionally, the

Institute of Electrical and Electronics Engineers (IEEE) offered a broadband wireless access system (IEEE 802.16), which concentrates an on air interface between the base and mobile stations (Tripathi and Reed, 2014, p. 897). Overall, 4G planned to be more cost-effective for users and mobile phone operators (Tripathi and Reed, 2014, p. 867).

The fifth generation/5G of communication technologies is the newest generation of mobile technologies involved in every sphere of human activity (Xiang, Zheng and Shen, 2016). The Internet of Things and Mobile Internet Systems are the most famous market driving forces of 5G. To improve radio access, 3GPP developed the new radio access technology (abbv. NR) (Dahlman, Parkvall and Sköld, 2018, p. 5), as well as the 5G Core Network, referred to as 5GCN (Dahlman, Parkvall and Sköld, 2018, p. 6).

2.5 Mobile Phone Development and Industry Life Cycle

The mobile phone industry is highly affected not only by product innovation (Giachetti, 2013, p. 62) but also by design (Wakefield *et al.*, 2007; Earnshaw and Vince, 2008). These indicators are the determinants of success. A lot of differently designed products are the result of innovation implementation. (Wakefield *et al.*, 2007, p. 230) However, not all of them were successful in the market. The positive outcome toward the acceptance of the device strongly depends on the market of the new product (Kim, 2016a).

2.5.1 The First Generation of Mobile Phones

The mobile phone industry began to emerge in the USA in the middle of the 1970s. The first marketed mobile phone was produced by Motorola (the Motorola DynaTAC 8000X) in 1983. Based on strong positions in the USA mobile phone market, Motorola became a worldwide market leader. During the same period, Ericsson and Nokia were also influential in the market (Giachetti, 2013). The first generation of mobile phones (1G-operating on analogue signals) was big and brick-shaped (Zheng and Ni, 2006). The handset's battery did not keep a charge for very long (Donner and Jonathan, 2009, p. 42), however, the price of the device was high. Thus, mobile phones were mainly used by businessmen and the devices were usually installed in a car.

2.5.2 The Second Generation of Mobile Phones

The second-generation (2G) of mobile phones was based on the well-known GSM standard (Wakefield *et al.*, 2007, p. 55). It originated in Finland and was developed by Radiolinja in 1991 (Holma and Toskala, 2004, p. 6). In order to attract new users and stimulate demand, it was necessary to make a shift (from only segment-businessmen) in the target group. Second-generation mobile phones were cheaper compared to first-generation phones; they had a small LCD (liquid-crystal display) display and some basic features. Vendors tried to offer improved handsets that could attract not only rich businessmen but also ordinary people. So, the rapid development of mobile networks/technologies influenced the size, weight, functionality, and price of mobile phones (Donner and Jonathan, 2009).

2.5.3 The Third Generation of Mobile Phones

The first marketed smartphone was the Ericsson R380s (Woyke, 2014, p. 16). It used the Symbian Operating System base and was one of the first phones to include WAP. The device was available on the global market in November 2000. The users of the R380 could also access simple web sites using the handset. Over time, smartphones were complemented by new features/functions and the devices were used not only as communication tools but also for listening to music and taking photos (Zheng and Ni, 2006; Agar, 2013; Woyke, 2014). By combining multiple functions, smartphone manufacturers became “potential competitors” with consumer electronics manufacturers (Giachetti, 2013, p. 56). The above mentioned situation is explained as digital convergence (Mishra and Henriksen, 2018, p. 113).

2.5.4 Mobile Phone Industry Life Cycle

The industry life cycle is a widely used term for explaining the stage of development of the chosen industry (Bayus, Erickson and Jacobson, 2003). In current work, the Mobile Phone Industry Life Cycle (MPILC) is used to explain at which stage of development a mobile phone is, as well as the smartphone industry. Figure 15 illustrates the changes in mobile phone and smartphone sales starting in the 1980s.

This paragraph did not aim to explain the differences or results of product improvement in the mobile phone industry. It focused on the illustration of changes at the industrial level. The early 1980s were characterized by sales of the first mobile phones produced by Motorolla. The situation in the mobile phone market, as well as additional information, was mentioned under "The First Generation of Mobile Phones" heading. Overall, this time frame is considered the introduction stage of the mobile phone industry life cycle characterised by a growth in sales.

In the early the 1990s, Motorola was still manufacturing and developing analogue devices while the others (for example, Nokia, which also established in Finland) were interested in improving devices for corresponding 2G technologies (Giachetti and Marchi, 2010). It caused serious problems for Motorola and induced leadership change at Nokia. The introduction stage of the mobile phone industry continued until 1994/1995.

In the mid-1990s, the strength of Nokia included not only advanced technologies but also easy to use interface, design, and relevant price (Funk, 2002, p. 147). The first "growth" period (1994-1995) of the mobile phone industry corresponded to the mentioned period and resulted in increasing product/industry profitability (Giachetti and Marchi, 2010). It attracted new companies and increased competition among mobile phone producers. Therefore Nokia, together with Motorola and Ericsson, created an "entry barrier" which could be defined as an attempt to limit the entrance of companies to the market (Funk, 2002, p. 156).

Even in 1994-1995, users in the mobile phone market could not be considered as a heterogeneous group, so competition influenced not only technological specification but also the design of mobile phones. Overall, companies had to consider knowledge/previous experience, cognitive style, and the gender of users in the product design process (Earnshaw and Vince, 2008, p. 262). During the first "growth" period (Figure 15), user awareness about products' technical specifications widened too (Giachetti, 2013, p. 53). Handsets turned into bar and flip shaped small mobile phones (Zheng and Ni, 2006). Overall, the first and the second generations of mobile phones developed to meet consumers' basic requirements and being in touch was quite enough for the handset users until the end of the 1990s (Zheng and Ni, 2006, p. 57).

A new wave of product development launched by Nokia was called the second "growth" stage (1996-2000) in the mobile phone market (Giachetti and Marchi, 2010). In the late 1990s, practically all phones had a proper keyboard to send messages/SMS (Short Message Service). The handsets also had simple video games. During this period, handsets obtained multitasked characteristics. Wireless Application Protocol (WAP), considered part of 2.5G, was the result of the joint work of Nokia, Motorola, and Ericsson (Schilling, 2010, p. 163). Later, WAP was one of the main drivers for the foundation of mobile Internet services (Wakefield *et al.*, 2007; Giachetti and Marchi, 2010). Nokia was the main presenter of innovative technologies during the mentioned period. An increase in the usage of SMS and WAP-based chats created the foundation for the further development of mobile phones. Additionally, GPRS and EDGE were also considered part of 2.5G/2.75G and these technologies ushered in the third generation (3G) of mobile communications.

The fast development of mobile communication technologies forced main market players to outsource the production of mobile phone components as well as the development of applications; later, even the design of the operating system was given to other companies. Based on product innovations, the companies had an opportunity to concentrate their efforts on creating additional economic value (Giachetti and Marchi, 2010). The vendors understood that research and development, design, and branding had greater added value than a process of manufacturing that engage the labour force for assembling a mobile phone (also including smartphones and other technological devices) for sales (Baporikar *et al.*, 2015, p. 76). Therefore, it was necessary to allocate money to R&D activities to set up additional functions, games and so on (Donner and Jonathan, 2009, p. 42). For example, one-third of Nokia's employees were members of the R&D team (Häikiö, 2002, p. 26). During this period, mobile phone companies based in developed countries kept their leading positions in terms of mobile phone penetration while the process was very slow for the developing world (Wakefield *et al.*, 2007; James, 2016).

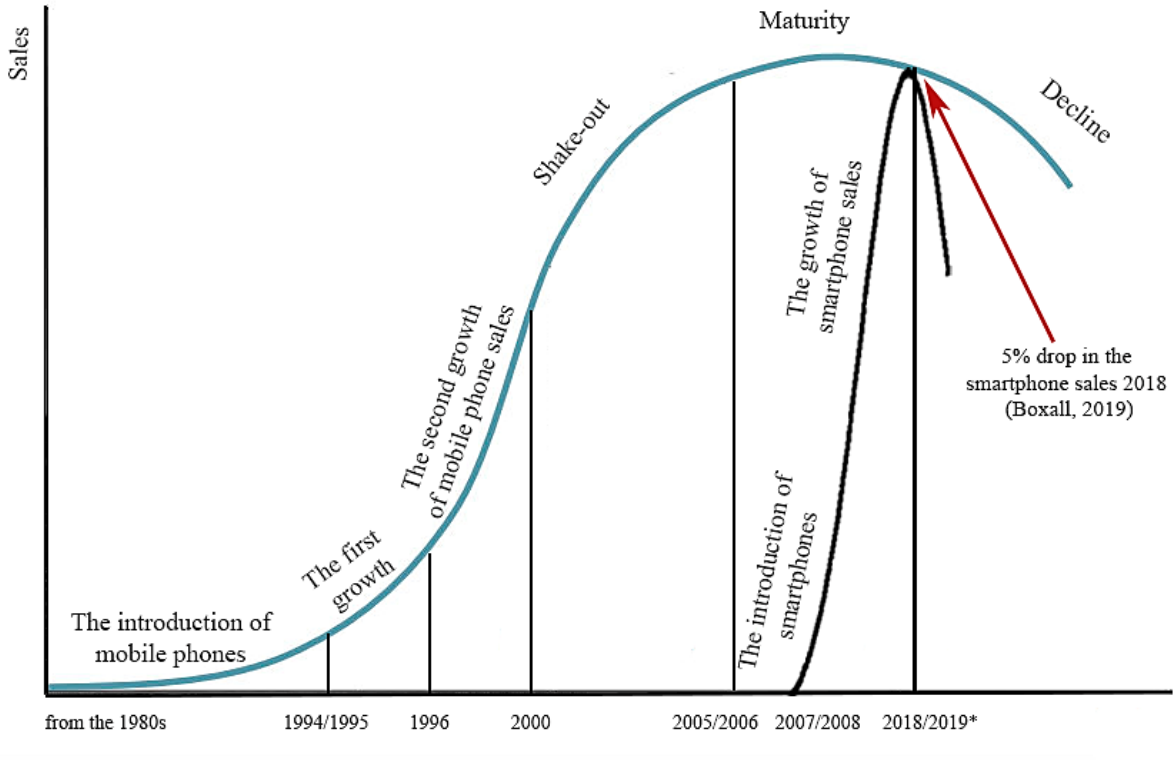


Figure 15. Mobile Phone and Smartphone Industry Life Cycle.

Source: Own editing based on the literature review (Giachetti and Marchi, 2010; Giachetti, 2013; Boxall, 2019).

Note 1: The mobile phone industry also includes smartphone production however the author was interested to show the decrease in sales.

Nokia had an advantage in the mobile phone market until the mid-2000s. Giachetti and Marchi (2010) coined the mentioned period the **shake-out** (Figure 15). By contrast, the number of the innovations offered by Nokia decreased significantly after the 2000s. At the beginning of the 2000s, after several unsuccessful attempts in the mobile phone market, Sony and Ericsson established a joint company. As a result, Ericsson had access to Sony's multimedia technology for the third generation of mobile phones. The joint venture was successful for ten years and a lot of mobile phones were sold (Trott, 2017, pp. 131, 283).

2.5.5 Mobile Phone Industry Life Cycle: the iPhone Changed the Face of the Industry

The introduction of the iPhone to the market changed design/aesthetics (Ling and Pedersen, 2005; Filieri and Lin, 2017) and handset owners' expectations. It complied with the maturity stage of the Mobile Phone Industry Life Cycle. As a result of the iPhone's introduction, Nokia lost the leading position in the handset design and its overall position in the market (Agar, 2013, p. 146). Furthermore, Sony Ericsson faced a significant loss of market share in the same period. The product design offered by Apple became popular in a short time and a lot of manufacturers began to follow it. Thus, from a strategic management point of view, it can be considered as a "dominant design" (Schilling, 2010, p. 61). In the above-mentioned situation, "dominant design" means a novelty in the market, which is widely accepted and applied by the other producers. It includes a touchscreen with a QWERTY keyboard as well as an App market.

Moreover, Samsung applied a successful "dominant design" offered by Apple using the reverse engineering techniques in a rapid way (Trott, 2017, pp. 123, 244). Despite the economic crisis of 2007-2008, Samsung invested a large amount of money in R&D activities which allowed the company to present a new line of smartphones in a short time (Song and Lee, 2014, p. 9). Because of the bigger amount of smartphone models and diversified prices, Samsung smartphones' global market share (32,3%) was twice that of Apple's (15,5%) in 2013 (Song and Lee, 2014, p. 9). Moreover, the first smartphones were not designed for 2.5 or 3G networks, the device was called a smartphone because of its innovative operating system (Zheng and Ni, 2006, p. 34). The earliest versions of iPhones were only compatible with the 2G environment.

By contrast, Gartner, well-known as a famous IT research and consulting company, claimed that global smartphone sales began to decline from the fourth quarter of 2017 (Meulen; and McCall, 2018) and continued in 2018 (Boxall, 2019). The number of smartphone sales to end-users kept decreasing during 2019 (Goasduff, 2019) as shown in Figure 15 as well as the presented numbers regarding sales of mobile phone and smartphone markets. At the end of 2019, the number of sales in the mobile phone market (which includes the smartphone market as well) was in the decline stage, however the smartphone market only reaches its maturity level based on the quantity of sales.

2.5.6 Emergence of Smartphones

There are different opinions about the development of smartphones (Zheng and Ni, 2006; Park and Chen, 2007; Woyke, 2014). Some researchers agree with the idea that the smartphones were developed/emerged from the Personal Digital Assistant (PDA) and support the notion with touch screens and the operating system (Woyke, 2014, p. 2). While other experts argue that the smartphone is a combination of the PDA and the mobile phone (Zheng and Ni, 2006; Park and Chen, 2007).

Table 5. The Definitions of Smartphones

Authors	Definitions of smartphone
Earnshaw and Vince "Digital convergence-libraries of the future"	"A smartphone can be defined as a phone that uses an open operating system that allows for the installation of natively-coded software." (Earnshaw and Vince, 2008, p. 273)
Woyke "The Smartphone: Anatomy of an industry" (2014, p. 2)	"… a smartphone distinguishes itself from a cellphone by running on an open operating system that can host applications (apps) written by outside developers." (Woyke, 2014, p. 2)

Zheng and Ni "Smart Phone and Next-Generation Mobile Computing" (2006, p. 5)	*"... smart phones* as high-end, multifunctional, business-centric cell phones with high-resolution color displays and fast mobile processors …" (Zheng and Ni, 2006, p. 5)
Mohd Suki "Students' demand for smartphones" (2013b, p. 236)	"Smartphones are a combination of personal device assistants and mobile phones that use advanced operating systems and permit users to install new applications, be constantly connected to the internet, and provide multifarious functionalities of both." (Mohd Suki, 2013b, p. 236)

Source: Own editing based on literature review (Zheng and Ni, 2006; Earnshaw and Vince, 2008; Mohd Suki, 2013a; Woyke, 2014).

According to the author of current work, smartphones came out as a result of the development and improvement of mobile phones by including some additional features for web browsing. So, smartphones are designed as multitask equipment (phone calls, text messages, web browsing) to satisfy users' needs and wants at the end of the 1990s (Zheng and Ni, 2006, p. 33). Some of the definitions explaining smartphones are illustrated in Table 5. Consequently, according to the author of the current work, the smartphone can be defined as *a device running on an installed operating system (OS) that allows users to personalize the device by adding new applications.*

2.5.7 Characteristics of Operating Systems

An Operating System (OS) is a set of programmes that control and command hardware components and offers common options (such as calendar, e-mail, alarm-clock) for smartphones (Lord and Velez, 2013, p. 225). iOS (OS designed by Apple) and Android (OS designed by Google) are the most famous among smartphone operating systems. Altogether 90% of all smartphone users own a phone that uses the iOS or Android (Reid, 2018, p. 14) operating systems. iOS only operates in smartphones designed and manufactured by Apple, while Android is commonly used by different smartphone vendors.

Table 6. The Comparison of Operating Systems According to Innovation Diffusion Characteristics

Characteristics of the Innovation Diffusion	iOS	Android
Economic and Social Aspects Of Relative Advantage	The relative advantage of iOS-based smartphones is characterized by social aspects according to the character of the users. The purchase of the iPhone has mainly "status-conferring" intention.	The economic aspect based on the income level of the users characterizes the relative advantage of Android-based smartphones. The purchase decision of an Android is supported by the economic interests of the buyer.
Complexity	iPhone handset owners argue about the simplicity (or the ease of use as mentioned in TAM) of the device.	Androids are not very complex devices, however, the operating system seems to be complicated compared to that of iPhones.
Trialability (opportunity to try the innovation)	The trialability of iOS-based devices is harder as they are not so affordable in the case of emerging economies and low and lower social classes.	To reach the trialability in terms of Android-based handsets is easier; the devices are cheaper and more affordable for buyers from developing countries as well as students. It increases the number of individuals who are able to try it.

Observability (hardware and software aspects)	iOS-based devices are leading in terms of design and hardware. However, in the case of a variety of applications, iOS users do not have so many alternatives to choose from.	Android producers compete with each other as well as iOS-based devices. As a result, the vendors attempt to create better-designed handsets and they sometimes succeed. However, there are a lot of applications made for these handsets and it is one of the advantages of having an Android.

Source: Jamalova & Constantinovits (2019).

The Android OS was designed by the Open Handset Alliance (OHA) founded by Google in cooperation with some other smartphone manufacturers and telecommunication companies in order to formulate mobile handset standards (Giachetti, 2013, p. 65). The members of the confederation (such as Samsung, Motorola, HTC and etc.) can use the OS without paying any charge (Hazlett, 2011) Previously the members of the confederation used Symbian and Windows OS and had to pay for it (Giachetti, 2013, p. 65).

There are serious academic discussions regarding two main OS market players (i.e. Android and iOS). The discussions related to the management style of application markets (Hazlett, 2011), the diffusion of smartphones with different OSs and user satisfaction (Kim *et al.*, 2015), market penetration (Tseng, Liu and Wu, 2014) and so on. Android OS is famous for being open to application developers which means that is easy to design applications and offer them in the Android market (Herman, Hadlaw and Swiss, 2014, p. 137). The "*Comparison of Operating Systems According to Innovation Diffusion Characteristics"* contains additional valuable information related to Oss is illustrated in Table 6. As for iOS-based smartphones, the application store is carefully controlled by Apple (Hazlett, 2011).

2.6 Review of Smartphone Characteristics Included in the Pilot Study

Smartphone attributes (or characteristics) are considered one of the main elements that create behavioural intention toward a product. A wide variety of studies took place in order to identify the importance of smartphone attributes for buyers/users. In the consumer behaviour context, product/service attributes are basically analysed from purchase (Kim, 2016b) purchase intention (Mohd Suki, 2013a; Chen, Liu and Ann, 2018), decision making (Işiklar and Büyüközkan, 2007; Kımıloğlu, Nasır and Nasır, 2010), and dependency (Swapana and Padmavathy, 2017) points of view.

Smartphone innovativeness is one of the crucial indicators for the handset buyers (Giachetti and Marchi, 2010; Kim, 2016a) and is the main predictor of the handset's success in a market (Coelho, Meneses and Moreira, 2013). Manufacturers try to make each new version/model more advanced and include some new features in order to attract more individuals (Kim *et al.*, 2016). Applying innovations to improve high-tech products (including smartphones) with a well-known brand name accepted by users is easier compared to unknown brands (Truong *et al.*, 2017). Also, the purchase of an innovative device is connected with the personality (Kim, Briley and Ocepek, 2015; Lee and Shin, 2018), income level, gender, education, the overall socio-demographic (Luthar and Kropivnik, 2011)/demographic (Hsiao and Chen, 2015) and the psychological profile (Ma, Yang and Mourali, 2014; Kim, Briley and Ocepek, 2015) of the buyer. According to the large-scale study conducted in three regions, technical features, word of mouth and the benefits of smartphones have a positive effect on the diffusion of innovative handsets (Kim, 2016a). Moreover, product innovativeness also influences user/buyer satisfaction in a positive way (Lee and Shin, 2018) and increases brand loyalty (Pappu and Quester, 2016).

Brand and brand trust are essential parts of the buyers' decisions regarding high-tech products (Truong *et al.*, 2017). The buyers tend firstly to decide the brand and later the model of the device in the smartphone market. Nevertheless, the individuals' attitude toward different brands is not the same. For example, Apple smartphones are considered to be more useful and highly ranked in comparison with Huawei and HTC smartphones (Liang *et al.*, 2018). As regards the smartphone market, a perceived attribute of innovation plays an important role in consumer-based brand equity (Huang and Shih, 2017). Also, brand awareness and quality of the handsets have a positive influence on individuals' purchase intentions (Bojei and Hoo, 2012; Coelho, Meneses and Moreira, 2013).

Satisfaction is considered to be among the most important and complex indicators that have a direct impact on consumer behaviour in any market. The user/buyer/satisfaction is mainly based on affective and cognitive influences during purchase and usage (Kim *et al.*, 2016). The individuals' satisfaction toward smartphones is connected to previous experiences (Liang *et al.*, 2018), product quality (Ruiz Díaz, 2017), handset features (Kim *et al.*, 2016), technical support (Kim *et al.*, 2015), innovativeness (Pappu and Quester, 2016) and so on. Customer satisfaction is one of the key elements of building brand loyalty (Liang *et al.*, 2018). However, the price (perception) of the smartphones also might be considered as an important part of satisfaction (Pappu and Quester, 2016).

It is evident from the literature that, mobile phones/smartphones are not only communication tools but are also universal indicators of fashion (Katz and Sugiyama, 2006), desired/actual status (Luthar and Kropivnik, 2011; Liao and Hsieh, 2013), pride (Salmi and Sharafutdinova, 2008), prestige (Kang and Jung, 2014) and so on. Social prestige is the part of social status measurement (Campbell, 2003) and the crucial indicator of measurement of 'Relative Advantage' (Rogers, 2003, p. 270). Social prestige can be used for indicating symbolic benefits (Liang *et al.*, 2018) which in the end, is a part of brand benefits (Park, Jaworski and MacInnis, 1986).

In South Korea, smartphones increase their owners' self-confidence and prestige (Kang and Jung, 2014). Moreover, the handset's prestige is more important for Chinese users compared to Germans (Rau *et al.*, 2015). In the case of the iPhone and Blackberry smartphones, the prestige is associated with status consumption (Liao and Hsieh, 2013). In the case of Azeri and Hungarian customers, the "good clothes open all doors" proverb includes also status indicators such as smartphones, and consumption style, and does not differ from the situation in Russia (Salmi and Sharafutdinova, 2008).

Every year several models are introduced into the market (Liang *et al.*, 2018) and the handsets' price category varies according to their purpose. Many studies (Mohd Suki, 2013a; Sata, 2013; Lee, 2014; Kim *et al.*, 2016) examined the influence of price on smartphone adoption. The price of the device had the strongest weight in the purchase decision in previous studies (Liao and Hsieh, 2013; Sata, 2013). Moreover, in the case of smartphones, continuous product development and innovation involvement push users to replace the handset, to purchase new and more advanced smartphones. In addition to this, everyone is aware of new phones models and buyers expect the release of new devices. So, media channels, together with the word-of-month (Mahajan, Muller and Bass, 1993) have a huge impact on innovation adoption in the smartphone market.

2.7 Basic Models of Consumer Behaviour Analysing Behavioural Intention towards Smartphones

Behaviour is a very comprehensive term, however, many different models were developed for analysing and understanding the behaviour of consumers (i.e. in the current case buyers' and users') from a practical point of view. The measurement of behaviour requires a careful consideration of the product or service's characteristics before choosing the correct model for it.

Even if the author mentioned the modern concepts of consumer behaviour, it would be incorrect to highlight the models of consumer behaviour before mentioning product development and specifications. For example, marketing actions in the case of low-tech products mainly focused on pricing while innovation or product improvement (Giachetti, 2013, p. 9) as well as brand-related indicators (Truong *et al.*, 2017) are essential in the case of high-tech products. These were the main reasons for organising paragraphs in such a way. The models frequently applied to the smartphone market are shown in Table 7.

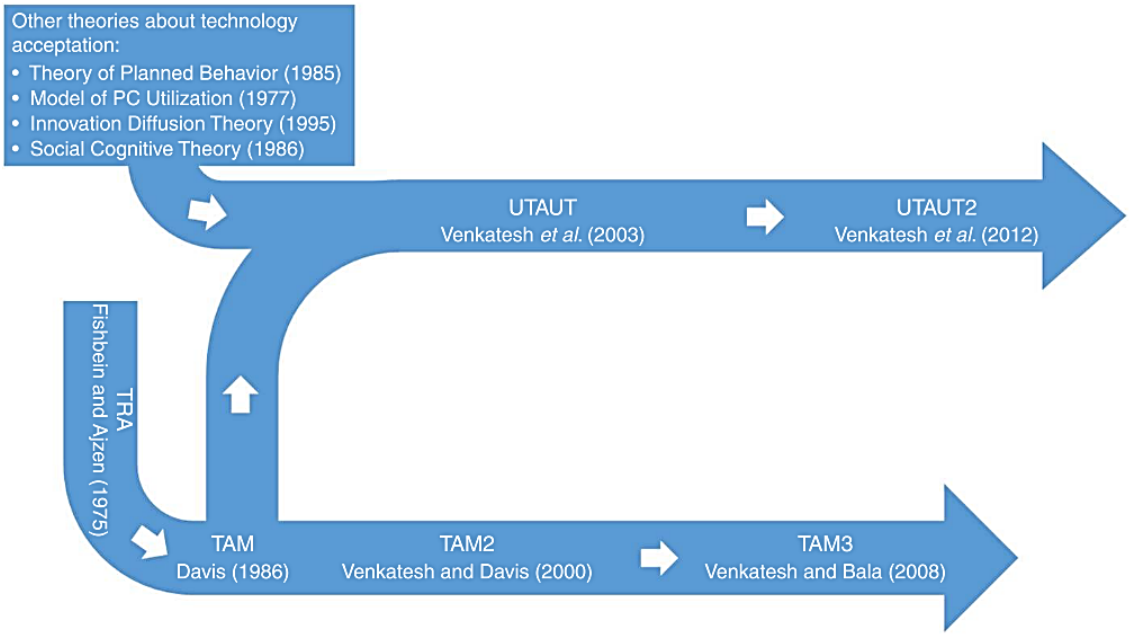


Figure 16. The Evolution of The Intention-based Theories about Technology Acceptation.

Source: Rondan-Cataluña et al. (2015, p. 791).

Interestingly, the Theory of Reasoned Action (TRA) and the Theory of Planned Behaviour (TPB) originating in the psychology/social psychology (Figure 16) still remains actual. These models created a framework (Figure 16) for the development of two different models: TAM and UTAUT. The Technology Acceptance Model (also TAM2) and the Unified Theory of Acceptance and Use of Technology (UTAUT) aimed to analyse the acceptance of new technologies by employees (Davis, 1989; Venkatesh *et al.*, 2003). Both models involved behavioural intention as dependent variable and were considered part of Organizational Behaviour. Innovation Diffusion Theory (Rogers, 2003) differs from previous models as it was part of innovation management and intended to evaluate behaviour (i.e. adoption/resistance) toward the diffusion of new technologies among the population.

In his later work, Venkatesh (2015) paid attention to the importance of the TAM in the development of the UTAUT. Because of simplicity, the TAM was one of the frequently used tools for measuring consumer/user behaviour toward smartphones (Rondan-Cataluña, Arenas-Gaitán and Ramírez-Correa, 2015). However, the Extension of the Unified Theory of Acceptance and Use of Technology (UTAUT2) offered by Venkatesh (2012) aimed to analyse the use of technologies from the consumer/owner point of view while TAM focused on employees' acceptance of technologies. This is one of the main reasons for applying the UTAUT2 for the Azerbaijani and Hungarian smartphone markets.

Table 7. Basic Models of Consumer Behaviour

Model	Short information	Latent Variables	Applied to the smartphone market
Fishbein and Ajzen (1975a) - **Theory of Reasoned Action (TRA)**	It is one of the fundamental sociological theories in order to measure/predict an individual's behaviour. The weakness of the TRA is the fact that it does not consider the relationship between the members of the social system.	**Independent Variables** (1975a): Behavioural believes; Evaluation of results; Normative beliefs; Motivation to Comply with Referents; **Dependent Variables:** Attitude; Subjective Norms; Intention; Behaviour.	Akmunawar et al. (2015); Hsiao (2013); Shin and Choo (2012);
Ajzen (1991) - Theory of Planned Behaviour (TPB)	Perceived Behavioural Control (Ajzen, 1991, p. 182) was included in the study. Venkatesh et al. (2003) considered the model as an extension of the TRA by including Perceived Behavioural Control.	**Variables:** Attitude; Subjective Norms; Perceived Behavioural Control (Ajzen, 1991, p. 182); Behavioural Intention; Behaviour	Piazza et al. (2019); Yang (2012);
Davis et al. (1989) - Technology Acceptance Model (TAM)	The theory was developed in order to measure human-technology interaction at job-based on the TRA (1975a) and the TPB (1991). The theory focused on identifying the main elements of the workers' technology acceptance.	**Independent Variables:** Perceived Usefulness Perceived Ease of Use **Dependent Variables:** Attitude toward using Behavioural Intention Actual System Use	Groß (2015); Ma et al. (2016); Mohammed (2018); Liu and Yu (2017);
Venkatesh and Davis (2000) The Theoretical Extension of The Technology Acceptance Model (TAM2)	The TAM2 includes not only well-known the TAM variables but also, social and cognitive influences for explaining individuals' reactions to a new system (Venkatesh and Davis, 2000).	**Independent Variables** Subjective Norm; Image; Job Relevance; Output Quality; Result Demonstrability; Experience; Voluntariness. (Venkatesh and Davis, 2000, p. 188)	Chun et al. (2012); Muñoz-Leiva et al. (2017)
Venkatesh et al. (2003) - The Unified Theory of Acceptance and Use of Technology (UTAUT)	The UTAUT based on eight theories and aimed to identify basic indicators influencing employees' adoption of advanced technologies. It is the first theory to consider the influence of moderating variables (such as age, gender, experience and voluntariness of use) on technology adoption.	**Independent Variables** Performance expectancy; Effort Expectancy; Social Influence; Facilitating Conditions. **Dependent Variables:** Behavioural Intention; Use Behaviour. **Moderating Variables:** Gender; Age; Experience; Voluntariness of Use	Choi et al. (2014) Partially by Mohammed (2018)
Venkatesh et al. (2012) - The Extension of the Unified Theory of Acceptance and Use of Technology (UTAUT 2)	Venkatesh et al. highlighted that all models offered until 2012, basically focused on explaining the behaviour of workers and not consumers. Whereas the current model was developed with the intention of applying it in the field of technological devices.	**Independent Variables** Performance expectancy; Effort Expectancy; Social Influence; Facilitating Conditions; Hedonistic Motivation; Price per value; Habit. **Dependent Variables:** Behavioural Intention; Use Behaviour. **Moderating Variables:** Gender; Age; Experience.	Ameen and Willis(2018); Alalwan et al.(2018); Merhi et al.(2019);

Rogers (2003) - Diffusion of Innovations DoI	The theory is one of the most influential theories which explains the adoption of innovations for newly marketed products (Rogers, 2003). According to Rogers, innovations are adopted in any social system within a different time frame. He defined the perceived characteristics of the innovations which have a huge impact on the adoption of high-tech products.	**Independent Variables** **Perceived Attributes of Innovations:** Relative advantage; Compatibility; Complexity; Trialability; Observability. **Type of Innovation Decision:** Optional; Collective; Authority; Nature of the Social System; Agents' Promotion Efforts. **Dependent Variable:** Rate of Innovation Adoption	Kim et al. (2014); Meng et al. (2015);

Source: Own editing based on literature review.

Note: Information was collected from the following sources: Akmunawar et al. (2015); Hsiao (2013); Shin and Choo (2012); Piazza et al. (2019); Yang (2012); Groß (2015); Ma et al. (2016); Mohammed (2018); Liu and Yu (2017); Chun et al. (2012); Muñoz-Leiva et al. (2017); Choi et al. (2014); Mohammed (2018) Ameen and Willis(2018); Alalwan et al. (2018); Merhi et al. (2019); Kim et al. (2014); Meng et al. (2015).

2.7.1 Behavioural Intention as the Main Element of The Study

Models for analysing technology adoption/diffusion differ from universal models for measuring behaviour. The characteristics of models are related to the specification of high-tech products which make them differ from other product categories (Jamalova and M. G. Constantinovits, 2020). However, the development of technology diffusion models are based on universal models such as Theory of Reasoned Action (Fishbein and Ajzen, 1975a) and Theory of Planned Behaviour (Ajzen, 1991). In order to be able to analyse actual usage, the authors of the UTAUT/UTAUT2 (Venkatesh *et al.*, 2003; Venkatesh, Thong and Xu, 2012) chosed intention (behavioural) and or usage-based models (Fishbein and Ajzen, 1975b; Davis, 1989; Ajzen, 1991) as a mainstream of the research.

The Technology Acceptance Model introduced by Davis et al. (1989) is one of the most cited models for analysing behaviour toward high-tech products (López-Nicolás, Molina-Castillo and Bouwman, 2008). It was developed based on the Theory of Reasoned Action (Davis, 1989; Davis, Bagozzi and Warshaw, 1989a). In the original version published in MIS Quarterly from 1989, Attitudes Toward Using and Behavioural Intention were two main dependent indicators (Davis, 1989). Later in the same year, the authors of the theory improved the model by excluding Attitudes Toward Using that only partially mediated relationships between variables in the case of technological products (Davis, Bagozzi and Warshaw, 1989b). As result, 'Behavioural Intention' became the key dependent variable of the model.

The definition of behavioural intention was not mentioned in any version of the UTAUT. Still, the authors (Venkatesh *et al.*, 2003; Venkatesh, Thong and Xu, 2012) openly explained the development of the model and the goal of the study – measurement of actual usage. Moreover, Venkatesh et al. (Venkatesh *et al.*, 2003; Venkatesh, Thong and Xu, 2012) mentioned the usage of the intention-based models and influence of the TAM on the development of the UTAUT/UTAUT2 (Venkatesh, 2015). Furthermore, Venkatesh et al. (2003) adopted a construction related to 'individual behavioural intention toward technology' from the Technology Acceptance Model (1989).

Based on above mentioned explanation, the author of current work considered it appropriate to use the definition given by Fishbein and Ajzen (1975a, p. 288) and later employed by Davis et al. (1989b, p. 984) as an explanation of behavioural intention. The mentioned definition of Ajzen and Fishbein (1975a, p. 288) states that "behavioural intention is a measure of the strength of one's intention to perform a specified behaviour" (as cited in Davis, Bagozzi and Warshaw, 1989b, p. 984).

2.8 Extention of Unified Theory of Acceptance and Use of Technology for Consumer Electronics

The theoretical and empirical sides of sociological, behavioural, and information systems disciplines might be combined in the case of analysing behaviour toward technological products (Tamilmani *et al.*, 2019). Social influences on consumer behaviour (Foxall, 1974) were widely studied from the mid 1970s. While it should be highlighted that, at the beginning (i.e. in the 1970s) these studies did not consider any certain product, they were based on the creation of theoretical frameworks.

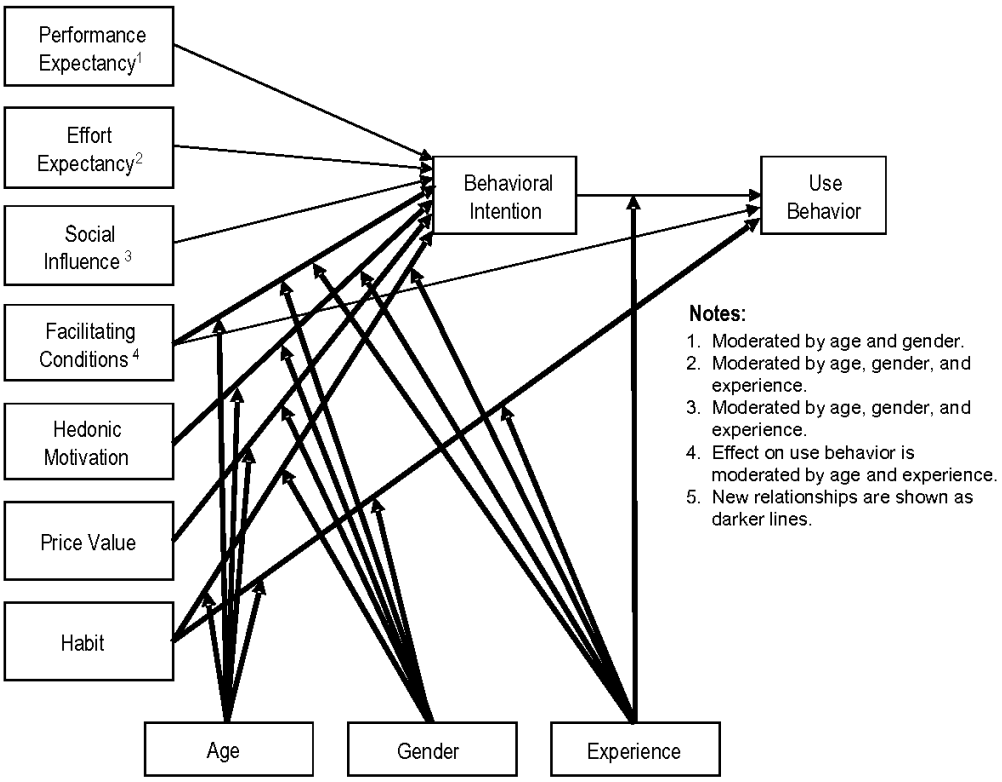


Figure 17. Extending the Unified Theory of Acceptance and Use of Technology (UTAUT 2).

Source: Venkatesh et al. (2012).

The original theory of Acceptance and Use of Technology (UTAUT) focused on users' acceptance of technological novelties in the workplace and was published in 2003. Later, in 2012, Venkatesh et al. offered a modified version of UTAUT, called the Extension the Unified Theory of Acceptance and Use of Technology (UTAUT2). The original model is illustrated in Figure 17. The difference between the UTAUT2 and the original model was the focus on consumer electronics.

The theory (Venkatesh *et al.*, 2003; Venkatesh, Thong and Xu, 2012) was built on the basis of eight theories connected to user acceptance of technologies. The model (UTAUT2) was originally developed to analyse the behaviour of users toward mobile Internet (Venkatesh, Thong and Xu, 2012). Four main variables of the model (performance, effort expectancy, social influence, and facilitating conditions) successfully forecast technology diffusion and acceptance (Venkatesh, Brown and Bala, 2013) however, there are some problems connected with moderators (Tamilmani, Rana and Dwivedi, 2017). Hedonistic motivation, price per value, and habit were the main independent variables included in the study (Venkatesh, Thong and Xu, 2012).

2.8.1 Model Review and Criticism

UTAUT is a good basis (Venkatesh, 2015) for attempting to measure consumer behaviour toward high tech products. However, the author (Venkatesh, 2015) of the model also accepts that modifications and adaptations might be required considering different circumstances. Even if the theory was originally published in 2012, the amount of Google Scholar citations is over 4500. It shows a high demand for the model which is eventually connected to the importance of technological devices in individuals' lives.

Table 8. Studies that have Applied the UTAUT2 to the Smartphone Market.

Studies applied the UTAUT2	Included variables	Results
Gupta et al. (2018)	The UTAUT2 variables, as well as Perceived Risk and Perceived Trust, were included in the study.	In the case of smartphone app adoption by tourists, Behavioural Intention did not show any significant relationship with Effort Expectancy, Facilitating Conditions and Hedonistic Motivations.
Rita et al. (2018)	The UTAUT2 variables, as well as Perceived Value, were used.	The relationship between Performance Expectancy and Behavioural Intention is partly confirmed, while Social Influence and Habit had no approved connection to Behavioural Intention.
Ameen et al. (2018)	Some independent (Performance Expectancy, Social Influence, Facilitating Conditions) variables of the UTAUT were deleted; Perceived Relative Advantage, Enjoyment, Culture-Specific Beliefs and Values, and National IT Development were included.	The results for Jordan and the UAE were not the same. For example, the relationship between Perceived Relative Advantage and Behavioural Intention was partly supported for the UAE and fully supported for Jordan. Culture-Specific Beliefs and Values partially influenced Behavioural Intention in the UAE and did not influence Behavioural Intention in Jordan.
Ma et al. (2016)	From the UTAUT variables only Facilitating Conditions and Behavioural Intention were included in the research.	Interestingly, there is no relationship between Facilitating Conditions and Behavioural Intention in the case of older Chinese adults' smartphone adoption.
Merhi et al. (2019)	Security, Privacy, Trust, and the UTAUT2-related variables (excluding Use Behaviour) were employed.	The results showed that Security, Privacy, and Trust have a statistically significant influence on Behavioural Intention both for Lebanese and British consumers. However, Social Influence has no impact on Behavioural Intention neither for Lebanese nor British consumers.

Source: own editing based on literature review.

Advantages of the UTAUT include the validation of the model in the various countries (Merhi, Hone and Tarhini, 2019), buyers' detailed understanding (Ameen, Willis and Hussain Shah, 2018), being focused on the consumer/buyer (Venkatesh, Thong and Xu, 2012; Venkatesh, 2015) and so on (see Table 8). The results of the analysis regarding mobile internet (Rondan-Cataluña, Arenas-Gaitán and Ramírez-Correa, 2015) showed that the UTAUT2 has enhanced its explanatory power compared to other models (TRA, TAMs, UTAUT). Also, UTAUT creates a better vision of connections between different kinds of motivations (i.e internal and external) related to handheld technology (Negahban and Chung, 2014).

From 2012, a lot of researchers applied the UTAUT2 to measure relationships between different Information Systems studies (Tamilmani, Rana and Dwivedi, 2017). One of the main limitations in the case of the UTAUT2 is a complex model that involves a large number of relationships and moderating variables (Figure 17). Some studies have shown that the usage of the model has limitations (in the case of satisfaction Montesdioca and Maçada, 2015).

SEM is the main statistical tool offered to test relationships between variables and it is sensitive to sample size. If the researcher wants to measure the moderating effect, the sample might have an appropriate number of respondents after separation according to the moderating variable. It is the main reason for the infrequent use of moderating variables in the UTAUT2 (Tamilmani, Rana and Dwivedi, 2017). According to the result of the meta-analysis, 41% of studies used price per value and only 35% used habit. Moreover, the results are contradictory (Tamilmani *et al.*, 2018). It is common to see an extension of the UTAUT2 by including different variables from external theories (Alalwan, Dwivedi and Rana, 2017; Ameen, Willis and Hussain Shah, 2018; Rita *et al.*, 2018; Merhi, Hone and Tarhini, 2019) which are considered a weakness of the UTAUT2 (Tamilmani, Rana and Dwivedi, 2017). The mentioned statement regarding the weakness of the model differs from the opinion of the main author (i.e. Venkatesh) of the model. Moreover, in a paper for the Wiley Encyclopaedia of Management, Venkatesh (2015) explained that new studies do not focus on enrichment (extending models by adding new variables) of the knowledge regarding technology adoption and use. In the current case, enrichment of the model considers the inclusion of three new variables: Symbolic Brand Image, Brand Awareness, and Satisfaction.

2.9 Extending the UTAUT2 by Symbolic Brand Knowledge and Satisfaction by Purchase

2.9.1 Extending the UTAUT2 using Symbolic Brand Image

Brand image is accepted as one of the indicators of brand knowledge(Keller, 1993). The involvement of the Symbolic Brand Image (SBI) scale began with the inclusion of a question regarding social prestige in the pilot study. The reason for it was an extensive literature review which showed that mobile phones/smartphones were not only communication tools but were also universal indicators of fashion (Katz and Sugiyama, 2006), desired/actual status (Luthar and Kropivnik, 2011; Liao and Hsieh, 2013), pride (Salmi and Sharafutdinova, 2008), prestige (Kang and Jung, 2014) and so on.

Owning high-tech products may also be connected to prestige (Hamann, Robert and Omar, 2007). Smartphones increased the self-confidence and the prestige of the owners in South Korea (Kang and Jung, 2014). Moreover, the handset's prestige was more important for Chinese users compared to Germans (Rau *et al.*, 2015). In the case of the iPhone and Blackberry smartphones, the prestige was associated with status consumption (Liao and Hsieh, 2013). In Russia, smartphones were considered status symbols (Salmi and Sharafutdinova, 2008). The author agrees(Jamalova and M. Constantinovits, 2020) that in the case of the Azeri and Hungarian customers, status indicators such as smartphones, and consumption style did not differ from the situation in Russia.

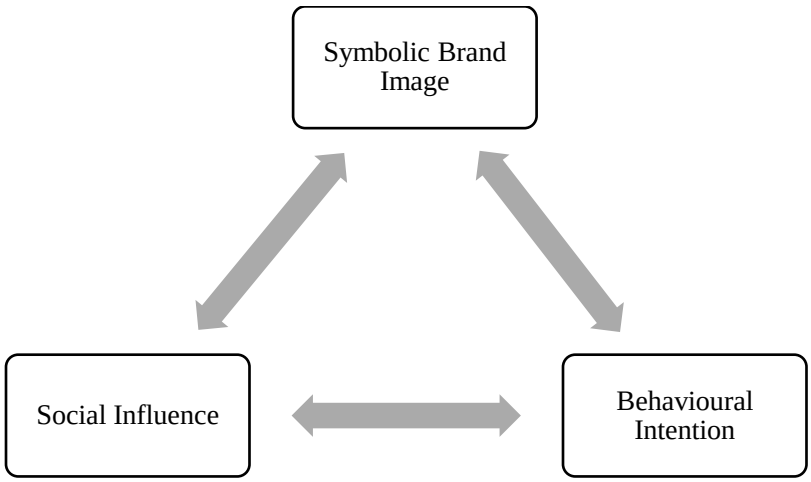


Figure 18. The Mediating Effect of SBI in the relationship between Social Influence and Behavioural Intention.

Source: own editing based on literature review.

Brand image was considered to be one of the influential factors in smartphone selection (Chen, Liu and Ann, 2018). Even if different sources proved that the price of smartphones decreases, handsets do not lose the importance of status representation (Katz and Sugiyama, 2006; Liao and Hsieh, 2013; Rau *et al.*, 2015). Social prestige is considered part of social status measurement (Campbell, 2003) and can be used for indicating symbolic benefits (Liang *et al.*, 2018) which in the end is a part of brand benefits (Park, Jaworski and MacInnis, 1986). Previous studies attempted to measure the relationship between brand image (containing SBI) and purchase intention (Chen, Liu and Ann, 2018) as well as the moderating effect of brand image in a relationship between product attributes and purchase intention. In marketing theory, Symbolic Brand Image (SBI) was classified as one of the measures of brand benefits (Keller, 1993). The aim of separate involvement of SBI (Figure 18) was to measure the mediating effect of SBI in the relationship between social influence and behavioural intention toward smartphones as well as to measure the direct influence of brand knowledge indicators on behavioural intention.

2.9.2 Extending the UTAUT2 by Brand Awareness

A brand is one of the influential factors before during and even after purchase behaviour. In the case of high-tech products, prices are not cheap, and devices have complex structures, and they are purchased only occasionally. According to Dibb et al. (2000), the mentioned reasons made brand awareness even more important in the case of high-tech products (as cited in Hamann, Robert and Omar, 2007). Higher adoption rates also influence the importance of the brand for users and buyers (Eric Viardot, 2004, p. 140). Brand awareness is one of the strongest predictors of attitudes (Twedt, 1967), which strengthens the usage of the scale for the smartphone market.

Table 9. Brand Awareness in The Smartphone Market.

Studies Related to Brand in The Smartphone Market	Sample Size, Geographic Area, and Statistical Analysis	Results of The Analysis
Petruzzellis (2010)**.**	Survey took place in the downtown of Italian city and the included the responses of 403 smartphone owners who participated in a survey.	In the Italian mobile phone market, brand knowledge (i.e. the author considered brand knowledge as a combination of **brand awareness** and brand image) is positively associated with the handset's phone diffusion.
Coelho et al. (2013)	Data from the United Arab Emirates (n=339) was tested using structural equation modeling	Brand awareness of the distributing company has a positive impact on the purchase intention of smartphone users.
Martins et al. (2019)	Influence of advertising on Portuguese smartphone users (n=303) was examined by partial least squares structural equation modeling (PLS-SEM).	According to the results of the study, **brand awareness** has a positive influence on smartphone purchase intention.
Huang and Shih (2017)	Questionnaire research (n=605) was conducted in a shopping mall in a southern Taiwanese city.	**Brand awareness** does not strengthen customer-based brand equity in the Taiwanese smartphone market.

Source: own editing based on literature review.

Numerous studies (Filieri and Lin, 2017; Huang and Shih, 2017; Sidorchuk *et al.*, 2018) have analysed the behaviour of smartphone users and their opinions about the brand. Consequently, a smartphone's brand is one of the crucial indicators influencing the buyer's decision before and during the purchase process, yet purchase decision is influenced by national culture (Erdem, Swait and Valenzuela, 2006). Basically, researchers analysed "brand" from different points of view as brand knowledge, brand identification, and brand loyalty while for current research brand awareness was considered to be the most influential. Furthermore, the literature proves that brand awareness is a crucial indicator in the context of smartphone purchase behaviour (Petruzzellis, 2010; Coelho, Meneses and Moreira, 2013; Martins *et al.*, 2019). Some of mentioned studies are included in Table 9.

2.9.3 Extending the UTAUT2 by Satisfaction by Purchase

The main point of current and future studies relates to previous experiences of smartphone owners. Previous experiences create attitudes and beliefs toward the smartphone brand or smartphone model which can be generalized in satisfaction/dissatisfaction with the product (Suh, Kim and Seol, 2017). Also, the lifespan of handsets becomes shorter (Suh, Kim and Seol, 2017) which considered being around two (Chen, Liu and Ann, 2018) or three years (Hew, Badaruddin and Moorthy, 2017). It means that users have an opportunity to try and use more smartphones. The explained situation formulated attitudes and behavioural intentions of smartphone users regarding different handset models and brands. Moreover, some studies determined a significant (i.e. moderate level strength) correlation between satisfaction and repurchase intention in the mobile phone market (Haverila, 2011). On the other side, scientists are also interested in measuring the satisfaction of telecommunication services (Kim *et al.*, 2015; Ruiz Díaz, 2017) which nowadays has become an essential topic because of high penetration rates. Some of mentioned studies are included in Table 10.

Table 10. Satisfaction in The Smartphone Market.

Studies Related to Satisfaction in The Smartphone Market	Sample Size, Geographic Area, and Statistical Analysis	Results of The Analysis
Liang et al. (2018)	A survey was conducted among 527 Taiwanese smartphone users. Data (97 Apple users, 118 Samsung users and 146 HTC uses from the total sample) were analysed using the partial least squares approach of structural equation modeling.	The study measures the association among customers' expectations, satisfaction, perceived usefulness, and brand loyalty. Satisfaction was an influential factor of HTC users' brand loyalty while for Apple and Samsung users perceived benefit was more important.
Ruiz Díaz (2017)	1259 respondents from different regions of Peru answered questions about mobile phone service satisfaction and loyalty.	The author was interested in understanding factors influencing customer satisfaction and loyalty toward service attributes in Peru. Consequently, consumer loyalty affected by a positive opinion about service.
Lee and Shin (2018)	388 young adults from South Korea answered to questions during face-to-face interviews. The results were analysed using structural equation modeling.	The study focused on investigating the impact of product smartness on satisfaction. Findings illustrated that perceived smartness of the product influences satisfaction.
M. Kim et al. (2015)	229 questionnaires filled out by South Korean students were analysed by the partial least squares approach of SEM.	The research aimed to evaluate the interconnection between interactivity indicators and customer satisfaction. Only some (network and content quality also compatibility) interactivity indicators had an impact on satisfaction.
M. K. Kim et al. (2016)	The answers of 700 smartphone users from South Korean cities were collected for research. The Partial Least Squares (PLS) method was applied for the research.	Device features (functions, usability, design) are positively related to satisfaction while satisfaction influences customer loyalty.
Hew et al. (2017)	Partial Least Squares Structural Equation Modeling (PLS-SEM) was applied to the database containing 510 respondents from Malaysia.	Confirmation is the individual's consistency with pre-purchase and after purchase opinion about the product and it responds positively to satisfaction. Also, brand attachment and perceived usefulness influence satisfaction.

Source: own editing based on literature review.

3 MATERIALS AND METHODS

The rapid development of technologies that began in the 1980s necessitated studies focusing on human-technology interaction. Several models aimed to analyze the above-mentioned interaction from different points of view. The current research includes two different questionnaires. The first questionnaire was focused on measuring buyers/users' attitudes toward different smartphone characteristics such as smartphone functions, features, and relative advantage indicators (Figure 19). The author's aim was to identify the main marketing categories which were considered essential for buyers/users as well as end-users of the devices and involve them in the second study. However, the second questionnaire focused on the building model that explains the behavioural intention of university students toward smartphones in Azerbaijan and Hungary.

3.1 Pilot Study

Factor analysis is one of the best-known and frequently used statistical techniques. Factor analysis may have exploratory or confirmatory characteristics depending on the research objective (Thompson, 2004; Mazzocchi, 2008). Exploratory factor analysis is basically used to find out unknown and non-observable trends/relationships that can take place in the study (Mazzocchi, 2008). Also, in this case, the dataset created a general picture of the situation by highlighting sampling variability (Brian S. Everitt, 2005, p. 2). Unfortunately, no scientific results related to the smartphone market/users in Azerbaijan and Hungary have been published. It was therefore necessary to conduct a pilot study.

3.1.1 Theoretical Background Based on Product and User-Oriented Perspective

As mentioned before, no studies had been conducted on the Azeri and Hungarian smartphone markets which created some difficulties for the author and made it necessary to conduct exploratory/pilot research. Thus, before making a serious marketing-oriented analysis for modelling behavioural intention in the smartphone market, the author attempted to find answers to the simple research questions. To achieve the aim of the study, it was decided to analyse and understand the product-based attributes that have a key influence on individuals' behavioural intentions towards the smartphone (Figure 19). The research questions were formulated as follows:

- *Which factors play an influential role on the formulation of behavioural intention towards smartphones between Azeri/Hungarian's?*
- *Are these factors interpretable from a logical point of view?*
- *How would smartphone-related indicators (product-oriented, marketing and social) move in the factor analysis among Hungarian and Azeri smartphone users?*

The answers to these questions can be found by conducting a questionnaire survey among smartphone users. The questionnaire was adopted from the Işiklar and Büyükozkan (2007) study in Turkey. The authors applied a multi-criteria decision technique for identifying more essential characteristics and measuring user preferences toward different functions by applying the five-point Likert scale. The mentioned research included mobile phone characteristics and only the brand from a marketing point of view. Later, Haverila (2011) modified the questionnaire and conducted the survey among males in Finland where smartphone price and design (separate from aesthetics) were also involved.

Three new variables innovativeness, satisfaction, and social prestige were added to the current survey. The main purpose for the current survey was not only to determine factors that influence

behavioural intention towards the product but also the identification of the importance of innovativeness, satisfaction and social prestige (i.e. as an explanation of SBI) in Hungary and Azerbaijan.

3.1.2 Data Collection

The main aim of the study was to measure and group factors influencing the behavioural intention of the Hungarian and the Azerbaijani smartphone users while some representatives of other countries also participated in the survey. Dispersing a questionnaire by social media is a frequently used tool in the smartphone market (Gazley, Hunt and McLaren, 2015; Stoica, Vegheş and Orzan, 2015). To approach a high number of respondents, the questionnaire was shared over Facebook. The survey was conducted over one month between March 20 and April 20, 2019. The sample size was bigger, however, according to the aim of the current research, only responses of Azerbaijani and Hungarian respondents were included in the pilot study. According to the statistical literature (Tabachnick and Fidell, 2013, p. 620), it is possible to apply Principal Component Analysis with a sample size of approximately 200 respondents (i.e. 230 respondents from Azerbaijan and 210 from Hungary), however factor loadings might be high. The output was analysed using the IBM SPSS Statistics 23 statistical software package.

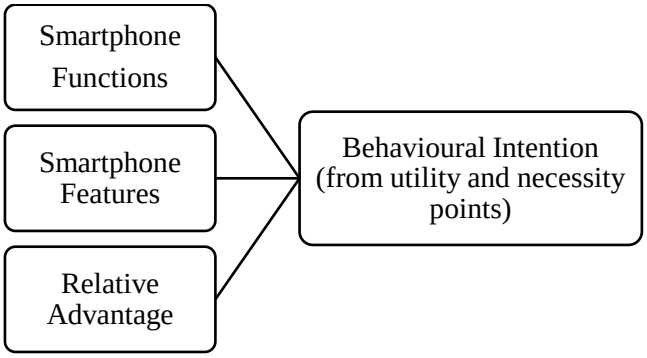


Figure 19. Behavioural Intention of Smartphone Users from Utility and Necessity Points of View.

Source: own editing.

3.1.3 Structure of the Questionnaire for Pilot Study

The questionnaire contained twenty-five self-reporting questions and some personal information questions regarding age, occupation, education and so on. The high number of questions reasoned with the multifunctional characteristics of handsets from product and user-related perspectives. In order to compile an easily understandable questionnaire, questions were grouped into several sections.

- The first section contained general information about the respondents' current smartphone: the manufacturer, the operating system, the handset's usage length.
- The second section covered main smartphone-oriented questions that were grouped into three blocks: Relative Advantage, Functions, and Features. Participants of the survey expressed their opinion about the importance of different smartphone characteristics in this section. The questions aimed to measure attitudes toward smartphone functions, features, and basic marketing indicators. Each question focused on one specific characteristic of the smartphone. Following the questionnaire design of previous studies (Işiklar and Büyüközkan, 2007; Haverila, 2011), the author of the current research allowed respondents to express their opinion using the Likert scale from (1) "not important at all" to (5) "very important".

- The last – third section aimed to gather more information about respondents' socio-demographic conditions. The detailed information about the demographic profile of respondents is shown in the next chapter.

3.1.4 The Reliability of Scales Included in the Pilot Study

Reliability is one of the most crucial issues in terms of conducting questionnaires. The reliability of the questionnaire aimed to prove that, several questions focused on the explanation of the same concept (Mazzocchi, 2008, p. 10). Cronbach's Alfa is accepted as a common measure of reliability in marketing and social sciences. The constructions used are confirmed as reliable if, the result of Cronbach's Alfa is greater than 0.7 and/or 0.8 (Field, 2013; Hair *et al.*, 2013) and 0.6 in some cases (Hair *et al.*, 2014).

Table 11. Measurements and Reliability for Azerbaijan and Hungary.

Concept	**Scale estimate (Azerbaijan/Hungary)**
"Relative advantage" (adapted from Rogers, 2003, p. 51) **Alpha = 0.700 (Azerbaijan)** **Alpha = 0.749 (Hungary)** **Number of items 6**	How important is the brand of a smartphone for you?
	How important is the design of a smartphone for you?
	How important is the innovativeness of a smartphone for you? (e.g. features as fingerprint usage, photographing)
	To what level are you satisfied with your smartphone?
	How important is the social prestige of a smartphone for you?
	How important is the price of a smartphone for you?
Multi-item measurement: "Features" **Alpha = 0.881 (Azerbaijan)** **Alpha = 0.785 (Hungary)** **Number of items 9**	How important is the screen size of a smartphone for you?
	How important is the weight of a smartphone for you?
	How important is the standby time of a smartphone for you?
	How important is the talking time of a smartphone for you?
	How important are the ports, compatibility to other devices?
	How important is the internal memory of a smartphone for you?
	How important is the external memory expandability of a smartphone for you?
	How important is the camera resolution of a smartphone for you?
	How important is the assortment of applications of a smartphone for you?
Multi-item measurement "Functions" **Alpha = 0.839 (Azerbaijan)** **Alpha = 0.684 (Hungary)** **Number of items 10**	How important are the phone calls for you?
	How important are the text messages for you?
	How important is the internet browsing for you?
	How important is E-mail for you?
	How important are social media applications on a smartphone?
	How important is a function making photos for you?
	How important is a function for making videos?
	How important is listening to music on a smartphone for you?
	How important is playing games on a smartphone for you?
	How important is for you the MS office applications on a smartphone?

Source: own editing based on literature review and statistical analysis.

To create an easily understandable and reliable questionnaire, smartphone characteristics were divided into three groups: Relative Advantage, Features, and Functions. The results of the reliability tests (the Cronbach's alpha) for each construction are in an acceptable range (see

Table 11) The first group aimed to explain the Relative Advantage from a marketing point of view and consisted of essential marketing terms. The results of the reliability test for Relative Advantage were in the accepted range for both of the countries (α(AZ)=0.7; α(HU)=0.749). The second group includes different smartphone features that had higher reliability scores compared to Relative Advantage (α(AZ)=0.881; α(HU)=0.785). The third group of questions aimed to explain smartphone functions. The result of Cronbach's alpha was very high for Azerbaijan while for Hungary it only reached the accepted range (α(AZ)=0.839; α(HU)=0.684).

3.1.5 Principal Component Analysis - General Requirements

In the current study, the author used Principal Component Analysis (PCA) in order to reduce the number of variables and find the answers to the above-mentioned research questions. PCA is a well-known tool (Tabachnick and Fidell, 2013, p. 637) that analyses variances by creating linear models (Field, 2013, p. 787). Moreover, PCA attempts to maximize the explanation of total variance (Field, 2013; Tabachnick and Fidell, 2013) and is considered irreplaceable for decreasing a large number of indicators by creating several components. This is the main reason the author chose PCA. As mentioned above, the number of variables included in the research is 25. Based on the sample size, Stevens (2002) offered the value of the factor loadings which might be significant (as cited in Field, 2013, p. 802). For the sample size around 200, factor/component loadings recommended were greater than 0.364 while in the current study the author deleted all loadings that were less than or equal to 0.4. All variables in both samples had component loadings higher than 0.45.

In this case, PCA is the best solution to decrease the number of variables and practically create interpretable components. As recommended by Kaiser (1960) components with eigenvalues higher than 1 were extracted (as cited in Field, 2013, p. 798). According to the results of the studies in Azerbaijan (n=230) and Hungary (n=210), in both countries, Kaiser-Meyer-Olkin measurement of sampling adequacy shows very high numbers (KMO=0.773 for Azerbaijan and KMO=0.737 for Hungary). Additionally, Bartlett's test based on the original correlation matrix (Hair *et al.*, 2014) also shows a significant result (p=0.000) for each case. In the end, 66.9% of the total variance was explained by the creation of six components for the Azeri sample. Eight components described roughly 70% of the total variance for the Hungarian smartphone users questioned.

Both analyses were run by using the same orthogonal rotation method – Varimax. Varimax is a well-known rotation solution that illustrates more interpretable results (Field, 2013, p. 1020). The choice of rotation method was closely related to the aim of the research and theoretical background (Field, 2013, p. 802). In these two surveys, the most explicable components also were the result of Varimax rotation.

The reliability of each component was measured in order to prove that variables creating components have a strong correlation (Field, 2013, p. 827). The reliability of constructions are measured with Cronbach's Alpha and results are accepted to be above 0.7 (Field, 2013; Tabachnick and Fidell, 2013). However, in some cases, Cronbach's alpha might have high numbers (Field, 2013, p. 829).

3.2 Confirmatory Study

3.2.1 Theoretical Background

The main problem of consumer behaviour (i.e. as a part of marketing) is the fact that all theories applied to study behaviour originated from social science (Fishbein and Ajzen, 1975a; Ajzen, 1991), organizational behaviour (Davis, Bagozzi and Warshaw, 1989a; Venkatesh *et al.*, 2003) and innovation management (Rogers, 1983, 2003). As usual, marketing scholars attempted to evaluate behaviour by involving different variables into these well-known concepts (Moon and Kim, 2001; Shih, 2004; El-Masri and Tarhini, 2017; Merhi, Hone and Tarhini, 2019), however, none of these concepts were focused on the adoption and use of innovative devices/consumer electronics purchased independently by user. Only in the last study, Venkatesh et al. (2012) brought attention to this notion and involved some new variables to the existing concept (i.e Extention of Unified Theory of Acceptance and Use of Technology) to be able to measure individuals' behaviours towards technological products.

3.2.2 The UTAUT2 Related Latent Constructions

The basic part of the model was adopted from the UTAUT2, developed in Venkatesh et al. (2012). It was the result of an extensive literature review which was explained in Chapter 2. There are two main purposes for choosing the model:

1. The UTAUT2 is the only model aimed to analyse diffusion and the use of high-tech products
2. To some extent, the UTAUT2 constructions are in compliance with components created by the PCA (detailly explained in Results and Discussion chapter)

'Social Influence' was included in the model from the beginning and was considered one of the crucial constructions (Venkatesh *et al.*, 2003; Venkatesh, Thong and Xu, 2012). It is one of the variables which impacts 'Behavioural Intention' (Venkatesh, Thong and Xu, 2012) however some authors consider it irrelevant. The original model in Venkatesh et al. (2012) mentioned their doubts regarding social influence, however, the author of the current study decided to keep the variable for further analysis. The authors of the model highlighted that social influence was moderated by personality (i.e age, gender, and experience). The results of the PCA for Hungary highlighted the importance of 'Social Environment'. Also, social influence is the result of verbal and nonverbal communication inside of a social system, work environment, and social media is one of the main tools. Consequently, the results of the exploratory PCAs are compatible with the UTAUT2.

The aim of the author was not only to see the interconnection between variables but also use the symbolic brand image (external variable) as a mediator variable in the study. As a result, we could discuss the mediating effect of symbolic brand-related beliefs among university students. The notion was properly explained in the literature review chapter.

Facilitating Conditions were also involved in the early versions of the model (Venkatesh *et al.*, 2003; Venkatesh, Thong and Xu, 2012) and it was considered to also define technology use (Venkatesh, Thong and Xu, 2012). However, in comparison with original UTAUT variables, facilitating conditions have a direct relationship with behavioural intention in the consumer use context (Venkatesh, Thong and Xu, 2012). However in the same paper, the authors of the UTAUT2 highlighted that the latent variable was directly influenced by the age and gender of the respondents. The facilitating conditions scale offered by Venkatesh et al. (2012) also aimed to measure compatibility, ease of use and ability to pay for smartphone services. According to the aim of the PCA, only some of the indicated categories were included in the exploratory research. As a result, the author was not certain about the relationship between variables.

Venkatesh et al. (2012) mentioned hedonistic motivation and price per value as theoretical contributions to understanding consumers' technology acceptance/use. Hedonistic motivation is an essential indicator of research with non-occupational characteristics (Venkatesh, Thong and Xu, 2012). The construction was included in current research because of the age of the respondents as well as the results of the PCA. The author is of the opinion that young smartphone users enjoy games and technology usage more, therefore the author was expecting to see a significant positive relationship between hedonistic motivation and behavioural intention in examined datasets.

Table 12. Each Construction Including Items and Sources.

Item (by a variable)	**Source**
Social Influence (UTAUT2)	
SI1. People who are important to me think that smartphone use is necessary for me.	Venkatesh et al. (2003; Venkatesh, Thong and Xu, 2012)
SI2. My friends and family influence my usage of the smartphone.	(Mohd Suki, 2013b)
SI3. It is important for me that my friends like the brand of smartphone I'm using.	(Mohd Suki, 2013b)
Facilitating Conditions (UTAUT2)	
FC1.I have enough resources to use a mobile subscription and mobile internet.	Venkatesh et al. (2003; Venkatesh, Thong and Xu, 2012)
FC2. A smartphone is compatible with other technologies I use.	Venkatesh et al. (2003; Venkatesh, Thong and Xu, 2012)
FC3. I can get help from others when I have difficulties using a smartphone.	Venkatesh et al. (2003; Venkatesh, Thong and Xu, 2012)
Hedonistic Motivation (UTAUT2)	
HM1. Using a smartphone is fun.	Venkatesh et al. (2012)
HM2. Using a smartphone is enjoyable.	Venkatesh et al. (2012)
HM3. Using a smartphone is very entertaining.	Venkatesh et al. (2012)
Price per value (UTAUT2)	
PV1. My smartphone is reasonably priced.	Venkatesh et al. (2012)
PV2. My smartphone is a good value for the money.	Venkatesh et al. (2012)
PV3. At the current price, my smartphone provides a good value.	Venkatesh et al. (2012)
Habit (UTAUT2)	
HT1. The use of a smartphone has become a habit for me.	Venkatesh et al. (2012)
HT2. I am addicted to using a smartphone.	Venkatesh et al. (2012)
Behavioural Intention (UTAUT2)	
BI1. I intend to continue using a smartphone in the future.	Venkatesh et al. (2012)
BI2. I will always use a smartphone in my daily life.	Venkatesh et al. (2012)
BI3. I will continue to use a smartphone regularly.	Venkatesh et al. (2012)

Source: own editing based on literature review.

Price per value also becomes necessary from theoretical and practical points of view as well. From a theoretical point of view price per value is expenses related to technology adoption and use (Venkatesh, Thong and Xu, 2012). The construction was not a part of the original UTAUT, it

was involved only in the extension of the UTAUT for the consumer technology context. From the practical side, the pilot study for Hungary has already proven the importance of the price/value ratio for Hungarian smartphone users.

The habit was involved in the research basically because of involvement playing games and social media as the result of PCA in both countries. However, the literature also proves smartphone dependency (Ting *et al.*, 2011; Park *et al.*, 2013; Swapana and Padmavathy, 2017; Nayak, 2018), which is linked to the habit of smartphone usage. So, the author of the current work certainly expects to define the relationship between the latent constructions (i.e. a habit has a positive influence on behavioural intention among the respondents). All questions/statements that aimed to measure the UTAUT2-related latent variables (Table 12) were adopted from the Venkatesh et al. (2012) study and were translated into Azeri and Hungarian languages by native speakers of the respective languages.

3.2.3 The UTAUT2 Related Latent Constructions Excluded from Study

'Performance Expectancy' and 'Effort Expectancy' first were offered by Venkatesh in 2003. Then, the model aimed to measure employee acceptance of information technologies (Venkatesh *et al.*, 2003). Later, the author offered changes and adoptions that allow for the use of the model for consumer electronics (Venkatesh, Thong and Xu, 2012). However, performance and effort expectancy remained among the variables of the new model.

The authors of the model explained performance expectancy as a degree of usefulness of technologies (Venkatesh, Thong and Xu, 2012) which to some level, is relevant to the Technology Acceptance Model and Diffusion of Innovations. The Unified Theory of Acceptance and Use of Technology was firstly introduced in 2003 and 'Performance Expectancy' was measured using the relative advantage scale offered by Moore and Benbasat (1991). The authors of the relative advantage scale (Moore and Benbasat, 1991, p. 197) mentioned similarities with Rogers' relative advantage and of Davis' perceived usefulness scales. The author of the current work agrees that performance expectancy is a strong predictor of behavioural intention (Venkatesh *et al.*, 2003) while in the current situation involving the indicator was not so essential because the smartphone industry had already reached maturity. Numbers regarding adoption/penetration rates also proved the usefulness of smartphones. For example, 59% of individuals all over the world owned smartphones. The indicator was only 55% (GSMA, 2018b) for developing markets, whereas for Northern America it was 80% in 2017 (GSMA, 2018a).

'Effort Expectancy' aimed to explain the simplicity of usage (Venkatesh *et al.*, 2003). It was partially connected to the Technology Acceptance Model (Perceived ease of use) and Diffusion of Innovations (Ease of use). The authors of the model (Venkatesh *et al.*, 2003) highlighted that effort expectancy was necessary and notable at the beginning of the adoption and the influence of the indicator on usage decreases over the time period. This was the main reason for excluding effort expectancy from the analysis. While in the case of smartphones, the scales offered to measure the connection between 'Performance Expectancy'/'Effort Expectancy' and 'Behavioural Intention' are outdated.

3.2.4 External Latent Constructions: Symbolic Brand Image, Brand Awareness, and Satisfaction

'Symbolic Brand Image' and 'Brand Awareness' are known as brand knowledge indicators. The first variable, Symbolic Brand Image, aims to explain brand preferences based on the social status and prestige of the handset brand. The scale was adapted from the study that aimed to measure the influence of product attributes, brand image, and perceived value on smartphone purchases in Taiwan (Chen, Liu and Ann, 2018). The pilot research had only one question

measuring prestige or the other constructions, which created only a general picture of the situation.

In the PCA's for both countries, prestige was grouped together with brand and innovativeness. It means that the prestige of the smartphone was based on its brand and how innovative, or in other words, how expensive handset is. The best indicator that complied with these parameters was symbolic brand image. Table 13 illustrates the items of the scale explained by brand choice motives such as celebrity endorsements, social status and personal taste (Chen, Liu and Ann, 2018).

Moreover, relative advantage raises a second question connected to brand awareness. According to the purpose of exploratory research, it was impossible to understand how informed smartphone users are about the handsets brand. However, the brand always had a relatively strong weight among the other variables. That is why the author included a separate item aimed at measuring the importance of brand awareness. The questions were adopted from several pieces of research focused on smartphone brand awareness (Wu and Ho, 2014; Huang and Shih, 2017; Filieri *et al.*, 2019) and are illustrated in Table 13.

Table 13. External Variables Included in the Analysis.

Item/construction (by a variable)	**Source**
Symbolic Brand Image (SBI)	
SBI 1 I'm adopting the smartphone brand due to celebrity endorsements.	Chen et al. (2018)
SBI 2 The smartphone brand represents a higher social status for me	Chen et al. (2018)
SBI 3 The smartphone's design reflects my personal taste.	Chen et al. (2018)
Brand Awareness (BA)	
BA1. I was aware of my smartphone brand before purchasing it.	Filieri et al. (2019); Huang and Shih (2017)
BA2. I can recognize my smartphone brand among other brands.	Huang and Shih (2017)
BA3. Most people know about my smartphone's brand.	Wu and Ho (2014)
Satisfaction by Purchase (SA)	
SA1. I'm satisfied with my smartphone choice.	M. K. Kim et al. (2016)
SA2. My smartphone meets my expectations.	M. K. Kim et al. (2016)
SA3. My smartphone fits my needs/wants.	M. K. Kim et al. (2016)

Source: own editing based on literature review.

The last external latent indicator included in the study was 'Satisfaction', which created a separate component in the PCA conducted for Hungarian smartphone owners. At the same time, Satisfaction moved together with smartphone price PCA calculated for the Azeri sample. All questions were adopted from Kim et al. (2016) which measured customer loyalty and satisfaction in the South Korean smartphone market.

3.3 The Final Research Model For Measuring Behavioural Intention in Azerbaijan and Hungary

Based on previously conducted exploratory factor analysis and literature review, the author of the current study proposed a research model. The model was developed on the framework of the UTAUT2 by involving three influential variables (Figure 20) from the exploratory factor analysis (i.e. symbolic brand image, brand awareness, and satisfaction).

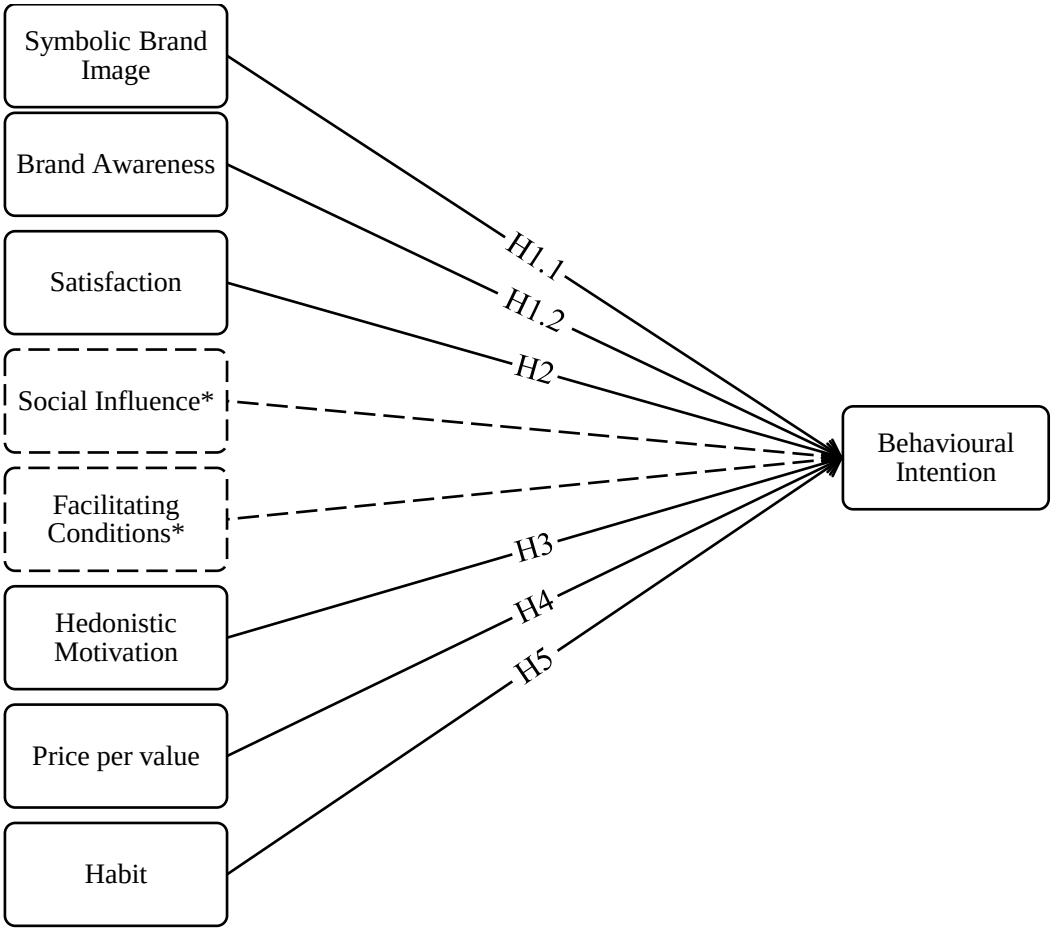


Figure 20. Proposed Research Model.

Source: Own editing.

Note: *Originally the author planned to have a separate hypothesis measuring the relationship between Social Influence and Behavioural Intention, however because of low numbers in reliability tests, it was impossible to identify whether there is a relationship or not.

3.3.1 Structure of the Questionnaire

The questionnaire contained self-reporting questions related to the above-mentioned latent constructions as well as some personal information. The large number of questions (26 self-reporting questions) was justified by the the high number of latent variables included in the study. In order to compile an easily understandable questionnaire, questions were grouped into multiple sections.

- In the paper-based version (Appendix II and III), the first section contains general information about smartphone owners and handsets: age, gender, manufacturer and smartphone model. In the online version (Appendix IV), this section is mentioned at the

end; to be confident and decrease the probability of mistake control question (i.e. occupation of the respondents) was also included.

- The second section in the paper-based questionnaire includes statements regarding Symbolic Brand Image, Brand Awareness, Satisfaction and the UTAUT2-related indicators (i.e. Social Influence, Facilitating Conditions, Hedonistic Motivation, Price per value, Habit, Behavioural Intention, and Use). The participants of the survey expressed their opinion using a five-point Likert scale (from 1 or "strongly disagree" to 5 or "strongly agree). Each assumption focused on the measurement of latent variables related to behavioural intention toward smartphones.

3.3.2 Data Collection

Based on the results of the pilot study and literature review, the final questionnaire aimed to identify the influence of different variables on behavioural intention. The questionnaire was distributed among Hungarian and the Azerbaijani students. The sampling method was based on an opportunity (convenience) sampling technique and limits the potential to generalise the findings (Babbie, 2016). Responses were collected during the same period: from the 25th of October until the 25th of December (two months) 2019. To reach so many respondents, paper-based and online versions were employed at the same time. The online survey was conducted by using Facebook; sharing the questionnaire among university students, which is a well-known approach for analysing behaviour in the smartphone market (Gazley, Hunt and McLaren, 2015; Stoica, Vegheş and Orzan, 2015). Each university student (mainly from Szent István University and Baku Engineering University) who had a smartphone could participate in the survey. However, it is important to highlight that the sampling technique employed limits the generalising potential of the findings to broader demographic ranges of Azerbaijani and Hungarian populations.

In order to meet the SEM requirement, the author's main purpose was to reach around 300 respondents from each country. According to the literature (Hair *et al.*, 2014), it is acceptable to use a sample size of approximately 300 students (i.e. 323 students from Azerbaijan and 318 students from Hungary) for structural equation modelling. After excluding questionnaires with missing data and duplicated responses, 283 questionnaires from the Azeri respondents and 288 questionnaires from the Hungarian sample remained. Moreover, in order to decrease the number of observations that significantly differ from general samples, the author deleted 5% of outliers. In the end, 234 Azeri and 247 Hungarian students filled out completed and usable questionnaires and the total sample size contained 481 respondents. The datasets were analysed using a IBM AMOS version 23 statistical software package (Arbuckle, 2014).

3.4 Structural Equation Modelling

In the middle of the 20th century, analysing the relationship between latent constructions created significant problems in various disciplines (Hoyle, 2012, p. 17). The achievements of different scientific fields merged at the beginning of the 1970s to establish a new approach called Structural Equation Modelling (SEM) (Hoyle, 2012, p. 17). The development of the social sciences and statistics created a basis for the formation of SEM that was based on the necessity of the measurement of "… multiple and simultaneous relationships involving several dependent and explanatory variables, and allows for the inclusion of latent variables which cannot be directly measured but can be expressed as a function of other measurable variables (Mazzocchi, 2008, p. 317)."

Nowadays SEM is considered a family of different structural techniques (Hoyle, 2012) in order to measure the relationship between latent variables which mainly have confirmatory characteristics (Byrne, 2016) and in fact combines measurement and structural models (Hair *et al.*, 2014; Byrne, 2016). The measurement model explains the combination of observed variables that aimed to describe latent constructions while the structural model (also known as the path model (Hair *et al.*, 2014, p. 19)) illustrates the relationships among latent constructions (Hair *et al.*, 2014). Moreover, it is one of the most frequently-used tools for measuring willingness to purchase, e-purchases, the relationships between customers and attitudes toward brands (Mazzocchi, 2008, p. 319). Studies that employed SEM for the measurement of behaviour in the smartphone market were shown in the review chapter.

3.4.1 SEM: Reliability and Validity

Reliability is a tool used to measure the internal relationship between variables and is aimed to identify one latent construction. Simply, the purpose of calculating reliability is to statistically indicate that a set of variables has a high chance of explaining the same construction/latent variable. The high numbers of the reliability tests decrease the value of the measurement error (Hair *et al.*, 2014). The coefficient alpha (also known as Cronbach's alpha) is a popular tool in the case of measuring reliability. Cronbach's Alpha (abbr. CA or α) is generally accepted to be in the range between 0.6 to 1, whereby a higher number expresses a better level of reliability (Malhotra and Birks, 2007, p. 358). Construction Reliability (CR) also known as Composite Reliability, is usually applied in the case of SEM. Generally, CR higher than 0.7 is considered a good level of reliability, while a number higher than 0.6 is also acceptable (Hair *et al.*, 2014, p. 619).

In order to have high validity scores and avoid mistakes, the author of the current research applied measurement scales from previous publications. Detailed information regarding scales was illustrated in the literature review and previous paragraphs. It means that in the current case, the author would assume that all latent constructions involved in the study complied with the requirements of construction validity. Hair et al. (2014) defined construction validity as *"the extent to which a set of measured items actually reflects the theoretical latent construction that those items are designed to measure (2014, p. 618)"*. Additionally, the statistics literature confirms that reliability estimates are also used as evidence of convergent validity (Hair *et al.*, 2014, p. 619) and high scores of Average Variance Extracted (AVE) prove convergent validity. In this case, AVE is the share of total variance explained by the latent variable (Malhotra and Birks, 2010, p. 734). Some authors (Malhotra and Dash, 2011) indicate that the acceptable range of AVE is higher than 0.45 while a number greater than 0.5 is a generally accepted level (Tabachnick and Fidell, 2013; Hair *et al.*, 2014) (see Table 14). In order to calculate the discriminant validity, the square of correlations of any two latent variables should be compared to AVE scores in the case of the model. Another way of determining discriminant validity (Shin and Biocca, 2017; Galib, Hammou and Steiger, 2018) illustrates that AVE must be higher than maximum shared variance (MSV) and average shared variance (ASV).

Table 14. Reliability and Validity Requirements for SEM.

Cronbach's Alpha (CA)	Construction/Composite Reliability (CR)	Convergent Validity measured by AVE	Discriminant Validity
> 0.6 better > 0.7	CR > 0.6 (better when 0.7)	AVE > 0.5 (sometimes 0.45)	AVE > MSV the square root of the AVE might be higher absolute value of the correlations

Source: own editing based on literature review.

3.4.2 Main Assumptions of Maximum Likelihood Estimation

Maximum Likelihood (ML) is the estimation technique that "iteratively improves parameter estimates to minimize a specified fit function (Hair *et al.*, 2014, p. 544)". It helps to analyse a particular number of latent variables used for measuring interrelations between constructions. Like any other statistical analysis/technique, ML also has requirements for data as well as the main SEM assumptions that must be followed. According to Tabachnick and Fidell (2013, p. 756), assumptions for using SEM are summarized as follows:

Sample Size – The sample size for SEM is dependent on different indicators (Hair *et al.*, 2014, p. 573) such as estimation technique (i.e. for current research maximum likelihood), the complexity of the proposed model, normality, missing data and so on. However, some general recommendations are made in what regards sample size. The essential requirement for analysing categorical data using SEM concludes that the sample size must be bigger than the number of variables multiplied by 10 (Byrne, 2016, p. 170). Jackson (2003) agrees that in the case of maximum likelihood, sample size less than the number of variables multiplied by 10 might influence research accuracy (Kline, 2011, p. 12). In conclusion, a sample size of 300 respondents is considered appropriate for less than seven constructions with an average level ($\approx$ 0.5) of communities (Hair *et al.*, 2014, p. 574). 19 observed variables have been involved in the model for measuring behaviour among questioned Hungarian students, and 18 observed variables have been included in the model of measuring behaviour among the Azeri students. (Hungarian analysis $19x10=190\leq247$; Azeri analysis $18x10=180\leq234$)

Missing Data – The statistics literature agrees to have less than 10% random missing data (Hair *et al.*, 2014, p. 571), however in the case of SEM, especially using the maximum likelihood technique, it is impossible to run an analysis based on a database with missing data. It is possible to use the imputation technique (Hair *et al.*, 2014, p. 571) however, the author of the current study deleted the questionnaires that had any missing data.

Multivariate Normality – generally, multivariate normality is essential in the case of SEM techniques (Kline, 2011; Hair *et al.*, 2014; Byrne, 2016). In the 1970s, multivariate normality was essential for each kind of SEM analysis and for this reason the concept was the subject of a lot of criticism (Byrne, 2016, p. 365). Starting in the1980s, statisticians attempted to develop a new analysis, which would be valid with multivariate non-normal and categorical data. Statistical literature supports that some kind of analysis included in the SEM family need raw data (Kline, 2011, p. 48). Even if ML generally requires normally distributed data, the results of non-normal distributed data are also valid (Kline, 2011, p. 48). J. Arbuckle (2012, p. 36) specified situations (i.e. in the case of ML) when a normal distribution is not essential and the categorisation of respondents is one of the terms.

Multicollinearity is considered an issue in the case of SEM. The explanation of the terms and the results of the multicollinearity analysis are illustrated separately.

Multivariate outliers – is the identifications of the filled out questionnaires that are significantly different from the general dataset (Hair *et al.*, 2014; Byrne, 2016). Outliers might be difficult to define in the case of a large number of variables; calculating Mahalanobis distance is a traditional solution. In the current survey, the author removed 5% of the outliers using Mahalanobis distance.

3.4.3 Multicollinearity

Multicollinearity is when several variables are strongly correlated with each other and almost explain the same construction (Hoyle, 2012; Byrne, 2016). It might influence the model fit and create additional problems. If there is multicollinearity between variables (Byrne, 2016, p. 194), it means that the correlation between latent variables is higher than one (> 1.00). In the case of the SEM analysis, it is totally unacceptable as it leads to growth in parameter and standard errors (Hoyle, 2012, p. 95).

Table 15. The Multicollinearity Results for the Azeri Sample.

Correlation			Estimate	Correlation			Estimate
SBI	↔	**HM**	.393	**BA**	↔	**HT**	.139
BA	↔	**HM**	.274	**SA**	↔	**PV**	.390
HM	↔	**PV**	.348	**PV**	↔	**HT**	.132
SA	↔	**HM**	.138	**HT**	↔	**BI**	.530
HM	↔	**HT**	.477	**SA**	↔	**BI**	.145
SBI	↔	**BA**	.171	**PV**	↔	**BI**	.412
SBI	↔	**PV**	.132	**SBI**	↔	**BI**	.271
SBI	↔	**SA**	.082	**HM**	↔	**BI**	.662
SBI	↔	**HT**	.182	**SA**	↔	**HT**	-.088
BA	↔	**PV**	.230	**BA**	↔	**BI**	.400
BA	↔	**SA**	.390				

Source: own editing based on CFA Azerbaijan.

Note: SBI – Symbolic Brand Image; BA – Brand Awareness; SA – Satisfaction; HM – Hedonistic Motivation; PV – Price per value; HT – Habit; BI - Behavioural Intention.

According to Byrne's (2016, p. 194) recommendations, the correlation between latent variables involved in the final model was checked. Multicollinearity results for the Azeri and Hungarian samples were illustrated in Tables 15 and 16. The result of the analysis proved that there was no multicollinearity issue in either the Azeri or the Hungarian sample and latent variables explained different constructions in both samples. All numbers are below the accepted threshold. It is the result of using widely known statistical scales and an accurate analysis.

Table 16. The Multicollinearity Results for the Hungarian Sample.

Correlation			Estimate	Correlation			Estimate
SBI	↔	**PV**	-.308	**SI**	↔	**HM**	.257
SA	↔	**HM**	.066	**SI**	↔	**PV**	.024
HM	↔	**PV**	-.008	**SBI**	↔	**BI**	.143
SBI	↔	**SA**	.012	**SA**	↔	**BI**	.016
SBI	↔	**SI**	.074	**SI**	↔	**BI**	.203
SBI	↔	**HM**	.107	**PV**	↔	**BI**	.161
SA	↔	**SI**	.010	**HM**	↔	**BI**	.565
SA	↔	**PV**	.091				

Source: own editing based on CFA Hungary.

Note: SI – Social Influence; SBI – Symbolic Brand Image; BA – Brand Awareness; SA – Satisfaction; HM – Hedonistic Motivation; PV – Price per value; HT – Habit; BI - Behavioural Intention.

3.4.4 Structural Model: Fit Indices

Fit indices are determinants of how well the proposed model (predicted structural model) complies with the data of the questionnaire survey (observed results). Chi-square compares the covariance matrices of the predicted and observed results (Hair *et al.*, 2014). It is the main index, however, scientists tend to measure some other indicators. Goodness-of-fit (GFI) aimed to measure the model's suitability with less influence of sample size while it is questionable (Hair *et al.*, 2014). Adjusted Goodness of Fit Index (AGFI) also takes into account the degree of freedom of the model (Byrne, 2016, p. 95). AGFI and GFI are based on a comparison of the offered model with the independent model (Byrne, 2016, p. 96). The Comparative Fit Index (CFI) measures the difference between the current and independent/null models. The Tucker-Lewis Index (TLI) compares normal chi-square (χ^2) values in the offered and null models. Standardized Root Mean Residual (SRMR) is used to identify the fit of the current model. Moreover, the lower number of SRMR proves better suitability of the model. Root Mean Square Error of Approximation (RMSEA) is widely used not only for the suitability of the model to survey participants but also to the overall population. SRMR and RMSEA (together with Root Mean Residual) are known in the statistics literature as badness-of-fit (Hair *et al.*, 2014, p. 579) indicators. Thresholds of the mentioned statistical indicators are illustrated in Table 17.

Table 17. Requirements for Fit Indices.

Structural Model variables	**χ^2**	**p.**	**χ^2/df***	**GFI**	**AGFI**	**CFI**	**TLI**	**SRMR**	**RMSEA**
Requirements for fit Indices	Significant p-values with good fit	≥ 0.05	<3 <5* sometimes acceptable	>0.9 >0.95*	>0.9 >0.8*	>0.95 >0.90* >0.80* sometimes acceptable	>0.9	≤ 0.08 <0.09*	≤ 0.08 < 0.05 good 0.05-0.10 moderate >0.10 bad

Source: Own editing based on Hair et al. (2014) and Hu and Bentler (1999).

Note 1: * - thresholds offered by Hu and Bentler (1999).

4 RESULTS AND DISCUSSION

4.1 Exploratory Research Conducted In Azerbaijan and Hungary

As previously explained, there is no previous research related to smartphone market/users' in Azerbaijan and Hungary. Therefore, a pilot study had to first be conducted to create a picture of the factors that have the influenced behavioural intention toward smartphones. The main research questions of the pilot study are stated in the Materials and Methods chapter. The questions can be specified as follows:

- *Which factors play an influential role on the formulation of behavioural intention towards smartphones among Azeris and Hungarians?*
- *Are these factors interpretable from a logical point of view?*
- *How would smartphone-related indicators (product-oriented, marketing and social) move in the factor analysis among Hungarian and Azeri smartphone users?*

4.1.1 Purpose of the Pilot Study

As mentioned above, the author of the current study used the same question structure as researchers in Turkey and in Finland. The study from Turkey aimed to analyse the multi-criteria decision-making approach in the mobile phone market (Işiklar and Büyüközkan, 2007). The authors of the first paper divided handset characteristics into two groups: product-related and user-related. Product-related characteristics included (Işiklar and Büyüközkan, 2007, p. 270) indicators such as "basic requirements, physical characteristics, and technical features" which might be accepted as being equal to the smartphone features scale offered by the author of this work. Işiklar and Büyüközkan (2007, p. 270) clarified user-related characteristics as the combination of "functionality, brand choice, and customer excitement".

The objective of the Finland study was to examine feature preferences and customer satisfaction among male mobile phone users (Haverila, 2011). Later, Haverila (2011) used almost the same questionnaire structure with some modifications. He also included some new indicators in the study.

In current work, user-related characteristics were shown as a combination of smartphone functions and relative advantage indicators from a marketing perspective. Moreover, the author added some new indicators (i.e. innovativeness, satisfaction, and social prestige) in order to have a clear picture regarding behavioural intention towards the smartphone. The results of the pilot study showed that smartphone features, functions and the relative advantage indicator can be summarized in the different number of factors. These components are named according to the nature of the characteristics.

4.1.2 Descriptive Statistics: Azeri Sample

The sample size of the questionnaire was 230 random smartphone users (Table 18) who filled out online questionnaire in two languages: Azerbaijani and Russian. 32 survey participants completed the questionnaires in Russian and the remaining 198 survey participants filled it out in Azeri. According to the statistics literature (Tabachnick and Fidell, 2013, p. 620), it is possible to apply PCA to a sample approximately 200 respondents, however, factor loadings might be high.

Table 18. The Demographic Profile of The Respondents from Azerbaijan and Hungary.

Demographic Variables	Scale	Number of Mentions Azerbaijan	Percentage Azerbaijan	Number of Mentions Hungary	Percentage Hungary
Age of respondent	>18	4	2%	8	4%
	18-24	34	15%	66	32%
	25-34	142	62%	90	43%
	35-44	28	12%	2	1%
	45-54	10	4%	28	13%
	55-64	12	5%	14	7%
Gender of respondent	Female	142	62%	116	55%
	Male	88	38%	94	45%
Qualification of respondent	Bachelor's Degree	98	43%	56	27%
	Master's Degree	116	50%	72	34%
	Ph.D. candidate / Ph.D.	6	3%	8	4%
	Elementary School	0	0%	8	4%
	Secondary Grammar School	6	3%	46	22%
	Vocational School	4	2%	20	10%
Occupation *	Childcare/Maternity leave	20	9%	2	1%
	Employee	60	26%	100	46%
	Employee in leading position	66	29%	10	5%
	Entrepreneur	28	12%	22	10%
	Household	10	4%	4	2%
	Pensioner	8	3%	0	0%
	Student	36	16%	70	32%
	Unemployed	2	1%	8	4%
Language	Azeri	162	70%	0	0%
	Russian	42	18%	0	0%
	English	26	12%	0	0%
	Hungarian	0	0%	210	100%
Brand of smartphone	Apple	90	39%	70	32%
	Samsung	66	28%	50	23%
	Xiaomi	40	17%	18	8%
	Huawei	8	3%	50	23%
	Other	28	12%	34	15%
Use length	≤ 1 year	76	33%	64	30%
	≥ 2 years	84	37%	78	37%
	1 – 2 years	70	30%	68	33%

Source: own editing based on the questionnaire survey.

Young smartphone users mainly filled the form. 77% of all respondents were aged between 18-34 years old, and the number of females who participated in the survey was high enough compared to males (Table 18). Moreover, the respondents of the survey were highly qualified individuals, which might influence the results of the analysis. 43% of respondents had only a bachelor's degree and 50% had a master's degree. Because the number of employed respondents

was 55%, students were less represented in the survey. Survey participants mainly preferred smartphones designed by Apple or Samsung. Interestingly, Xiaomi was in third place and 17% of smartphone users preferred this brand.

4.1.3 Descriptive Statistics: Hungarian Sample

The survey was conducted among 210 random Hungarian smartphone users who filled out the online questionnaire. Table 18 illustrates information regarding respondents' general profiles. Young adults (18-34) were the most represented (77%) age group, and more than half of the respondents, were females. in contrast, only 27% of Hungarian respondents had bachelor's degrees and 34% had masters, which was lower compared to the respondents from the Azeri sample. Some of the respondents graduated from secondary grammar school and vocational school. Like in the Azeri sample, employees were also more numerous than students among questioned individuals. However, students (32%) were more represented in the Hungarian sample compared to the Azeri sample. Employees in a leading position numbered at only 5% of the total respondents. According to the survey results, Hungarian participants own less Apple and Samsung smartphones compared to the questioned Azeris. The share of individuals owning Huawei smartphones was 23% among Hungarian interviewees while only 3% Azeris used this brand. The use length of smartphones can be considered roughly the same in both countries.

4.2 The Results of Principal Component Analysis for Azerbaijan

Finding the answers to the above-mentioned research questions required for the conducting of the pilot study and finding out general trends regarding behavioural intention towards smartphones in Azerbaijan and Hungary. The survey was carried out through Facebook over one month between March 20 and April 20, 2019. Consequently, almost 67% of the total variance was explained and six components were extracted (Table 19).

The first component of the Azeri sample was named 'Basic Technical Characteristics'. The number of the variables included in a component was eight. Overall, in the case of the unrotated solution, around 30% of the total variance was explained by this component, while the rotated solution using Varimax decreased total variance to approximately 19%. Also, the eigenvalue was high enough, almost reaching eight. The component mainly consisted of features such as, camera resolution, internal memory, the assortment of applications, external memory expandability, screen size, and design. A strong correlation among items proved that all indicators related to the same component. No smartphone function was involved in the analysis. However, factor loading in the case of ports and compatibility was significantly low in comparison with the other variables. The mentioned component was nearly the same with easy to use sub-criteria offered by Işiklar and Büyüközkan (2007).

The second component was named 'Use of Social Media', as variables aimed to explain camera and social media usage. The component consisted of five variables and all of them were grouped under 'Social Media Use' (i.e. making photos/videos, social media, listening to music and internet browsing). The variables were strongly correlated with each other. More than 10% of total variance was clarified by this component. The eigenvalue of the component was about 2.5. Unfortunately, previous studies (Işiklar and Büyüközkan, 2007; Haverila, 2011) did not involve any of these variables in their investigation. Previous surveys were conducted in 2007 and 2011 when social media and Internet browsing were only beginning to gain popularity.

Table 19. The Results of PCA for Azerbaijan.

Variables	*1st component*	*2nd component*	*3rd component*	*4th component*	*5th component*	*6th component*
Basic Technical Characteristics (n=8; 18.799% of total variance explained; eigenvalue =7.633)						
Feature: Internal memory	.779					
Feature: Assortment of applications	.755					
Feature: Screen size	.734					
Feature: External memory expandability	.731					
Feature: Camera resolution	.700					
Feature: Weight	.589					
Relative Advantage: Design	.566					
Feature: Ports, compatibility to other devices	.562					
Cronbach alpha/correlation	.865					
Use of Social Media (n=5; 11.777% of total variance explained; eigenvalue =2.513)						
Function: Making photos		.808				
Function: Making videos		.788				
Function: Social media		.506				
Function: Listening to music		.457				
Function: Internet browsing		.448				
Cronbach alpha/correlation		.818				
Communication Possibility (n=4; 11.174% of total variance explained, eigenvalue =2.229)						
Function: Text messages			0.767			
Function: Phone calls			0.764			
Feature: Standby time			0.657			
Feature: Talking time			0.618			
Cronbach alpha/correlation			0.785			
Work-related functions (n=2; 9.272% of total variance explained, eigenvalue =1.900)						
Function: Office applications				0.747		
Function: E-mail				0.658		
Correlation Coefficient*				0.537		
Gaming Potential (n=4; 9.064% of total variance explained, eigenvalue =1.346)						
Relative Advantage: Prestige					0.727	
Relative Advantage: Brand					0.644	
Relative Advantage: Innovativeness					0.622	
Function: Playing games					0.509	
Cronbach alpha/correlation					0.611	
Price/value ratio (n=2; 6.867% of total variance explained, eigenvalue =1.117)						
Relative Advantage: Price						0.791
Relative Advantage: Satisfaction						0.704
Correlation Coefficient*						0.386

Source: own editing based on the questionnaire survey.

Note 1: Principal Component Analysis; Varimax rotation with Kaiser Normalization; Factors with an eigenvalue higher than 1 were extracted; n=230; TVE=66.9%; KMO=0.773.
Note 2: Spearman's Correlation calculated $p \leq 0.01$.

The variables related to ‘Communication Possibility’ were in third place for the questioned Azeri smartphone users. The component was mainly made up of standby/talking time as well as messages and phone calls. ‘Communication Possibility’ described almost 9% of the total variance (Table 19). In the Işiklar and Büyüközkan (2007) study, the sub-criteria, which had roughly the same characteristics, was named ‘Technical features’ (including talking/standby time, roaming and safety) and in the end, it showed a comparatively strong weight in decision making. For Azeri smartphone users that filled out the questionnaire, text messages and phone calls were more essential indicators of the component. The eigenvalue of the component was around 2.3 and the Cronbach’s alpha was around 0.78.

The fourth component was called ‘Work-related Functions’. It included only two variables; office applications and e-mails; however, the Spearman correlation was considered at a middle level in the case of two variables (roughly equal to 0.55). Around 9.2% of the total variance was clarified by this component. The eigenvalue of the component was also greater than one. Unfortunately, these variables were not included in previous studies.

According to the results of the PCA, only some relative advantage indicators included in the same – fifth component. The represented variables were ‘Prestige, Brand, Innovativeness’. The mentioned indicators were grouped together with playing games. It means that Azeri smartphone users who participated in the survey were interested in gaming features. Moreover, the relative advantage indicators tended to prove the gaming potential of the handset. The factor loading for playing games was low enough compared to the others. However, the result of Cronbach’s Alpha is in the acceptable range. Gaming potential was around 9% of the total variance with a quite high eigenvalue (Table 19; n=4; eigenvalue =1.346).

The last component was named the ‘Price/value Ratio’, which was formed from two main indicators: satisfaction and price. Almost 7% of the total variance was explained by this component. There was a significant correlation between variables however the correlation coefficient indicates the strength of the relationship at low-medium level (i.e. roughly equal to 0.39). The UTAUT2 used price per value as one of the items of technology acceptance and use (Venkatesh, Thong and Xu, 2012).

4.3 The Results of Principal Component Analysis for Hungary

The survey in Hungary was conducted during the same period as in Azerbaijan and the number of respondents slightly differed from the Azeri sample (n=210). According to the results, eight components explained 69% of the total variance.

The first component was called ‘Relative Advantage’ as it included almost (excluding satisfaction) all variables represented on the Relative Advantage Scale. The output proved that innovativeness, brand, and design were the most influential variables of the first component. The price and prestige of handsets were less important for the Hungarian respondents. Relative advantage explained around 12% of the total variance, and the level of correlation (Cronbach’s alpha) inside the component was high. Unfortunately, previous studies (Işiklar and Büyüközkan, 2007; Haverila, 2011) included only one indicator - brand - in the survey, which makes it impossible to compare current results with previous studies. The Cronbach’s Alpha was almost 0.8 which is accepted as a high level of reliability.

Table 20. The Results of the Rotated Component Matrix in The Hungarian sample.

Variables	*1st component*	*2nd component*	*3rd component*	*4th component*	*5th component*	*6th component*	*7th component*	*8th component*
Relative Advantage (n=5; 11.95% of total variance explained, eigenvalue =5.747)								
Relative Advantage: Innovativeness	0.768							
Relative Advantage: Brand	0.762							
Relative Advantage: Design	0.706							
Relative Advantage: Price	0.573							
Relative Advantage: Prestige	0.529							
Cronbach alpha/correlation	0.791							
Outside Use (n=4; 11.273% of total variance explained, eigenvalue =2.409)								
Feature: Talking time		0.813						
Feature: Ports, compatibility to other devices		0.730						
Feature: Standby time		0.684						
Function: Listening to music		0.524						
Cronbach alpha/correlation		0.719						
Camera-Related Functions (n=5; 9.622% of total variance explained, eigenvalue =2.293)								
Feature: Camera resolution			0.817					
Function: Making photos			0.678					
Function: Making videos			0.639					
Feature: External memory expandability			0.505					
Feature: Internal memory			0.455					
Cronbach alpha/correlation			0.739					
Social Environment (n=3; 9.611% of total variance explained, eigenvalue =1.901)								
Function: Internet browsing				0.830				
Function: Social media				0.702				
Function: E-mail				0.583				
Cronbach alpha/correlation				0.659				
Usability (n=3; 8.144% of total variance explained, eigenvalue =1.485)								
Feature: Weight					0.673			
Function: Office applications					0.634			
Feature: Screen size					0.500			
Cronbach alpha/correlation					0.558			
Communication Tool (n=2; 7.189% of total variance explained, eigenvalue =1.218)								
Function: Text messages						0.782		
Function: Phone calls						0.755		
Correlation Coefficient*						0.416		
Gaming (n=2; 6.22% of total variance explained, eigenvalue = 1.153)								
Function: Playing games							0.817	
Feature: Assortment of applications							0.504	
Correlation Coefficient*							0.318	
Satisfaction (n=1; 4.996% of total variance explained, eigenvalue = 1.045)								
Relative Advantage: Satisfaction								0.874

Source: own editing based on the questionnaire survey.

Note1: Principal Component Analysis; Varimax rotation with Kaiser Normalization; Factors with an eigenvalue higher than 1 were extracted; n=210; TVE=69%; KMO=0.737.

Note 2: Spearman's Correlation calculated $p \leq 0.01$.

‘Outside Use’ was the second powerful component for the Hungarian smartphone owners. It consisted of talking/standby time and compatibility with the other devices as well as listening to music. However, listening to music had the lowest weight in the component. Talking time was the most important indicator of the second component. More than 11% of total variance was explained by this component. Cronbach’s Alpha was above 0.7, which was accepted as a medium-high level of reliability.

The third component of Hungarian PCA combined camera resolution, photo, and video making features with storage capabilities (internal memory and external memory expandability) and was called ‘Camera-Related Functions’ (Table 20; n=5; eigenvalue =2.293). The variables were strongly correlated with each other (α=0.739) and 10% of variance was explained by this component. By contrast, the output of PCA for the Azeri sample illustrated that making photos/videos moved together with social media indicators, while camera resolution and memory-related features were included in the first component.

‘Social Environment’ (n=3; eigenvalue =1.901) included only 3 variables: Internet browsing, social media, and e-mail. The strength of the correlation between variables was in the accepted range (α=0.659) and less than 10% of variance was related to the component. The results of PCA for both countries vary in the case of the current component. In the results based on the Azeri sample, Internet browsing, and social media were part of the component called the ‘Use of Social Media’ while e-mail moved separately with ‘Work-related Functions’.

According to the results of the survey conducted with Hungarian respondents, the fifth component was named usability and it included weight, office applications and screen size (Table 20; n=3; eigenvalue =1.485). About 8.2% of the total variance was described by the component. In contrast, weight and screen size were included in the ‘Basic Technical Characteristics’ component; office applications were involved in a separate component in the Azeri sample. The strength of the correlation between variables was below α=0.558, compared to the previous components.

Communication Tool was the sixth component (eigenvalue =1.218) that presented about 7.2% of total variance according to the analysis based on the Hungarian sample. The component consisted of only two variables (i.e. text messages and phone calls), which were correlated with each other to some extent (i.e. Spearman correlation coefficient was roughly equal to 0.42). According to the results of the survey among Azeri smartphone users, the mentioned variables grouped standby and talking time together. So, text messages and phone calls are important for smartphone users in both countries however, usage might be considered from different angles.

The seventh component, which also had an eigenvalue higher than one was named ‘Gaming’ and it contained two variables. Playing games and assortments of applications were aimed to explain the same category. Interestingly, the same variables were grouped separately according to the results of the PCA conducted using the Azeri sample. In the end however, both outputs had the component related to games. The strength of correlation between variables included in the component was weak, however results were significant (i.e. Spearman correlation coefficient was roughly equal to 0.32).

The last component of the PCA based on the Hungarian sample was ‘Satisfaction’ (Table 20; n=1; eigenvalue = 1.045). The component had only one variable; satisfaction. Around 5% of the total variance was explained by this component. Based on these results, satisfaction was used as one of the independent variables in the confirmatory analysis.

4.3.1 The Results of Pilot Study

The results of two PCAs showed that all components could be combined; technical characteristics (including photography), communication device, use (work-related functions, outside use, social media, gaming), satisfaction and relative advantage (Figure 21). However, the results of the analysis in Hungary showed the importance of relative advantage indicators and satisfaction for smartphone users. In contrast, Azeri smartphone owners were interested in basic technical characteristics and price/value ratio. Furthermore, the communication possibility was very important for Azeri smartphone users. The mentioned results of two exploratory pieces of research supported the author's choice.

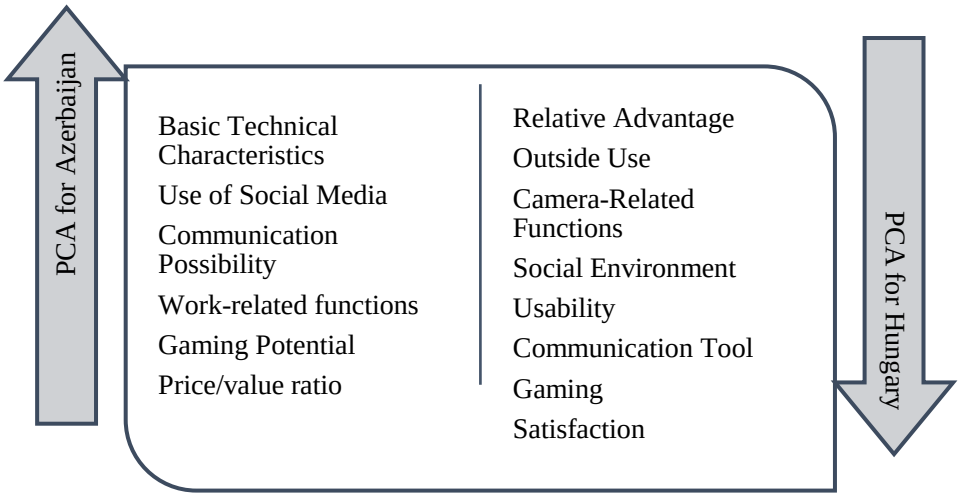


Figure 21. A Comparison of the Results of the Pilot Study for Azerbaijan and Hungary.

Source: Own editing based on PCA.

4.4 Reasons for Model Choice

The main aim of the second/confirmatory study was to offer a model for analysing factors that influenced students' behavioural intentions and compare the results of two countries. The current model was developed on the basis of the PCA results illustrated in Figure 21 and the extensive literature review in the previous chapter. Venkatesh et al. (2012) offered the best fit model including the same indicators as the results of the exploratory analysis.

4.4.1 Briefly About Model - UTAUT2

The first version of the Venkatesh *et al.* (2003) model was developed to measure employee acceptance of information technologies (Venkatesh *et al.*, 2003). In the current research, the author focused on the second version (or so-called extension) of the model which was developed for analysing the behaviour of users toward consumer electronics (Venkatesh, Thong and Xu, 2012). Model development, studies in smartphone market and criticism are discussed in the Review chapter. For achieving the goal of the current study, it was necessary to make some changes in the model and adapt by involving the results of the pilot study. It created favourable conditions to understand the behavioural intention of Azeri and Hungarian smartphone owners.

4.4.2 PCA and UTAUT2

Some components of the PCA conducted between Azeri and Hungarian respondents comply with the constructions of the UTAUT2 (Table 21). For example, the price/value ratio was the result of the analysis based on the Azeri sample and it was one of the indicators in the Venkatesh et al. (2012) model. According to the author of the current study, social environment was closely relates to social influence; usability, use of social media and outside use might be explained by using facilitating conditions and habit categories. Finally, gaming potential and gaming were strongly related to hedonistic motivation and habit constructions. Based on the mentioned similarities, the authors considered using the UTAUT2 as a relevant model for measuring the behavioural intentions of university students. The constructions and their compliance with the indicators included in the UTAUT2 are shown in Table 21. According to the mentioned similarities, the authors considered using the UTAUT2 as a relevant model for measuring the behavioural intentions of university students.

Table 21. The Results of the Pilot Study and the Related the UTAUT2 Constructions.

The Results of PCA	**The UTAUT2-related Constructions**
Price/Value Ratio	Price per value
Social Environment	Social Influence
Usability Use of social media Outside use	Facilitating Conditions and Habit
Gaming Potential and Gaming	Hedonistic Motivation and Habit

Source: Own editing based on the results of PCA.

The proposed model of user behaviour in the smartphone market included the relationships among ten latent variables (in some literature latent constructions (Hair *et al.*, 2014, p. 547)). *Latent constructions/variables are complex terms that are impossible to measure/observe directly by one indicator.* For example, symbolic brand image, brand awareness, satisfaction and so on, cannot be measured directly. Therefore, the author applied a set of questions/items in order to be able to measure them. The items employed to measure latent variables were the result of an extensive literature review about the smartphone market. Basically, in the current research, the latent variables measured used three questions (only Habit/HT was measured by two questions). Further analysis will be conducted using SEM.

Additionally, the 'Satisfaction' and 'Relative Advantage' indicators strengthened the assumption of the author of the current study to involve satisfaction as an additional indicator. Moreover, the brand had a strong factor loading that raised the author's attention to include brand knowledge in the study. In the literature, brand knowledge is considered a combination of brand awareness and brand image (Keller, 1993). Prestige was the remaining indicator that sustained the involvement of SBI.

4.5 Confirmatory Research Conducted in Azerbaijan and Hungary

4.5.1 Purpose of Confirmatory Research

The above-mentioned exploratory research created a picture about factors that might influence the behavioural intentions of smartphone users in Hungary and Azerbaijan. As a result, the author concluded to use the UTAUT2 in combination with some additional indicators (i.e. SBI, brand awareness, satisfaction). The survey aimed to identify the connection between variables and offer a model that might explain the behavioural intentions of students towards smartphones.

Table 22. Descriptive Statistics of Respondents for Final Model.

Category	Azerbaijan				Hungary			
	Paper Based		Online		Paper Based		Online	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Respondents	160	68.38%	74	31.62%	45	18.22%	202	81.78%
Gender								
Female	106	45.30%	57	24.36%	31	11.84%	150	60.73%
Male	54	23.08%	17	7.26%	14	5.26%	52	21.05%
Age								
17	64	27.35%	0	0.00%	0	0.00%	0	0.00%
18	40	17.09%	0	0.00%	6	1.97%	0	0.00%
19	16	6.84%	0	0.00%	14	5.26%	0	0.00%
20	5	2.14%	0	0.00%	15	5.59%	0	0.00%
21	20	8.55%	0	0.00%	3	1.97%	0	0.00%
22	11	4.70%	0	0.00%	4	1.32%	0	0.00%
23	2	0.85%	0	0.00%	1	0.33%	0	0.00%
24	2	0.85%	0	0.00%	2	0.00%	0	0.00%
0 – 18	0	0.00%	16	6.84%	0	0.00%	8	3.24%
18 – 24	0	0.00%	58	24.79%	0	0.00%	194	78.54%
Total	160	68.38%	80	31.62%	52	17.11%	202	81.78%
Brand								
Alcatel	0	0	0	0.00%	0	0.00%	1	0.40%
Asus	0	0	0	0.00%	0	0.00%	1	0.40%
Blackview	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Hoffmann	1	0.43%	0	0.00%	0	0.00%	0	0.00%
Honor	2	0.85%	2	0.85%	0	0.00%	4	1.62%
HTC	2	0.85%	0	0.00%	0	0.33%	3	1.21%
Huawei	3	1.28%	2	0.85%	8	2.96%	58	23.48%
Iphone	61	26.07%	29	12.39%	21	6.91%	73	29.55%
Leeco	1	0.43%	0	0.00%	0	0.00%	0	0.00%
Lenovo	0	0.00%	0	0.00%	0	0.00%	1	0.40%
LG	2	0.85%	0	0.00%	0	0.00%	3	1.21%
Meizu	0	0.00%	1	0.43%	0	0.00%	0	0.00%
Nokia	2	0.85%	0	0.00%	1	0.33%	1	0.40%
Oukitel	0	0.00%	1	0.43%	0	0.00%	0	0.00%
Oneplus	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Oppo	0	0.00%	0	0.00%	1	0.33%	0	0.00%
Samsung	62	26.50%	24	10.26%	8	3.95%	38	15.38%
Sony	0	0.00%	0	0.00%	0	0.00%	2	0.81%
Vernee	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Vivo	1	0.43%	0	0.00%	0	0.00%	0	0.00%
Xiaomi	23	9.83%	15	6.41%	6	1.97%	17	6.88%
Total	160	68.38%	80	31.62%	45	17.11%	202	81.78%

Source: own editing based on the questionnaire survey.

The next stage was to choose an appropriate research technique in order to achieve the purpose of the study. To attain the correct results, the author followed Hair et al.'s (2014, p. 643) recommendations about the "two-step SEM approach". First, reliability, normality convergent validity, and AVE will be tested, and only after can goodness and model fit be examined.

4.5.2 Descriptive Statistics: Azeri and Hungarian Samples

The responses of 234 Azeri students and 247 Hungarians were included in the final survey (Table 22). Inappropriate and incomplete questionnaires (i.e. missing answers and personal information) were removed from the database. 5% of outliers were excluded from the study to have a better picture of the general situation and avoid mistakes.

Women made up 70% of both samples. The respondents of the study were 17-24 year-old university students who basically owned iPhone (38.46% of Azeri respondents, 36.46% of Hungarian respondents) or Samsung smartphones (36.76% of Azeri respondents, 19.33% of Hungarian respondents). Chinese manufactured Xiaomi (16.24% of Azeri respondents, 8.85% of Hungarian respondents) and Huawei smartphones (2.13% of Azeri respondents, 26.44% of Hungarian respondents) were in third and fourth place. It is important to note that the Azeri students basically used Xiaomi while the Hungarian respondents preferred Huawei.

4.6 Exploratory Factor Analysis

Exploratory factor analysis (EFA) was conducted to be certain about constructions and correlations between items/variables. Following the aim of the study, ML (Promax rotation) extraction method was chosen. Factor loadings above 0.35 meet the minimal requirement for the sample size is around 250 respondents (Hair *et al.*, 2014, p. 115). Accordingly, 0.3 was considered the threshold level for factor loadings. Kaiser–Meyer–Olkin measure of sampling adequacy (well known as KMO) was accepted to be higher than 0.5 while values greater than 0.7 indicate reliable and separate factors (Field, 2013, p. 101).

4.6.1 EFA for Azerbaijan

Firstly, FC3 was deleted from the analysis due to very low factor loadings (< 0.3; TVE=0.5; KMO=0.802). Also, items of social influence construction were weakly correlated (factor loadings less than 0.3) with each other. For this reason, 'Social Influence' was excluded from EFA. As a result, total variance increased around 0.09 (TVE=0.59). For model validating purposes, Kaiser-Meyer-Olkin's measure of sampling adequacy greater than 0.6 was accepted (Mohd Suki, 2013b).

Factor loadings lower than 0.3 were the main reason for excluding SBI3 from the analysis, which caused an increase in total variance (TVE=0.61; KMO=0.798). BA3 also had a slightly high number from 0.3, however, removal of the items negatively influenced the whole pattern matrix. The author therefore decided to use it in a further analysis. Moreover, Cronbach's Alpha of BA construction was greater than 0.6 which is accepted in the statistical literature. The results of exploratory factor analysis, as well as correlations/Cronbach's Alpha, were illustrated in Table 23.

The constructions of 'Hedonistic Motivation', 'Satisfaction', and 'Behavioural Intention' had high results for Cronbach's Alpha. 'Habit' consisted of only two items. That was the reason for the replacement of Cronbach's Alpha with the Spearman Correlation Coefficient. Based on the same reason, the Spearman Correlation Coefficient was calculated for SBI and 'Facilitating Conditions' (FC). There were significant correlations between items for all three constructions, however, the strength of the relationship might be considered medium-strong (0.66) only in the

case of habit. Moreover, factor loadings of all constructions excluding SBI and FC were high enough.

Table 23. Pattern Matrix of EFA Azerbaijan.

Item	1st factor	2nd factor	3rd factor	4th factor	5th factor	6th factor	7th factor	8th factor	α*	α - if item deleted
HM3	.918								0.872	0.803
HM1	.843									0.838
HM2	.797									0.816
SA3		.928							0.888	0.815
SA2		.837								0.841
SA1		.781								0.864
BI3			.748						0.797	0.724
BI1			.705							0.722
BI2			.693							0.726
HT1*				.869					0.665	
HT2*				.751						
BA2					.837				0.681	0.479
BA1					.688					0.488
BA3					.314					0.739
PV3						.682			0.69	0.617
PV1						.662				0.641
PV2						.591				0.531
SBI2*							.996		0.364	
SBI1*							.390			
FC1*								.867	0.429	
FC2*								.362		

Source: own editing based on statistical analysis.

Note 1: items FC3 and SBI3 was excluded; construction SI was excluded.
Note 2: KMO=0.798; TVE=60.938; Factors with eigenvalues higher than 1 extracted; Extraction Method: Maximum Likelihood. Rotation Method: Promax with Kaiser Normalization.
Note 3: α* - Cronbach's Alpha; SI – Social Influence; SBI – Symbolic Brand Image; FC- Facilitating Conditions; BA – Brand Awareness; SA – Satisfaction; HM – Hedonistic Motivation; PV – Price per value; HT – Habit; BI - Behavioural Intention.
Note 4: **In the case of HT, SBI, and FC Spearman Correlation Coefficient was calculated; P ≤0.01.

4.6.2 EFA for Hungary

In the beginning, when all variables were included in the survey, KMO was equal to 0.749 and TVE was only 52.425. Firstly, FC3 excluded from analysis because of very low (>0.2) factor loadings (KMO=0.748; TVE=50.529). Interestingly, all items of FC construction moved in different factors. For the same reason, FC2 was the next item excluded from the analysis. It is a well-known fact that the remaining item cannot explain the latent variable in the analysis, so the construction was deleted as a result. (KMO=0.75; TVE=53.732).

Table 24. The Pattern Matrix of EFA Hungary.

Items	1st factor	2nd factor	3rd factor	4th factor	5th factor	6th factor	α*	α - if item deleted
SA1		0.812						0.723
SA2		0.939					0.809	0.656
SA3		0.680						0.872
HM1	0.793							0.911
HM2	0.972						0.903	0.799
HM3	0.859							0.859
SBI1					0.568			0.531
SBI2					0.765		0.626	0.463
SBI3					0.498			0.582
PV1**				0.896			0.487**	
PV2**				0.911				
BI1			0.592					0.818
BI2			0.824				0.764	0.542
BI3			0.836					0.566
BA1						0.526		0.488
BA2						0.626	0.570	0.479
BA3						0.522		0.739

Source: own editing based on statistical analysis.

Note 1: constructions FC, HT, and SI were excluded.
Note 2: KMO=0.712; TVE=59.976; Factors with eigenvalues higher than 1 extracted; Extraction Method: Maximum Likelihood. Rotation Method: Promax with Kaiser Normalization.
Note 3: α* - Cronbach's Alpha; SI – Social Influence; SBI – Symbolic Brand Image; BA – Brand Awareness; SA – Satisfaction; HM – Hedonistic Motivation; PV – Price per value; HT – Habit; BI - Behavioural Intention.
Note 4: **In the case of PV construction Spearman Correlation Coefficient was calculated. P ≤0.01.

Habit consisted of two items; from the beginning, the items moved together with BI items. HT2 also showed cross-loadings from the beginning and all previous actions did not change it. All of the loadings were less than 0.3. Thus, the construction (i.e. HT/Habit) was deleted from further analysis. (KMO=0.724; TVE=55.934). Interestingly, SI3 from the beginning was moving in the

same factor with SBI and all the above-mentioned changes did not influence SI3. So, it was necessary to drop it from further analysis. The other items of the social influence construction also did not fit requirements. Moreover, the removal did not make any significant change in KMO, while TVE almost reached the threshold of 60% (KMO=0.712; TVE=59.976).

Interestingly, 'Satisfaction', 'Hedonistic Motivation', and 'Behavioural Intention' constructions also had high results for Cronbach's Alpha in Hungary (Table 24). SBI and Brand Awareness had low numbers near the threshold of 0.6 (i.e. 0.62 and 0.57 respectively). In the case of Hungary, price per value included only two items. That was the reason for the replacement of Cronbach's Alpha with the Spearman Correlation Coefficient. There was a correlation between items of price per value, however, the strength of the relationship might be considered to be at medium (0.48) level. Moreover, in the case of the Hungarian sample, the factor loadings of all constructions were high enough.

4.7 Reliability and Validity

4.7.1 Results of the Reliability Tests for Azerbaijan

Firstly, the outliers that might influence the results of the SEM were deleted from the analysis. According to the results of the Azeri sample, Social Influence (abbr. SI; n=3; α(SI)=0.362) and Facilitating Conditions (Table 25; abbr. FC; n=3; α(FC)=0.359) seemed to be problematic in terms of reliability. It was impossible to increase the reliability of SI construction as all items of construction showed very low correlations with each other. Consequently, strengthened by the results of EFA SI will not be involved in further analysis.

The situation regarding FC differs from the above described. If the author excludes/deletes the third item, the Cronbach's Alpha increases significantly and rises to the accepted level (Table 25; abbr. FC; n=2; α(FC)=0.55). So, it is possible to use the construction in future investigations. Moreover, the results of EFA also support using FC in further analysis.

From the beginning, reliability scores for SBI (abbr. SBI; n=3; α(SBI)=0.526) and 'Brand Awareness' (abbr. BA; n=3; α(BA)=0.681) were in the accepted range. However, the deleted item allowed defining how the results could be improved. Also supported by EFA outcome, SBI3 was excluded from SBI construction which allowed for better results (n=2; α(SBI)=0.568). The removal of SBI3 also was necessary in order to have valid results of EFA. The results of Cronbach's Alpha also offer to delete BA3, which would increase the correlation between items from 0.681 to 0.739. However, based on EFA results, the author of the current research decided to use BA3 in further analysis. The results of the Cronbach's Alpha for all remaining latent constructions are in acceptable range and are illustrated in Table 25.

In the case of the SEM, it is impossible to conduct an analysis by employing one reliability and validity test. For this reason, Construction/Composite Reliability (CR), Average Variance Extracted (AVE), Maximum Shared Variance (MSV) and Maximum Reliability (Max R(H)) were calculated. Statistical requirements for the following measures are illustrated in the Reliability and Validity Requirements Table. CR results of all variables were above of accepted level of 0.6. The numbers indicating MSV and Max R(H) levels were in the acceptable range. The results of the mentioned tests for Azerbaijan were illustrated in Table 27.

The numbers for AVE were lower than 0.45 only in one construction: Facilitating Conditions. Also, CR and MSV results were lower than the allowed level. The square root of the AVE for FC is less than the absolute value of the correlations with the other latent variables. The results for FC violated all mentioned requirements and it will be excluded from further analysis. All other latent variables meet the statistical requirements and were used for further analysis.

Table 25. The Results of Cronbach's Alpha for Azerbaijan

Latent Construction	Items in Latent Construction	If item deleted	Cronbach's Alpha
SBI*	SBI1 SBI2 SBI3 - deleted	0.402 0.230 **0.568**	0.526
BA	BA1 BA2 BA3	0.488 0.479 0.739	0.681
SA	SA1 SA2 SA3	0.864 0.841 0.815	0.888
SI**	SI1 SI2 SI3	0.365 0.237 0.210	0.362
FC*	FC1 FC2 FC3 - deleted	0.195 0.132 ***0.550***	0.359
HM	HM1 HM2 HM3	0.838 0.816 0.803	0.872
PV	PV1 PV2 PV3	0.641 0.531 0.617	0.69
HT	HT1 HT2		0.796
BI	BI1 BI2 BI3	0.722 0.726 0.724	0.797

Source: own editing based on statistical analysis.

Note 1: SBI – Symbolic Brand Image; BA – Brand Awareness; SA – Satisfaction; SI – Social Influence; HM – Hedonistic Motivation; PV – Price per value; HT – Habit; BI - Behavioural Intention.

Note 2: * - In order to achieve high reliability one item might be deleted from constructions (Strengthened with EFA, SBI3 and FC3 deleted, BA3 kept).

Note 3: ** - Because of the low-reliability score, the construction was deleted from further analysis (Strengthened with EFA, SI was deleted from analysis).

4.7.2 Results of Reliability Tests for Hungary

Facilitating Conditions (abbr. FC; n=3; α(FC)=0.251), Brand Awareness (abbr. BA; n=3; α(BA)=0.57) and Social Influence (abbr. SI; n=3; α(SI)=0.485) showed low Cronbach's Alpha results for Hungarian students. All items of FC construction had extremely low correlations and it was impossible to increase the reliability construction even by dropping one of the items. As a result, FC was excluded from further analysis. The results of the Cronbach's Alpha for all remaining latent constructions are in acceptable range and are illustrated in Table 26.

The Brand Awareness situation differs from the one above described. The level of Cronbach's Alpha was close to the threshold nevertheless, BA construction was used in further analysis based on the results of EFA. The calculation of the reliability and validity tests were the next stage of construction validation. The results for AVE(BA) and CR(BA) were 0.563 which were lower than the accepted range. The square root of the AVE for BA was higher than the absolute value of the correlations with the other latent variables. The reliability and validity results for BA

violated two requirements from three and BA construction was excluded from further analysis. All other latent variables meet the statistical requirements and were used for further analysis. The results of the mentioned tests for Hungary were illustrated in Table 28.

The correlation among the items in the case of 'Social Influence' was very low (n=3; α=0.485) and according to the results of EFA, items did not move in the same factor. So, the appropriate choice was to remove the construction. In the case of SBI, the composite reliability result of the original construction was lower than the accepted range (CR(SBI)=0.639). The author attempted to increase composite reliability by excluding SBI3 from the analysis and increased its number up to the accepted level (CR(SBI)=0.665).

Table 26. The Results of Cronbach's Alpha for Hungary.

Latent Construction	Items in Latent Construction	If item deleted	Cronbach's Alpha
SBI*	SBI1	0.531	0.626
	SBI2	0.463	
	SBI3 - deleted	0.582	
BA	BA1	0.434	0.570
	BA2	0.494	
	BA3	0.482	
SA	SA1	0.723	0.809
	SA2	0.656	
	SA3	0.872	
SI**	SI1	0.268	0.485
	SI2	0.285	
	SI3 - deleted	0.521	
FC**	FC1	0.200	0.251
	FC2	0.149	
	FC3	0.195	
HM	HM1	0.911	0.903
	HM2	0.799	
	HM3	0.859	
PV	PV1	0.708	0.832
	PV2	0.627	
	PV3	**0.897**	
HT**	HT1		
	HT2		
BI	BI1	0.818	0.764
	BI2	0.542	
	BI3	0.566	

Source: own editing based on statistical analysis.

Note 1: SI – Social Influence; SBI – Symbolic Brand Image; BA – Brand Awareness; SA – Satisfaction; HM – Hedonistic Motivation; PV – Price per value; HT – Habit; FC- Facilitating Conditions; BI - Behavioural Intention.
Note 2: * - In order to achieve high reliability one item deleted from constructions.
Note 3: ** - Because of the low numbers of reliability and validity tests as well as the results of EFA the construction was deleted from further analysis.

Table 27. The Results of Reliability and Validity Analysis for Azerbaijan.

	CR	AVE	MSV	MaxR(H)	SA	FC	HM	PV	HT	BA	BI	SBI
SA	0.889	0.728	0.187	0.894	**0.853**							
FC	**0.556**	**0.387**	**0.411**	0.566	0.398	**0.622**						
HM	0.875	0.701	0.441	0.878	0.138	0.428	**0.837**					
PV	0.695	0.459	0.203	0.901	0.433	0.450	0.370	**0.677**				
HT	0.802	0.671	0.286	0.829	-0.088	0.235	0.476	0.138	**0.819**			
BA	0.704	0.461	0.282	0.793	0.389	0.531	0.275	0.263	0.139	**0.679**		
BI	0.799	0.571	0.441	0.805	0.140	0.641	0.664	0.451	0.535	0.395	**0.755**	
SBI	0.751	0.652	0.144	1.173	0.077	0.145	0.379	0.134	0.171	0.167	0.262	**0.807**

Source: own editing based on statistical analysis.
Note 1: CR - Construction/Composite Reliability; AVE – Average Variance Extracted; MSV - Maximum Shared Variance; Max R(H) - maximum reliability; SI – Social Influence; SBI – Symbolic Brand Image; BA – Brand Awareness; SA – Satisfaction; HM – Hedonistic Motivation; PV – Price per value; HT – Habit; FC- Facilitating Conditions; BI - Behavioural Intention.
Note 2: according to the result of EFA Azerbaijan, SI construction was deleted; according to the result of EFA Azerbaijan, SBI3 and PV3 items was deleted.

Table 28. The Results of Reliability and Validity Analysis for Hungary.

	CR	AVE	MSV	MaxR(H)	HM	SBI	PV	SA	BI
HM	0.908	0.768	0.316	0.947	**0.876**				
SBI	0.665	0.522	0.093	0.833	0.105	**0.723**			
PV	0.852	0.665	0.093	0.927	-0.010	-0.305	**0.815**		
SA	0.850	0.658	0.008	0.908	0.064	0.013	0.091	**0.811**	
BI	0.794	0.569	0.316	0.836	0.562	0.144	0.161	0.015	**0.754**

Source: own editing based on statistical analysis.
Note 1: CR - Construction/Composite Reliability; AVE – Average Variance Extracted; MSV - Maximum Shared Variance; Max R(H) - maximum reliability; SI – Social Influence; SBI – Symbolic Brand Image; BA – Brand Awareness; SA – Satisfaction; HM – Hedonistic Motivation; PV – Price per value; HT – Habit; BI -Behavioural Intention.
Note 2: according to the result of EFA Hungary, SI, FC and HT constructions were deleted; according to the result of EFA Hungary, SBI3 items were deleted.

4.8 Results and Discussion

The current survey focused on an investigation of the main drivers of behavioural intention toward smartphones from a cross-cultural point of view. The Extension of The Unified Theory of Acceptance and Use of Technology was partially applied by involving brand knowledge indicators and satisfaction of purchase in the study. The mentioned indicators were identified as the result of the pilot study. The statements measuring SBI, Satisfaction of Purchase, and Brand Awareness were included in the final questionnaire.

The proposed model examined university students in Azerbaijan and Hungary. Widespread usage of smartphones and the review of the literature regarding performance and effort expectancy (Venkatesh *et al.*, 2003; Venkatesh, Thong and Xu, 2012; Venkatesh, 2015) allowed the author to exclude the indicators from the study. The results of the current surveys were different from the original results. This might be due to a specific segment and age (17-24) of respondents, economic and cultural situations and so on. According to the results of path analysis, students' behavioural intentions toward smartphones were affected by hedonistic motivation and habit in both countries.

4.8.1 Probability Value (p-value)

Probability level is used to define "a fraction or a proportion" (Gravetter and Wallnau, 2014, p. 151). It is a value at which the mentioned assumption/hypothesis can be supported by statistical calculations. In a current study, all hypotheses accepted if $p \leq 0.05$, (there is a significant relationship between variables), and $p \leq 0.01$ (i.e. confidence interval 99%), which explains the strong relationship between variables (formulated as there is a **strong (or highly significant)** relationship between variables). As result, the author of the study set the confidence interval (Byrne, 2016) at 95% for latent variable-related hypotheses (i.e. hypotheses 1-5). The confidence interval in the case of model building/validation (i.e. Hypothesis 6: model explains behaviour of students) is defined by scholars and acceptable ranges are illustrated in the Materials and Methods chapter.

4.9 Results for Azerbaijan: Structural and Measurement Models and Hypothesis Testing

4.9.1 Structural Model

The proposed model was tested employing the ML estimation technique using AMOS 23.0. Basic goodness-of-fit indices were employed to measure the fit of the proposed structural model (Table 29); Chi-square, $\chi 2/df$, GFI, AGFI, CFI, TLI, SRMR, and RMSEA were calculated. The chi-square value was 207.183 ($p > 0.05$), which showed that the model was a good fit. $\chi 2/df$ was 1.594, which was below the threshold of 3.00 (Hu and Bentler, 1999).

The results of GFI, CFI, and TLI for the structural model were 0.915, 0.95 and 0.943 respectively; the values for all indices were in the accepted range (Hu and Bentler, 1999; Hair et al., 2014). According to the results of the Azeri sample, AGFI was a slightly lower than 0.9 (i.e. 0.876); however, it was suitable according to requirements offered by Hu and Bentler (1999). SRMR and RMSEA showed reliable results that were lower than the suggested criteria 0.08 (Hair et al., 2014). All the fit indices proved that the proposed model complied with the suggested criteria. The goodness of fit of the proposed structural model was illustrated in Table 29.

Table 29. Fit Indices of Structural and Measurement Models for Azerbaijan.

Structural Model variables	χ^2	p.	χ^2/df*	GFI	AGFI	CFI	TLI	SRMR	RMSEA
Requirements for fit Indices	Significant p-values with good fit	≥ 0.05	<3 <5* sometimes acceptable	>0.9 >0.95*	>0.9 >0.8*	>0.95 >0.90* >0.80* sometimes acceptable	>0.9	≤ 0.08 <0.09*	≤ 0.08 < 0.05 good 0.05-0.10 moderate >0.10 bad
Structural Model Azerbaijan	207.183	0.00	1.594	0.915	0.876	0.956	0.943	0.050	0.05
Proposed Model Azerbaijan	425.389	0.00	3.272	0.819	0.762	0.829	0.799	0.156	0.099

Source: own editing based on literature review.

Note 1: thresholds offered by Hair et. al (2014) was not marked; * - thresholds offered by Hu and Bentler (1999).
Note 2: number of observations/respondents (N(AZ)=234); the number of observed variables that create latent construction (m(AZ)=19).

4.9.2 Measurement model

Three UTAUT2-related variables (Hedonistic Motivation, Price per value, and Habit), as well as SBI, Brand Awareness and Satisfaction of Purchase were involved in the path analysis. According to the results of the path analysis of the survey conducted with Azeri participants, all hypotheses (excluding SBI) were confirmed. Unfortunately, according to the results of the path analysis, SBI did not influence the behavioural intention of the questioned university students in Azerbaijan.

Table 30. The Test Results of Hypotheses for Azerbaijan.

Hypotheses	Estimate	S.E.	C.R.	P
H1.1 SBI → BI	0.034	0.053	.635	0.526
H1.2 BA → BI	0.226	0.048	4.715	≤ 0.001**
H2 SA → BI	-0.071	0.032	-2.209	0.027*
H3 HM → BI	0.313	0.043	7.299	≤ 0.001**
H4 PV → BI	0.307	0.054	5.719	≤ 0.001**
H5 HT → BI	0.164	0.034	4.768	≤ 0.001**

Source: own editing based on statistical analysis.

Note 1: SBI – Symbolic Brand Image; BA – Brand Awareness; SA – Satisfaction; HM – Hedonistic Motivation; PV – Price per value; HT – Habit; BI - Behavioural Intention.
Note 2: S.E. – Standard Error; E - Path Estimate/Parameter Estimate; C.R. – Critical Ratio;
Note 3: * means $p \leq 0.05$ (significant); ** means $p \leq 0.01$ (highly significant).

According to the results of the ML estimate, brand awareness and the UTAUT2-related variables had highly significant relationships with behavioural intention (Table 30). Only in the case of satisfaction was value of p was higher than 0.001; path estimate, and critical ratio proved that the

relationship between satisfaction of purchase and behavioural intention had effects opposite to what was expected. Behavioural intention of Azeri respondents who participated in the survey had a briefly positive influence on satisfaction of purchase. Social influence and facilitating conditions were excluded from the analysis based on the low numbers for reliability tests. In the end, the results of four of six path estimates of the Azeri Sample were significant in the proposed direction. Figure 22 demonstrates all the above and the hypothesized relationship between variables in the Azeri sample.

The last hypothesis mentioned in the introduction is related to the results of the measurement model. The above-illustrated results of the measurement model (Table 29) prove that the proposed measurement model was not a good representation of the students' behavioural intention towards the smartphone. Even in the case of relying on requirements offered Hu and Bentler (1999), which support lower threshold values for model validation, GFI (0.819<0.9) and SRMR (0.156 > 0.08) did fall in the accepted range. The goodness of fit of the proposed measurement model for Azerbaijan was illustrated in Table 30. As result, the structural model was a good representation of the hypothesized relationships among questioned Azeri students.

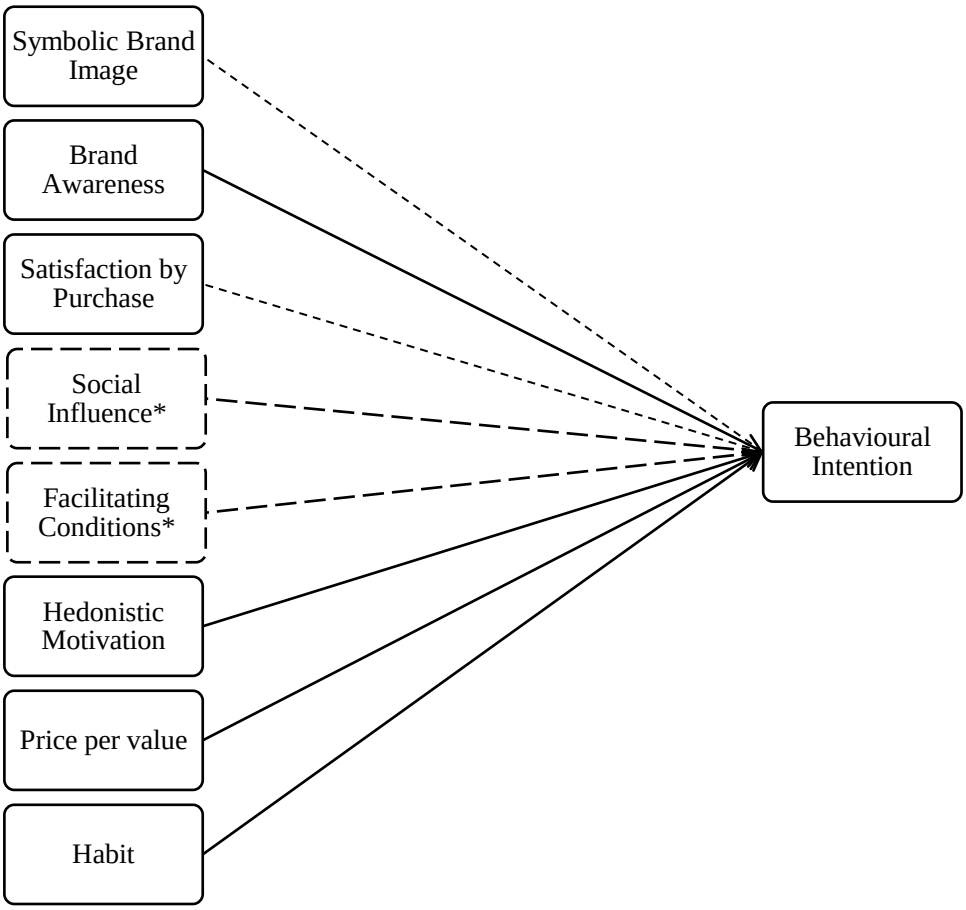


Figure 22. Measurement Model for Azerbaijan: Hypotheses Testing.

Source: own editing.

Note 1: ⟶ significant relationship; ⇢ insignificant relationship ⇠ did not pass reliability/validity tests.
Note 2: * Originally the author planned to have a separate hypothesis measuring the relationship between Social Influence and Behavioural Intention, however because of low numbers in reliability tests, it was impossible to identify whether there is a relationship or not.

4.10 Results for Hungary: Structural and Measurement Models and Hypothesis Testing

4.10.1 Structural Model for Hungary

Chi-square value for the Hungarian sample was 177.204 ($p > 0.05$), which might indicate the good model fit (Table 31). $\chi 2/df$ was 2.645, which was below the threshold of 3.00 (Hu and Bentler, 1999). The results of the GFI, CFI, and TLI were 0.913, 0.863, and 0.935 respectively. As expected, the values for all mentioned indices were in the accepted range (Hu and Bentler, 1999; Hair et al., 2014). AGFI was also lower than 0.9 (i.e. 0.863) in Hungary, however, it is suitable according to requirements offered by Hu and Bentler (1999). SRMR showed reliable results that were lower than the suggested criteria 0.08 (Hair et al., 2014) while RMSEA was slightly higher than the accepted level. The numbers were high in comparison with the results of the Azeri sample. The current structural model made for Hungary was a good representation of the hypothesized relationships. The goodness of fit indices of the proposed structural model is illustrated in Table 31.

Table 31. Fit Indices of Structural and Measurement Models for Hungary.

Structural Model variables	**χ^2**	**p**	**χ^2/df***	**GFI**	**AGFI**	**CFI**	**TLI**	**SRMR**	**RMSEA**
Requirements for fit Indices	Significant p-values with good fit	≥ 0.05	<3 <5* sometimes acceptable	>0.9 >0.95*	>0.9 >0.8*	>0.95 >0.90* >0.80* sometimes acceptable	>0.9	≤ 0.08 <0.09*	≤ 0.08 < 0.05 good 0.05-0.10 moderate >0.10 bad
Structural model for Hungary	177.204	0.00	2.645	0.913	0.863	0.935	0.912	0.0772	0.082
Proposed model for Hungary	248.566	0.00	3.359	0.878	0.827	0.897	0.874	0.1084	0.098

Source: own editing based on statistical analysis.

Note 1: * - thresholds offered by Hu and Bentler (1999).
Note 2; the number of observations/respondents (N(HU)=247); the number of observed variables that create latent construction (m(HU)=14).

4.10.2 Measurement model

In the Hungarian sample, SBI had a direct influence on behavioural intention. However, the value of p was higher than 0.001 that means that the result is not highly significant. The satisfaction of purchase had no direct impact on behavioural intention (Table 32). The results of reliability tests of the second brand knowledge indicator - Brand Awareness were insufficient. Only two of the UTAUT2 related variables: Hedonistic Motivation and Price per value had a highly significant influence ($p \leq 0.001$) on Behavioural Intention. Based on the output of reliability tests, Habit (i.e. last two of the UTAUT2 indicators) were excluded from the analysis. In the end, the results of three of five path estimates of the Hungarian Sample were significant in the proposed direction. Figure 23 proves all above mentioned the hypothesized relationship between variables in the Hungarian sample.

Table 32. The test results of hypotheses for Hungary.

Hypotheses	**Estimate**	**S.E.**	**C.R.**	**P**
H 1.1 SBI → BI	2.665	1.103	2.416	0.016*
H 1.2 BA → BI	Low-reliability scores			
H2 SA → BI	-0.042	0.063	-0.671	0.502
H3 HM → BI	0.404	0.049	8.183	≤ 0.001**
H4 PV → BI	0.126	0.039	3.263	≤ 0.001**
H5. HT → BI	Low-reliability scores			

Source: own editing.

Note 1: SBI – Symbolic Brand Image; BA – Brand Awareness; SA – Satisfaction; HM – Hedonistic Motivation; PV – Price per value; HT – Habit; BI - Behavioural Intention.
Note 2: S.E. – Standard Error; E - Path Estimate/Parameter Estimate; C.R. – Critical Ratio.
Note 3: * means $p \leq 0.05$ (significant); ** means $p \leq 0.01$ (highly significant);

The last hypothesis mentioned in the introduction was related to the results of the measurement model. The goodness of fit of the proposed measurement model for Hungary was illustrated in Table 30. The illustrated results proved that the proposed measurement model might be a good representation of the student's behavioural intention towards the smartphone in Hungary.

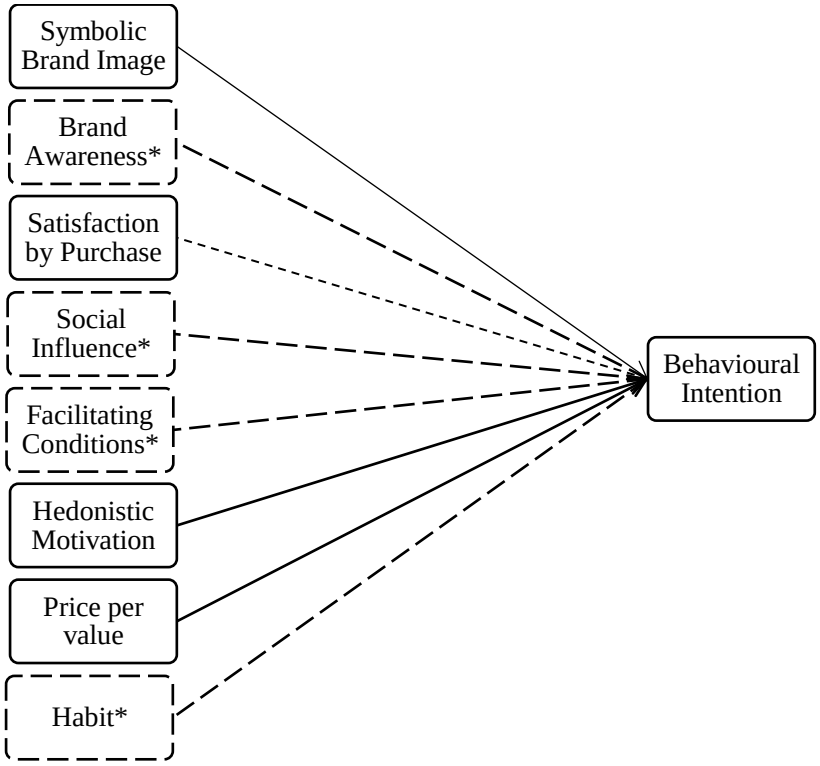


Figure 23. Measurement Model for Hungary: Hypotheses Testing.

Source: own editing based on statistical analysis.

Note 1: ⟶ significant relationship; ⇢ insignificant relationship; - - - - - - - - did not pass reliability/validity tests.
Note 2: * Originally the author planned to have a separate hypothesis measuring the relationship between Social Influence and Behavioural Intention, however because of low numbers in reliability tests, it was impossible to identify whether there is a relationship or not.

4.11 Discussion

Symbolic Brand Image (SBI) → Behavioural Intention (BI)

Symbolic Brand Image was involved in the research as the result of the pilot study conducted among Azeri and Hungarians. In the beginning, the aim of the author was the involvement of SBI was to measure the mediating effect of SBI in the relationship between Social Influence and Behavioural Intention toward smartphones. However, the results of reliability tests of Social Influence made impossible to define whether there is a relationship or not. Then the author of current research decided to measure the influence of the Symbolic Brand Image of the smartphone on students between 17-24.

The results prove that questioned Azeri students were not influenced by their smartphones' Symbolic Brand Image. Moreover, the author already indicated comparatively high prices in terms of iPhones and Samsung handsets in Azerbaijan by comparing prices of the same smartphone models in different countries. It was also proven by the results of descriptive statistics; More Azeri students (in comparison with Hungarians) had Xiaomi smartphones which considered to be cheaper in comparison with Huawei. A large number of Consumer Price Index (149%) indicated by the UN statistics (United Nations, 2020a) also prove the mentioned idea. "Affordability of devices and services" calculated for Azerbaijan (We Are Social & Hootsuite, 2019a) illustrates that the Azerbaijani population has less money for purchasing a smartphone in comparison with Hungarian (We Are Social & Hootsuite, 2019b). It means that in the past few years inflation was high in Azerbaijan, and in combination with low income, it made expensive smartphones less accessible for Azeri smartphone users. Also, students are the group, highly influenced by the changes in income level. So, considering the income and affordability level of Azeri students, it is logical that respondents' behavioural intentions toward smartphones were not influenced by SBI.

Interestingly, the results of the survey among Hungarian students showed the direct influence of the SBI of smartphone manufacturers on students' behavioural intentions (Hu: SBI→BI; P=0.016). The lower CPI number (114%) compared to Azerbaijan might explain this. Moreover, per capita GDP, the unemployment rate (United Nations, 2020b), as well as the affordability of handsets (We Are Social & Hootsuite, 2019b) in Hungary, have higher numbers in comparison with Azerbaijan. Considering the macroeconomic situation, Hungarian students have better chances to buy or receive a better smartphone. It can be the main reason for the positive relationship between SBI and the behavioural intentions of the questioned Hungarian students. Earlier, Chen et al. (2018) proved that brand image had a positive influence on purchase intention in Taiwan. The survey result for Hungary corroborated the findings of Chen et al. (2018) in Taiwan, however the result differed from the current research findings in Azerbaijan.

Table 33. The comparison of results between the Azeri and Hungarian samples.

	AZERBAIJAN		HUNGARY	
Hypotheses	**Method**	**Status**	**Estimate**	**Status**
Hypothesis 1.1 Symbolic Brand Image has a significantly positive influence on the Behavioural Intentions of students toward smartphones in examined countries.	SEM	Rejected	SEM	Accepted
Hypothesis 1.2 Brand Awareness has a significant positive influence on the Behavioural Intentions of students toward smartphones in examined countries.	SEM	Accepted	SEM	Not reliable
Hypothesis 2 Satisfaction has a significant positive influence on the Behavioural Intention of students toward smartphones in examined countries.	SEM	Rejected	SEM	Rejected
Hypothesis 3. Hedonistic Motivation has a significantly positive influence on Behavioural Intention of students toward smartphones in examined countries.	SEM	Accepted	SEM	Accepted
Hypothesis 4. Price per value has a significantly positive influence on Behavioural Intention of students toward smartphones in examined countries.	SEM	Accepted	SEM	Accepted
Hypothesis 5. Habit has a significantly positive influence on the Behavioural Intentions of students toward smartphones in examined countries.	SEM	Accepted	SEM	Not reliable
Hypothesis 6. The proposed models are valid and can be applied for measuring the Behavioural Intentions of students toward smartphones in the examined countries.	Model validation	Rejected	Model validation	Accepted

Source: own editing.

Brand Awareness (BA) → Behavioural Intention (BI)

Predictably, brand awareness had a significant positive effect on behavioural intention towards smartphones among Azeri students (Az: BA→BI; P≤ 0.001). It means that well-informed users/students are more likely to have positive behavioural intentions toward purchasing and using smartphones. Unfortunately, the results of the path analysis for the Azeri sample could not be compared with the Hungarian sample. Brand Awareness was excluded from the analysis because of low-reliability scores. In previous studies (Huang and Shih, 2017; Filieri *et al.*, 2019) related to the smartphone market, brand awareness was measured for analysing brand equity. Only one study (Wu and Ho, 2014) measured the relationship between brand awareness and purchase intention where variables did not have any direct relationship. So, the results of the current study do not corroborate any previously-mentioned research, however, they are consistent with the findings of Mohd Suki (2013b) related to the brand name and smartphone demand in Malaysia. The brand name scale used in Malaysia does not differ much from the brand awareness scale employed in the current survey.

The Satisfaction of Purchase (SA) → Behavioural Intention (BI)

There are a lot of studies that aimed to measure smartphone owners' satisfaction (Kim *et al.*, 2016; Ma, Chan and Chen, 2016; Pappu and Quester, 2016), however, research measuring the relationship between satisfaction and behavioural intention is scarce. Previous studies proved that satisfaction has a positive influence on repurchase intention in Nigeria (Adekunle and

Ejechi, 2018). Also, a relationship between smartphone use and life satisfaction was proven both in the USA and in South Korea (Kang and Jung, 2014).

According to the results of the path analysis, satisfaction had a significant effect in Azerbaijan (Az: SA→BI; P=0.027) while it had no effect on behavioural intention among Hungarian students (Hu: SA→BI; P≥ 0.05). The difference in results between the Azeri and Hungarian samples proved the difference in consumers' behavioural intentions in different countries (Table 33). In Azerbaijan, the hypothesis was rejected because of the direction of the relationship. The parameter/path estimate, and critical ratio showed negative scores for satisfaction, while the result of the analysis was significant for Azeri students. In terms of satisfaction, a similar situation was reported by Hair et al. (2014, p. 656).

Hedonistic Motivation (HM) → Behavioural Intention (BI)

Hedonistic motivation was considered one of the three key indicators included in the updated version of the UTAUT modified for consumer electronics (Venkatesh, Thong and Xu, 2012). According to the results of the survey conducted among Azerbaijani (Az: HM→BI; P≤ 0.001) and Hungarian students (Hu: HM→BI; P≤ 0.001), hedonistic motivation has a positive influence on the formulation of survey participants' behavioural intention (Table 33). The result of the study confirms previous research regarding technology acceptance in Portugal (Macedo, 2017), in terms of mobile banking in Jordan (Alalwan, Dwivedi and Rana, 2017). However, in some studies (Gupta, Dogra and George, 2018; Merhi, Hone and Tarhini, 2019) these variables had no relationship. The moderators of the strong positive relationship between latent variables can be the age, gender, and/or experience/status of smartphone users (Venkatesh, Thong and Xu, 2012). In the current research, the significance of the relationship could be connected to age (17-24) and smartphone users' occupations.

Price per value (PV) → Behavioural Intention (BI)

The findings proved that price per value had a positive significant effect on behavioural intention towards smartphones (Table 33) among Azeri (Az: PV→BI; P≤ 0.001) and Hungarian students (Hu: PV→BI; P≤ 0.001). The price per value attracts the particular attention of Azeri and Hungarian smartphone users. The results might be significant due to students' relatively low income and purchasing power. Mainly, parents are the buyers of students' smartphones as therefore price per value plays an essential role because students have a certain defined budget for their smartphones. Mentioned reasons directly influence the behavioural intention of survey participants. Previous studies examining price per value presented contradictory results; some of them proved (Alalwan, Dwivedi and Rana, 2017; Ameen and Willis, 2018; Ameen, Willis and Hussain Shah, 2018) a relationship between price per value and behavioural intention while the others rejected it (Macedo, 2017; Merhi, Hone and Tarhini, 2019). As mentioned before, it could be connected with the users' segment, as well as cultural or economic differences among others.

Habit (HT) → Behavioural Intention (BI)

Habit was one of the indicators included in the UTAUT to extend it to the consumer use context. Venkatesh et al. (2012) included habit as a strong predictor of learned automatized behaviour. The construction proved its importance, however, it is rarely involved in the UTAUT2-related studies (Tamilmani *et al.*, 2018). The findings of the current study (Table 33) confirm that habit is one of the strong predictors of behavioural intentions toward smartphones (Az: HT→BI; P≤ 0.001) among questioned Azeri university students. Unfortunately, habit did not pass reliability and validity tests in the case of Hungarian sample. The results of this study support previous findings. All reviewed studies (Macedo, 2017; Gupta, Dogra and George, 2018; Merhi, Hone and Tarhini, 2019) also showed that habit had a positive relationship with behavioural intention.

5 CONCLUSION AND RECOMMENDATION

The current study focused on understanding the formulation of students' behavioural intentions (Azerbaijani and Hungarian) toward smartphones. The main part of the research was conducted in Azerbaijan and Hungary at the same period. The final questionnaire development was based on the literature review regarding behavioural intention toward smartphones (i.e. relying on the UTAUT2); the survey combines the statements related to several new constructions as symbolic brand image, brand awareness, satisfaction of purchase as well as the UTAUT2-related variables. The hypotheses built on the direct relationship between latent constructions and model validation. The confirmatory study was made by using SEM, and the ML estimation technique.

Paper-based questionnaires were distributed among students of Baku Engineering University in Azerbaijan and Szent István University students in Hungary. The online version of the questionnaire was available in respondents' native languages while the control question about occupation allowed the author to only include students in the analysis. The questionnaires (i.e. in Azeri and Hungarian) were shared in different Facebook groups to reach the required amount of responses.

5.1 Azerbaijani Analysis

Azerbaijan is the country in the Caucasus with rich crude oil fields. Until 1991, the country was the part of the USSR and after proclaiming independence; the economy was mainly focused on crude oil manufacturing. However, in the last several years, the government changed policy toward supporting the development of the other fields of the economy (such as agriculture and tourism). Due to a simmering conflict with Armenia, the political situation in the country cannot be considered stable. This conflict not only negatively influences the economy but also takes the lives of Azeri citizens. This is the main reason why the median age of the Azeri population is very young at 32.4 years (We Are Social & Hootsuite, 2019a), compared to populations of European countries. Based on all macroeconomic indicators, Azerbaijan is a developing country with higher-middle income (World Bank, 2020) in the middle of the Caucasus and Asia.

The author has to highlight that Azerbaijan is a Muslim country where traditional values (including religion and tolerance) strongly impact people's lives (Inglehart and Welzel, 2005; Inglehart *et al.*, 2014). The economy is not so highly developed which makes survival values essential (Inglehart and Welzel, 2005). A reader might consider the influence of these details hard to prove. The income differences between Azeri and Hungarian survey respondents might be seen from brand choice. Around 37% of questioned Azeri students chosen Samsung which is a brand that is well-known for having smartphone models in different price categories. About 17% of respondents chose Xiaomi, which offers even cheaper, budget models of Samsung. It proves a hidden influence of income difference on the questioned Azeri students. The usage of iPhone smartphones as a status statement or belonging to a particular social group has already been proven. Therefore, the author did not connect it to owners' income levels.

The result of the survey conducted in Azerbaijan was illustrated in Table 30. The main findings show that the proposed model for measuring university students' behavioural intentions in Azerbaijan was not in compliance with the responses of students (n=234). As a result, the offered model was not valid for determining the behavioural intentions of the questioned Azeri students.

According to the results of the literature review, the author's aim was to extend the UTAUT2 by including brand awareness, symbolic brand image, and satisfaction. Furthermore, symbolic brand image did not have an impact on the behavioural intentions (SBI→BI) of the students from Azerbaijan who participated in this study. The mentioned findings were strengthened with results illustrated in Inglehart et al.'s (2014) cultural map. For a nation that lives under the strong

influence of survival values, the symbolic brand image of a smartphone does not seem necessary. It has been proven that brand awareness of questioned students had a positive influence on the formulation of behavioural intention (BA→BI; P≤ 0.001). Brand awareness is one brand knowledge indicator that allow a user to choose the device which is more suitable for his/her needs. Even if students do not have a high enough income for better smartphones, they try to choose the best price-quality ratio, which requires brand knowledge. The last latent variable involved from the pilot study (Satisfaction) showed a significant impact on behavioural intention (SA→BI; P=0.027), however the parameter estimate (C.R.=-2.209) indicated the opposite direction of the relationship.

The main part of the proposed model involved the UTAUT2-related variables such as social influence, facilitating conditions, hedonistic motivation, price per value, habit, and behavioural intention. Unfortunately, social influence and facilitating conditions failed to pass reliability and validity tests. Therefore, only the relationships between behavioural intention and hedonistic motivation (HM→BI; P≤ 0.001), price per value (PV→BI; P≤ 0.001), Habit (HT→BI; P≤ 0.001) were measured. The results of the analysis proved a strong positive relationship (P≤ 0.001) between behavioural intention and the above-mentioned variables in the Azeri sample.

5.2 Hungarian Analysis

Hungary is situated in Eastern Europe. The country was a satellite state of the Soviet Union for 40 years and became independent in 1989. During this period, it was a state with a strong economy that exported a lot of light industrial and agricultural products to former Soviet Union states. The development of the economy continued after Hungary became independent. Nowadays, Hungary is a high-income country (World Bank, 2020) with branches/representative offices of international companies. The median age of Hungarians is 43.4; it is significantly higher in comparison to that of Azerbaijan. Based on macroeconomic data (Table 1.), Hungary is in a better economic situation than Azerbaijan.

The country was listed as part of Catholic Europe in the Inglehart – Welzel cultural map (Inglehart *et al.*, 2014). Secular-rational values are quite high (compared to Azerbaijan) and regarding survival versus self-expression, Hungary remains at the border of survival values. Like in Azerbaijan, around 40% of respondents used iPhones. Around 20% of respondents had Samsung and less than 9% preferred Xiaomi to the other handsets. These numbers are roughly half (36.76% of Azeri respondents own Samsung; 16.24% of Azeri respondents use Xiaomi) of surveyed Azeri brand users. Additionally, more than one-fourth of Hungarian survey participants were Huawei owners, which priced higher than Samsung and Xiaomi.

The main findings show that the proposed model for measuring the behavioural intentions of university students in Hungary was more in compliance with the responses of students (than the Azeri model) and it illustrates a good model fit (Table 31). As a result, the model was valid for determining the behavioural intentions of Hungarian respondents.

Symbolic brand image had a positive impact on the behavioural intention of the Hungarian students (SBI→BI; P=0.016), who participated in this study. However, low scores on reliability tests (CR and AVE as well as Cronbach's Alpha) in the case of brand awareness, did not allow the author to compare results. Satisfaction of purchase was the last latent variable involved from the pilot study and it did not have any impact on the behavioural intentions of Hungarian respondents. In contrast, there is a significant negative relationship between satisfaction of purchase and behavioural intention in the Azeri sample.

The main part of the proposed model included the UTAUT2-related variables such as social influence, facilitating conditions, hedonistic motivation, price per value, habit, and behavioural

intentions. Unfortunately, social influence, facilitating conditions, and habit failed to pass reliability tests. So, only the relationships between hedonistic motivation (HM→BI; P≤ 0.001), price per value (PV→BI; P≤ 0.001), and behavioural intentions were measured. The results of the analysis proved that there is a strong positive relationship between behavioural intention and the above-mentioned variables in the Hungarian sample.

5.3 Contribution of the Research

The literature review illustrated a lack of research on behavioural intention towards smartphones by involving marketing related indicators, particularly in Azerbaijan and Hungary. Based on this knowledge gap, the main aim of this study was to develop a research model that defines the factors affecting the formulation of behavioural intention toward smartphones in Azerbaijan and Hungary from a different angle. It is a completely new point of view to smartphone adoption that simultaneously involves measuring the impact of marketing-related indicators (i.e. SBI, brand awareness, and satisfaction) as well as the UTAUT2-related indicators. The mentioned external/marketing-related indicators were included as a result of the pilot study. The theoretical contributions of the research are listed below:

The first contribution of the research is the application of the UTAUT2 in the context of smartphone adoption in Azerbaijan and Hungary. The model (i.e. UTAUT2) was widely used for measuring behaviour toward high-tech products and services e.g. (El-Masri and Tarhini, 2017; Ameen, Willis and Hussain Shah, 2018; Merhi, Hone and Tarhini, 2019) criticized for displaying the high number of relationships and a lot of moderating variables that are rarely involved in studies (Tamilmani, Rana and Dwivedi, 2017; Tamilmani *et al.*, 2019). Unfortunately, no previous researcher has applied the UTAUT2 to Azerbaijan/Hungary for measuring behavioural intention toward smartphones. The illustrated analysis is a pioneer in the mentioned topic.

The inclusion of only the UTAUT2-related parameters/variables without investigating the role of other essential indicators might create a wrong understanding of the situation. Therefore, before identifying the final model used for analysing the behavioural intentions of university students in Azerbaijan and Hungary, the author of the current study conducted a pilot survey. Satisfaction, brand awareness, and SBI were included as the result of the mentioned study.

The second contribution of this work was to determine the importance of satisfaction, brand awareness, and SBI in the formulation of behavioural intention of the questioned Azeri and Hungarian students. In previous studies related to the smartphone market, satisfaction was mainly analysed in connection with brand loyalty e.g. Hsiao and Chen, 2015; Ruiz Díaz, 2017). Only one of the reviewed papers (Hew, Badaruddin and Moorthy, 2017) tested satisfaction in the smartphone repurchase intention context. None of the examined studies used satisfaction of purchase for extending the UTAUT2.

The studies illustrated in the Literature Review chapter measured brand awareness in the smartphone market and its relationship with purchase intention (Coelho, Meneses and Moreira, 2013; Martins *et al.*, 2019), mobile phone choice (Petruzzellis, 2010) or brand equity (Huang and Shih, 2017). However, none of the examined papers illustrated the influence of brand awareness in combination with the UTAUT2-related variables.

Originally, SBI is part of the brand image scale (Chen, Liu and Ann, 2018) and it was involved in the study to measure the mediating effect. The author's idea was to measure the mediating effect of SBI in the relationship between social influence and behavioural intention toward smartphones. However, low scales of reliability tests did not allow the author to apply it. Therefore, the author measured the direct relationship between SBI and behavioural intention.

The third contribution to the body of knowledge is the combination of the UTAUT2 with product/market orienting indicators. Mainly studies extended the UTAUT2 with trust (Alalwan, Dwivedi and Rana, 2017; Merhi, Hone and Tarhini, 2019), as well as security, and privacy (Merhi, Hone and Tarhini, 2019), risk (Alalwan *et al.*, 2018) and so on. Therefore, this survey is supposed to be a useful guide for other scientists to understand at which level marketing-related indicators influence university students' behavioural intentions.

5.4 Limitations and Research Recommendations

The current study has also limitations. The sample size of the research was in the acceptable range (N= 234+247=481). At first, the sampling method was built upon on a convenience sampling technique (Babbie, 2016), and involved respondents from two universities in Azerbaijan and Hungary. However, it is important to note that the applied sampling technique limits the generalizing potential of the findings to the entire Azerbaijani and Hungarian populations.

Secondly, some of the used latent constructions failed reliability tests the terms of the Azeri and Hungarian samples. Venkatesh (2015) strongly encouraged authors to apply the UTAUT2 in different countries. In the first version of the UTAUT published in 2003, facilitating conditions did not have any direct relationship with behavioural intention. According to Venkatesh et al. (2003), the relationship is highly dependent on users' age and experience. It can be the main reason for low reliability and validity scores in terms of facilitating conditions. Also, the author of the model (Venkatesh *et al.*, 2003) noted that the usage of the social influence indicator in the models measuring behavioural intention could be questionable. Interestingly, the social influence construction was deleted from the study during the exploratory factor analysis stage. It means that the correlations between items of the scale were not strong enough and the items moved together with items of the other constructions. Moreover, inappropriate results of reliability and validity tests were also reported in terms of brand awareness and habit in the Hungarian sample.

Thirdly, the survey had self-administered characteristics and some of the answers might not reflect users' real opinions. The respondents could have reported answers that differed from their real opinions to stay socially accepted. It means that opportunity sampling itself has some limitations while it is a generally accepted method of measuring behaviour (Ameen, Willis and Hussain Shah, 2018; Merhi, Hone and Tarhini, 2019).
Different cultural values (Inglehart *et al.*, 2014), religion, political situation, macroeconomic conditions (We Are Social & Hootsuite, 2019a, 2019b), and other factors surely influenced the results of the study, however this is very hard to illustrate. It is a very wide topic that requires a lot of time and financial support to realize. However, the current study aimed to define factors influencing the formulation of behavioural intentions towards smartphones of questioned university students in Azerbaijan and Hungary.

The applied quantitative survey had cross-sectional characteristics (i.e. was measuring the impact of the UTAUT2 and marketing variables on the behavioural intention during the given period – two months), namely, data for final questionnaire was gathered only once in Azerbaijan and Hungary. Even if the questionnaire was strongly based on the literature review and previous studies of the smartphone market, the employment of quantitative research methods decreases the possibility of detailed/in-depth analysis. However, the application of a quantitative analysis is in line with the purpose and objectives of the research, as well as previous studies on a similar topic.

In terms of future research objectives, this study did not take into account a lot of marketing indicators that might influence the behavioural intention of university students towards smartphones. The author would like to pay more attention to the formulation of students'

behavioural intentions by involving new variables in the study as well as conducting research in different countries. Unfortunately, there is a huge knowledge gap related to technology adoption in the developing world. Moreover, the involvement of cultural variables as well as measuring the moderating effect of gender, experience, etc. can yield interesting results.

6 Summary

The purpose of this Ph.D. thesis was to examine the formulation of the behavioural intentions of university students in Azerbaijan and Hungary. After conducting an extensive literature review and a pilot study, the author offered an extension of the UTAUT2 by several variables. This resulted in three external marketing variables namely: symbolic brand image, brand awareness, and satisfaction of purchase, which were involved in the study. The questionnaire was mainly based on the scale developed for the UTAUT2 which means that questions were adopted from the original Venkatesh et al. (2012) study. The scales for the remaining latent variables (i.e. symbolic brand image, brand awareness, and satisfaction of purchase) were borrowed from the studies related to the smartphone market. Participants of the survey expressed their opinion using a five-point Likert scale (from 1 or "strongly disagree" to 5 or "strongly agree). The final survey was conducted in Azerbaijan and Hungary over the same period and aimed to confirm/reject the influence of the latent variables.

Overall, 323 Azeri and 318 Hungary students participated in the survey. After screening results and deleting questionnaires with repeated answers and outliers, the total sample size became 481 respondents (i.e. 234 Azeri respondents and 247 Hungarian). The respondents were mainly students of Szent István University in Hungary and Baku Engineering University in Azerbaijan. The students filled out the questionnaires in their mother tongue. However, in order to reach a high response rate, an online questionnaire was shared on Facebook, which allowed the author to involve other university students in the study.

Table 34. The Comparison of the Hypotheses Between the Azeri and Hungarian Samples

Hypotheses	AZERBAIJAN	HUNGARY
Hypothesis 1.1 Symbolic brand image has a significantly positive influence on behavioural intention in examined countries.	Rejected	Accepted
Hypothesis 1.2 Brand awareness has a significantly positive influence on behavioural intention in examined countries.	Accepted	Not reliable
Hypothesis 2 Satisfaction of purchase has a significantly positive influence on behavioural intention in examined countries.	Rejected	Rejected
Hypothesis 3. Hedonistic motivation has a significantly positive influence on behavioural intention in examined countries.	Accepted	Accepted
Hypothesis 4. Price per value has a significantly positive influence on behavioural intention in examined countries.	Accepted	Accepted
Hypothesis 5. Habit has a significantly positive influence on behavioural intention in examined countries.	Accepted	Not reliable
Hypothesis 6. The proposed models are valid and can be applied for measuring behavioural intention of students toward smartphones examined countries.	Rejected	Accepted

Source: own editing

SEM using an ML estimation technique was chosen as a statistical tool for analysing the collected data. It is a well-known technique for model validation and/or defining causal relationships between latent variables. In order to be confident about the analysis, 10% of outliers were deleted from the analysis. The outliers were checked by employing a widely

applied tool – Mahalanobis Distance. As a result, the dataset of Azerbaijani and Hungarian students consisted of 234 and 247 respondents respectively. The answers to research questions and hypotheses were checked based on the above-mentioned number of respondents. Unfortunately, some variables (i.e. facilitating conditions, social influence for both samples, in addition to brand awareness and habit in the Hungarian sample) failed Exploratory Factor Analysis and the reliability and validity tests. So, it was impossible to check the mediating effect of symbolic brand image on social influence like the author had planned.

The formulation of the behavioural intention of questioned students is different in examined countries (Hypotheses 1-5). Symbolic brand image, hedonistic motivation, and price per value positively influenced the behavioural intentions of surveyed Hungarian students while brand awareness, hedonistic motivation, price per value, and habit positively influenced the behavioural intentions of Azeri students who participated in the survey. The results of the last hypothesis illustrate that the current measurement model made for Azerbaijan was not a good representation of the hypothesized relationships. The offered model for Azerbaijan and the answers of respondents do not relate to each other. However, the same model explains the behavioural intentions of the Hungarian university students.

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Appendix II: Questionnaire for Pilot Study

1. Do you use a smartphone? (Control question)

- Yes
- No

2. Which kind of smartphone do you use?

- Android
- iOS/ Apple

3. Which company is the producer of the device?

- Samsung
- Apple
- Huawei
- Sony
- Nokia
- Xiaomi
- HTC
- Motorolla
- Alcatel
- Other (please mention)

4. Please type what is the model of handset? _____

5. What is the age of your device? _____

6. How important is the mentioned function?

	Not important at all	*Less important*	*Rather important*	*Very important*	*Essential*
Phone calls					
Text messages					
Internet browsing					
E-mail					
Social media					
Making photos					
Making videos					
Listening to music					
Playing games					
Office applications (notebook, calculator, etc.)					
Other					

7. How important are the following features?

	Not important at all	Less important	Rather important	Very important	Essential
Design					
Screen size					
Weight					
Standby time					
Talking time					
Ports, compatibility to other devices					
Internal memory					
External memory expandability					
Camera resolution					
Assortment of applications					
Prestige					

Respondent's profile

8. Age of respondent

- 18
- 18-24

- 25-34
- 35-44
- 45-54
- 55-64

9. Gender of respondent

- Female
- Male

10. Qualification of respondent

- Less than 8 grades (in Azeri version: less than 9 grades)
- Eight grades (in Azeri version: nine grades)
- Vocational school
- Secondary technical school
- Secondary grammar school
- Bachelor’s degree
- Master’s degree
- PhD

11. Occupation of respondent

- Student
- Pensioner
- Entrepreneur
- Employee in a leading position
- Employee
- Childcare/maternity leave
- Household
- Unemployed
- Other

Appendix III: Confirmatory Research Questionnaire in Hungarian

Kérdőív az okostelefon-használathoz való viszonyulásról

Kedves Kitöltő!
Kutatásom célja a magyar fiatal okostelefon-használók vásárlói és felhasználói viselkedésének elemzése. A kérdőív teljes egészében anonim, a válaszok csoportosan kerülnek kiértékelésre.
Kérlek, őszinte válaszaiddal segítsd munkámat!
Köszönettel:
Maral Jamalova
Kérlek írd le, milyen márkájú és típusú okostelefont használsz! _____

Nem :_____ Életkor: _____

JELÖLD MEG, MENNYIRE ÉRTESZ EGYET AZ ALÁBBI ÁLLÍTÁSOKKAL!

1 - Egyáltalán nem értek egyet; 2 - Nem kimondottan értek egyet; 3 - Egyet is értek, meg nem is; 4 - Többnyire egyetértek; 5 - Teljes mértékben egyetértek

	1	2	3	4	5
Márkaimázs					
1. Ismert emberek, hírességek ajánlása is hatással van rám telefon-vásárláskor.					
2. A telefonom márkája magasabb társadalmi státuszt tükröz számomra.					
3. A telefonom külseje visszatükrözi a személyes ízlésvilágomat.					
Márkatudatosság					
4. Vásárlás előtt már ismert volt számomra az a márka, amely a telefonom márkája.					
5. Meg tudom különböztetni a telefonomat más márkáktól.					
6. A legtöbb ember számára ismerős az a márka, amilyen telefonom nekem is van.					
Elégedettség					
7. Elégedett vagyok a telefonommal.					
8. A telefonom teljesíti az elvárásaimat.					
9. A telefonom beteljesíti a vágyaimat.					
A környezet hatása					
10. A számomra fontos emberek szerint szükségem van okostelefonra.					
11. A családtagjaim és barátaim befolyásolják az okostelefon-használatomat.					
12. Fontos számomra, hogy a barátaim is kedveljék azt a márkát, amilyen telefonom nekem is van.					
A használatot előmozdító feltételek					
13. Rendelkezem a mobiltelefon- és mobilinternet-előfizetéshez szükséges anyagi háttérrel.					
14. A telefonom kompatibilis a többi eszközzel, amit használok.					
15. Van kihez fordulnom segítségért, ha nehézségem támad a telefonom használatában.					
Élvezeti faktor					
16. Okostelefont használni szórakoztató.					
17. Okostelefont használni élvezet.					
18. Okotelefont használni örömteli dolog.					

Ár, érték					
19. A telefonom ésszerűen van árazva.					
20. A telefonom jó ár/érték aránnyal rendelkezik.					
21. Jelenlegi árán a telefonom megfelelő színvonalat nyújt.					
Személyes magatartás					
22. Az okostelefon használata szokásommá vált..					
23. Okostelefon-függő vagyok.					
Viselkedési szándék					
24. A jövőben is szándékomban áll okostelefont használni.					
25. Mindig a mindennapjaim része lesz az okostelefon-használat.					
26. Tervezem, hogy rendszeresen használom majd az okostelefonomat.					

Appendix IV: Confirmatory Research Questionnaire in Azerbaijani

Azərbaycanlı Tələbələr Arasında Smartfondan İstifadə Niyyətinin Araşdırılması
Hörmətli Sorğu İştirakçısı

Bu anket ***Azərbaycanlı Gənc Smartfon Istifadəçilərinin Davranışının Araşdırılması*** üçün hazırlanmışdır. Paylaşdığınız bütün məlumatların anonimliyinə qarantiya verilir. Paylaşdığınız məlumatlar Azərbaycanda elmin inkişafı və elmi mətbuatda Azərbaycanla bağlı araşdırmaların sayının artmasına böyük kömək göstərəcəkdir. Zəhmət olmazsa, obyektiv olun.

Cinsiniz :_____ Yaşınız: _____

İstifadə etdiyiniz smartfonun markası və modeli:_____

Zəhmət olmazsa, aşağıdakı fikirlərə obyektiv olaraq münasibətinizi bildirin.

Hər bir fikir üçün aşağıdakı cavablarından birini seçəcəksiniz:

"1- Qətiyyən razı deyiləm, 2- Razı deyiləm, 3- Nə razıyam, nə də razı deyiləm, 4- Razıyam, 5- Tamamilə razıyam"

	1	**2**	**3**	**4**	**5**
Simvolik Marka Imici					
1. Məhşurların seçdiyi smartfon brendini/markasını seçirəm.					
2. Smartfon markası mənim üçün daha yüksək sosial statusu təmsil edir.					
3. Smartfonun dizaynı mənim zövqümü əks etdirir.					
Brend Haqqında Məlumatlılıq					
4. İstifadə etdiyim smartfonun markası/brendi barədə öncədən məlumatlı idim.					
5. İstifadə etdiyim smartfon brendini digər brendlər arasından seçə bilərəm.					
6. Bir çox insan istifadə etdiyim smartfon markasını tanıyır.					
İstehlakçı Məmnuniyyəti					
7. Smartfon seçimimdən razıyam.					
8. İstifadə etdiyim smartfon gözləntilərimə cavab verir.					
9. İstifadə etdiyim smartfon istəklərimə/ehtiyaclarıma uyğundur.					
Sosial Təsir					
10. Mənim üçün vacib olan insanlar smartfondan istifadənin vacib olduğunu düşünürlər.					
11. Dostlarım və ailəm smartfondan istifadə etməyimə təsir göstərir.					
12. Dostlarımın istifadə etdiyim smartfon markasını bəyənməsi mənim üçün önəmlidir.					
Asanlaşdırıcı Şərtlər					
13. Mobil operator və mobil internetdən istifadə etmək üçün lazımi vəsaitim var.					
14. Smartfon mənim istifadə etdiyim digər cihazlarla birlikdə və ya qarşılıqlı istifadəyə uyğundur.					
15. Smartfondan istifadə etməkdə çətinlik çəkdiyimdə başqalarından yardım istəyə bilərəm.					

Hedonik Motivasiya					
16. Smartfondan istifadə əyləncəlidir (entertaining).					
17. Smartfondan istifadə etməkdən həzz alıram (enjoyable).					
18. Smartfondan istifadə xoşdur (fun).					
Pulun Dəyəri					
19. Smartfonun qiyməti münasibdir.					
20. Smartfonum onu aldığım qiymətə dəyər.					
21. Smartfon cari qiymətə yaxşı dəyər təklif edir.					
Vərdiş					
22. Smartfondan istifadə mənim üçün vərdişə çevrilmişdir.					
23. Smartfondan asılıyam .					
Davranış Niyyəti					
24. Gələcəkdə smartfondan istifadə etməyə davam etmək niyyətindəyəm.					
25. Gündəlik həyatımda daim smartfondan istifadə edirəm.					
26. Smartfondan mütəmadi olaraq istifadə etməyə davam edəcəm.					

Appendix V: Output of Model Validation for the Azeri Sample

Number of variables in your model:	43
Number of observed variables:	18
Number of unobserved variables:	25
Number of exogenous variables:	24
Number of endogenous variables:	19

Number of distinct sample moments:	171
Number of distinct parameters to be estimated:	41
Degrees of freedom (171 - 41):	130

			Estimate	S.E.	C.R.	P	Label
BI	<---	SBI	.034	.053	.635	.526	par_10
BI	<---	BA	.226	.048	4.715	***	par_11
BI	<---	SA	-.071	.032	-2.209	.027	par_12
BI	<---	HM	.313	.043	7.299	***	par_13
BI	<---	PV	.307	.054	5.719	***	par_14
BI	<---	HT	.164	.034	4.768	***	par_15
SBI2	<---	SBI	1.239	2.335	.531	.596	par_1
SBI1	<---	SBI	1.000				
BA2	<---	BA	.932	.183	5.089	***	par_2
BA1	<---	BA	1.000				
SA3	<---	SA	1.000				
SA2	<---	SA	.913	.059	15.571	***	par_3
SA1	<---	SA	.839	.057	14.850	***	par_4
HM3	<---	HM	.902	.062	14.630	***	par_5
HM2	<---	HM	1.000				
HM1	<---	HM	.841	.065	12.980	***	par_6
PV3	<---	PV	.700	.118	5.942	***	par_7
PV2	<---	PV	1.000				
PV1	<---	PV	.862	.132	6.520	***	par_8
HT1	<---	HT	1.000				
HT2	<---	HT	.811	.131	6.171	***	par_9
BI1	<---	BI	1.000				
BI2	<---	BI	1.273	.166	7.660	***	par_16
BI3	<---	BI	1.070	.157	6.833	***	par_17

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	41	425.389	130	.000	3.272
Saturated model	171	.000	0		
Independence model	18	1879.406	153	.000	12.284

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.152	.819	.762	.623
Saturated model	.000	1.000		
Independence model	.241	.426	.359	.382

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.774	.734	.831	.799	.829
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.850	.657	.704
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	295.389	236.698	361.686
Saturated model	.000	.000	.000
Independence model	1726.406	1590.379	1869.834

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	1.826	1.268	1.016	1.552
Saturated model	.000	.000	.000	.000
Independence model	8.066	7.409	6.826	8.025

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.099	.088	.109	.000
Independence model	.220	.211	.229	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	507.389	514.669	649.057	690.057
Saturated model	342.000	372.364	932.860	1103.860
Independence model	1915.406	1918.602	1977.602	1995.602

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	2.178	1.926	2.462	2.209
Saturated model	1.468	1.468	1.468	1.598
Independence model	8.221	7.637	8.836	8.234

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	87	94
Independence model	23	25

Appendix VI: Output of Model Validation for the Hungarian Sample

Number of variables in your model:	45
Number of observed variables:	19
Number of unobserved variables:	26
Number of exogenous variables:	26
Number of endogenous variables:	19

Number of distinct sample moments:	190
Number of distinct parameters to be estimated:	59
Degrees of freedom (190 - 59):	131

Result (Default model)
Chi-square = 275.313
Degrees of freedom = 131
Probability level = .000

Regression Weights:

			Estimate	S.E.	C.R.	P	Label
SBI2	<---	SBI	1.000				
SBI1	<---	SBI	.393	.138	2.860	.004	par_1
SA2	<---	SA	1.000				
SA1	<---	SA	.844	.064	13.199	***	par_2
SI2	<---	SI	.310	.198	1.561	.119	par_3
SI1	<---	SI	1.000				
HM3	<---	HM	.960	.046	20.784	***	par_4
HM2	<---	HM	1.000				
HM1	<---	HM	.708	.042	16.789	***	par_5
PV2	<---	PV	.976	.062	15.834	***	par_6
PV1	<---	PV	1.000				
BI1	<---	BI	.349	.040	8.660	***	par_7
BI2	<---	BI	.964	.081	11.968	***	par_8
BI3	<---	BI	1.000				
SA3	<---	SA	.997	.095	10.510	***	par_24
PV3	<---	PV	.474	.047	10.168	***	par_25
BA3	<---	BA	1.000				
BA2	<---	BA	.731	.152	4.824	***	par_26
BA1	<---	BA	.681	.135	5.058	***	par_27

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	59	275.313	131	.000	2.102
Saturated model	190	.000	0		
Independence model	19	2061.319	171	.000	12.054

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.046	.898	.852	.619
Saturated model	.000	1.000		
Independence model	.175	.496	.440	.446

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.866	.826	.925	.900	.924
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.766	.664	.708
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	144.313	100.494	195.892
Saturated model	.000	.000	.000
Independence model	1890.319	1747.741	2040.291

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	1.119	.587	.409	.796
Saturated model	.000	.000	.000	.000
Independence model	8.379	7.684	7.105	8.294

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.067	.056	.078	.007
Independence model	.212	.204	.220	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	393.313	403.755	600.367	659.367
Saturated model	380.000	413.628	1046.784	1236.784
Independence model	2099.319	2102.682	2165.997	2184.997

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	1.599	1.421	1.809	1.641
Saturated model	1.545	1.545	1.545	1.681
Independence model	8.534	7.954	9.143	8.547

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	142	154
Independence model	25	26

Kérdőív az okostelefon-használathoz való viszonyulásról

Appendix VII: Online Questionnaire

Kedves Kitöltő!

Kutatásom célja a magyar fiatal okostelefon-használók vásárlói és felhasználói viselkedésének elemzése. A kérdőív teljes egészében anonim, a válaszok csoportosan kerülnek kiértékelésre.

Kérem, őszinte válaszaival segítse munkámat!

Köszönettel:
Maral Jamalova

*Required

1. **Használ okostelefont?** *
Mark only one oval.

- ◯ Igen *Skip to question 2.*
- ◯ Nem *Stop filling out this form.*

Márkaimázs, márkatudatosság, elégedettség

2. **Jelölje meg, mennyire ért egyet az alábbi állításokkal!** *
Mark only one oval per row.

	1 Egyáltalán nem értek egyet	2 Nem kimondottan értek egyet	3 Egyet is értek, meg nem is	4 Többnyire egyetértek	5 Teljes mértékben egyetértek
Ismert emberek, hírességek ajánlása is hatással van rám telefon-vásárláskor.	◯	◯	◯	◯	◯
A telefonom márkája magasabb társadalmi státuszt tükröz számomra.	◯	◯	◯	◯	◯
A telefonom külseje visszatükrözi a személyes ízlésvilágomat.	◯	◯	◯	◯	◯

3. **Jelölje meg, mennyire ért egyet az alábbi állításokkal!** *
Mark only one oval per row.

	1 Egyáltalán nem értek egyet	2 Nem kimondottan értek egyet	3 Egyet is értek, meg nem is	4 Többnyire egyetértek	5 Teljes mértékben egyetértek
Vásárlás előtt már ismert volt számomra az a márka, amely a telefonom márkája.					
Meg tudom különböztetni a telefonomat más márkáktól.					
A legtöbb ember számára ismerős az a márka, amilyen telefonom nekem is van.					

4. **Jelölje meg, mennyire ért egyet az alábbi állításokkal!** *
Mark only one oval per row.

	1 Egyáltalán nem értek egyet	2 Nem kimondottan értek egyet	3 Egyet is értek, meg nem is	4 Többnyire egyetértek	5 Teljes mértékben egyetértek
Elégedett vagyok a telefonommal.					
A telefonom teljesíti az elvárásaimat.					
A telefonom beteljesíti a vágyaimat.					

Technológia befogadása és alkalmazása

5. **Jelölje meg, mennyire ért egyet az alábbi állításokkal!** *
Mark only one oval per row.

	1 Egyáltalán nem értek egyet	2 Nem kimondottan értek egyet	3 Egyet is értek, meg nem is	4 Többnyire egyetértek	5 Teljes mértékben egyetértek
A számomra fontos emberek szerint szükségem van okostelefonra.					
A családtagjaim és barátaim befolyásolják az okostelefon-használatomat.					
Fontos számomra, hogy a barátaim is kedveljék azt a márkát, amilyen telefonom nekem is van.					

6. **Jelölje meg, mennyire ért egyet az alábbi állításokkal!** *
Mark only one oval per row.

	1 Egyáltalán nem értek egyet	2 Nem kimondottan értek egyet	3 Egyet is értek, meg nem is	4 Többnyire egyetértek	5 Teljes mértékben egyetértek
Rendelkezem a mobiltelefon- és mobilinternet-előfizetéshez szükséges anyagi háttérrel.					
A telefonom kompatibilis a többi eszközzel, amit használok.					
Van kihez fordulnom segítségért, ha nehézségem támad a telefonom használatában.					

7. **Jelölje meg, mennyire ért egyet az alábbi állításokkal!** *
Mark only one oval per row.

	1 Egyáltalán nem értek egyet	2 Nem kimondottan értek egyet	3 Egyet is értek, meg nem is	4 Többnyire egyetértek	5 Teljes mértékben egyetértek
Okostelefont használni szórakoztató.					
Okostelefont használni élvezet.					
Okotelefont használni örömteli dolog.					

8. **Jelölje meg, mennyire ért egyet az alábbi állításokkal!** *
Mark only one oval per row.

	1 Egyáltalán nem értek egyet	2 Nem kimondottan értek egyet	3 Egyet is értek, meg nem is	4 Többnyire egyetértek	5 Teljes mértékben egyetértek
A telefonom ésszerűen van árazva.					
A telefonom jó ár/érték aránnyal rendelkezik.					
Jelenlegi árán a telefonom megfelelő színvonalat nyújt.					

9. **Jelölje meg, mennyire ért egyet az alábbi állításokkal!** *
Mark only one oval per row.

	1 Egyáltalán nem értek egyet	2 Nem kimondottan értek egyet	3 Egyet is értek, meg nem is	4 Többnyire egyetértek	5 Teljes mértékben egyetértek
Az okostelefon használata szokásommá vált..					
Okostelefon-függő vagyok.					

10. **Jelölje meg, mennyire ért egyet az alábbi állításokkal!** *
Mark only one oval per row.

	1 Egyáltalán nem értek egyet	2 Nem kimondottan értek egyet	3 Egyet is értek, meg nem is	4 Többnyire egyetértek	5 Teljes mértékben egyetértek
A jövőben is szándékomban áll okostelefont használni.					
Mindig a mindennapjaim része lesz az okostelefon-használat.					
Tervezem, hogy rendszeresen használom majd az okostelefonomat.					

Személyes információk

11. **Nem** *
Mark only one oval.

- Nő
- Férfi

12. **Életkor** *
Mark only one oval.

- 0 - 18
- 18 - 24
- 25 - 34
- 35 -

13. **Foglalkozás** *

Mark only one oval.

- ◯ Tanuló
- ◯ Nyugdíjas
- ◯ Vállalkozó
- ◯ Vezető beosztású alkalmazott
- ◯ Alkalmazott
- ◯ GYES/GYED
- ◯ Háztartásbeli
- ◯ Pillanatnyilag munkanélküli
- ◯ Other: _____

14. **Kérem írja le, milyen márkájú és típusú okostelefont használ!** *

_____

7 List of Tables

8 List of Figures

9 Acknowledgements

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