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PREDICTORS OF CUSTOMER CHANNEL CHOICE IN THE HIGH-VALUE ELECTRONIC DEVICE PURCHASE DECISION PROCESS

PREDIKTOROK A NAGY ÉRTÉKŰ ELEKTRONIKAI KÉSZÜLÉKEK VÁSÁRLÁSI DÖNTÉSI FOLYAMATBAN

TARALIK Krisztina – TÖRCSVÁRI Zsolt

ABSTRACT

Difficulties and uncertainties in the customer journey reduce customer experience, while lower levels of uncertainty improve perceived control and trust, thereby increasing customer experience. Level of uncertainty experienced during the purchase decision may be related to the channel, product, or individual factors. The purpose of this study is to assess the relationships between the channel usage patterns of 415 online survey respondents and four hypothesized groups of predictors: demographic characteristics, the channel used by consumers in the earlier stages of the journey, shopping attitude and technological readiness (TR) factors during high-value electronic devices. Examining the channel usage preferences of the respondents, 6 types of patterns were identified, of which the 4 most frequently occurring patterns were retained in the further studies. A factor analysis was performed to reveal the close correlation between the explanatory variables compiled to measure the latent variables (within different dimensions of shopping attitude and TR). To identify the most significant explanatory variables multinominal logistic regression were used. In addition to the fact that all four groups of predictors contain factors that showed a measurable effect on the respondents' channel choice, it is important to highlight the effect of the need for physical touch and the channel used in the previous stage, which proved to be the strongest predictors. When evaluating our results, it should be noted that the four identified shopping pattern categories were represented in strongly different proportions in the sample, thereby significantly impairing the learning efficiency of the algorithm. Thus, our model can be considered applicable primarily to the "Blended" pattern category, which was overrepresented in the sample.

ABSZTRAKT

Az ügyfélút során tapasztalt nehézségek és bizonytalanságok csökkentik az ügyfélélményt, míg az alacsonyabb bizonytalansági szint növeli az észlelt kontrollt és a bizalmat, ezáltal javítva az ügyfélélményt. A vásárlási döntés során tapasztalt bizonytalanság mértéke összefüggésben áll a csatornával, termékkel, valamint az egyéni jellemzőkkel. A tanulmány célja, hogy megvizsgálja online kérdőíves kutatásunk 415 válaszadójának csatornahasználati szokásai, valamint négy feltételezett prediktor változó csoport - így a demográfiai jellemzők, az ügyfélút

korábbi szakaszaiban használt csatornatípus, a vásárlási attitűd és a technológiai felkészültség (TR) - összefüggéseit nagy értékű elektronikai cikkek vásárlásakor. Válaszadóink csatornahasználati preferenciáit vizsgálva 6-féle mintázatot azonosítottunk, amelyből a 4 leggyakrabban előforduló mintázatot tartottuk bent a további vizsgálatokban. A látens változók mérésére (a vásárlási attitűd és a TR különböző dimenzióiban) összeállított magyarázó változók közötti korrelációk feltárására faktoranalízist végeztünk. A magyarázó változók azonosításához multinominális logisztikus regressziót alkalmaztunk. Amellett, hogy a prediktorok mind a négy csoportja tartalmaz olyan tényezőket, amelyek mérhető hatást mutattak a válaszadók csatornaválasztására, fontos kiemelni a fizikai érintés igényének és az ügyfélút korábbi szakaszában használt csatorna típusnak a hatását, amelyek vizsgálatunkban a legerősebb prediktoroknak bizonyultak. Eredményeink értékelésénél fel kell hívni a figyelmet arra, hogy a négy azonosított vásárlási mintázat kategória erősen eltérő arányban képviseltette magát a mintában, jelentősen rontva ezzel az algoritmus tanulási hatékonyságát. Így modellünk elsősorban a mintában felülreprezentált "Blended" mintázatú kategóriára tekinthető alkalmazhatónak.

INTRODUCTION

Retailing is more dynamic and complex than ever. As a result of the creative use of the opportunities provided by IT, more and more developments appeared in retail, which led to the fact that retail industry reached an inflection point like the introduction of POS scanning (Baird and Kilcourse, 2011). The development of IT - in addition to its impact on business solutions - has also radically changed users' confidence, user habits and expectations (Kang et al., 2015; Quach et al., 2016; Rese et al., 2014; Verhoef et al., 2015). This process was further accelerated by the COVID pandemic in the last 2 years.

Companies are making significant efforts to meet the expectations of their customers and provide them with the best experiences (Stein and Ramaseshan,

2015). Customer experience is the internal and subjective reaction of customers as a result of any interaction with the company (Frow and Payne, 2007; Gentile et al., 2007; Verhoef et al., 2009). These interactions take place through channels or touchpoints. Customer experience includes the entire process of customer journey, including the pre-purchase stage (need recognition, information search, consideration or evaluation of alternatives), the purchase stage (choice, ordering, payment), and the post-purchase stage (consumption, use, engagement, service requests) (Lemon and Verhoef, 2016), and these stages encompass different combinations of communication and sales activities.

An omnichannel retailer strategy ensures the seamless use of multiple touchpoints at every stage of the customer journey, from information search to post-purchase services (Verhoef et al., 2015), enabling a completely seamless and consistent customer experience (Manser Payne et al., 2017).

More and more retailers are trying to carefully plan their combined retail operations and try to optimize at every point of contact (Grewal et al., 2021). To this end it is essential to understand the needs, fears and critical aspects of consumers that lead them to one or another touch point in omnichannel retailing, which can help managers to determine how to attract customers and manage the buying process most effectively (Grewal et al., 2017).

The aim of the study was to identify channel choice patterns and determine the effect of important explanatory factors on *channel* (instore, online) *choice* on B2C market (therefore, in this study, the term "customer" is used in the same sense as "consumer") at different stages of the purchase decision process of high-value electronic devices. Researchers intended to evaluate relationships between consumers' channel choice and four assumed predictor groups: demographic characteristics, the channel consumer uses in earlier stage of the journey, purchasing attitude and technological readiness factors.

Based on a literature review, the article will first examine the factors influencing the physical and mental efforts of buyers during their customer journey. This will be followed by an overview of the methodology and the results of the primary analysis based on the formulated research objectives, at the end of the study the researchers' conclusions will be presented.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Effort level of purchasing decision

Today, customers can choose from a wide variety of products and services offering similar features, while their time and money are limited, however they have a natural desire to choose the best possible alternative, therefore purchasing decision requires a certain degree of physical and mental effort. Although to reduce uncertainty, customers require information that helps them in their decision, if consumers are overwhelmed by too many informational or sensory cues in a variety of channels, it requires more cognitive effort from them (Dolbec and Chebat, 2013; Walsh and Mitchell, 2010).

The level of uncertainty experienced during the purchase decision may be related to the *individual factors, channel or product* (Santos and Gonçalves, 2019).

Individual factors

The name "consumer black box" indicates the complexity of the effects of individual characteristics including factors such as demographic attributes, motivation, perception, attitude, self-concept, and so on. Due to the complexity of personal characteristics, the literature reports on a wide range of variables included in the studies influencing channel choice. Rodríguez-Torrico et al., (2017) considered the effect of impulsiveness and need for touch of buyers, while in publications of Konuş et al., (2008) the price consciousness, shopping

enjoyment, innovativeness, motivation to conform, brand/retailer loyalty, and time pressure were examined. Nguyen et al., (2022) identified trust/perceived uncertainty, social influence, customer characteristics, review culture beside the product attributes, and time constraints as key factors affecting channel choices. Difficulties and uncertainties in any stage of decision-making process reduce the customer experience, while the lower the level of uncertainty the greater the perceived control and higher degree of confidence in purchasing decisions for customers (Schul and Mayo, 2003) and consumers are more likely to enjoy their shopping processes (Iman Khalid A-Qader et al., 2016). One of the important factors that can reduce or increase this uncertainty is the technological savvy of consumers. Technology Acceptance Model by Davis and Venkatesh, (1996) assesses and predicts the user acceptance of emerging IT, captures extrinsic motivation by the perceived usefulness and the perceived ease of use.

Based on the literature the authors decided to examine the effect of two latent variables - *purchasing attitude and technological readiness* – on channel choice in addition to the respondents' demographic characteristics, in order to determine how these explanatory factors influencing the *channel* (store, online – mobile and large screen) *choice* at different stages of the purchase decision process.

Items used in the measurement of purchasing attitude were the *need for physical touch, impulsiveness, innovativeness, brand- and price consciousness, convenience, and whether the customer perceives shopping as an experience* (details available in Table 1.). *Technological readiness of respondents* was measured based on the Technological Readiness Index 2.0 (Table 2) developed by Parasuraman and Colby (2015).

Role of Channels

Considering the role of channels in control vs. uncertainty, both online and offline channels provide characteristics that can reduce the uncertainty level of buyers.

In-store shopping provides interactions with products (physical touch) and other people (Peck and Childers, 2003), while online channels, in addition to providing a large amount of available information, also support the customer's decision-making process with decision-making tools for searching, comparing and evaluating alternatives. Of course, both channels have characteristics that can increase customer uncertainty, such as fewer in-store alternatives, or online information overload or the lack of interaction with products.

The omnichannel service allows customers to switch between online and offline channels during the customer journey, the customer can choose the combination of channels that best meets their expectations, thereby increasing the shopping convenience of customers.

Thanks to the seamless interchangeability of channel use, different channel usage patterns have emerged. According to Verhoef et al., (2007) "research shopping" behaviour means that the customer uses one channel to search for information and the other to make a purchase. Two opposite channel usage patterns of this are webrooming and showrooming behaviour. The most common behaviour when customers researching items online, and then buying them in store is called webrooming behaviour (Santos and Gonçalves, 2019). In contrast, when consumer inspects items first in the brick-and-mortar store and then buys them online is the showrooming behaviour (Verhoef et al., 2015; Frasquet and Miquel-Romero, 2021; Wang and Wang, 2022). Whitin showrooming behaviour two more types can be distinguished. The competitive showrooming behaviour (Chiu et al., 2011) or free riding behaviour (van Baal and Dach, 2005) means that customer searches offline at a retailer and purchases online from another retailer, while the loyal showrooming behaviour means that customer searching offline at a retailer store and purchasing online from same retailer (Schneider and Zielke, 2020; Frasquet and Miquel-Romero, 2021; Wang and Wang, 2022). In addition to these variations, Gu and Tayi (2016) identified the pseudo-showroom pattern,

which refers to when a consumer examines a product in a seller's offline store before purchasing a related but different product in the same seller's online store. Based on the channel choice patterns identified in the literature, the researchers intended to *identify the channel choice patterns appearing in the sample* during purchasing process of valuable electronic devices.

Product category

Involvement is an important factor influencing the information search, and evaluation (Puccinelli et al., 2009) and in addition to other factors (such as marketing activities), it is strongly linked to the product category. The complexity of the product, the impact of the purchase decision - the weight its price in the customer's budget, the length of time the product is used, the reversibility of the decision - are factors that influence the customer's involvement. *In this study the purchasing decision process was examined in case of valuable electronic devices which represents significant parts in the buyers' budget which increase the level of involvement.*

Several considerations justified the examination of this product category. First of all, the role of electronic devices in e-commerce in Hungary. Based on The Statista's 2021 country report, consumer electronics is the product category that Hungarian consumers primarily searched for and bought online compared to other product categories. The 2022 statistics of Statista by segments shows and forecast that the e-commerce in Hungary the highest in electronics commerce during the examined time period (2017-2025). (Fig. 1.)
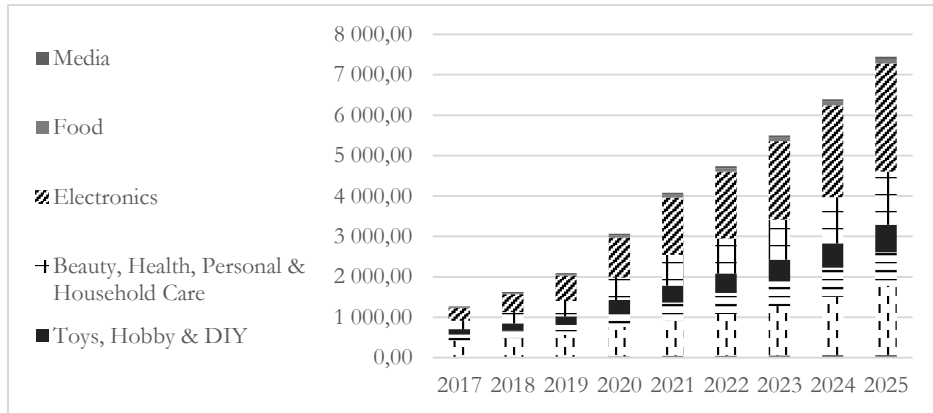
Figure 1.   E-commerce revenue in Hungary from 2017 to 2025, by segment
(in billion U.S. dollars)
Source: "Hungary," 2022.

International statistics also confirm the important role of this product category in
e-commerce. The Global Data (2021) predicts that by 2025 online sales
penetration in electronics product category will reach nearly 50 % (49,6%), the
highest rate among product categories.

Authors also considered that valuable electronic devices represent significant
parts in the buyers' budget which increase the level of involvement. For highly
involved consumers very important to choose the best option according to their
shopping needs, and thus perceive a higher level of uncertainty in the purchase.

Research questions and hypotheses.

Based on a literature review focusing on the various factors that influence the
efforts - and through this - the customer experience, this study focuses on the
following research questions:

RQ1.   What types of channel usage patterns can be identified in the sample
when purchasing high value electronic devices?

RQ2.   What are the most important explanatory variables affecting channel choice?

The prior empirical results allowed us to assume the following research hypotheses:

H1.   Based on the secondary e-commerce statistics online channel use during the entire customer journey and webrooming behaviour appear as the dominant channel usage behaviour.

H2.   Each of the four examined variable groups (demography, purchasing attitude, technological readiness and channel type used in earlier stage of the journey) includes important explanatory variables affecting the channel choice.

MATERIAL AND METHODS

Data collection

Online survey was conducted with convenience sampling. The Google form was shared on Facebook, and among the students of 2 Hungarian universities (Budapest Business School and Hungarian University of Agricultural and Life Science - MATE). The questionnaire was available between 10th of February and 29th of March in 2022. During this period 415 responses were collected. Although the employed convenient sampling method, university students were intentionally overrepresented in the sample as the use of omnichannel buying behaviour is considered to be more typical for young generations.

Measurement

The purchasing attitude of respondents' statements related to shopping attitudes were collected from literary sources (referenced below the Table 1.) and selected a shorter series of these in order to achieve a greater willingness to respond.

Dimensions examining the purchasing attitude of respondents and the statements belonging to each dimension is showed in Table 1. The items collected from the sources listed in Table 1 were translated into Hungarian.

Table 1. Dimensions and statements regarding the purchasing attitude

	Statements	Source of items
PhT1.	It is more convenient for me to make a purchase decision if I can first physically inspect the product.	Compilation of authors based on Rodríguez-Torrico et al., (2017) and Peck and Childers, (2003)
PhT2.	If I can't touch the product in the store, I'm reluctant to buy it.	
I1.	I often make unplanned purchases.	(Brashear et al., 2009)
I2.	I like to purchase things on a whim.	
I3.	I think twice before committing myself.	
I4.	I always stick to my shopping lists	
Inn1.	I like to take chances.	
Inn2.	I like to experiment with new ways of doing things	
BC1.	I usually purchase brand name products.	
BC2.	All brands are about the same.	
PC1.	I usually purchase the cheapest item.	
PC2.	I usually purchase items on sale only.	
PC3.	A person can save a lot by shopping for bargains	
C1.	I hate to spend time gathering information on products.	
C2.	I do not like complicated things.	
C3.	It is convenient to shop from home.	
SE1.	Shopping is fun.	
SE2.	Buying things makes me happy.	

PhI: Importance of Physical touch; I: Impulsiveness; Inn: Innovativeness; BC: Brand Consciousness; PC: Price Consciousness; C: Importance of Convenience; SE: Shopping is experience
Source: The items complied by authors based on studies of Peck and Childers, (2003), Brashear et al., (2009),Rodríguez-Torrico et al., (2017).

The channel preferences of respondents were measured by usage frequency of different channels (offline and online) in different stages of high-value electronic device purchasing decision process.

Most of the channel choice pattern described by literature focus on the first part of the customer journey leading up to the purchase (such as webrooming or showrooming), therefore the examined stages were the *information search - evaluation*

of alternatives – purchase and *post purchase* stage*,* the examined channels were *instore / offline channels; and the small (mobile) and large (tablet, PC) screen online channels.* The respondents indicated the frequency of their use of offline and online channels in each buying stage on a 5-point Likert scale, where 1 means never, 5 means always. To measure the respondents' technological skills TRI 2.0 (Technological Readiness Index) by Parasuraman & Colby (2015) was used which determines 4 dimensions, from which two are motivators and two are inhibitors of TR (Parasuraman and Colby, 2015).

Table 2. Dimensions and statements of TRI 2.0

Optimism	OPT1.	New technologies contribute to a better quality of life.
	OPT2.	Technology gives me more freedom of mobility.
	OPT3.	Technology gives people more control over their daily lives.
	OPT4.	Technology makes me more productive in my personal life.
Innovativeness	INN1.	Other people come to me for advice on new technologies.
	INN2.	In general, I am among the first in my circle of colleagues and friends to acquire new technology when it appears.
	INN3.	I can usually figure out new high-tech products and services without help from others.
	INN4.	I keep up with the latest technological developments in my areas of interest.
Discomfort	DIS1.	When I get technical support from a provider of a high-tech product or a service, I sometimes feel as if I am being taken advantage of by someone who knows more than I do.
	DIS2.	Technical support lines are not helpful because they don't explain things in terms I understand.
	DIS3.	Sometimes, I think that technology systems are not designed for use by ordinary people.
	DIS4.	There is no such thing as a manual for a high-tech product or a service that's written in plain language.
Insecurity	INS1.	People are too dependent on technology to do things for them.
	INS2.	Too much technology distracts people to a point that is harmful.
	INS3.	Technology lowers the quality of relationships by reducing personal interaction.
	INS4.	I do not feel confident doing business with a place that can only be reached online

Source: These questions comprise the Technology Readiness Index 2.0 which is copyrighted by Parasuraman and Rockbridge Associates, Inc., 2014. This scale may be duplicated only with written permission from the authors.

The questionnaire specified statements measured on 5-point Likert scale for all three topics (purchasing attitude, channel usage frequency and TRI dimensions). In attitude and TR measurement scale 1 means "I totally disagree" while 5 means "totally agree", while in channel usage frequency measurement 1 means "I never use it" while 5 means "I always use it".

The last part of questionnaire includes demographic questions such as gender, age group, education level, residence, perceived income level.

Data analysis

SPSS 28.0 were used to data analysis. Beside descriptive statistics (frequency, mean, std. deviation) association between nominal variables by Chí square test, between nominal and ordinal variables (measured on Likert scale) by variance analysis were examined. To reduce the distorting effect of close correlation among explanatory variables, factor analysis was performed. The sample appropriateness for factor analysis by KMO Measure of Sampling Adequacy and Bartlett's Sphericity test was verified.

KMO measure indicates middle level adequacy (0,675) in case of purchasing attitude variables and high level of sample adequacy (0.783) in case of TR variables, the Bartlett's sphericity test showed Sig. 0.000 level in both statistics. These results verified the appropriateness of the sample. The factors were rotated with Varimax.

To identify the most significant explanatory variables multinominal logistic regression were used, because the channel usage pattern is categorical variable. Custom/stepwise model were used by backward elimination. The model was evaluated and developed by means of Model fitting information, Goodness-of-fit table, Pseudo R-square values and the Classification table.

Sample composition.

Our survey was filled by 415 respondents. Two thirds (60.5%) of our respondents were female, and students from two Hungarian universities represented a large part of the sample (the Budapest Business School and the Hungarian University of Agriculture and Life Science), which is also reflected in sample distribution of respondents by age groups and place of residence. The overrepresentation of the university age group in the sample is important because, based on the Eurostat statistics, the proportion of online shoppers in the EU in the 16-24 age group (78%) is above the population average (73%) (Állami Számvevőszék, 2022). According to forecasts, those born after 1998 (Generation Z) will have a purchasing power of 44 billion dollars and within a few years they will control 40% of all consumer purchases (WebMa, 2022). The perceived income level (the respondent's subjective assessment of his/her own income, which affects the willingness to spend) of most of our respondents were at least average, only 9.4 % of respondents perceived their income level less than average.

Table 3. Demographic distribution of the sample

Gender n (%)	Male 161 (39.5)				Female 251 (60.5)		
Age group n (%)	18 or younger	19-24	25-30	31-40	41-50	51-60	60 or elder
	1 (0.2)	233 (56.1)	34 (8.2)	34 (8.2)	74 (17.8)	29 (7.0)	10 (2.4)
Education level n (%)	Comple-ted 8 classes	Qualifi-cation	Graduati on	Postgrad. cert.	BA/BSc cert.	MA/M Sc cert.	PhD/ DLA
	1 (0.2)	8 (1.9)	220 (53.0)	57 (13.7)	70 (16.9)	46 (11.1)	13 (3.1)
Income level n (%)	Well below average	Below average		Average	Above average	Well above average	
	7 (1.7)	32 (7.7)		227 (54.7)	133 (32.0)	16 (3.9)	

Source: Based on authors' research

RESULTS

Channel usage patterns in the sample RQ1.

To examine channel choice pattern the most frequently used channel in each stage of purchasing decision were examined, and classified in 3 categories: online, combined (online and offline with the same perceived frequency) and instore. The most frequently used channels were examined the channel usage pattern of respondents and categorized these patterns into 6 categories. Table 4 shows the 6 pattern categories with explanation in descending order of frequency of occurrence in the sample.

Table 4. Distribution of Channel choice pattern in the sample

Pattern	Explanation	Freq.	%
Blended	Either online channel use was the more frequent, or the frequency of online and offline channel use was the same, but the frequency of in-store purchases does not exceed online channel use in any of the stages. ($f_{online} \geq f_{offline}$)	208	50.1
Totally online process	The respondent indicated the use of the online channel with a higher frequency value in each examined stage.	100	24.1
Webrooming	They use online channels more frequently in the earlier stages of the purchasing process (information search and evaluation of alternatives), and in later stages they switch to more frequent use of offline channels.	54	13.0
Totally instore process	The respondent indicated the use of the offline channel with a higher frequency value in each examined stage.	30	7.2
Showrooming	They use offline channels more frequently in the earlier stages of the purchasing process (information search and evaluation of alternatives), and in later stages they switch to more frequent use of online channels.	12	2.9
Blended instore	Either offline channel use was the more frequent, or the frequency of online and offline channel use was the same, but the frequency of online purchases does not exceed offline channel use in any of the stages. ($f_{offline} \geq f_{online}$)	11	2.7
Total		415	100.0

Source: Based on authors' research

The relatively big number of categories in this dependent variable pushed authors to reduce the number of categories. The showrooming and blended instore

patterns frequency in the sample were very low. Possibility to merge these categories either with each other or with other bigger categories were considered. The showrooming behaviour means special way with instore beginning followed by online purchase, which excludes the merge of the two low frequency categories. The blended category (most frequent in the sample) includes patterns where respondents use mainly online or both channel in the examined stages of purchasing process, which does not offer good solution to merge, therefor these categories were defined as missing value.

The most important explanatory variables affecting channel choice RQ2.
Multinominal logistic regression was conducted to examine which variables in the questionnaire have the most important effect on the channel choice patterns of respondents.

To avoid the bias from correlations among explanatory variables, regression factor analysis were conducted for the purchasing attitude and TR variables. In both cases the resulted factor memberships showed very similar pattern to the *a priori* dimensions determined in Table 1 and 2.

At purchasing attitude factors the 1st factor includes all the 4 statements which belong to the Impulsiveness dimension in our *a priori* classification. It shows a positive relationship with a thoughtful, follow-the-list purchase, while a negative relationship with an impulsive decision, there was labeled by *Consciousness shopping*. The 2 statements of „Shopping is experience" *a priori* dimension belong to the 2nd factor – labelled with *Shopping is experience*. The 3rd factor sits on 3 variables, from these 2 belong to the "Importance of Physical touch" *a priori* dimension and shows positive relations with these statements, and 1 belongs to "Importance of Convenience" *a priori* dimension, and it shows negative relationship – labelled by *Importance of Physical touch*. The 4th factor sits on 2 from the 3 statements of "Price

Consciousness" *a priori*y dimension, and emphasize the role of price discounts, labelled by *Bargain hunting.* The 5th factor sits on 2 Brand Consciousness and 1 Price Consciousness statements. These statements perceive that brand are similar and prefer low prices – labelled by *Price sensitivity.* The 6th factor sits on 2 from 3 "Importance of Convenience" statements, which reject the complicated and time-consuming decisions, therefore was labelled by *Simplification.* The 7th factor sits on the 2 Innovativeness statements, it is positively related to giving chance to new ways and new things labelled by *Innovativeness.*

The factors of TR variables were consistent with dimensions of Parasuraman & Colby (2015) (Table 2). The 8 statements belong to motivator variables formed 2 factors, the Innovativeness and the Optimism factors including the 4-4 statements according to Parasuraman and Colby TRI 2.0 measurement method. The 8 inhibitor statements also formed 2 factors, the Discomfort and Insecurity. Here we found slight difference in case of the fourth variable of Insecurity (I do not feel confident doing business with a place that can only be reached online). Although both the inhibitor factors sit on variable, the correlation was greater in case of the Discomfort factor.

Multinominal Logistic Regression of the three-stage process

After the factor analysis, multinominal logistic regression was conducted. The channel choice pattern categories were defined as dependent variable, age group, gender, education level and the perceived income level of respondents as factors and purchasing attitude factors and TRI factors as covariates. Considering all the variables involved in the analysis the sample includes 372 valid and 43 missing responses from the total of 415.

Table 5. The most important predictors of channel usage pattern

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	694.350a	0.000	0	
Gender	702.194	7.844	3	0.049
Age group	746.903	52.553	15	0.000
Importance of Physical touch	761.234	66.884	3	0.000
TRI Innovativeness Factor	704.815	10.465	3	0.015
Simplification	702.887	8.537	3	0.036
The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.				
a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.				

Source: Based on authors' research

The likelihood ratio tests the final model against one in which all the parameter coefficients are 0 (Null). The chi-square statistic is the difference between the -2 log-likelihoods of the Null and Final models. The likelihood ratio in model-fitting test showed <0.001 significance level, which means that Final model is outperforming the Null.

The Pearson and Deviance significance level were 0.701 and 1.000 which confirmed that model adequately fit the data. (If the significance value is small - less than 0.05 - then the model does not adequately fit the data.)

For regression models with a categorical dependent variable, it is not possible to compute a single R^2 statistic therefore pseudo-R^2 statistic were calculated to evaluate the proportion of variance in the dependent variable associated with the predictor (independent) variables. The results of different pseudo- R^2 test were as follows: Cox and Snell 0.345, Nagelkerke 0.384 and McFadden 0.185.

The classification table gives information about the practical results of the multinomial logistic regression model.

Table 6. Classification table of the model

Observed	Predicted				
	Totally online pr.	Totally instore pr.	Web-rooming	Blended	Percent Correct
Totally online process	**35**	1	2	59	36.1%
Totally instore process	2	**8**	1	15	30.8%
Webrooming	1	4	**7**	39	13.7%
Blended	20	4	5	**169**	85.4%
Overall Percentage	15.6%	4.6%	4.0%	75.8%	58.9%

Source: Based on authors' research

In classification table the cells on the diagonal (n) and the last column (%) show correct predictions for the categories. The model least correct in prediction of webrooming pattern (13.7%), much more correct in prediction of totally instore (30.8%) and online (36.1 %) patterns and in case of Blended pattern is the best (85.4%). Overall, this model classified 58.9 % of the cases correctly.

Predictors of separate stages of purchasing process

After examining the predictors of the three-stage process (pre-purchase with information search and evaluation - purchase - post-purchase), the predictors in each stage separately from information search to post purchase stage were checked. In addition to the previously mentioned factors and covariates the considered predictors were supplemented with the most frequently used channel of the previous phase(s).

Each multinominal logistic regression analysis resulted significant (<0,001) likelihood ratio, and high Pearson and Deviance significance level, which indicated the adequacy of the models.

Table 7. Results of models' pseudo-R^2 tests in the different stages of process

	Information search	Evaluation	Purchase	Post purchase
Cox and Snell	0.256	0.510	0.289	0.369
Nagelkerke	0.306	0.609	0.327	0.419
McFadden	0.163	0.392	0.157	0.217

Source: Based on authors' research

Based on results the influence of the channel the respondents used in earlier stage(s) of the journey is an important predictor. In later stages (evaluation, purchase and post-purchase) the effect of channels used in earlier stage(s) in each later stage entered in the models, and each model shows high correct % in each category (the lowest value was 31%). The correlation between the earlier and later stages most frequently used channels were evaluated. On Figure 2 double-headed arrows and values near arrows indicate correlation and correlation level between stages.

On the Fig 2. single-headed arrows pointing from the predictors to the dependent variables, and predictors emphasized with bold letter are significant in the overall three-stage process. The percentages at the head of the single-headed arrows show the correct percentage of the model of the most frequently used channel in the given stage of customer journey.
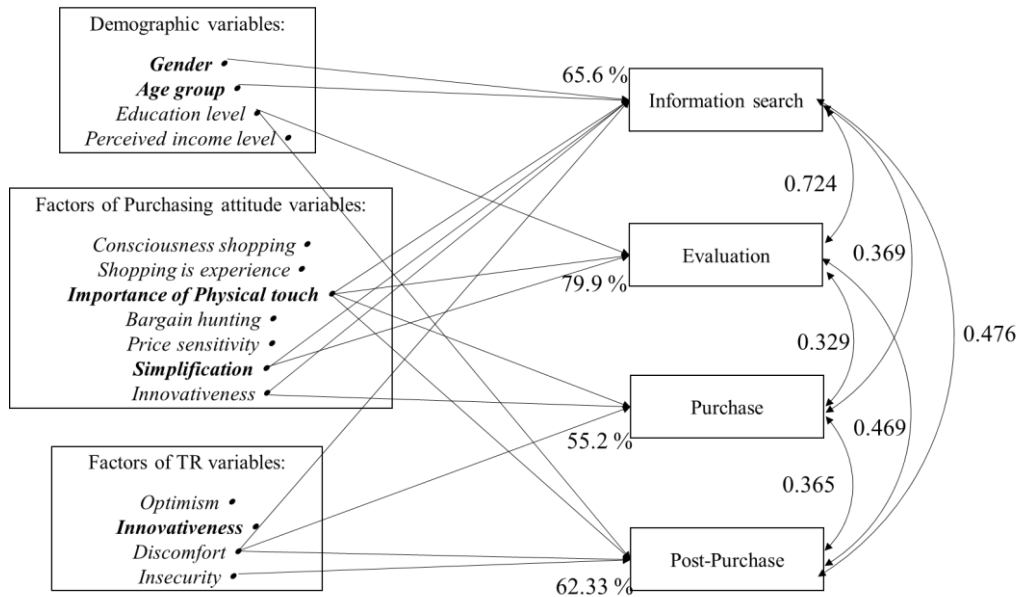
Figure 2. Model of channel usage pattern based on the examined predictors.
Source: Based on authors' research

Based on the separate stages and the overall process models the most important predictor in customer channel choice is the Importance of Physical touch which has effect on each separate stages and the overall process. The effect of this attitude factor is not surprising, if importance level of physical touch increases the customer prefers the instore channel – accordingly to results of the models.

Beside the importance of physical touch *from the attitude factors* the simplification and the innovativeness turned out as important predictors. The role of *simplification* attitude factor (including statements: "I hate to spend time gathering information on products." and "I do not like complicated things") is important in the *information search* and *evaluation* stages, and in case of the overall process also. The parameter estimates table of analysis shows stronger positive relationship between the simplification predictor and the usage of instore channel. *Innovativeness* attitude factor was important predictor at *information search* and

purchase stages. As expected, the Innovativeness level showed stronger positive relationship with the usage of online and online-offline combination channels.

From TRI factors the 2 inhibitor dimensions became important predictor in models of separate stages. The TRI *discomfort* is important predictor of *information search, purchase,* and *post-purchase* stages, while TRI *insecurity* is predictor of the *post-purchase* stage. The Wald statistic was significant (<0.05) in case of TRI discomfort at purchasing stage which showed stronger positive relation with instore channel, which means that as the level of discomfort increases, the use of the store channel increases.

From demographic parameters gender and age group were important at information search stage and in the tree-stage process. Males use online channels more frequently for information search than females. Respondents in the age groups between 19 - 24 and 31 - 40 use online channels in the largest proportion to search for information.

Education level showed important effect at evaluation and post-purchase stage. At evaluation stage higher education level did not show such a clear tendency that the frequency of use of one or the other channel would increase with a higher level of education. The biggest ratio of BA certificated respondents uses most frequently the online channel for information search. Although the biggest ratio of graduated respondent group also uses online channels for information search, the ratio of combined channel usage is the highest while the instore information search is the lowest in this education level group. At post-purchase stage the most frequently used channels distribution was very similar in each education level, except in MA/MB certificated respondent group. While the frequency distribution in the other education groups showed 41.7 - 47.4% online and only 21.1 - 25.7% store channel use, the online ratio of the MA/MB qualified group was 37% and they use the offline channel in the largest proportion (39.1%).

DISCUSSIONS

Results of the research questions

The first aim of this study was to identify different patterns in channel usage of buyers when purchase high-value electronic devices (RQ1.) Based on the most frequently used channel of the respondents in different stages (information search – evaluation – purchase – post-purchase) of customer journey, 6 purchase patterns could be identified: Totally online process, totally instore process, blended (online and offline combination which does not include stage with only instore channel), blended instore, webrooming and showrooming. Half of respondents fall into the Blended category, meaning they use of online channels at least as often or more often than offline channels, while 24.1% of the respondents use online channels the most frequently during the entire customer journey, and 13 % of the sample shows webrooming behaviour.

This finding neither confirms nor reject the H1 hypothesis, rather complements it, because half of the sample showed blended channel use with an online predominance, which does not belong to the classic channel usage patterns. While the classic omnichannel customer behaviour types: the entire online process and webrooming behaviour were also identifiable with relative high frequency (in comparison with the frequency of the other 3 channel use pattern categories).

The second part of the study intended to identify important predictors of customer channel choice during purchasing process of high-value electronic devices (RQ2.). The results of multinominal logistic regression model confirm and supplement the results of previous research on customer channel choice. The importance of physical touch turned out as the most important predictor of channel preference, which influences channel choice in the each of the consecutive stages. The other very important predictor of channel use pattern is the channel customer used most frequently in the earlier stages of customer

journey. In addition to these most important predictors in the identified model, both the purchasing attitude factors, and TRI factors turned out as important predictors of one or more stages of the customer journey.

Despite the fact that demographic characteristics have an indisputable effect on channel choice, as confirmed by our model, no clear trend emerged with advancing age or education. Although age and gender are predictors of a stage or the entire process.

These results confirmed the H2 hypothesis that each of the four examined variable groups (demography, purchasing attitude, technological readiness and channel type used in earlier stage of the journey) all contain important explanatory variables affecting the channel choice during customer journey.

Implication of the study

The diversity of channels and the changing complex customer journey provides opportunities and at the same time forces retailers to implement multi-channel strategies and give their consumers the opportunity to use the channels that best suit their needs. Forecasting the customer's channel usage pattern, the factors on the basis of which channel the customer will contact the company at a given stage of the customer journey, helps to reach customers in a more targeted manner, increase the customer experience and strengthen the long-term relationship with the company. This study explores predictors that can be used to predict a customer's channel usage during the customer journey.

Limitation of this study is the sampling method, which was non-probability (convenient) method. The 19-24 age group (university students) and Pest and Norther Hungary were overrepresented in the sample. Although internet use and omnichannel shopping behaviour are more typical of the younger generation, which justifies the overrepresentation of the younger age group, due to this

sampling method, the weight of the predictors may have shifted in the model. In the future, it would be worthwhile to examine the predictive power of the model with other sample compositions, even for individual age groups.

Limitation of the model implementation that the distribution of the four purchase pattern categories in the sample was not balanced, which significantly impairs the learning efficiency of the algorithm. Although our model correctly classified 58.9% of the cases, the explanatory power of the model is quite different between the individual purchase pattern categories. The highest the explanatory value (85.4%) in case of blended category with a large number of elements in the sample, while the prediction ability is much lower in the case of the other purchase patterns. In the webrooming category - where the number of sample elements was very low - the explanatory value is so low that we cannot even talk about the practical applicability of the model, therefore, in the future, it would be worthwhile to further test the model on respondents showing a webrooming pattern.

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