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Citizen adoption of e-government services – Evidence from Hungary

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Abstract In a citizen centric approach – which became increasingly popular in the last decade – e-government success begins with citizens starting to use e-government systems, solutions, services. In line with this our paper investigates the factors – presented by the technology acceptance literature – influencing e-government service usage, on a large representative Hungarian sample concerning a wide range of B2C public administration services. Our results imply that the Hungarian government can further increase the usage of e-government services by influencing effort expectancy, trust of internet, facilitating conditions, user experience or habits.

Keywords: • e-government • technology adoption • UTAUT • e-government adoption •

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1 Introduction

Some current streams of e-government research focus on customer centric service development and performance assessment (see Scott et al. 2009; Alomari 2012; Barbosa 2013; Nica 2015; Carter et al., 2016). This perspective acknowledges the key role of citizens as end users of e-government services (Clarke – Pucihar 2013). One of the main questions of citizen centric e-government research – and also e-government research in general – is: why do or do not citizens use e-government services, what motivates technology acceptance on the field (Bannister – Connolly, 2012; Rana et al., 2013). In order to develop citizen-centred electronic services that create value for citizens and society alike, government agencies must explore and understand the factors that drive adoption and usage of these digital innovations first (Carter – Belanger 2005).

The theories of technology acceptance are relatively often used in e-government literature: amongst the most cited 15 e-government articles 5 used TAM (Technology Acceptance Model) or DOI (Diffusion of Innovation) (Belanger – Carter 2012, 371). Rana et al. (2013) identified 54 articles using TAM, 20 using DOI and 13 based on UTAUT (United Theory of Acceptance and Use of Technology) in the e-government literature. So technology adoption by individuals has been the subject of several studies, as we will show in a literature review in the next section. Although this field is not underresearched most of the studies fall into the following categories:

- analysing technology adoption of e-government services under hypothetical circumstances (e.g. Alomari et a. 2014; Nemeslaki et al. 2016);
- analysing only intent to use not actual usage of an e-government service (e.g. Carter – Belanger 2005, Lin et al. 2011);
- analysing actual usage of only one system or service (e.g. Hung et al. 2006, AlAwadhi – Morris 2008).

In this paper we aim to present a more comprehensive research on e-government adoption: we explore adoption factors of 12 different Hungarian e-government services, focusing on actual usage, using a large and representative sample. These 12 service areas represent the whole palette of currently available e-government services in Hungary. Also, our research is broad from a theoretical point of view: we examined many of the possible factors of technology acceptance suggested by the literature, this way presenting results independent of the different models. We believe that this rich evidence will give researchers and practitioners a more detailed view of factors driving citizen adoption of e-government services.

2 Literature review

In the end, the success of e-government initiatives depends significantly on whether users – public employees or citizens – are willing to accept and use the innovation, the new tool, system or service. One of the most utilised models for the exploration of information technology innovation acceptance is the TAM (Technology Acceptance Model – see Davis 1989; Venkatesh – Davis 2000). The essence of the model is rather simple: attitudes regarding use, intention to use, and actual use are defined by two variables: perceived usefulness of the system and its perceived ease of use. In the IT literature, more than 100 empirical studies tested these simple relationships of the TAM model. The effect of perceived usefulness was supported in 74% of these studies, while ease of use often proved to be a necessary, but not sufficient condition (Lee et al. 2003).

Regarding e-government innovation adoption, a considerable number of empirical research papers utilised the TAM model, or its expanded versions. Carter and Belanger (2005) also performed their research using a modified version of TAM, finding that regarding e-government services, three primary factors define citizens' intention to use: perceived ease of use, compatibility (congruency with and similarity to citizens' normal way of communication or transactions) and reliability (whether users judge the service to be reliable and safe, and trust it). Many also used the TAM model regarding the acceptance of other e-government innovation, for example, e-voting technology (Schaupp – Carter 2005; Chiang 2009; Choi – Kim 2012, Nemeslaki et al. 2016), and found its explanatory power to be strong.

The original TAM model was extended by many, and the UTAUT model (United Theory of Acceptance and Use of Technology, Venkatesh et al. 2003; see Figure 1) attempted to unify these improvements into a single model. In the last decade, the use of the UTAUT model gained acceptance in the e-government literature as well (e.g. Gupta et al. 2008; Powel et al. 2012). Here, along with the original two TAM variables, the moderating effects of social environmental influence, other workplace driving factors, and individual characteristics (users' age, gender, experience, and voluntary nature of use) are also present in the model's context. Hung et al. (2006) used an expanded TAM and UTAUT model to research factors influencing willingness to use a Taiwanese online tax system, and found the following significant factors that effected attitudes regarding use: perceived usefulness, perceived ease of use, perceived risk, trust, compatibility, as well as external influence, interpersonal influence, self-efficacy (one's mental image of one's own efficiency) and facilitating conditions. Along with external factors, factors such as media influence should be mentioned, while interpersonal influence may take the form of colleagues and friends' positive opinions on e-government services, and their encouragement to use it. Finally, the easy accessibility and availability of the necessary devices, hardware, and software is a must among the facilitating conditions.

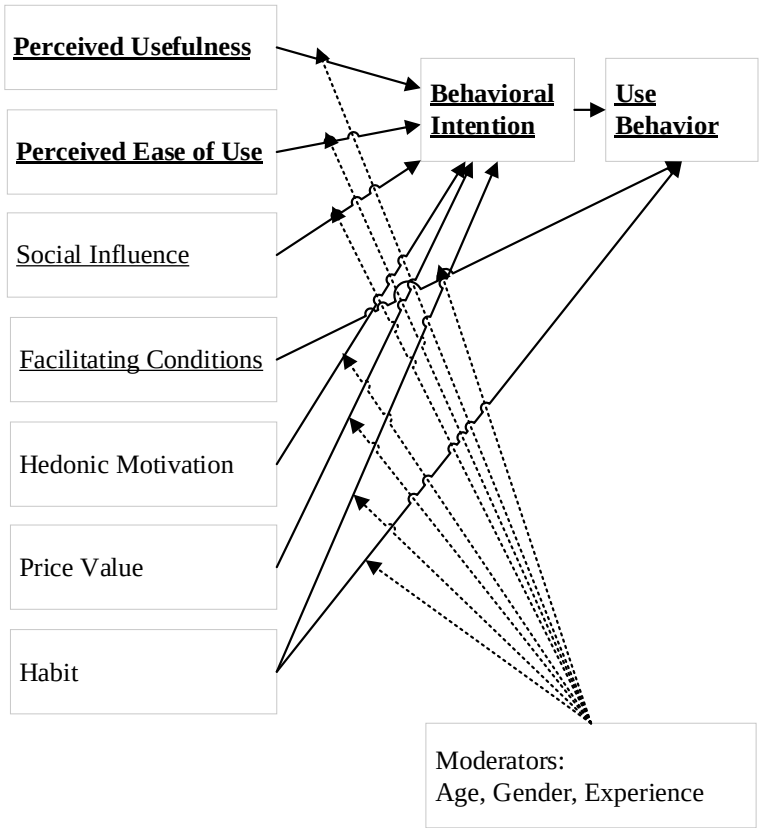

Figure 1: The TAM (elements in bold; Davis 1989) and the expanded UTAUT model (elements underlined, Venkatesh et al. 2003) and UTAUT 2 (the entire figure; Venkatesh et al. 2012)

While UTAUT is a popular model, Venkatesh et al. (2012) proposed a further extended version, UTAUT2. With three new constructs – hedonic motivation, price value, and habit – the predictive power of their model increased significantly.

Diffusion of Innovation (DOI, Rogers 2003) is also a widely used model in IT adoption research, but e-government researchers claim that its core constructs are similar to and substitutable by TAM factors: relative advantage with perceived usefulness and complexity with perceived ease of use (Carter – Bélanger 2005; Colesca – Dobrica 2008). Rana et al. (2013) compared the explanatory power of the five most used IT adoption models in a meta-analysis based on 87 studies of citizen centric e-government services. Based on their results, all of the basic relationships of TAM could be confirmed. This was the most widely used model in research focused on e-government adoption, and this also seemed the most appropriate one for studies that focus on citizens. Although DOI was the second most common research framework, only a small number of its relationships were validated, and empirical research only concentrated on three of its explanatory variables

(compatibility, complexity, relative benefits). The most important of the new variables of the UTAUT model is the social effect, while the effect of facilitating conditions was under-researched. This meta-analysis also highlighted that factors – that all central models lack – such as trust, safety, privacy, and risk – appear rather often in empirical studies on e-government adoption and seem to have significant effects.

Naturally, along with using the theories of the scientific mainstream, independent e-government acceptance theories have also been constructed. Ziemba and co-authors (2013, 2015), for example, examine factors of a successful e-government in one such model. In their model of e-government adoption at the local and state levels, they attempt to explain the three factors of e-government adoption (ICT availability, ICT competence and awareness, ICT use) with economic, socio-cultural, technological, and organisational factors. In Table 1 we summarise a number of further e-government technology adoption models, to demonstrate the diversity of theoretical approaches.

Table 1: Special e-government technology adoption models (partially based on Panda – Sahu 2013)

Authors	Model focus	Studied factors
TAS – GENIS-GRUBER (2008)	Cultural Factors' Affect on Adoption, partially based on Hofstede (with a focus on e-procurement)	Power Distance Index; Individualism Index; Uncertainty Avoidance Index; Trust; Technology Acceptance Ratio
GUHA – CHAKRABARTI (2014)	Analysis of adoption factors from a network theory viewpoint	Partner selection Network goal Institutionalisation Network structuring Incentive design
AZADEGAN – TEICH (2010)	Technology adoption based on the DOI and TOE (Technology, Organization, Environment) models and motivation theories (with a focus on e-procurement)	Technological factors: perceived benefits, relative benefits, compatibility, complexity; Organisational factors: organisational competence, technical skills, financial skills, cultural and organisational skills; Partner factors: partner competence, strength, other partner factors Network factors: network size, internal relationships, technology infrastructure, other network factors

The model of Ziemba et al. (2015) is one of the few e-government adoption researches in Central and Eastern European context. While the usage of TAM is not without exception in Hungarian technology adoption research as well (e.g. Keszey – Zsukk 2017), Hungarian e-government adoption research is still rare (e.g. Nemeslaki et al. 2016; Molnár et al., 2017).

3 Research model and methodology

The empirical basis of or research was the Good State Public Administration Opinion Survey (henceforward referred to as Survey; Kaiser 2017) carried out in Hungary 2017. The data collection was planned, tested and carried out by Szociometrum Social Science Research. The survey questions were tested on a representative sample for the adult (age 18+) Hungarian population. The sampling method was multistage, proportionally stratified probability sampling, while the database was also corrected ex post with matrix weighting procedure concerning age, gender, region, settlement type and education. (See descriptive statistics in Table 2.)

Table 2: Descriptive statistics of the Good State Public Administration Opinion Survey sample

Gender	**Frequency**	**Percent**	**Age**		
Female	1352	54%	Mean		46.51
Male	1154	46%	Median		45
Total	2506	100%	Range		19 - 89
Education	**Frequency**	**Percent**	St. Dev		16.334
Maximum primary school	796	32%	**Type of settlement**	**Frequency**	**Percent**
Secondary school	1211	48%	Capital (Budapest)	460	18%
Bachelor degree	399	16%	County centres	539	22%
Master degree	99	4%	Town	635	25%
Postgradual degree	2	0%	Village	872	35%
Total	2506	100%	Total	2506	100%

The Survey contained 70 questions, some with many sub-questions, of which we are only using some (see Appendix 1) to explore the influencing factors of e-government service usage. The Survey provided the opportunity to use a large (n=2506) representative database, with data about citizens' usage and experience of 12 different areas of e-government services (see list in Table 3) and the citizens general background as well.

For these 12 administrative areas citizens were asked whether they had to use these public services in the past 3 years, if yes, whether they did that themselves, and finally if yes, in what way did they gather information (in person, via phone, via e-mail, via website) or handled the necessary transaction (in person, via phone, online or via app, via post). This data gave us the opportunity to compare citizens using online and traditional channels in the information or the transaction phase of public administration on different fields.

Table 3: List of government service areas and frequency of online usage (11. Administration of construction affairs was omitted from further analysis due to the low subsample size)

Government service areas	N	Frequency	
		Information online	Transaction online
1. Income tax administration	399	71 (19%)	101 (27%)
2. Tax administration at municipalities	238	18 (8%)	17 (7%)
3. Other tax administration at the national tax and customs administration agency	129	25 (21%)	22 (18%)
4. Administration of government issued documents	1041	150 (16%)	59 (6%)
5. Family support administration	222	25 (12%)	15 (7%)
6. Health insurance administration	126	19 (16%)	13 (11%)
7. Unemployment administration	159	8 (5%)	6 (4%)
8. Social benefits administration	239	13 (6%)	5 (2%)
9. Pension insurance administration	97	11(12%)	7 (7%)
10. Land registry administration	147	19 (14%)	13 (9%)
11. Administration of construction affairs	41	7 (18%)	9 (25%)
12. Motor vehicle administration	395	73 (20%)	44 (11%)

To test the different factors of e-government adoption we used as many variables from the literature (summarized in the previous section) for which we had the corresponding relevant data in the Survey. This gave us the opportunity to test the effect of the following factors:

- Effort expectancy (Perceived ease of use)
- Trust of internet
- Trust of government
- Facilitating conditions
- Experience
- Habit
- Age
- Gender

The basis of this factor selection was Venkatesh et al. (2012). We analysed most of the factors and moderators included in UTAUT2 (presented in Figure 1). Notice that we did not use one of the key variables of TAM, perceived usefulness, as the survey question concerning this was too distant and biased. We also did not include price value and hedonic motivation, as by definition these concepts are less relevant in e-government settings and also did not have a real history in e-government adoption research.

Our list of factors under examination is also similar to e-government adoption research carried out by Carter – Belanger (2005) in two respects: we tested many potential factors from different theoretic models, and we included the factor of trust. Trust related concepts are amongst the most common extensions of TAM in e-government research and their significance is shown in many studies (e.g. Schaupp – Carter 2005, Powell et al. 2012). Just like these previous studies we included both trust in the internet and trust in the government in our research.

For measurement of the factors we used direct survey variables in case of age and gender, and factor analysis in case of the other six. The original questions, their measurement, factor component matrices and KMO statistics can be found in Appendix 1. Although answers to the key construct questions were measured on a Likert scale, if a Likert scale is equidistant it behaves more like an interval-level measurement and therefore, can be viewed as an interval scale and used for factor analysis (see Carifio – Perla 2007).

The operationalization methods of the Good State data collection did not allow us to build regression or structural equation model – common in the TAM literature – for the analysis. So to test the relationships between the potential influential factors and actual usage we used traditional association metrics and statistical tests to identify significant differences between online and offline e-government service users. Being aware of the limits of the measurement scales used in the data collection not only ANOVA-based mean tests, but also nonparametric Mann Whitney U test and median tests where employed to identify significant differences of distributions and medians. The limitations of the database is also the reason behind our decision that age, gender and experience were also be tested as potential influential factors and not as modifiers.

Although the database served as a source of many limitations, but it was also advantageous from another point of view: it allowed us not only to test adoption factors of actual usage, but we could distinguish between informational and transaction level of e-government usage as well. In summary, the guiding research question of our study was: *Which factors – presented in the technology acceptance literature – are associated with informational or transactional e-government service use in comparison to traditional forms of public service use concerning a wide range of B2C public administration services in Hungary?* The research model is represented in Figure 2.

4 Results

A summary of our results is presented in Table 4 and Figure 2. We indicated all the connections, where we found statistically significant differences between mean or median values of online and offline users of administrative government services.

The sample for construction affairs administration (11.) was too low to carry out in depth statistical analysis or find significant results – so in the further discussion we focus on the other eleven service areas.

Table 4: Results by government service areas where factor values for online users are significantly higher than factor values for offline users (*: p<0.05, **: p<0.01, bold: difference in factor is larger than 25% of the range of its value)

Government service areas	Adoption factors found significant	
	Information online	**Transaction online**
1. Income tax administration	Effort expectancy*, Trust of internet**, Facilitating conditions**, Experience**, **Habit****	Effort expectancy**, Trust of internet**, Trust of government*, Facilitating conditions**, Experience**, **Habit****
2. Tax administration at municipalities	Facilitating conditions**, Habit*	**Trust of internet****, Facilitating conditions**, **Habit****
3. Other tax administration at the national tax and customs administration agency	Effort expectancy*, Trust of government**, Facilitating conditions**, **Habit****	Effort expectancy**, Experience*, **Habit****
4. Administration of government issued documents	Effort expectancy*, Trust of internet**, Trust of government**, Facilitating conditions**, Experience**, **Habit**,** Age*	Effort expectancy**, Trust of internet**, Facilitating conditions**, Experience**, **Habit****
5. Family support administration	Trust of internet**, Facilitating conditions**, Habit**,	**Trust of internet**,** Facilitating conditions**, Experience**, **Habit****
6. Health insurance administration	**Trust of internet**,** Facilitating conditions**, Experience**, Habit*	**Trust of internet***, Facilitating conditions*, Experience*, **Habit****
7. Unemployment administration	**Trust of internet**,** Habit*	Experience*, **Habit****
8. Social benefits administration	**Trust of internet**,** Facilitating conditions**, **Habit****	Facilitating conditions**, Experience**, **Habit****
9. Pension insurance administration	Trust of internet**, Facilitating conditions**, Experience**, **Habit***, Gender*	**Trust of internet***, Trust of government*, Facilitating conditions**, Experience*, **Habit****
10. Land registry administration	Trust of internet*, Facilitating conditions**, Experience*, **Habit****	Facilitating conditions**, Habit*
11. Administration of construction affairs	-	-
12. Motor vehicle administration	Effort expectancy*, Trust of internet**, Experience**, **Habit***	Effort expectancy***, Trust of internet**,** Facilitating conditions**, Experience**, **Habit****

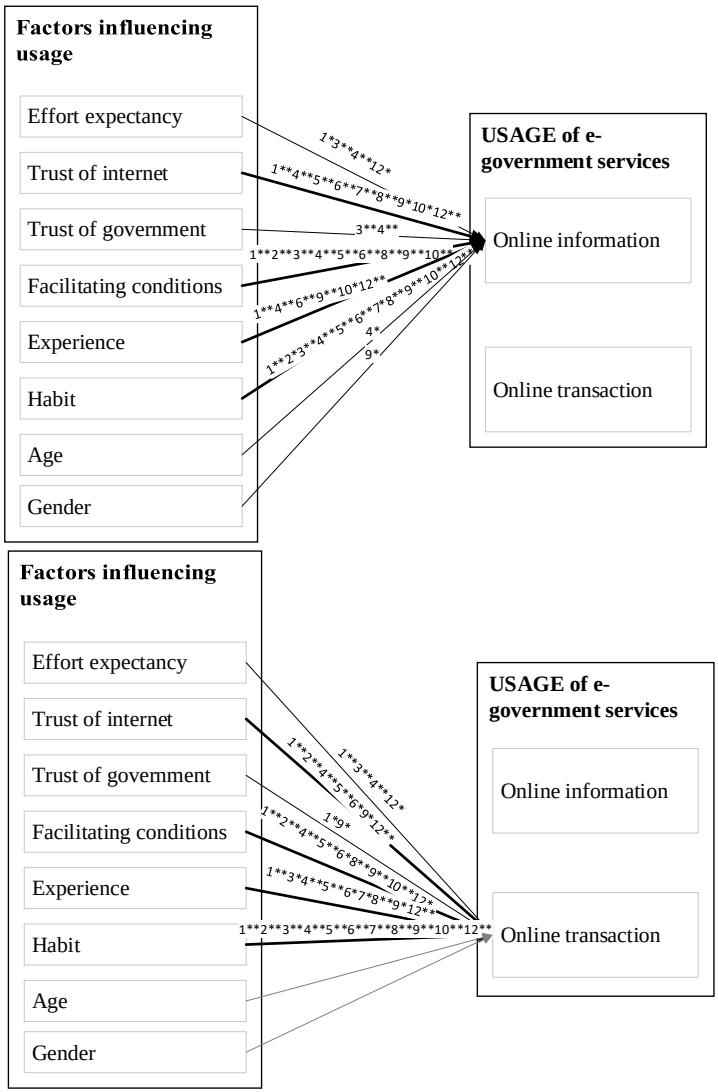

Figure 2: Model Results
(the identification number of the government service area – see numbered list in Table 3 – is indicated above the arrows where factor values for online users are significantly higher than factor values for offline users, *: p<0.05, **: p<0.01)

We see that the most common relationships related to informational e-government usage are with habit, facilitating conditions and internet trust: the level of these factors was significantly higher for online users than for offline ones in at least nine of the eleven observed service areas. These factors are similarly important in case of e-government transactions as well, although here the level of experience is also significantly higher for online users. On the other hand, trust in the government, age or gender does not seem to

differentiate between citizens using e-government services and citizens that are choosing offline administrative options (only in some rare, specific service areas).

5 Discussion

Concerning the original factors of TAM our results seem to be less decisive. The effect of performance expectancy was not measurable based on our database and effort expectancy seems to be an important determinant in only four out of the eleven Hungarian e-government service areas. These areas are: income and other tax administration, government issued document and motor vehicle administration – most of these being the larger subsamples and still showing significant relationships only at $p<0.05$ levels. So effort expectancy seems not to be the main factor behind Hungarian citizens' decision of using online or offline e-government platforms. One of the reasons behind this result could be that we tested effects on actual e-government usage only, and not on behavioural intention – while according to the original TAM, effort expectancy has a direct effect on intent to use and not on actual usage.

If we look at the extended UTAUT2 factors we see more significant results. Habit seems to be the most important differentiator between offline and online usage in all e-government service areas. The relationship with habit is significant in all 22 cases (all 11 analysed service areas, regarding both online information and transaction), and in 17 instances the level of habit for online users is more than 25% higher than others (as a percentage of the range of this variable). We conceptualized habit as prior behaviour (Kim – Malhotra 2005), so our results suggest that prior general administrative behaviour and platform choices influence electronic government adoption of Hungarian citizens the most. Habit has been one of the two factors in UTAUT2 with assumed direct effect on actual usage – this direct effect has been found significant originally by Venkatesh et al (2012) and in case of e-government usage here as well.

The other factor of UTAUT2 (and UTAUT) with hypothesised direct effect on usage is the factor of facilitating conditions. Facilitating conditions – measured by the accessibility of devices and internet connection – was the second most important factor in our study of Hungarian e-government adoption as well: found significant in 18 out of 22 cases. According to a study of the Hungarian Central Statistical Office (2015) 76% of adult Hungarian citizens are using computers and the internet – only 1-2% less than the European average (although some differences between rural areas might still exist; Csótó – Herdon, 2008). This means that the significant effect of facilitating conditions for some citizens is not caused by a nationwide lagging of ICT penetration. The generally high level of connectivity might also be a reason why there is a significant but never above 25% difference in the value of the facilitating conditions factor when comparing online and offline government service users.

We mentioned that internet and government trust are frequent extensions of the TAM/UTAUT in e-government literature. The phenomenon that only internet trust has a significant effect on e-government adoption is also not uncommon. Trust in the government seemed not to be a significant influencer of adoption in international studies

(e.g. Powell et al. 2012) or in other Hungarian studies (NEMESLAKI et al. 2016) – and that is what we see in our case as well. Examining a broad spectrum of e-government areas we found a statistically significant relationship between citizens' trust in the government and e-government adoption only in four cases. Interestingly enough three of these cases are tax and pension related transactions, which have serious financial components – these seem to be the cases where higher level of government trust leads to more online transactions.

Conversely, trust in the internet seems to have a significant effect in a wide range of Hungarian e-government areas (in 16 analysed cases). In 8 instances the trust level of online government service users is above 25% higher than the offline ones. This is not entirely surprising in Hungarian context, as the low level of internet trust among Hungarians was one of the factors why Hungary lagged behind in terms of e-commerce and especially e-payment market developments (e.g. Aranyossy – Juhász 2013; Fehér – Varga 2017). Concerning Hungarians' e-voting attitude Nemeslaki et al. (2016) found that internet trust is the second most important factor, and the statistical data collection of HCSO (2015) also stated that 11% of Hungarian citizens are not using e-government transactions because they do not trust the systems enough to give their personal data. Our results also confirm this important role of trust in the internet in Hungarian e-government adoption.

Although we handled the variables of age, gender and experience differently than the original UTAUT2 by analysing them as factors and not moderators, our results here are also noteworthy. While based on our analysis the age and gender of the citizens are not differentiating factors in terms of administrative channel choice (offline vs. online) – experience is. Citizens choosing six of the informational and nine of the transactional e-government services have significantly higher level of experience in other, non-governmental online transactions than offline citizens. This also suggests, that experience is more important when citizens have to choose a transactional channel, and less for collecting information online – so to administer online people rely more on prior experiences of e-transactions.

6 Conclusions, limitations and implications for theory and practice

In this paper we tested six factors of the UTAUT2 model extended with trust to analyse e-government adoption on a large Hungarian sample. One of the novelties of our research was that we examined factors of actual e-government usage and not only the behavioural intent. Also the robustness of our findings is increased by the fact that not only one but eleven, a near total spectrum of Hungarian G2C administration service areas were examined. We found that the key factors differentiating e-government users are habit, trust in the internet and facilitating conditions, while in case of online transactions prior e-commerce experience is also important.

Practitioners might also be interested in some of the detailed results of analysis on the level of the eleven individual government service areas. The service with the highest proportion of online users (27% vs. the average 9,6%) was income tax administration.

This is not surprising knowing that the Hungarian tax authority informs about the possibilities of the online income tax administration option every citizen yearly, strongly arguing for the usage of the online platform. Also, at the beginning of 2017 a new income tax administration service was launched making the tax declaration process faster and easier and the usage of the platform more user friendly. While the Hungarian online income tax administration platform seems to be a success it is still true that all of the examined factors except for age and gender show a significant effect on adoption (see Appendix 2), so there are still possibilities to increase the number of online users by influencing citizens' internet trust or facilitating conditions for example.

On the other hand, the most frequently used administrative service seems to be the administration of government issued documents: more than 41% of the citizens had to deal with this process. While many people search for information online regarding this process only 6% of them chose online transactional options. This gives the government an opportunity to have a significant impact on e-government penetration based – partly – on our results as well: by influencing effort expectancy, trust of internet, facilitating conditions, experience or even habit if possible.

Methodological limitations of our study could also guide future research. A more model-specific data collection method – including direct questions regarding performance expectancy and more detailed Likert-scales to measure – would have supported more complex analysis, potentially even with PLS method. On the other hand our data and analysis could be used to draw more in depth conclusions regarding the individual e-government areas – the length of this paper did not allow the publication of these details.

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Appendix

Good State Public Administration Opinion Survey – selected questions, measurements and results of the factor analyses

Code	Question	Measurement	Factor Component Matrix
	USAGE		
K25.	During the last three years – 2014-15-16 – did you have to deal with any of the following public administration matters?	binary variables: YES – NO	
K25-26-27-28.1.	*Income tax administration*		
K25-26-27-28.2.	*Tax administration at municipalities*		
K25-26-27-28.3.	*Other tax administration at the national tax and customs administration agency*		
K25-26-27-28.4.	*Administration of government issued documents*		
K25-26-27-28.5.	*Family support administration*		
K25-26-27-28.6.	*Health insurance administration*		
K25-26-27-28.7.	*Unemployment administration*		
K25-26-27-28.8.	*Social benefits administration*		
K25-26-27-28.9.	*Pension insurance administration*		
K25-26-27-28.10.	*Land registry administration*		
K25-26-27-28.11.	*Administration of construction affairs*		
K25-26-27-28.12.	*Motor vehicle administration*		
K26.	If yes: Did you administer it yourself?	binary variables: YES – NO	
K27.	If yes: What channels of information did you use before starting the administrative process? *1. personal customer service 2. telephone 3. e-mail 4. website 5. none*	binary variables: YES – NO	
K28.	Did you use the following channels as part of the administrative process? *1. personal customer service 2. telephone customer service 3. online service or application 4. postal service 5. other*	binary variables: YES – NO	
	EFFORT EXPECTANCY	Factor analysis of the following variable (KMO: 0.740)	
K6.1	It is characteristic of me that I start an online administration process, but I get stuck and I quit.	Likert scale: 1-perfectly true …. 4-not true at all	0.948
K6.2	It is characteristic of me that I start an online administration process, but I do not finish in time and I quit.	Likert scale: 1-perfectly true …. 4-not true at all	0.947
K6.3	It is characteristic of me that in an online administration process I can only partially arrange what I want to.	Likert scale: 1-perfectly true …. 4-not true at all	0.903
K6.8	I find it easy to orient myself on the websites where I have to administer.	Likert scale: 4-perfectly true …. 1-not true at all	0.138
	TRUST OF INTERNET	Factor analysis of the following variable (KMO: 0.806)	
K6.4	I never give my bank account data while shopping online.	Likert scale: 1-perfectly true …. 4-not true at all	0.807
K6.5	I do not register on online platforms till I have to.	Likert scale: 1-perfectly true …. 4-not true at all	0.843
K6.6	I am averse from giving my personal information on the internet.	Likert scale: 1-perfectly true …. 4-not true at all	0.891
K6.7	There are some personal data of mine which I would not give even while registering on state organisations' websites.	Likert scale: 1-perfectly true …. 4-not true at all	0.789
	TRUST OF GOVERNMENT	Factor analysis of the following variable (KMO: 0.769)	
K9.1	If the state registers our real estates, motor vehicles, their property rights are insured.	Likert scale: 4-perfectly true …. 1-not true at all	0.660
K9.3	Without official documents we would not be able to enter into contracts, sign on for jobs.	Likert scale: 4-perfectly true …. 1-not true at all	0.449
K9.8	Public administration is necessary to care for pensioners and the ones in need.	Likert scale: 4-perfectly true …. 1-not true at all	0.678
K9.9	State care actually comes to those who are entitled to it.	Likert scale: 4-perfectly true …. 1-not true at all	0.633
K9.10	A country can be efficient only if it has an efficient public administration.	Likert scale: 4-perfectly true …. 1-not true at all	0.566
K9.11	The Hungarian public administration works efficiently.	Likert scale: 4-perfectly true …. 1-not true at all	0.717
K23.2	State organisations protect are personal information properly.	Likert scale: 4-perfectly true …. 1-not true at all	0.609

Code	Question	Measurement	Factor Component Matrix
	FACILITATING CONDITIONS	Factor analysis of the following variable (KMO: 0.675)	
K17.1	How many personal computers are there in your household?	Integer	0.520
K17.2	How many notebook/laptop/netbook are there in your household?	Integer	0.688
K17.3	How many tablet are there in your household?	Integer	0.632
K17.5	How many smart phone are there in your household?	Integer	0.831
K1.	How many internet connections are there in your household?	Integer	0.792
	EXPERIENCE	Factor analysis of the following variable (KMO: 0.810)	
K5	How often do you do the following activities?	Likert scale: 1 – never …. 4 – almost every day	
K5.1	*searching online*		0.599
K5.2	*reading news online*		0.551
K5.3	*e-mail*		0.676
K5.4	*online messaging*		0.571
K5.5	*using social media platforms*		0.432
K5.6	*making online phone calls*		0.626
K5.7	*e-learning*		0.598
K5.8	*working online*		0.580
K5.9	*shopping online*		0.675
K5.10	*selling online*		0.565
K5.11	*online banking*		0.630
	HABIT	Factor analysis of the following variable (KMO: 0.701)	
K15.13	If possible I avoid dealing with administration online.	Likert scale: 1-perfectly true …. 4-not true at all	0.860
K15.14	I prefer dealing with administration in person than online.	Likert scale: 1-perfectly true …. 4-not true at all	0.839
K15.15	I prefer dealing with administration online than on the phone.	Likert scale: 4-perfectly true …. 1-not true at all	0.818
	AGE		
D6.	Please give the year of your birth	From this transformed: Age in years – String	
	GENDER		
D5.	Responder's gender	binary variable: male – female	

Appendix 2

1. PERSONAL INCOME TAX ADMINISTRATION

(ANOVA, significant mean differences, * p<0.05; ** p<0.01)

FACTORS INFLUENCING USAGE	online information		online transaction	
	no	yes	no	yes
n	296 (81%)	71 (19%)	267 (73%)	101 (27%)
Effort expectancy	-0.025*	0.245*	-0.026**	0.324**
Trust of internet	-0.037**	0.452**	-0.125**	0.495**
Trust of government	-0.094	0.043	-0.080*	0.188*
Facilitating conditions	0.278**	0.702**	0.184**	0.766**
Experience	0.143**	0.797**	-0.005**	0.941**
Habit	-0.095**	0.809**	-0.263**	1.015**
Age	no significant relationships			
Gender	no significant relationships			

4. ADMINISTRATION OF GOVERNMENT ISSUED DOCUMENTS

(ANOVA, significant mean differences, * p<0.05; ** p<0.01

Nonparametric Mann Whitney U test (p<0.05), significant distribution differences with bold)

FACTORS INFLUENCING USAGE	online information		online transaction	
	no	yes	no	yes
n	815 (84%)	150 (16%)	972 (94%)	59 (6%)
Effort expectancy	-0.026**	0.307**	-0.002**	0.366**
Trust of internet	-0.052**	0.571**	0.039**	0.572**
Trust of government	-0.121**	0.192**	-0.098	0.114
Facilitating conditions	0.141**	0.786**	0.183**	0.816**
Experience	-0.016**	0.650**	0.048**	0.873**
Habit	-0.179**	1.001**	-0.017**	1.108**
Age	**44 years**	**42 years**	no significant relationships	
Gender	no significant relationships			