E-Government Services and the Digital Divide

A Quantitative Analysis of the Digital Divide between

the General Public and Internet Users

Doc. Ing. Jiřina Bokšová PhD Department of Finance and Accounting, SKODA AUTO University, Mladá Boleslav, Czech Republic

Michal Bokša MPhil Academic Researcher, SKODA AUTO University

Ing. Josef Horák PhD Department of Finance and Accounting, SKODA AUTO University

PhDr. Karel Pavlica PhD Department of Human Resources Management, SKODA AUTO University

Prof. Ing. Jiří Strouhal PhD Department of Finance and Accounting, SKODA AUTO University

Prof. Ing. Stanislav Šaroch PhD Department of Law and Economics, SKODA AUTO University

Abstract: The purpose of this article is to assess the digital divide that exists between the general public and (active) Internet users in their support for the digitalization of public services (E-Government). In conducting this study, the SKODA AUTO University Research Team gathered data from 1,613 respondents – 611 respondents who are active Internet users (using computer-assisted web interviews) and 1,002 respondents from the general public (using pen-and-paper or computer-assisted personal interviews). Results have indicated that the divide exists, although it does not pose as considerable a challenge to the current E-Governance as is often assumed. Based on the current divide, improved ICT skills and higher Internet usage among citizens could increase overall support for the digitalization of public services by up to 20 percentage points. Data results also identified two societal segments, namely, respondents from 1) the age category 60+ years and 2) 'Below-average income' respondents, as particularly vulnerable and marginalized.

Keywords: E-Government; Digitalization; Internet users; Survey; the Czech Republic.

Introduction

The purpose of this paper is to further advance the understanding of how the approach towards E-Government and digitalization of public services fluctuates between general public and active Internet users. Undeniably, in a modern fast-paced online environment, there is an increased need not only for developing advanced and complex E-Government services, but also an increased need for citizens to actually use such services. Specifically, only in such a scenario can all benefits, which digitalized public services provide, be utilized to their maximum potential (Boksa et al., 2019). As a result, it can be easily argued that the success of E-Government is largely dependent on citizens themselves accessing and using digitalized public services (Hardill & O'Sullivan, 2018; Kunstelj, Jukic & Vintar, 2007). Yet, in spite of more than a decade of varying efforts across developed societies to increase citizens' participation in E-Government, numerous obstacles still exist. The relevance and size of these obstacles can be easily demonstrated by a sheer number of scholarly articles focusing on this issue (Axelsson, Melin & Lindgren, 2010; Holzer & Manoharan, 2012; Axelsson & Melin, 2008; Dodel & Aquirre, 2018). Assessing scholarly research in this field over the past decade, it can be inferred that the lack of ICT skills among the domestic population has been commonly noted and perceived as a key culprit for sluggish growth of citizen engagement with E-Government (Boksa et al., 2019; Fuglerud, 2009).

In order to further advance scholarly understanding of such conclusions, this research article, based on a large survey of nationally representative data, aims to further explore to what extent individual ICT skills truly inform and affect citizens' attitudes and perceptions of E-Government. The overall research approach implemented by the SKODA AUTO University Research Team is based on comparing assessments toward E-Government among two groups (represented by two distinct data sets) – the 'General public' and active 'Internet users'. An essential premise of the research is that those who are active Internet users by default possess more advanced ICT skills and, according to the current academic understanding, should therefore demonstrate more favourable predisposition and attitudes toward the digitalization of public services. Importantly, the scope of this research does not only aim to shed more light on such a supposition, by either validating or refuting current scholarly understanding, but it likewise strives to provide quantifiable evidence, which will indicate the extent of the difference between the two sample groups. If current academic understanding is accurate, our SKODA AUTO University Research Team's survey should be in line and further substantiate the proposition that a positive correlation exists between the population's ICT skills and its tendency to be in favour of advancing digitalization of public services (see Dodel & Aquirre, 2018; Deursen, Helsper & Eynon, 2014). Aside from academia, this view is currently also

maintained by some of the most prominent international bodies and organizations, such as the United Nations (<u>Stoiciu, 2011</u>) or European Union (<u>Davies, 2015</u>).

Throughout this paper, the terms E-Government, digitalized public services or simply digitalized services are used interchangeably, always ultimately referring to the currently available governmental services to which citizens have online access (typically via the governmental online portal).

Data Collection and Methodology

Considering the scope of this paper, which strives to compare the varying attitudes toward e-Government currently found in 1) the general public and 2) active Internet users, the data collection process was itself divided into two phases, altogether based on a large-scale survey with 1,613 respondents.

Within the first phase the SKODA AUTO University Research Team focused on active Internet users and utilized a computer-assisted web interviewing (CAWI) method. Between 31 October 2019 and 6 November 2019, the team successfully gathered data/complete answers from 611 respondents who are active Internet users on a daily basis. The essential criteria for quota selection were gender, age, education level, the municipality size, and region. As a result, the collected data are representative of the adult (Internet active) population specifically in the Czech Republic and to a greater extent of the Central and East European area.

The second phase subsequently focused on a data collection from the general public.ⁱ Herein, the SKODA AUTO University Research Team implemented face-to-face interviewing methods, specifically, the Pen-and-Paper Personal Interview (PAPI) and Computer-assisted Personal Interview (CAPI). Overall, the data were collected from 1,002 respondents – out of which 680 were interviewed via PAPI and 322 via CAPI methods. The criteria for quota selection were identical with those implemented during the first phase of the data collection process in order both to preserve the comparability between data sets and to again ensure that the data are representative of the adult population.

Of note, the binary division between general public and active Internet users in the result section intrinsically resulted from the data gathering process and generated data samples, where the CAWI method was used for active Internet users and PAPI and CAPI were used for the general public. Data gathering was conducted professionally via cooperation with market research institution STEM. Statistical collection was based on random sampling within preselected categories (age, gender, location, education level) in order to make the results nationally representative.

There were three identical questions that were posed to all respondents, each with multiple fixed answers. Comparing responses between 1) General public and 2) Internet users while simultaneously correlating them with respondents' gender, age, education level, the municipality size, and region (criteria for quota selection) generated data points from which the SKODA AUTO University Research Team inferred the results and conclusions provided below.

The **first question** asked: "*Do you support the digitalization of Government services?*" with possible answers, in descending order, being: 1) Certainly yes, 2) Rather yes, 3) Rather no, 4) Certainly no, 5) I do not care.

The **second question** asked: "*How well-informed are you about tools currently offered by E-Government public services?*" with possible answers, in descending order, being: 1) Certainly well-informed, 2) Rather well-informed, 3) Rather not well-informed, 4) Certainly not well-informed.

The **third question** asked respondents to fill in the blank: "*Further digitalization of public services is personally for you* …" with possible answers, in descending order, being: 1) Certainly beneficial, 2) Rather beneficial, 3) Rather not beneficial, 4) Certainly not beneficial.

Literature Review and Academic Contribution

Considering previous academic research focused particularly on the issue of the digital gap between Internet users and the General Public, as well as on how the lack of ICT skills among the domestic population undermines citizens' engagement with E-Government, several studies ought to be highlighted.

In terms of appropriate operational definitions and measuring processes of the digital divide itself, a study 'How to measure the digital divide?' prepared by the Korean Agency for Digital Opportunity and Promotion (<u>ITU, 2004</u>) represents a valid source. Although the study itself was prepared in 2004, large portions of its content remain pertinent and relevant to current research within this field to this date and can well serve as a comprehensive steppingstone.

Regarding particular research papers that looked at specific and country-associated digital divides, Nam & Sayogo (2011), need to be mentioned, as they studied this particular phenomenon in the case of the United States of America. Similarly, Brandtzæg, Heim & Karahasanovic (2011), addressed this divide in Europe. Nevertheless, it is of relevance that both of these studies focused on the presently most developed societies. Specifically, the former focused solely on the United States of America, while the latter restricted its concentration primarily to Norway, Sweden, Austria, the United Kingdom, and Spain. As such,

presently still developing societies that are undergoing digitalization transformation as well, such as those we can find in Central and Eastern Europe, have been notably neglected.

Regarding the further interlinks that exist between digital divide and often associated ereadiness, Hanafizadeh, Hanafizadeh & Saghaei (2009) well discuss and investigate further model definitions and methodologies while identifying their potential weaknesses and strengths. Further elaboration on varying e-readiness assessment measures have been also provided in greater detail, particularly by Hanafizadeh, Hanafizadeh & Khodabakhshi (2009). Nevertheless, thus far, the most notable review of existing literature on digital divide and its assessment can be found in Hanafizadeh, Hanafizadeh & Bohlin (2013).

Lastly, it is worth noting that some scholarly work, such as Alshehri & Drew (2011), has focused on the nexus between ICT skills and E-Government from the reversed perspective – thus implying that it is in fact via developing and increasing the number of digitalized public services that ICT skills among the population rise. While the SKODA AUTO University Research Team acknowledges that this relation does exist and has a (perhaps even notable) effect, such a perspective is beyond the scope of this paper, which will consider the issue only from a standpoint of how ICT skills affect citizens' attitudes toward E-Government, not viceversa.

Considering the current level of scholarly understanding and knowledge regarding the digital divide, this research paper therefore strives to further advance the contemporary debate and academically contribute on several levels.

First, by focusing on the Czech Republic the collected data consider how current scholarly understanding of the digital gap and public attitudes toward digitalization of governmental services (a process which is typically studied in countries marked with very high or high living standards) matches and corresponds with the realities in former Eastern bloc countries, especially those that during the 1990s underwent a major economic transformation and subsequently joined the European Union. Currently, no research provides such data and this study aspires to fill this gap.

Second, survey results from the Czech Republic have a unique advantage – they are to a large extent applicable when assessing the public attitudes toward digitalization of governmental services on the EU level as a whole. This is particularly true because the Czech Republic's level of E-Government/digitalization of public services and of human digital skills consistently ranks, according to the Digital Economy and Society Index (DESI), to be among the countries that most closely correspond with the EU average (European Commission, 2019a). Specifically, the overall index score of the Czech Republic and the EU average score have over the past years been, respectively, 45.3 and 46.9 (2017), 47.6 and 49.8 (2018), 50.0 and 52.5

(2019) (European Commission, 2019b). In other words, Czech society's preparedness for the digitalization transformation, parallels that of the EU as a whole, when averaged. Hence, the survey data can be likewise utilized as an instrument to convey, or at least approximate, information pertinent to the current situation within the European Union (as no other data specifically focusing on the researched issue are otherwise available). Of note, according to the most recent 2020 data issued by the EU DESI the Czech Republic shows complete average 4G coverage, meaning that 100% of local households are covered by the technology (EU average is 96%). Furthermore, 62% of local citizens are reported to have at least basic digital skills (EU average is 58%) and 26% have above basic digital skills (EU average is 33%) (European Commission, 2020). These data points further strengthen the suitability of the survey's results for approximation of EU average.

Third, the SKODA AUTO University Research Team strongly believes that socio-economic factors play a crucial role in the structure and social fabric associated with the contemporary digital divide. Hence, the conducted survey specifically focused on these indicators, aside from the main questions, in order to further verify or refute such interconnections, while striving to identify (in case they are corroborated) those that can be presently deemed to have the most notable ramifications on the digital divide as such.

Finally, the Research Team views the currency of provided results as another notable contribution, given that the majority of studies and quantitative data associated with digital divide and distinction between Internet users and general public now derive from studies, many of which, could be today regarded as out-of-date (see literature review and further references throughout this paper).

Results

The outcomes have been divided into three main categories, each being effectively interlinked with one of the aforementioned questions. Therefore, the results specifically elucidate and provide further quantification of differentiation between the general public and Internet users in regard to:

- 1) General support for E-Government and digitalization of public services;
- 2) Differences in awareness regarding E-Government services;
- 3) Perceived personal benefits resulting from E-Government services.

Results, along with accompanying charts and graphs for each category, are provided below.

1) General support for e-government and digitalization of public services

The aim of the first category was to better quantify the difference among both data sets (General public and Internet users) regarding the support for E-Government and digitalization of public services. Data points and results, generated in this instance primarily via the first question '*Do you support the digitalization of Government services?*', are largely in accordance with the current academic literature (see <u>Wangpipatwong, Chutimaskul & Papasraton, 2008; Mofleh & Wanous, 2008; Carter & Belanger, 2004; Rokhman, 2011</u>).

The overall results in this segment clearly indicate considerably higher support for E-Government and digitalization to be found among active Internet users, rather than among the general public (see Table 1). Hence, this substantiates a notion that, with improved e-literacy, society's overall demand for digitalization of public services is bound to further increase.

	General public	Internet users
Certainly yes	35%	57%
Rather yes	32%	29%
Rather no	9%	6%
Certainly no	8%	2%
I do not care	16%	6%

Table 1. 'Do you support the digitalization of Government services?'

Among Internet users, more than a half (57% exactly) of all respondents unequivocally stated that they certainly support the digitalization of Governmental services. Combined with those who answered 'Rather yes', the overall support for E-Government stands at a notable 86%. Regarding the general public, the overall support for E-Government (combining 'Certainly yes' and 'Rather yes') stands at still significant 67%. Hence, despite the 19 percentage points difference in support between the general public and Internet users, the digitalization of public services and E-Government enjoys a considerable backing throughout society.

When assessing the aforementioned question with regards to the gender of respondents, in both data sets (general public and Internet users), males have demonstrated to be consistently more inclined to support E-Government rather than females. Within the general public, the overall support (combining 'Certainly yes' and 'Rather yes') for males stood at 71%, while for females it stood at 62%. Similarly, within the category of active Internet users, the overall support for E-Government among males stood at 90%, while among females it stood at 82%.

Data likewise demonstrated a strong association between the educational background of respondents and their support for E-Government. Specifically, the data (both 'General

population' and 'Internet users' sets) indicate a strong positive correlation between the higher support for E-Government and higher education (see Figure 1). Utilizing the 'Internet users' data set, it can be easily demonstrated that, while a respondent without a completed high school education was likely to favour digitalization of public services in 49% of cases, for a university graduate the percentage increased up to 72%. Although there is a generally significant disparity between the support provided by highly educated respondents as opposed to those who have lower education levels, it is worth highlighting that even among the least educated groups the overall support (79% when 'Certainly yes' and 'Rather yes' are combined) for digitalization is still the most common answer.





Arguably, the most noteworthy results were, however, within the first query '*Do you support the digitalization of Government services?*' generated by a supplemental question posed in the 'General public' set. Specifically, the additional question asked whether the respondent uses the Internet on a daily basis or less (or not at all). The purpose of this question was to better inform our research regarding the overall impact of Internet usage when assessing the support for E-Government and digitalization of public services.

Herein, the data revealed a considerable gap which itself exists among general population segments that use the Internet on a daily basis and those segments that do not use it as frequently or at all (see Figure 2). While the former group favours further digitalization of public services in 80% of cases, the latter group supports it only in 43% of cases. Besides the significant drop in the overall support the data suggest that a considerable increase occurs in the 'I do not care' category (from marginal 9% to noteworthy 30%), likely reflecting the opinions especially of those societal segments that do not utilize the Internet at all or perhaps

less than on a weekly basis, which might result in a higher lack of interest. These data further support previous results and academic understanding indicating that a strong positive correlation exists between the support for digitalization processes on a governmental level and penetration of Internet usage within a given society.



'Do you support digitalization of Government services?' Frequency of using Internet within the General public set

■ Certainly yes + Rather yes ■ Certainly no + Rather no ■ I do not care

Figure 2. Frequency of using Internet within the General public set

2) Differences in awareness regarding e-government services

Utilizing the second question '*How well-informed are you about tools currently offered by E-Government public services?*', the SKODA AUTO University Research Team strived to establish and quantify the difference between 'General public' and 'Internet users' perceived awareness regarding digitalized public services. Importantly, this question was solely based on a self-assessment of each individual respondent, without any further queries or techniques implemented at this stage by the Research Team that would aim to determine how such self-assessment is correlated with an actual real understanding of tools currently offered by E-Government services. In other words, while some respondents might have a lower understanding of available services, they still might consider themselves to be better informed than they are and vice versa. The primary purpose was to assess whether Internet users generally consider themselves to be, regarding the digitalized services, better informed than the general public, to what extent, and how does such self-perception translate into differences between varying age groups, or educational backgrounds.

The data obtained via this question generated thought-provoking results. Whilst Internet users regard themselves to be overall (combining answers 'Certainly well-informed' and

'Rather well-informed') slightly better informed than the general public, the difference is not significant and certainly not as high as initially expected. Ultimately, the difference between General public and Internet users' perceived sense of being well-informed about tools currently offered by E-Government public services was only three percentage points; with the former group stating that 21% consider themselves to be well-informed and the latter stating that 24% consider themselves to be well-informed (see Table 2).

	General public	Internet users
Certainly well-informed	2 %	3 %
Rather well-informed	19 %	21 %
Rather not well-informed	45 %	59 %
Certainly not well-informed	34 %	17 %

Table 2. 'How well-informed are you about tools currently offered by E-Government public services?' The results were also indicative of a fact that the majority within both the 'General public' and 'Internet users' categories, 79% and 76% respectively, consider themselves not to be well-informed. Importantly, within the General public data set 34% of respondents stated that they are 'Certainly not well-informed'. Such a response rate is arguably in line with previous similar surveys, for instance, the Accenture survey (Accenture, 2019) conducted in July 2019 of 5,000 respondents originating from five countries (namely, Australia, Germany, Singapore, the UK, and the US). Therein, gathered data indicated that 31% (slightly less than 34% of respondents within our General public sample) of citizens do not use or are not aware of digital government services (Accenture, 2019). Therefore, besides our survey validating these results, it has similarly indicated that such number is ultimately cut in half when concerned 'only' with respondents who are active Internet users ('Certainly not well-informed' category in this data set stood at 17%). Such a drop is a good indication of the currently existing knowledge gap between General public and Internet users regarding E-Government services.

Two key conclusions can be further drawn based on the SKODA AUTO University Research Team's survey results. First, the ability to inform the public and further raise awareness regarding E-Government remains to be one of the key challenges in the current trend of digitalization of public services, as also indicated by works such as Carter *et al.* (2016), Weerakkody & Choudrie (2005) and Choudrie & Dwivedi (2005). Second, Internet users – a group which utilizes the Internet daily and, hence, by default possesses better IT/Internet skills than the general public – do not perceive themselves to have a considerably higher understanding of digitalized government services.

Data points further indicated that males, 29% of cases, generally regard themselves to be more well-informed than females, 18% of cases. Furthermore, those who certainly support the digitalization of governmental services (results provided by the first question) are more likely

to consider themselves to be well-informed — a strong positive correlation has been identified between these two answers. Unfortunately, even within such an auspicious category those who regard themselves as overall well-informed represent 'only' 31%.

In both 'General public' (see Figure 3) and 'Internet users' (see Figure 4) a principle where respondents with higher education were typically more likely to self-assess themselves as certainly or rather well-informed applies in the majority of cases.



Certainly + Rather well-informed Certainly + Rather not well-informed

Figure 3. Differences according to the educational background — General public



Certainly + Rather well-informed Certainly + Rather not well-informed

Figure 4. Differences according to the educational background — Internet users

Comparing results generated by 'General public' and 'Internet users' data sets via the prism of respondents' educational background, two notable aspects emerge.

First, those respondents with a university-level education were, equally in both data sets, in 35% of cases likely to perceive themselves as either 'Certainly well-informed' or 'Rather well-informed'. Thus, this (university graduates) category perceives itself as being by far the most well-informed out of all categories within this division, irrespective of whether data originated from 'General public' or 'Internet users' sets. As a result, it could be (potentially wrongly) assumed that, regarding the level of awareness of offered E-Government services, education rather than, for instance, the frequency of Internet usage might be a key determining variable. Nevertheless, a strong positive correlation similarly exists between the frequency of Internet usage and higher education so that respondents with a university degree are almost certain to be utilizing the Internet daily. Hence, despite a strong positive correlation between the level of education and perceived (relatively) high awareness regarding E-Government services, it is important that no direct causation links are necessarily assumed, as other variables (such as frequency of Internet usage) are as likely, if not more, to be causing it.

Second, while the well-informed (including 'Certainly well-informed' and 'Rather wellinformed') category progressively increases along with higher education (Non-High School 13%, High School 25%, University 35%) in the 'General public' data set, the situation slightly alters within the 'Internet users' set. Herein, respondents in Non-High School and High School category equally answered to be Certainly or Rather well-informed in 21% of cases. Thus, this potentially again demonstrates that frequency of Internet usage (on a daily basis in this instance) might be a more significant variable affecting the perceived awareness regarding E-Government services rather than educational background itself. Nonetheless, such a perception is simultaneously somewhat countered by the fact that respondents with tertiary education, as in the case of the 'General public' set, still scored considerably higher.

The last notable aspect conducted by the SKODA AUTO University Research Team in the 'Differences in Awareness regarding E-Government Services' subsection was to divide respondents according to their age categories within the 'General public' data set (see Figure 5). Respondents were split into four key categories: a) 18-29 years; b) 30-44 years; c) 45-59 years; d) 60+ years. The results indicated that respondents representing the 30-44 years category consider themselves to be generally most well-informed, followed by the 45-59 years category and 18-29 years category. Unsurprisingly, the 60+ years category scored to regard itself as the least informed, with overall 83% of respondents from this age group perceiving themselves as either Rather not or Certainly not well-informed. On the other hand, it is worth highlighting that differences in perceived awareness between different age groups are not as

considerable as initially believed or oftentimes intrinsically implied by numerous academic works, such as Phang *et al.* (2005) or Becker *et al.* (2008).



Figure 5. Differences according to age — General public

3) Perceived personal benefits resulting from e-government services

Numerous academic works, such as Veiga & Rohman (2017), Elder-Vass (2016) and Gluckman (2018), have often highlighted the positive ramifications that E-Government brings for the overall economy, primarily in the form of driving opportunities for private companies or in triggering further innovations. Nonetheless, apart from scholarly works focusing on a mandatory adoption, such as Chan *et al.* (2010), considerably less has been written about how E-Government benefits are perceived directly by citizens, taking into consideration varying factors such as age, education, or their material/financial background. Consequently, this study strived to further quantify the divide between how the alleged benefits provided by E-Government services are being perceived by the 'General public' and 'Internet users'. Results pertinent to this effort were based on data collected primarily via the third question, which asked respondents to answer whether digitalization of public services is personally, for them, 1) Certainly beneficial, 2) Rather beneficial, 3) Rather not beneficial, or 4) Certainly not beneficial.

While the majority in both data sets perceived digitalization of public services as beneficial (see Table 3), this number was considerably higher within the 'Internet users' data set (92% of respondents answered either 'Certainly beneficial' or 'Rather beneficial') – as opposed to the 'General public' data set, where this number stood at a still respectable 72%. Furthermore,

within the 'Internet users' sample, only 1% of respondents stated that they consider E-Government transformation as 'Certainly not beneficial'; while this number was slightly higher in the other data set ('General public' – 9%). Despite these, relatively marginal, discrepancies, respondents in both data sets indicated strong support (by viewing such process as beneficial) for further digitalization of public services.

	General public	Internet users
Certainly beneficial	26 %	48 %
Rather beneficial	46 %	44 %
Rather not beneficial	19 %	7 %
Certainly not beneficial	9 %	1 %

Table 3. 'Further digitalization of public services is personally for you...'

Comparing how educational background affects responses in each sample, results indicate, as per previous cases, that higher education progressively leads to more favourable views - in this instance views regarding the personal benefits provided by the digitalization of public services (see Figure 6). Importantly, even respondents in a 'General public' category that do not possess a high school diploma (Non-High School segment – data-wise the most skeptical group from the educational background perspective) still demonstrate to have a solid majority (65%) that views E-Government transformation as a process which is overall beneficial to individual interests.





Certainly + Rather beneficial

Certainly not + Rather not beneficial

Figure 6. Differences according to the educational background — General public

It is worth noting that the difference between varying categories is lower considerably within the 'Internet users' data set (see Figure 7). The respondents from a Non-High School category view digitalization of public services as beneficial in 87% of responses, from a High School category in 94%, and from a University category in 96% – a notable increase when compared

with earlier 'General public' data sets where these results stood at 65%, 75%, and 87%, respectively. Furthermore, it is interesting to note that within the 'Internet users' data set the gender division follows the same patterns as mentioned before, meaning that males are more inclined to view digitalization of public services as more beneficial than females. Specifically, 53% of males stated that such a process is certainly beneficial (as opposed to 43% of females), and 42% of males regarded it as rather beneficial (as opposed to 46% of females). In total, 95% of males from the data set perceive it as overall beneficial, while 'only' 89% of females share such a point of view.



Figure 7. Differences according to the educational background — Internet users

Nevertheless, the overall positive view on personal benefits generated as a result of E-Government transformation changes considerably when respondents are categorized according to their age or material/financial background.

Dividing the 'General public' data set into categories according to age (see Figure 8) immediately indicates how closely correlated the age of respondents is with how the digitalization of public services as such is being perceived. While within the two youngest categories (18-29 years and 30-44 years), 81% of respondents answered that they regard E-Government transformation as a personally beneficial process, the situation is markedly different on the other end of the age spectrum. In fact, within the 60+ years category, 44% of respondents view digitalization of public services as not being beneficial – some respondents in the survey openly labelled such a trend as harmful. These results are largely in line with the current academic understandings, as indicated by numerous studies pointing out the

tremendous variety of difficulties citizens over 60 years face when using the Internet (Denvir, Balmer & Pleasence, 2012).

> Further digitalization of public services is personally for you...?' Differences according to age - General public





Figure 8. Differences according to age —General public

For a better understanding of dynamics particularly between the general public and its approach toward E-government, the SKODA AUTO University Research Team asked an appendix question regarding respondents' financial/material background. Dividing the resulting sample according to this added sub-question is further revealing and indicates how closely correlated are views on the digitalization of public services with socio-economic aspects of each respondent (see Figure 9).



Further digitalization of public services is personally for you...?' Differences according to socio-economic background - General public

Figure 9. Differences according to socio-economic background — General public

While respondents representing 'Above-average income' and 'Average income' categories overall viewed E-Government transformation as a personally beneficial process (81% and 75%, respectively), respondents from the 'Below-average income' category did not. In fact, the 'Below-average income' category was the only segment of respondents throughout the entire data collection process where the majority (51%) considered the digitalization of public services not to be a personally beneficial process. As a result, the negative socio-economic background (while itself strongly positively correlated with factors such as lower education or low frequency of utilizing the Internet) possibly represents another notable variable affecting an individual's attitude toward further digitalization of public services.

Conclusions

The SKODA AUTO University Research Team's results have to a considerable extent corroborated that the digitalization of public services is weakened by a lack of ICT skills and Internet usage among the citizens. This was particularly reflected by a fact that those groups with lower ICT skills and less frequent Internet usage demonstrated consistently lower support for E-Government. While those who use the Internet on a daily basis (and are thus also assumed to have higher ICT capabilities) supported E-Government transformation in 86% of cases, respondents from the general public supported it 'only' in 67% of cases. This discrepancy therefore indicates the digital divide, in support of digitalization of public services, between these two segments to be at around 19 percentage points. However, it is of note that these results likewise demonstrated that even within the general public as such, the overall support for E-Government stands auspiciously high. The size of the digital divide has been further confirmed by the fact that within the 'Internet users' data set 92% of respondents perceived digitalization of public services as a personally beneficial process, while within the 'General public' this number stood at a still high 72% — hence making the divide between these two segments to be at around 20 percentage points. The 19-percentage-points difference (between the 'General public' and 'Internet users' data segments) in support of E-Government and the 20-percentage-points difference (between the same segments) in perceiving E-Government as a personally/individually beneficial process are very closely ranged - thereby largely corroborating estimates regarding the size of the digital divide.

Educational background of respondents emerged to be a very significant variable affecting our results. It can be assessed that, almost throughout the entire survey, those respondents with higher education, irrespective of whether they belonged to the 'General public' sample or the 'Internet users' sample, demonstrated overall more favourable views of digitalization of public services. Respondents with the highest education were most supportive of E-Government transformation, they considered themselves to be most aware of tools currently offered by E-

Government public services, and, ultimately, they perceived E-Government to be the most personally beneficial (out of all studied groups). Nonetheless, as indicated above by the SKODA AUTO University Research Team, the effects of the education variable should not be overestimated, as higher education has also a strong positive correlation with higher Internet usage – a variable which in itself might be actually more significant. Likewise, it is of note that, although respondents with higher education were more likely to view E-Government more favourably, the overall positive approach towards digitalization of public services was maintained even within 'Non-High School' respondents — hence indicating that E-Government and digitalization enjoy relatively strong support throughout society.

Gathered data likewise showed that respondents, irrespective of whether they represented 'General public' or 'Internet users' samples, largely regard themselves as not being sufficiently informed about the currently offered E-Government services. Considering the General public data set, 34% of respondents even stated that they are 'Certainly not well-informed'. As indicated above, our results are in line with a similar survey conducted by Accenture in 2019 in Australia, Germany, Singapore, the UK, and the US, where 31% of respondents stated that they do not use or are not aware of digital government services. The SKODA AUTO University Research Team estimates that insufficient publicity and marketing are among the most problematic features in current efforts to promote active usage of digitalized public services. Interestingly, the data show that this is an area in which the digital divide between 'General public' and 'Internet users' is not notably manifest. The reported difference between 'General public' and 'Internet users' perceived sense of being well-informed about tools currently offered by E-Government public services was only three percentage points; with the former group stating that 21% consider themselves to be well-informed and the latter stating that 24% consider themselves to be well-informed. These results demonstrated a considerable lack of governmental information campaigns that would promote E-Government services - not only for the general public but even for citizens who are active Internet users.

Data results have also identified groups with an overall lowest degree of support for E-Government. In congruence with the most current academic understanding, the SKODA AUTO University Research Team's results confirmed the age group 60+ years, throughout several observed areas, to consistently rank as a societal segment with one of the lowest support for digitalization of public services. In fact, up to 44% of respondents within this category viewed E-Government as not being beneficial. Likewise, these respondents were by far most likely to consider themselves not being sufficiently informed about offered digitalized public services — overall 83% of respondents from this age group perceived themselves as either Rather not or Certainly not well-informed. Aside from the 60+ years societal group, data identified 'Below-average income' respondents to be most distrustful of E-Government

transformation and likely among the most vulnerable societal segments for not being fully incorporated in digitalization processes. The 'Below-average income' category was the only segment of respondents, throughout the entire data collection process, where the actual majority (51%) considered the digitalization of public services not to be a personally beneficial process (thereby scoring even lower than the 60+ years societal group). Results, therefore, indicated a continued and high need for more programs concentrating on these groups, enabling them to access benefits E-Government provides with ease and ensuring they are fully included in the occurring digitalization processes.

In conclusion, the current digital divide, between the general public and (active) Internet users, in support of E-Government, has been estimated at around 20 percentage points. Gathered data corroborated the understanding that with increased ICT skills and Internet usage among citizens the demand for E-Government increases. Furthermore, the SKODA AUTO University Research Team views auspiciously the fact that digitalization of public services, already as of now, enjoys majority support even among the general public and relatively across all societal segments. It simultaneously acknowledges, however, that some groups within society continue to be marginalized and excluded from the process. The negligence of these groups inadvertently results in a not insignificant diminishment of otherwise considerable support for the current digital transformation of governmental services.

Acknowledgement

This article utilizes data collected within the project 'New challenges of e-Government in the European context for increasing the competitiveness of the Czech Republic' (TL01000147), which was supported by the Technologická Agentura České republiky (TACR).

References

- Accenture. (2019). Nearly One-Third of Citizens Unaware of Digital Government Services, Accenture Survey Finds. Released online 09 July 2019. Accessed 15 May 2020. Available from <u>https://newsroom.accenture.com/news/nearly-one-third-of-citizens-unaware-of-digital-government-services-accenture-survey-finds.htm</u>
- Axelsson, K., & Melin, U. (2008). Citizen Participation and Involvement in eGovernment Projects: An Emergent Framework. Proceedings of 7th International Conference EGOV 2008. August 31–September 05, Turin, Italy. Available from <u>https://www</u>

.researchgate.net/publication/220266346 Citizen Participation and Involvement in eGovernment Projects An Emergent Framework

- Axelsson, K., Melin, U., & Lindgren, I. (2010). Exploring the importance of citizen participation and involvement in e-government projects: Practice, incentives, and organization. *Transforming Government: People, Process and Policy 4*(4), 299-321. <u>https://doi.org/10.1108/17506161011081309</u>
- Becker, J., Niehaves, B., Bergener, P., & Räckers, M. (2008). Digital Divide in eGovernment: The eInclusion Gap Model. Proceedings of International Conference on Electronic Government, 231–242. <u>https://doi.org/10.1007/978-3-540-85204-9_20</u>
- Boksa, M., Boksova, J., Horak, J., Pavlica, K., Strouhal, J., & Saroch, S. (2019). *Digitalni Cesko v digitalin Evrope*, Mlada Boleslav, SKODA AUTO VYSOKA SKOLA. Available at <u>https://az749841.vo.msecnd.net/sitescssavs/alv1/24cfb734-6e18-4a45-80ae-</u> <u>9f240bb44b15/Digitalni Cesko FINAL%20ONLINE%20VERSION.47e7a82c5a032c</u> <u>9a6521b27138f4dc85.pdf</u>
- Brandtzæg, P., Heim, J., & Karahasanovic, A. (2011). Understanding the new digital divide— A typology of Internet users in Europe. *International Journal Human-Computer Studies*, 69, 123-138. <u>http://dx.doi.org/10.1016/j.ijhcs.2010.11.004</u>
- Carter, L., & Belanger, F. (2004). Citizen Adoption of Electronic Government Initiatives. Proceedings of the 37th Hawaii International Conference on System Sciences. Available at <u>https://www.researchgate.net/publication/221182224</u> <u>Citizen Adoption of Electronic Government Initiatives</u>
- Carter, L., Weerakkody, V., Phillips, B., & Dwivedi, Y. (2016). Citizen Adoption of E-Government Services: Exploring Citizen Perceptions of Online Services in the US and UK. *Information Systems Management Journal, 33*(2). Available at https://www.researchgate.net/publication/295871477 Citizen Adoption of E-Government Services Exploring Citizen Perceptions of Online Services in the <u>US and UK</u>
- Chan, F., Thong, J., Venkatesh, V., Brown, S., Hu, P., & Tam, K. (2010). Modeling Citizen Satisfaction with Mandatory Adoption of an E-Government Technology. *Journal of the Association for Information Systems, 11*(10), 519-549. Available at <u>https://ssrn.com/abstract=1976951</u>
- Choudrie, J., & Dwivedi, Y. (2005). A Survey of Citizens' Awareness and Adoption of E-Government Initiatives, The 'Government Gateway': A United Kingdom Perspective. Proceedings of the eGovernment Workshop 2005. Available at https://pdfs.semanticscholar.org/4f8d/16bab6f1c0f5edc6a6fcc026ca5643227551 .pdf
- Davies, R. (2015). eGovernment Using technology to improve public services and democratic participation. European Parliamentary Research Service. Available at https://www.europarl.europa.eu/RegData/etudes/IDAN/2015/565890/EPRS_IDA(2015)565890_EN.pdf
- Denvir, C., Balmer, N., & Pleasence, P. (2012). Portal or Pot Hole? Exploring How Older People Use the 'Information Superhighway' for Advice Relating to Problems with a Legal

Dimension. Ageing & Society, 34(4), 670-699. <u>https://doi.org/10.1017</u> /S0144686X12001213

- Deursen, A., Helsper, E., & Eynon, R. (2014). Measuring Digital skills From Digital Skills to Tangible Outcomes project report. Oxford Internet Institute. Available at <u>https://www.lse.ac.uk/media-and-communications/assets/documents/research</u> /projects/disto/Measuring-Digital-Skills.pdf
- Dodel, M., & Aquirre, F. (2018). Digital inequalities' impact on progressive stages of egovernment development' Proceedings of the 11th International Conference on Theory and Practice of Electronic Governance. Available at https://dl.acm.org/doi/10.1145/3209415.3209475
- European Commission. (2019a). The Digital Economy and Society Index. Accessed 15 February 2020. Available at <u>https://ec.europa.eu/digital-single-market/en/desi</u>
- European Commission. (2019b). Czech Republic, country report. Accessed 15 February 2020. Available at: <u>https://ec.europa.eu/digital-single-market/en/scoreboard/czech-republic</u>
- European Commission. (2020). Czech Republic, country report. Accessed 26 February 2020. Available at <u>https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=66910</u>
- Elder-Vass, D. (2016). *Profit and Gift in the Digital Economy*, Cambridge, Cambridge University Press.
- Fuglerud, K. (2009). ICT Services for Every Citizen: The Challenge of Gaps in User Knowledge. Proceedings of Universal Access in Human-Computer Interaction Addressing Diversity. Available at <u>https://link.springer.com/chapter/10.1007/978-3-642-02707-9_5</u>
- Gluckman, P. (2018). The Digital Economy and Society A Preliminarily Commentary. *Policy Quarterly*, *14*(1). Accessed at <u>https://ojs.victoria.ac.nz/pq/article/view/4763/4231</u>
- Hanafizadeh, M., Hanafizadeh, P., & Bohlin, E. (2013). Digital Divide and e-Readiness: Trends and Gaps. *International Journal of E-Adoption*, *5*(3). Available at <u>https://dl.acm.org/doi/abs/10.4018/ijea.2013070103</u>
- Hanafizadeh, M., Hanafizadeh, P., & Saghaei, A. (2009). The Pros and Cons of Digital Divide and E-Readiness Assessments. *International Journal of E-Adoption*, 1(3). Available at: <u>https://www.igi-global.com/article/pros-cons-digital-divide-readiness/37576</u>
- Hanafizadeh, P., Hanafizadeh, M., & Khodabakhshi, M. (2009). Taxonomy of e-Readiness Assessment Measures. *International Journal of Information Management*, 29(3), 189-195. Available at: <u>https://www.researchgate.net/publication/236155058</u> <u>Taxonomy of e-Readiness Assessment Measures</u>
- Hardill, I., & O'Sullivan, R. (2018). E-government: Accessing public services online: Implications for citizenship. *Local Economy: The Journal of the Local Economy Policy Unit*, 33(1), 3–9. https://doi.org/10.1177/0269094217753090
- Holzer, M., & Manoharan, A. (2012). Active Citizen Participation in E-Government: A Global Perspective. Hershey, IGI Global. <u>https://doi.org/ 10.4018/978-1-4666-0116-1</u>

- ITU. (2004). How to measure the digital divide?. Korean Agency for Digital Opportunity and Promotion. Available at <u>https://www.itu.int/osg/spu/ni/digitalbridges</u>/presentations/02-Cho-Background.pdf
- Kunstelj, M., Jukic, T., & Vintar, M. (2007). Analysing the Demand Side of E-Government: What Can We Learn From Slovenian Users?. Proceedings of the International Conference on Electronic Government 2007. Available at https://link.springer.com/chapter/10.1007/978-3-540-74444-3_26
- Mofleh, S., & Wanous, M. (2008). Understanding factors influencing citizens' adoption of egovernment services in the developing world: Jordan. *INFOCOM-Journal of Computer Science*, 7(2), 1-11. Available at <u>http://infocomp.dcc.ufla.br</u> /index.php/INFOCOMP/article/view/211
- Nam, T., & Sayogo, D. (2011). Who uses e-government? Examining the digital divide in egovernment use. Proceedings of the 5th International Conference on Theory and Practice of Electronic Governance. Available at <u>https://www.researchgate.net</u> /publication/221547762 Who uses e-government Examining the digital divide <u>in e-government use</u>
- Phang, C., Li, Y., Sutanto, J., & Kankanhalli, A. (2005). Senior Citizens' Adoption of E-Government: In Quest of the Antecedents of Perceived Usefulness. Proceedings of the 38th Hawaii International Conference on System Sciences. Available at https://www.researchgate.net/publication/221180966 Senior Citizens%27 Adopti on of E-Government In Quest of the Antecedents of Perceived Usefulness
- Rokhman, A. (2011). E-Government Adoption in Developing Countries; the Case of Indonesia. *Journal of Emerging Trends in Computing and Information Science*, *2*(5). Available at <u>http://www.cisjournal.org/archive/vol2no5/vol2no5_4.pdf</u>
- Stoiciu, A. (2011). The Role of e-Governance in Bridging the Digital Divide'. UN Chronicle XLVIII, 3. Available at <u>https://unchronicle.un.org/article/role-e-governance-bridging-digital-divide</u>
- Veiga, L., & Rohman, K. (2017). e-Government and the Shadow Economy: Evidence from Across the Globe. Proceedings of the International Conference on Electronic Government, 105-116. Available at <u>https://link.springer.com/chapter/10.1007/978-3-319-64677-0_9</u>
- Wangpipatwong, S., Chutimaskul, W., & Papasraton, B. (2008). Understanding Citizen's Continuance Intention to Use e-Government Website: A Composite View of Technology Acceptance Model and Computer Self-efficacy. *The Electronic Journal of e-Government*, 6(1), 55-64. Available at https://academic-publishing.org/index.php/ejeg/article/view/484
- Weerakkody, V., & Choudrie, J. (2005). Exploring E-Government in the UK: Challenges, Issues and Complexities. Journal of Information Science and Technology, 2(2), 22-45. Available at <u>https://www.researchgate.net/publication/239919201</u> Exploring E-Government in the UK Challenges Issues and Complexities

Endnote

ⁱ The SKODA AUTO University Research Team defines this term, for the needs of this research, as a broad reference to the general populace. As such, the term is statistically defined by the nationally representative data sample in which all segments of society are proportionally represented – based on indicators such as age, gender, level of education, municipality size, and region. Of note, this data segment by default did not distinguish between respondents that use the Internet regularly or not.