Innovative Concept of Providing Local Public Services Based on ICT

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Abstract

The public sector faces the challenge of re-evaluating public service delivery mechanisms with a citizen orientation. The eGovernment concept should not only focus on delivering a large number of services to increase efficiency and effectiveness when deciding on a top-down approach, based on government needs, but decisions should be made on the basis of citizens' needs, a bottom-up approach. The object of the paper is to identify problems of public service innovations demand and supply, which determinate the adoption of local public service innovations based on the use of IT technology in the condition of Slovak Republic. The results of the investigation confirmed that there is citizen demand for innovation of local public services, but the process of developing and implementing innovative concepts of public services fails on the grounds of the low innovation potential of the service providers.

Keywords:

Electronization; innovation; consumer innovativeness; innovation potential; public services.

1. Introduction

Information and communication technologies (ICT) in the innovation process can significantly contribute to the realization of one of the key conditions for a successful implementation of innovations in the system of public services, namely the direct involvement of the citizen as a consumer of public services in the innovation process of such services (Von Hippel 2007; Korteland and Bekkers 2008). A stimulus for innovation is identification with the new idea of not only all those involved externally in the provision of public services, i.e. building social capital, but also from those within the body itself.

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The importance of ICT in innovation in public services in the world is growing. However, Slovak practice with project implementation of the electronization of public services lags far behind (Gasova and Stofkova 2017; Romanová and Červená 2017); the reason often stated as the reluctance of the citizens themselves as consumers of public services to adopt the innovation of services based on their electronization.

Projects of electronization of public services often fail, and the return on the invested funds in the form of real utilization of e-government services by citizens is low (Špaček 2015). Also, a failure to adopt innovation of public services, or, respectively, its frequent understanding as “extra work” on the part of public employees themselves, is often behind the failure of such innovation (Considine et al. 2009, Piotrowicz 2015, Plaček et al. 2020). From this perspective, it is important to address the innovation potential of public organizations as providers of public services, which determines the supply of public services innovation (Králiková and Surma 2019).

The object of the paper is to identify problems of public service innovations demand and supply, which determine the adoption of local public service innovations based on the use of IT technology in the condition of Slovak Republic.

For this reason, the study is dedicated to finding answers to the questions whether “Citizens as consumers of local public services are interested in innovations of such services and there exists a demand for innovation of public services” and whether “The development and implementation of innovative concepts of public services fail because of the weak innovation potential of providers of local public services.”

The methodology of solving the research problem is innovative with regard to the choice of methods for researching the demand for innovation of public services and the offer of innovation of public services in the context of marketing theory, in which the concept of evaluating the citizen innovativeness as a consumer of public services and the concept of evaluating the innovative potential of local government as a provider of public services are used. These methods of researching the innovative concepts of public services have not been applied in the Slovak Republic so far.

2. Theoretical framework

On the demand side of public services, the pressure to increase their value, the benefits that consumers bring to the public are an interest in innovation. However, there is a lack of motivation and capacity to innovate on the supply side of public services. On the demand side, we use the concept of exploring innovation from the point of view of consumers’ willingness to accept innovation and, on the supply side, the concept of exploring the innovative potential of the organization. The above-mentioned concepts are described in this chapter.

2.1 Consumer innovativeness – demand for innovations

The success of innovation is directly dependent on its acceptance by consumers. This implies in the very process of innovation to understand the needs of consumers and of innovation to meet these needs. The adoption of innovations by consumers depends primarily on the characteristics of the innovation itself (Maden and Köker 2013) and the specific characteristics of consumers (Dobre et al. 2009).

The decisive characteristics of innovation in relation to its adoption may be considered as follows: relevant advantage, compatibility, complexity, may be personally appraised and visibility (Gregor and Mičieta 2010, Hroncová-Vicianová and Hronec 2017). A relevant advantage of the innovation provides added value for the consumer, which the consumer gains via replacement of another innovative product/new products (cost effectiveness, ease of operation, social prestige, satisfaction, etc.; Kotler and Armstrong 2017; Stawasz 2016). Compatibility is a measure of how innovation meets the requirements of potential consumers and their ability to utilize the innovation (Gregor and Mičieta 2010), which is combined with another feature of innovation, i.e. complexity. For the consumers, the possibility of appraisal means a non-binding testing declaring the positives and the benefits of the innovation, which significantly reduces their uncertainty and thereby also accelerates their decision to adopt the innovation (Kotler and Armstrong 2017). Visibility of an innovation alerts potential bidders to the benefits it brings to already existing consumers (Gregor and Mičieta 2010). In addition to the abovementioned properties of innovations, crucial factors for the adoption of innovations are the specific characteristics of potential consumers. Rogers (2003) divides consumers in relation to the adoption of innovation in five categories differentiated by consumer behaviour (Robinson 2009).

Specific characteristics of consumers are reflected in consumer innovativeness and their willingness to adopt innovation. The concept of consumer innovativeness, which is associated with the interests of consumers relating to new innovative products, is one of the key areas of inquiry into innovation in marketing science (Midgley and Dowling 1978; Steenkamp et al. 1999; Tellis et al. 2009; Šebo and Virdzek 2012; Maden and Köker 2013; Šebo and Šebová 2016; Balco et al. 2018). According to Steenkamp et al. (1999) this interest is driven by four factors: the need for initiatives/incentives, the need to know new information, the need for independence from the experience of others and the need to be unique.

It is important to note that these factors determine the so-called innate, or natural, innovativeness of a consumer (consumer innate innovativeness – CII), which can be seen as a characteristic of the disposition of a consumer. Midgley and Dowling (1978) considered natural consumer innovativeness to be one component in the resulting consumer innovativeness, which can be characterized as a pattern of behaviour of the consumer.

The authors Goldsmith and Hofacker (1991) define another type of consumer innovativeness, namely consumer innovativeness in the consumption of a certain category/product type, i.e. consumer interest in new innovative products of a certain type (domain specific innovativeness – DSI), which is the result of the inherent consumer innovativeness, and consumer interest in a particular type of product. Studies (Roehrich 2004) demonstrated an increased level of interest in a particular type of product as natural innovativeness.

Consumer innovativeness is related to many factors in regard to the attributes of innovation themselves which we characterized above, as well as characteristics of individuals (recipients), which we will address in five categories: search for novelty, risk taking, opinion leadership, habit, nostalgia and education (Hronec and Štrangfeldová 2013, Huňady et al. 2018; Pisár and Šipikal 2017).

Searching for new products is the desire to seek for something new and different. It is one of the key components of innovation and plays an important role in the early stages of consumer adoption of innovations, especially those based on technology (Tellis et al. 2009). Raju (1977) reported a tendency to take risks or consumer adventure as an essential component of innovativeness. Midgley and Dowling (1993) expressed a similar tendency of opinion leadership playing an important role in the correlation between innovativeness and consumers who are not subject to the pressure of their surroundings and take on the role of innovators (Roehrich 2004). Addiction can be seen as consumer resistance to change and is closely related to its inertia. It reflects the rigidity of consumer or general reluctance to try something new. Several studies indicate that addiction negatively affects consumer innovativeness (Dobre et al. 2009). Nostalgia is reflected in the preferred products of the past, as well as negatively affecting consumer innovativeness (Maden and Köker 2013).

In terms of introducing innovation in public services, the illustrated facts provide a logical answer, which is an important factor in the willingness of consumers/citizens to adopt innovative public services. The interest of citizens in innovative public services is a definite behavioural pattern of citizens (acquired innovation) materialized in the form of citizens' demand for innovative public services. This behaviour of citizens is directly determined by citizen innovativeness in the consumption of public services, which to a greater extent depends on their interest in public service than from their natural innovativeness. Therefore, from the point of view of the successful implementation of innovation, the moment the interest of citizens for public service innovation awakens, i.e. their direct participation in the innovation process, is very important. For a better understanding of the inferred dependence, refer to Figure 1.

Figure 1
Citizens' demand for innovation in public services

Source: Author's own based on Midgley and Dowling 1978; Goldsmith and Hofacker 1991; Roehrich 2004.

If we want to predict the demand for innovation in certain local public services, the acquired citizen innovativeness in the consumption of public services provided by the selected municipalities should be examined.

Measuring consumer innovativeness is important from the perspective of the selection of the strategy for introducing innovation and the definition of the marketing mix. In order to measure consumer innovativeness, several scales were gradually created that were initially based on the concept of time, i.e. as an indicator of consumer innovativeness the time interval of the adoption of an innovation by consumers since its introduction was used (Tellis et al. 2009).

The scale of measurement of consumer innovativeness, like consumer innovativeness itself (innate and acquired), can be divided into two categories. The scale of measurement of innate, natural consumer innovativeness places an emphasis more on defining consumer propensity to search for innovations and their creativity than how to measure innovation itself (Roehrich 2004; Goldsmith and Foxall 2003). The scale of measurement obtained from consumer innovativeness focuses on finding consumer propensity to purchase a new product, i.e. adopt innovation (Raju 1980; Goldsmith and Hofacker 1991; Goldsmith and Foxall 2003; Roehrich 2004). The most commonly used scales of measurements for obtaining consumer innovativeness are the Goldsmith-Hofacker scales and the Roehrich scale of measuring consumer innovativeness.

Both scales of measurement of consumer innovativeness are associated with specific characteristics of the consumer, which can be summarized as follows: interest in new products/resistance to new products, creativity/inertia, a tendency to take risks/risk aversion, opinion leadership/mimicking others' opinions (Tellis et al. 2009). These characteristics are reflected in individual items of the assessment of innovativeness by a specific scale. The assessment items can evaluate innovativeness as such (interest in anything new), innovativeness in consumption (interest in new products), innovativeness of a specific area of consumption (interest in new products from a certain category).

In the research of consumer innovativeness in the consumption of public services we use a marketing concept in the research of consumer innovativeness employing the Roehrich scale and the Goldsmith Hofacker scale in measuring consumer innovativeness adapted for the evaluation of the consumer innovativeness/citizen in the consumption of public services (Table 1).

2.2 The innovative potential of organizations – supply of innovations

The current evaluation of the innovations on offer gives priority to the evaluation of the innovation potential of organizations. Research into the characteristics of organizations which have an impact on their innovation potential has been carried out in numerous studies (Burns and Stalker 1994; Damanpour 1991). There are a large number of studies of the other features of organizations influencing their ability to innovate. A summary of 83 studies published concerning this issue in the period 1980–2003 was attempted by the authors Vincent et al. (2004) using meta-analysis; they defined 15 factors of the innovation capacity of organizations: economic (competitiveness (+) turbulence (+), uniformity (-), urbanization (+), organizational (hierarchy (+), complexity (+), formalization (+) functional coordination (+), specialization (+), demographic (age (+), management education (+), professionalism (+), number of employees (+) and processes (dichotomous evaluation of innovation (-), an inter-sectoral evaluation of innovation (+)).

In the evaluation of the various combinations of the above-mentioned factors, several models evaluating the innovation potential of an organization have been devised: the diamond model (Tidd et al. 2005), the innovation channel model (Hansen and Birkinshaw 2007), the innovation funnel model (Barber 2011). The diamond model works with five areas of evaluation: strategy, processes, organization, networking and learning (Tidd et al. 2005). The evaluation of each area is represented by the individual axes of the diamond. The greater the area of the pentagon, the higher the organization's innovation capacity (Figure 2).

Table 1

Goldsmith-Hofacker scale measuring citizen innovativeness in the consumption of public services provided by local government

	Citizen innovativeness in the consumption of public services	
	Positive	Negative
Compared with my friends and acquaintances I am among the first to use the new services offered to the public in my village/town	X	
Compared with my friends and acquaintances I use the new services offered to the public in my village/town more	X	
In general, I am among the first to hear about a new public service offered by local government in my village/town	X	
If I learn there is a new service in addition to existing public services in my village/town, I am interested in using it	X	
If I learn there is a new service during a visit to a local government in my village/town, I am interested in using it	X	
I am interested in the use of a new public service offered by local government in my village/town; although I have no details about it in advance, I want to try it out	X	
I have a personal experience with the use of newly offered public services in my village/town	X	
I prefer the use of electronic services (e.g. banking, eshop) compared to traditional services (going to the bank, shopping in the shops)	X	
I am interested in the use of new public services offered by local government in my village/town if they have similar features to commercial electronic services	X	
I am interested in the use of new public services offered by local government in my village/town if these new public services save money	X	
I am not interested in the use of a new public service offered by local government in my village/town if I have no details about it in advance		X
I am not interested in the use of new public services offered by local government in my village/town if I do not know someone who uses them		X
I am not interested in the use of new public services offered by local government in my village/town if I do not necessarily need them		X

Source: Amended, based on Goldsmith and Hofacker 1991; Roehrich 2004.

Figure 2

Evaluation of the innovation capacity of an organization – Diamond model

Source: Author's own based on Tidd et al. (2007).

Hansen and Birkinshaw (2007) perceive the process of innovation as a value chain. The process involves three stages: the generation of ideas, the development of ideas in the form of innovation and, finally, the diffusion of innovation. Figure 3 shows the three phases of the innovation process along with the identification questions and indicators of the individual phases.

The questionnaire to evaluate the innovation potential of an organization through the value chain (Figure 2) normally contains statements to 2–3 questions from each part of the value chain with possible answers: Disagree = 1 point, Agree = 2 points. They are completed by employees from different departments of the organization. The lower the score the worse the outcome of the evaluation of the innovation potential of the organization. Subsequently, the average from the responses for each part is compiled and the area with the lowest number of points is the one to which the organization should give priority when building their innovation potential (Hansen and Birkinshaw 2007).

We examined the reluctance of providers of public services (supply side) to accept a new way of providing public services (innovation potential) in municipalities that use “Municipality Data Centre” (MDC).

The MDC project will increase the amount of provided electronic services, and it will improve their quality. It will decrease the administration burden for both office workers and citizens of the municipalities (MDC 2015). Law no. 305/2013 Coll. imposes an obligation, pursuant to § 17 paragraph 1, on municipalities from 1 November 2016 to execute public authority electronically. A written appeal for the

national project “Municipality Data Centre” (code: OPIS-2011/1,2/03-NP) was issued by the Ministry of Finance of the SR on 13 December 2011 as an intermediary authority for the Operation programme of Digitalization of the Society (hereinafter OPIS).

For these purposes, the Ministry of Finance of the Slovak Republic and The Association of Towns and Communities of Slovakia established the Slovak company The Digitalized Data Centre of Local and Regional Governments of Slovakia (hereinafter DEUS) in 2011, which will help to achieve the goal of the OPIS, which was intended to build up information society in order to develop a knowledge-based economy. The DEUS is the authorized recipient of the non-repayable grant (MDC 2015). MDC clearly fulfils its mission, but the interest of local governments exceeds its current capacities. The use of the system is growing significantly (the system processed 100,000 submissions in 2017 and almost 1.6 million submissions were processed already in 2018).

3. Material and methods

The object of the paper is to identify problems of public service innovations demand and supply, which determines the adoption of local public service innovations based on the use of IT technology in the condition of Slovak Republic. The subject of the research is the innovation concept of local public services based on ICT.

The aforementioned theoretical and methodological framework is based on selected theories relevant to the subject of the research: the theory of market failure – public goods – citizen demand for public services; the theory of state failure – public choice theory, the theory of bureaucracy – the risk of failure in the supply of innovations of public services; research into the discrepancy between demand and supply of public services through marketing concepts of research of innovation – consumer innovativeness/citizen willingness as a consumer to adopt innovative public services (demand side) and the innovative potential of organizations providing public services (supply side).

Our research is based on our research conducted in 2017 (Mikušová Meričková et al. 2017, Mikušová Meričková and Muthová 2018). The identified problems of local public ITC innovations were based on the results of primary research conducted in 32 towns involved in the appeal for the electronization of the local services “e-Mesto” launched in 2013 to obtain non-repayable grants (hereinafter NPG) in order to provide access to municipal electronic services. In this case our results are based on the results of primary research conducted in participating municipalities in MDC project.

3.1 Citizen willingness as a consumer to adopt innovative public services

We formulated the hypothesis: Citizens as consumers of local public services are interested in innovations of such services and that there exists a demand for innovation of public services.

We assume that citizens are interested in innovations which increase their benefits from the consumption of public services. If we identify citizen innovativeness as consumers of public services, it is possible to consider an existing demand for innovation of public services.

The one part of the research focuses on the analysis of the demand of citizens surveyed in the sample municipalities concerning innovation of local public services, which are the subject of the MDC project.

The data collection method in the primary research is a structured questionnaire due to the applied concept of measuring consumer innovativeness. When formulating the questionnaire, we started from the evaluation concept of the Goldsmith-Hofacker scale of measuring innovativeness in an effort to identify consumer demand for innovation of local public services in general. The concept was extended by supplementary questions identifying the preferences of citizens in the specific consumption of electronic local public services and issues identifying barriers to the implementation of innovation of local public services based on IT technologies on the demand side, i.e. that of the citizens.

The basic sample, as a set of statistics in this case, consists of residents of 1,494 participating municipalities as all statistical units that meet the required characteristics. The basic sample is very extensive as it comprised 4,439,609 inhabitants; we therefore determined the selection sample which comprised 225 citizens from the monitored municipalities. We obtained the selection sample by means of quota sampling according to the following statistical attributes: gender and age group, whereby its structure corresponds to the basic sample.

3.2 The innovative potential of organizations providing public services

We formulated this hypothesis: The development and implementation of innovative concepts of public services fail because of weak innovation potential providers of local public services. The innovative potential of local governments will be assessed in five areas, as identified by the diamond model (strategy, processes, organization, networking and learning), regarding their transformation of qualitative data to quantitative by using a Likert scale (total disagree = 1, total agree = 5). We compare our results with the results of our research conducted in 2017 (Mikušová Meričková et al. 2018). We are using a similar methodology in this case as in the previous case.

The subject of the research are specific innovation projects of local public services which use ICT. Specifically, the MDC project. The MDC is a national project

which is aimed at the digitalization of the Public administration and the development of E-services delivered on the local and regional levels (MDC 2015). The MDC project is designed for a municipality with a population of more than 500 and less than 20,000 citizens.

The data collection method in the primary research, with respect to the applied evaluation concept of the diamond model, is a structured questionnaire. We evaluate the innovation potential of 54 out of the 1,494 municipalities involved in the MDC project in 2018 (Babín, Baldovce, Beňuš, Bory, Braväcovo, Brezovica, Bukovina, Čajkov, Dedinky, Dubinné, Ďurďové, Figa, Filakovo, Folkušná, Harhaj, Harmanec, Henclová, Horná Štubňa, Hradisko, Hrochoť, Kokšovce, Kolinovce, Kozárovce, Krškany, Lenka, Lesnica, Liesek, Lukavica district of Bardejov, Malá Domaša, Moštenica, Oravský Podzámok, Podhorany, Podhradík, Polomka, Predajná, Rabčice, Raslavice, Ratka, Ráztoka, Richvald, Slovenská Krajňa, Spišské Hanušovce, Spišský Štiavnik, Svit, Štvrtok, Tajov, Teplý vrch, Terchová, Tŕnie, Údol, Uňatín, Vitanová, Záborské, Žalobín). The selected sample is considered to be representative. We acknowledge that, given the extremely limited size of our sample (N=54), the generalization of our findings need reflection.

In both cases (on the demand side and on the supply side), we translated the obtained data by means of numerical codes, and it was furthermore statistically processed using the:

- Chi-square test (tests the representativeness of the selected sample),
- Multiple-response analysis (identification of preferences of citizens in the consumption of specific electronic local public services and evaluation of the innovation potential of the executive branch of local government within the diamond model and innovation offered by local public services based on information-communication technology),
- Spearman correlation coefficient (verification of dependence of the characteristics on the consumers' gender, ages and level of education and interest in innovation of local public services using IT).

For the evaluation, we use IBM SPSS Statistics 19 statistical software; for testing we consider the significance level of 0.05.

4. Results and discussion

4.1 The evaluation of citizen willingness as a consumer to adopt innovative public services

Research into the demand for innovation of local public services based on the use of ICT in the MDC project focuses on several areas:

1. Citizens' demand for innovation of local public services, measuring citizen innovativeness as a consumer in the consumption of local public services,
2. The demand for innovative, electronic local public services – manifested as the preferences of citizens in the consumption of specific electronic local public services,
3. The relationship between the characteristics of consumers/citizens and their demand for innovation of local public services using IT.

The selected sample of respondents/citizens is constructed so that its structure according to the basic characteristics of gender and age group corresponds to the basic sample of all the citizens monitored in the 1,494 municipalities (Table 2).

Table 2

The selected sample for measuring citizen innovativeness in the consumption of local public services (potential demand)

Classification symbol	Gender		Age group				
	Men	Women	18–24	25–34	35–44	45–54	55+
Basic sample %	48.22	51.78	10.39	19.03	19.87	16.22	34.55
Selected symbol %	48.89	51.11	11.11	20.89	18.22	16.44	33.33

Source: Author's own, and on the basis of data from the Statistical Office of the Slovak Republic (2016).

We found that the selected sample is representative according to gender and age group (p-value 0.040; 0.956) by using the chi-square test. The results found in the questionnaire survey can be generalized for the entire population of all 1,494 municipalities.

Citizen innovativeness as potential consumers of electronic local public services was evaluated with the Goldsmith-Hofacker scale for measuring consumer innovativeness. The results are illustrated in Figure 4. We can compare these results with results of our research conducted in 2017 (Mikušová Meričková et al. 2017).

Figure 4
Citizens' demand for innovation of local public services, citizen innovativeness in the consumption of local public services

Source: Author's own.

Figure 5
Citizens as innovators in the process of diffusion of innovation of local public services

Source: Author's own.

Ranging from 49.2 % to 64.2 % of the surveyed population of all municipalities involved in the MDC project (59.1 % to 68.2 % in 2017), with a 95 % reliability, residents expressed interest in the consumption of innovative local public services. Similarly, with 95 % reliability, it can be said that between 69.4 % and 81.7 % (between 56.4 % and 65.9 % in 2017) of the population of all those surveyed are actively interested in the innovation of local public services – Figure 5.

In terms of the distribution of the category of consumers in the process of diffusion of innovation, the bulk of the population in relation to the innovation of local public services behave rather more like innovators than followers. This is a positive finding if we consider the existence of demand for innovation of local public services; such demand for innovation of local public services in the municipalities studied exists, people are interested in innovations that would increase their benefits from the consumption of services provided by the local government.

In the next step of the analysis we evaluate the demand for innovative, electronic local public services – manifested as the preferences of citizens in the consumption of specific electronic local public services as defined in the MDC project. The subject of electronization should be a list of 137 services provided by the local government. We discover in which services on this list the highest potential demand is for their innovation by means of their electronization. Figure 6 shows the five, the electronization of which citizens have the highest interest in, leading us to the identification of the highest demand of citizens through the use of the multiple-response analysis method.

Of the six services the electronization of which citizens expressed the highest interest in only service payment of local taxes (3), release process of news and information service (4) and payment of local fees for municipal waste and minor construction waste (5) are among the mandatory services which municipalities are obliged to electronize in the MDC projects. The remaining services on the figure (Figure 6) are among the optional services, i.e. services from which the applicants are entitled to choose any number that they consequently undertake to electronize within the project (Ministry of Finance, Slovak Republic 2013). The municipalities therefore, prior to deciding on their electronization, should discover the preferences of their citizens. The reality is, however, according to our findings, that none of the municipalities involved in the MDC project conducted such surveys of the preferences of their citizens. According to European commission (2020), there is a growing interest in electronic public services. There is increasing interest in all age groups, but especially in the group from 25 to 34 years old (82 % of people in this group use electronic public services for interaction with public authorities in 2019, while it amounted to only 43 % in 2013). TNS conducted the survey for the Ministry of Finance in 2014. They found out that more than half the citizens of Slovak republic (55 %) did not have enough information about electronic public services.

Figure 6
The demand for innovative, electronic local public services – preferred service

Source: Author's own.

Furthermore, in analyzing the demand of citizens for the innovation of local public services we find whether there is a relationship between the characteristics of consumers/citizens (gender, educational attainment, age category, income) and their demand for the innovation of local public services using IT. When testing dependence, we used Spearman's correlation coefficient.

In the case of gender, no dependence for demand for innovation was confirmed. Education, income and age group had a more significant impact on the demand for innovation of most local public services through their electronization. Interest in the electronization of local public services is higher for people with higher educational attainment, higher income and a lower age. Given that more than 2/3 of the urban population has completed secondary or higher education, it can be assumed that the demand in municipalities for innovation of local public services by means of electronization of public services will exist and has the potential to grow if electronized services meet the requirements of comprehensiveness and accessibility. Residents do not perceive electronic public services as a full equivalent of the original public service; they consider e-services as provided by local government to be incomprehensive (p-value 0.118). The realistic accessibility of the provided electronic public services is also limited by the lack of digital literacy and households with computers with an internet connection (p-value 0.005).

4.2 The evaluation of the innovative potential of organizations providing public services

The analysis of innovation offered by local public services leads to testing the scientific hypothesis of the low innovation potential of providers of local public services, which is one of the reasons for the failure of the creation process and the successful implementation of innovations of local public services. The key is the evaluation of the innovative potential of the executive branch of local governments in the following areas: strategy, processes, organization, networking and learning, as identified in the evaluation of the diamond model. Each individual area is provided with statements to which the employees of the assessed organizations express their affirmative or negative arguments. The qualitative features in the form of statements/responses are transformed into quantitative indicators as in the value chain concept: totally disagree = 1, totally agree = 5. We evaluate the innovation potential of 54 from 1,494 municipalities involved in the MDC project. The selected sample is considered to be representative.

Table 3

The selected sample for evaluating the innovation potential of organizations providing public services (potential supply)

Classification symbol	Number of residents in municipality						
	1-199	200-499	500-1,000	1,000-1,999	2000-4,999	5,000-9,999	More than 10,000
Basic sample %	15.60	30.25	26.77	18.14	7.43	1.47	0.33
Selected symbol %	14.81	29.63	24.07	16.67	11.11	1.85	1.85

Source: Author's own, and on the basis of data from the Statistical Office of the Slovak Republic (2016).

We found that the selected sample is representative according to the number of residents in the municipality (p-value 0.535). However, the results can be influenced by a response bias. For this reasons, the answers of the respondents were verified in relation to the information published on the websites of the municipalities.

Table 4 clearly illustrates the municipalities' answers to the questions if the employee agrees or totally agrees with the question.

The innovative capacity of the individual municipalities was evaluated by a modification of the diamond model and value chain. Within the framework of the evaluation according to the value chain concept, a municipality can receive a highest score of 125 points based on their responses if the answer to each question is positive (totally agree = 5 points) and a lowest score of 25 points for a negative answer to each question (totally disagree = 1 point). The results for the evaluation of the innovation capacity of municipalities according to their replies to the value chain concept are illustrated in Figure 7.

The average number of points achieved in the evaluation of the value chain concept was 91.35 points.

We evaluated the innovation potential of the municipalities by means of the diamond model in terms of strategy, processes, organization, networking and learning from the municipalities' responses to a number of issues in each field. The average gained points from the responses to each area we apply to each of the axes of the diamond model representing the evaluated fields. Figure 8 illustrates the results of the evaluation of innovation capacity from the perspective of the local governments in the diamond model.

Table 4

Evaluation of the innovation potential of the executive branch of local government – innovation offered by local public services

Evaluated field	Question	Number of selections	% of surveyed municipalities which responded "YES" to this question
Strategy	Local government employees in the organization knows the innovation strategy and its goals	33	62.26%
	The municipality has mechanisms for implementation of development strategy of a municipality	22	41.51%
	The municipality uses predictive methods and tools to help us evaluate future threats and opportunities	16	30.19%
	The municipality has a system in place to select new projects	29	54.72%
	Innovations are part of the development strategy of a municipality	21	39.62%
Processes	Innovative projects are usually completed in time and in accordance with the budget	29	54.72%
	The organizational structure of municipality does not limit innovation but supports them	35	66.04%
	The municipality monitors the needs of citizens	37	69.81%
	Management of the municipality is interested in innovation	39	73.58%
	The municipality innovates local public services	33	62.26%

Organization	Local government employees have a clear idea of how innovation can help the municipality	23	43.40%
	Local government employees from various departments work well with each other	41	77.36%
	When implementing new services for citizens or innovative ideas, the municipality engages all local government employees	40	75.47%
	Local government employees are involved in designing ideas to improve the provision of public services	33	62.26%
	Communication between departments is efficient and top-down, bottom-up, also between different departments of the municipality	32	60.38%
Networking	The municipality organizations systematically compare processes and services with other municipalities	16	30.19%
	Local government employees work well at teams	44	83.02%
	The municipality builds relationships with other municipalities	24	45.28%
	The municipality builds relationships with external organizations; individuals bringing new information; exchange experiences; building social capital – public-private-civic mix and co-creation in the innovation process	24	45.28%
Learning	The municipality builds relationships with other local government organizations	36	67.92%
	Local government employees are regularly trained	41	77.36%
	Local government projects are being evaluated in order to improve results in the future	34	64.15%
	The municipality learns from own mistakes	47	88.68%
	The municipality collaborates with universities and research centres to develop the knowledge in the local government organization	7	13.21%
	The municipality learns from own and transferred experience (e.g. from other local government, organizations)	39	73.58%

Source: Author's own.

Figure 8
Evaluation of innovation capacity from the perspective of the local governments (diamond model)

Source: Author's own.

Legend: 1–199: Baldovce, Bukovina, Ďurďové, Folkušná, Henclová, Hradisko, Lenka, Uňatín; 200–499: Bory, Dedinky, Dubinné, Figa, Harhaj, Lesnica, Lukavica district of Bardejov, Malá Domaša, Moštenica, Podhradík, Ratka, Ráztoka, Štvrtok, Teplý vrch, Trnie, Údol; 500–999: Bravčovo, Čajkov, Harmanec, Kokšovce, Kolinovce, Krškany, Podhorany, Richvald, Slovenská Kráľná, Spišské Hanušovce, Tajov, Záborské, Zolobin; 1,000–1,999: Babin, Beňuš, Brezovica, Horná Štubňa, Hirochoť, Oravský Podzámok, Predajná, Rabčice, Vitanová; 2,000–4,999: Kozárovce, Liesek, Polomka, Raslavice, Spišský Štiavnik, Terchová; 5,000–10,000: Svit; More than 10,000: Filakovo.

The areas of the diamond corresponding to individual municipalities vary in relation to their innovation potential in the different evaluated areas. The municipalities with high innovative potential in all evaluated areas include Záborské, Richvald, Baldovce. Municipalities with a lower evaluated potential in all areas are Ratka, Harhaj, Spišský Štiavnik, Teplý vrch. The remaining municipalities achieve differing evaluations in various fields (Figure 8). The evaluated municipalities have the largest reserves in the area of networking and strategy (Figure 9).

Figure 9

Evaluation of innovation capacity from the perspective of the local governments (diamond model) – the average result in the questions

Source: Author's own.

Legend: L – learning; N – networking; O – organization; P – processes; S – strategy.

The problem in the area of networking is in particular the lack of systematic comparison of processes and services with other municipalities – benchmarking analysis. However, it may be positively perceived that although municipalities do not compare their processes and services with other municipalities, it shows that they are able to cooperate with other municipalities in developing new services for their citizens (p -value 0.008, 0.003; $r_s = 0.360, 0.394$). Local governments not only take on the positive experiences from other local governments, but build cooperation with external organizations and individuals. The municipalities declare the building of partnerships with other municipalities in Slovakia and abroad, regional development agencies, suppliers of information systems, businesses and so on.

One of the limits of the research method is the insufficient sample size. The validity of our results can be confirmed by results of our previous research (Mi-

kušová Meričková and Muthová 2018). The results confirmed our hypothesis that “The development and implementation of innovative concepts of public services fail because of the weak innovation potential providers of local public services.” The municipalities have the largest reserves in the area of networking and strategy as confirmed in our previous research (Mikušová Meričková and Muthová 2018). Also according to the Supreme Audit Office (SAO) the biggest problem is the missing strategy for development of eGovernment. However, the SAO considers the process of informatization to be successful in municipalities. The improvement is mainly due to the acquired experience of employees of municipal authorities, such as also the growing number of eGovernment. A negative evaluation of the development of eGovernment was recorded only by four per cent of the sample checked by the SAO (SAO 2020). Špaček et al. (2019) confirmed that the situation is similar in the Czech Republic, Hungary and Romania. The problems are a lack of real strategic thinking, legislative issues and organizational imbalances.

The results of the SAO inspection show that public service electronicization projects usually do not meet the set objectives. The SAO has already pointed out that the problem is the outsourcing of IT services. According to the SAO the internal provision of IT services may be more beneficial to the organization and the state. IT solutions by internal employees use a better knowledge of their own processes and information systems and are therefore possibly faster and more effectively applicable in practice (SAO 2020). However, the results of the SAO inspection confirmed that insufficient staff capacity is a problem for the successful implementation of eGovernment.

Another problematic area is the area of “strategy”. Moreover, innovation as expressed by the local governments in strategic documents appears sporadically. Municipalities introduce innovation in communicating with citizens (sending information via SMS notifications, Facebook, e-mail or RSS feeds), and the use of renewable energy and waste management. The declared efforts to innovate in the interest of development can therefore be considered more or less a formality. For example, an electronic mailbox is a matter of course in Slovakia. The results showed that only 0.49 % of the 149,000 inhabitants in the inspected municipalities had an active electronic mailbox in 2018 (SAO 2019). Citizens still prefer personal or paper contact with the authorities.

According to European commission (2019) Slovakia has a non-consolidated eGovernment. This means that a government in this scenario does not utilize ICT opportunities yet and has a limited number of users of online public services but could reap corresponding benefits in the future (European commission 2019, 77). Slovakia could enhance penetration (for example % of individuals using the internet (internet use) and % of individuals submitting filled-in forms of users who need to submit forms (eGovernment user) and digitization (online availability, usability, mobile friendliness, transparent government, citizens and business mobility and

key enablers) by digitizing both front and back offices of public services providers. First, ICT opportunities would need to be realized and citizens and business would need to be convinced to use eGovernment services.

Insofar as we view the evaluated area “process”, it can be seen as positive that the municipalities, according to their response, monitor the needs of their citizens, and more than 60 % of this is achieved also thanks to innovations of local public services. Innovation is most often cited by the municipalities as the electronization of public services, electronic discussion forums for the municipalities’ people, mobile applications through which citizens can draw attention to illegal waste dumps or the poor condition of public spaces, and communicating through Facebook. Monitoring the needs of the citizens takes place through the City Monitoring application, web sites, Facebook, offices of first contact and questionnaires. When it comes to introducing innovation, it is important not only to gain support from municipality leaders, but also support from municipality employees themselves. Smaller municipalities do not have the capacity to promote and educate eGovernment. For them it is necessary to improve communication, education and promotion from the state.

The answer to the question of the role played by local government employees in the innovation process is evaluated in the “organization” area. 60 % of the municipalities claimed that the local government employees are involved in designing ideas for improving the provision of public services. It is notably innovations in communication with citizens, monitoring of citizens’ needs and providing benefits for those members of the population with permanent residency. It should be noted that only 41.8 % of local government employees have a clear idea of how local government innovations can be useful in the future. According to Urs (2018) the problem is a lack of interinstitutional interoperability, outdated internal procedures and lack of management support in municipalities.

According to claims, local government employees are continuously educated through courses (mainly focused on legislative changes, the increase of computer literacy, e-learning courses, etc.). Also they learn from positive experience of innovation from other local governments, not only from Slovakia but also from abroad, e.g. cross-border projects, conferences, forums; also from own mistakes). The largest reserve in the evaluated area “learning” is the municipality cooperation with universities and other research centres.

From the list of e-services, only 27 public services have been involved in projects for the electronization of local public services in more than half of the municipalities of our selected sample. According to the Campeginini methodology (2010) and online sophistication ranking, most electronic public services in Slovakia are only at the one-way interaction level, where an individual may download the form but ultimately must hand it over to the relevant office.

We also wanted to know if the size of the municipality has an impact on the component of the innovative potential of the municipality. There is a weak cor-

relation between the size of the municipality and one component of the innovation potential – Mechanisms for the implementation of the development strategy of a municipality (p-value 0.032; $r_s = 0.292$).

The next question is which components of the innovation potential have an impact on the offer of innovation of local public services using information-communication technologies. There is a strong correlation between the implemented mechanisms utilized in innovation within the framework of the strategy of development of municipalities and existing innovations in the provision of local public services (p-value 0.000, 0.000 respectively; $r_s = 0.686, 0.551$ respectively). Innovations allow the local governments to more intensively monitor their citizens' needs and adapt to these needs according to the nature of innovation and the course of the innovation process (p-value 0.004; $r_s = 0.383$). The nature of innovation, in addition to the needs of citizens, is determined by the success of innovation processes in other municipalities (p-value 0.001; $r_s = 0.431$). Initiating elements in the innovation process of local public services are local government employees (0.000; $r_s 0.614$), whose inspiration is once again found in already successfully implemented innovation in local public services of other municipalities in Slovakia and abroad. The conclusion can therefore be deduced that local governments, concurrent with employee initiative, will monitor the needs of their citizens and implement the mechanisms of innovation of local public services in their own development strategy, which will result in the innovation of local public services based on the needs of citizens (p-values of 0.001, 0.001, 0.000, 0.000 respectively; $r_s = 0.422, 0.447, 0.664, 0.577$ respectively).

5. Conclusions

The object of the paper was to identify problems of public service innovations demand and supply, which determines the adoption of local public service innovations based on the use of IT technology in the context of the Slovak Republic.

The results of the investigation confirmed that there is a demand from citizens for the innovation of local public services, but the process of developing and implementing innovative concepts of public services fails on the grounds of the low innovation potential of the service providers. According to Heeks and Bailur (2007) rankings of e-government development also often focus largely on policy statements and the willingness of employees to adapt to the innovation of public services. There exists a discrepancy between the demand for and the supply of innovative local public services using IT technologies, and, furthermore, poor public awareness of the possibilities of using electronic public services is a serious problem. In the process of introducing the innovation of public services it is essential to focus primarily on the requirements of users' benefit from the consumption of services

and on the ease of use of services by respecting the preferences of citizens, ensuring inclusiveness and accessibility of services and effective communication to citizens.

The reality is, however, according to our findings that none of the municipalities involved in the MDC project conducted such surveys of the preferences of their citizens. Our previous research also shows a similar result (Mikušová Meričková et al. 2017). This may also be one reason for the failure of projects for the electrification of public services in the conditions of Slovak municipalities (the electronic public services used 68,339 citizens to 31 May 2018 – Data.gov.sk). Also Gauld (2009; Gauld et al. 2020) says that “the actual purpose of e-government is of course disputed but one theme is largely managerially driven cost-cutting, rather than necessarily a focus on citizen preferences.” Municipalities do not have a clear strategy for introducing the innovation of public services, the starting point of which would be to establish an initial assumption about demand for innovation of local public services in relation to the demographic structure of the population of the local authority and identify categories of citizens as innovators in the process of diffusion of innovation, or respectively the target group of citizens which should be the subject of marketing communication in the process of introducing innovation and subsequent investigation into the preferences of citizens in relation to a specific innovation. After identifying the demand for specific electronic services, securing the comprehensiveness and availability of these services should follow. Citizens do not perceive electronic public services as a full equivalent of the original public service, they consider e-services to be incomprehensive. About a third of the urban population is formed by people aged 55 years and over who have low computer literacy and a lower level of being equipped with computers connected to the internet (which citizens themselves admit as a problem of realistic access to e-services provided by the local government). This conclusion was also confirmed by research conducted by Gauld et al. (2020). Older age and less education were associated with lower ITC and e-government use (Dugdale et al. 2005; Norris 2001; Thomas and Streib 2003). In relation to support for demand for electronic public services, the very innovation process of electrification should be preceded by a preparation of citizens through training courses on IT skills within the framework of informal education.

One of the limits of the research method is the insufficient sample size. The problem with our research is the low level of responsiveness to the questionnaire. Visser et al. (1996) claim that surveys with low response rates are not necessarily low in validity. It is not appropriate to distribute the questionnaire electronically due to the research problem in our case. We could exclude respondents without internet access and without ICT skills. Respondents completed the questionnaire in person. The disadvantage of this way of addressing respondents is time consuming. Also there exist concerns if respondents have really understood the questions. We performed a pre-test to verify the comprehensibility of the questions. Pre-testing will help us determine if respondents understand the questions. Also there is problem with the selection sample of municipalities. We acknowledge that, given the

extremely limited size of our sample (N=54), the generalization of our findings need reflection.

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