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Abstract

This paper addresses the people's knowledge, acceptance and attitude towards the concept of the Smart City. Therefore, inhabitants of Leipzig (Germany) and Tallinn (Estonia) were surveyed online and asked to evaluate 10 technologies that can be used in a Smart City and to rate the Smart City concept itself. First, results show significant differences in the level of knowledge and acceptance towards smart technologies between citizens of Leipzig and Tallinn. In addition, the data provides information on the extent to which citizens are willing to live in a Smart City and how they perceive its advantages. Second, the data provides information about perceived opportunities and risks towards the Smart City and thus gives information about which aspects should be addressed in future strategic communication in order to increase the people's trust and acceptance.

Introduction

We live in a rapidly changing world, in which central transformations such as urbanization, climate change and an aging society pose numerous challenges for future cities (Mandl & Zimmermann-Janschitz, 2014). Especially the aspect of digitalization is an important component in the processes of change in modern cities and influences numerous spheres of life of their citizens (Vogel, Weißer and Hartmann, 2018).

In the context of urbanization and digitalization, the demand for efficient and sustainable city concepts is becoming increasingly apparent. Between 2010 and 2015, the number of Smart City strategies published by cities worldwide has increased more than eightfold (Berger, 2017, p. 8). In a Smart City, the use of information and communication technology (ICT) aims at making living more efficient and resource-saving and at actively involving the public in decision-making (Loew & Rohde, 2011). With the aim of working constructively together as "Smart People" on sustainable Smart City programs, it is important to sensitize both knowledge and awareness of the inhabitants of all social classes, to create participatory access to engage citizens in decision making processes and to analyze the public opinion. Finally, the added value of a Smart City is reflected in the potential of the people who live inside of it (Mandl & Zimmermann-Janschitz, 2014).

The achievement of this goal is closely linked to an appropriate strategic communication. Current approaches suggest considering strategic communication as an agile management process (Van Ruler, 2018). Communication embodies an interactive and participatory procedure in which meanings for strategy building and implementation are continuously presented and negotiated (ibid.). Following Zerfass et al. (2018), we interpret a Smart City as a “focal entity” that has to be linked to a “communication of strategic significance”. Therefore, it is important to explore the people’s opinion towards this topic in order to develop adequate communication strategies.

A Smart City can be considered a symbol of the use of innovations. In addition, with the help of a participatory approach and involving the citizens, negotiations are being held collectively on how the city should be further developed and designed. This study addresses the public’s attitude towards the Smart City concept and determines the knowledge, acceptance as well as perceived opportunities and risks linked to the Smart City. Finally, it aims to examine which aspects are of significant importance for strategic communication of Smart City issues.

Theoretical Background

Smart City Concepts

"Smart City" refers to a city in which ICT as well as resource-saving technologies are systematically used to move towards a post-fossil society, to reduce the consumption of resources, to permanently increase the quality of life of the citizens and the competitiveness of the local economy – in other words, to improve the sustainability of the city. An elementary characteristic of a Smart City is the integration and cross-linking of these areas in order to realize the possible ecological and social improvements. Essential in this context is a comprehensive integration of social aspects of the urban society as well as a participatory approach (Loew & Rohde, 2011). In addition, there are various "smart" fields of action in which a Smart City operates. These include the government, economy, mobility, environment as well as the citizens and the way of living (Giffinger et al., 2007).

Leipzig versus Tallinn

The city of Leipzig has decided to aim at becoming a Smart City (Smart City Leipzig, n.d.). For this reason, the city has joined the project *Triangulum* and is being supported by the EU Commission to develop a Smart City strategy (Stadt Leipzig, n.d.). The central subjects of the project are sustainable mobility, a smart economy, renewable energies and intelligent living (Smart City Leipzig, n.d.). In addition, the urban population should be able to actively participate in designing and developing their city using innovative technologies (Stadt Leipzig, n.d.). To achieve this goal, various companies and authorities as well as research institutes are involved in the project (Smart City Leipzig, n.d.). The region around Leipzig is considered the largest urban agglomeration for microelectronics and IT in Germany and is home to a high number of qualified specialists. The so-called *Silicon Saxony* network, which includes the Leipzig region, consists of 350 companies from the service sector, manufacturing and supply sectors as well as participants from universities and research institutes. Public institutions and start-ups are also part of the network (Silicon Saxony e.V., n.d.). To date, however, the city is still in the beginning of its development process to become smart.

In Estonia, there are numerous sectors where ICT solutions are already used – such as digital identity, security, healthcare, online administration or education. A particularly important solution is the digital identity, which is provided to all citizens. With this, citizens can identify themselves online, sign digital documents and use e-services such as the e-government system to vote online (E-estonia, n.d.). The fact that the citizens and companies are willing and able to use the technologies offered is openly communicated by the city and

regularly investigated. In addition, Tallinn's citizens are actively involved in the planning and development processes. To this end, Tallinn's first digital tool for participation in urban planning (AvaLinn) has been published, in which citizens can give feedback and participate in brainstorming (Plantera, 2018).

Innovation and Strategic Communication

Innovation communication aims to develop understanding and trust in innovation and to discuss innovation in the context of key issues. Not only opportunities but also potential risks of an innovation should be addressed, and scientific findings should be included and made freely accessible. On the one hand, innovations have several challenges to face, such as the user's fear of the new (reservation), a lack of connection (lack of examples), a high degree of abstraction (complexity) or separation from established issues (innovations changing the way of living). On the other hand, due to their novelty, they offer the chance of publication (high news value) and a change of positioning – e.g., as a way of overcoming a crisis (Zerfass, 2005).

Since a Smart City can be considered a symbol of the use of innovations, the inclusion of innovation communication and so-called innovation clusters in this context is essential. Nowadays, corporations between business partners such as engineering offices, research institutes, political decision-makers and distribution partners are becoming more and more important for the development of innovations (Zerfaß & Huck, 2007). These innovation clusters can be characterized as "a mix of competition and co-operation, self-interest and shared visions" (Zerfass, 2005, p. 9). Depending on their proximity, they can become an innovation driver of entire regions such as the *Silicon Saxony* network. Innovation clusters are quite similar to the Smart City itself as they both focus on interdisciplinary cooperation.

Nevertheless, since the idea of the Smart City refers not solely to the development of innovations or economic processes, but also to sharing concepts and citizens' participatory engagement, the Smart City itself can be interpreted as a focal entity. Following Zerfass et al. (2018), all communication that is important for the survival and sustainable success of an entity can be classified as strategic communication. Further, communication is considered strategic if an entity uses it to participate in conversations of strategic significance that are linked to its goals. Strategically significant conversations can take place in different areas – from social media and mass media to private dialogues between consumers (Zerfass et al., 2018). In relation to the goals of a Smart City, conversations that are linked to sustainability, the use of resource-saving technologies or participation, can be examples for strategic communication.

Additionally, when talking about the participatory approach of a Smart City, it is necessary to consider strategic communication as an interactive process that functions like a continuously reflective cycle (Van Ruler, 2018). Such an agile communication process focuses on both internal and external arenas and their presentation and negotiation of meanings. This perspective on the flow of communication can be applied to citizens' engagement in a Smart City and would make it possible to continuously negotiate decision-making processes together. Before decision-making processes (such as the use of new ICTs) can be discussed, however, the diffusion process of innovations must first be taken into account. Due to the novelty of an innovation, uncertainty and perceived risk are important components of the diffusion process. By obtaining information about an innovation due to strategic conversations, this obstacle can be overcome and a high knowledge as well as acceptance of new technologies can be created (Rogers, 2003). In this context, mass media and, above all, journalism are important mediators. Their reporting should not only focus on the technical aspects of an innovation, but also include economic and social aspects. The task is to address the usefulness and benefits of an innovation so that in result, the significance and personal relevance prevail (Zerfass, 2005). In parallel, it should be taken into account that while mass media are best suited to increase people's knowledge about an innovation, personal contacts tend to be more suitable for shaping or changing people's opinions about an innovation – especially if the near peers already adopted the innovation (Rogers, 2003).

Technology Acceptance

Different models have been established for the analysis of people's acceptance towards new technologies – a proven common method is the Technology Acceptance Model (TAM). According to Davis (1989), the behavioral intention (BI) to use a new technology is influenced by how a person perceives its usability (PU) and ease of use (PEOU). PU on the one hand is related to the technology's functions: If they appear to be beneficial to a person, it is more likely to be used. On the other hand, it is linked to the perception of how easy it is to use its functions. It should be noted that users are also willing to accept some difficulty in using a technology if it offers them much needed functionality. Finally, these two dimensions result in a positive or negative attitude of users towards the BI to use the technology in question (Davis, 1989). Several studies examined the factors influencing the technology acceptance and were able to identify relevant variables such as the *Big Five* personality traits, perceived risk and trust (e.g., Hubert et al., 2019; Jackson et al., 2013; Svendsen et al., 2013; Taiwo et al., 2012; Zhou &Lu, 2011).

Nevertheless, only a few studies have so far focused in particular on technologies that can be used in a Smart City. If a Smart City is considered as a symbol for the use of ICT, it is also essential to examine how citizens evaluate these technologies as well as the overall concept of a Smart City. A special aspect of smart technologies is that they aim at increasing sustainability and efficiency. This seems particularly important in the context of raising voices for a more environmentally friendly lifestyle in cities. While most studies focus on the factors influencing the determinants of the TAM, there is a research gap regarding the attitude of potential users towards smart technologies. In particular, it is important to investigate associated opportunities and risks in order to react adequately with the help of strategic communication concepts.

First of all, this study intends to examine the knowledge and acceptance of the citizens regarding technologies that can be used in a Smart City. Therefore, Tallinn is used as an example for a city that already considers and communicates itself as being smart. In addition, Leipzig is used as an example because it is part of the EU-funded Smart City project "Triangulum" and recently started to work on a Smart City strategy. Second, this study examines which aspects should be addressed in the future strategic communication of Smart City initiatives in order to increase people's knowledge, acceptance and trust. To close this research gap, the attitude of citizens of Leipzig and Tallinn towards the Smart City concept will be investigated. The aim is to find answers to the following questions:

RQ1: What level of knowledge and acceptance do the citizens of Leipzig and Tallinn have about the Smart City topic?

RQ2: How do the citizens of Leipzig and Tallinn position themselves regarding the Smart City concept and smart technologies?

Methods

An online survey was used to investigate the knowledge, acceptance and attitude of the inhabitants of Leipzig and Tallinn towards the Smart City concept. For the six fields of action of a Smart City, a specific search for technologies was conducted to reflect the respective area.

In result, respondents were asked to evaluate 10 technologies that can be used in a Smart City[1]. Each technology was explained in a short summary using an easily understandable wording. In doing so, the technologies were described objectively and without adding advantages or disadvantages. Further, the respondents were asked to rate the Smart City concept itself. The questionnaire ended with the invitation to leave comments and thoughts about the Smart City concept. Finally, both quantitative and qualitative data were generated. The TAM was used to measure the technology acceptance of the respondents. Due to the fact that most of the presented technologies are not available yet, but aim for future use, the investigation on the PEOU was excluded. According to each technology presented to the participants, they were asked to rank themselves on a five-level Likert scale (strongly agree to strongly disagree): *I am already familiar with the described technology or innovation* (knowledge); *I consider the technology described to be useful* (PU); *I would like to apply or use the described technology myself* (BI).

The recruiting of Leipzig's citizens took place in the period from January 4th to January 31st 2018, considering the age and gender structure as well as the educational level and income structure. On the one hand, the link to the survey was spread via social networks. On the other hand, websites and mailing lists were used to contact potential participants in the study. In cooperation with Tallinn University, the study was replicated, and a survey of Tallinn citizens was conducted. For this purpose, the study was translated into Estonian language with the help of a professional translator. In contrast to Leipzig, Tallinn has Facebook groups for each of its eight districts. The citizens were recruited through these groups in the period from January 23 to February 8, 2019.

To determine the level of knowledge of the inhabitants of Tallinn and Leipzig, a variable was used to count how many respondents knew how many of the technologies presented (between zero and ten). In doing so, respondents who knew between zero and three technologies were considered to have a low level of knowledge. Respondents who knew at least four and a maximum of seven technologies were considered to have a medium level of knowledge, and respondents who knew more than seven technologies to have a high level of knowledge. To define these categories, the average level of knowledge of the respondents was taken into account. The same approach was used to define the level of PU and BI. Both the level of knowledge as well as the PU and BI were considered separately for the participants

[1] (1) Multi-function poles, (2) Early warning systems, (3) Smart waste management, (4) Online voting, (5) Home and building automation, (6) Smart meters, (7) Self-driving cars, (8) Car sharing apps, (9) Smart public transport, (10) Fix My City app

from Leipzig and Tallinn and compared to each other (RQ1). Therefore, a t-test for two independent samples was chosen and analyzed using the statistical software SPSS. The qualitative data was evaluated using the software MAXQDA. The comments of Tallinn citizens were translated into English language with the help of a professional translator. Thus, the qualitative data consists of German and English comments[2].

Findings

The dataset contains 1,106 cases, of which 409 originated from Tallinn and 697 from Leipzig. As the data shows, about one third of the respondents are male and two thirds are female, and the average age is around 35 years. Furthermore, the majority of the respondents have a highly educated background (55 percent), while 40.5 percent have a medium education and only about two percent of the respondents have a low education. It should be noted that about a quarter of the participants in the study belong to the group of students.

RQ1: What level of knowledge and acceptance do the citizens of Leipzig and Tallinn have about the Smart City topic?

It was found that 42 percent of the respondents had a low level of knowledge about the technologies presented, while 48.4 percent had a medium level and 9.6 percent a high level. In addition, 11.6 percent of the respondents showed a low level of PU and 42.4 percent a medium level of PU in relation to the technologies. In comparison, 46.9 percent of the respondents showed a high PU regarding the technologies. While around 30 percent show a low BI and around 44 percent a medium BI, the percentage of the respondents with a high BI towards the technologies is 25.9 percent.

The average level of knowledge of the citizens of Leipzig, measured by the number of technologies already known to the respondents ($M=3.75$, $SD=2.53$), contains approximately one technology less than that of the citizens of Tallinn ($M=4.65$, $SD=2.15$). As a t-test for independent samples show, this difference is highly significant ($t(965)=-6.29$, $p<0.001$). While the respondents from Leipzig are already familiar with about four technologies on average, the respondents from Tallinn are familiar with about five of the technologies presented (see Table 1).

[2] In the following, all comments of the respondents are presented in English.

Table 1. A comparison of the citizens of Leipzig and Tallinn

t-test	City	M	SD	T	df	p
Knowledge	Leipzig	3.75	2.53	-6.29	965	<0.001***
	Tallinn	4.65	2.15			
Perceived Usefulness (PU)	Leipzig	6.96	1.98	-2.46	1104	0.014*
	Tallinn	7.27	2.11			
Behavioral Intention (BI)	Leipzig	5.39	2.32	-7.35	1104	<0.001***
	Tallinn	6.44	2.27			

Source: Smart City 2019 data set (N=1106). Note: * for p <0.05, ** for p <0.01, *** for p <0.001.

Furthermore, the average number of technologies perceived as useful by the citizens of Leipzig (M=6.96, SD=1.98) is about one third less than that of the citizens of Tallinn (M=7.27, SD=2.11). This difference is significant (t(1104)=-2.46, p<0.05). In conclusion, on average, Tallinn citizens find a higher number of the technologies presented useful.

Finally, the average number of technologies that Leipzig citizens would like to use themselves (M=5.39, SD=2.32) is about one less than that of Tallinn citizens (M=6.44, SD=2.27). This difference of the BI also proved to be highly significant (t(1104)=-7.35, p<0.001). It can thus be concluded that, on average, Tallinn citizens would like to use about six of the technologies presented, while Leipzig citizens would like to use only about five of these technologies themselves.

RQ2: How do the citizens of Leipzig and Tallinn position themselves regarding the Smart City concept and smart technologies?

The respondents' evaluation of the overall concept of the Smart City is shown in Table 2. First of all, results show how the respondents perceive their own skills when dealing with smart technologies. While the majority (61 percent) would find it easy to use the technologies of the Smart City, only a small part of the respondents disagrees (12 percent). Second, the respondents rated the extent to which smart technologies would make their everyday life more efficient. While over a half are of the opinion that they can handle everyday tasks faster with the help of Smart City technologies, around 15 percent disagree with this opinion. Third, the respondents were asked to state if they would like to live in a Smart City. As the results show, the majority (46.6 percent) support living in a Smart City. In contrast to this, 21.1 percent of the respondents reject living in a Smart City.

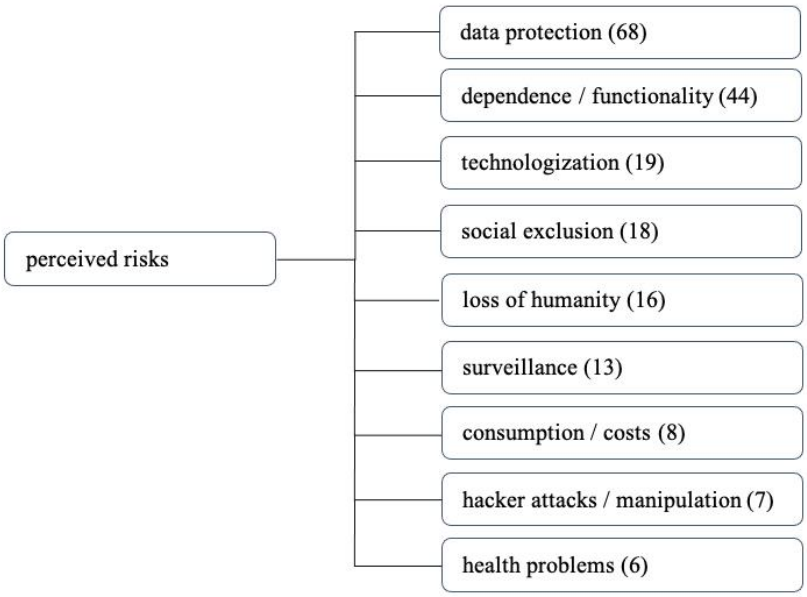
Table 2. Evaluation of the Smart City Concept

Item	Agreement	Frequency	Percentage
I would find it easy to use the technologies of the Smart City.	rather disagree	133	12
	partly agree	298	27
	rather agree	673	61
	total	1.104	100
With the technologies of the Smart City, I could do everyday activities more quickly.	rather disagree	165	14.9
	partly agree	310	28.1
	rather agree	629	57
	total	1.104	100
I would like to live in a Smart City.	rather disagree	233	21.1
	partly agree	357	32.3
	rather agree	514	46.6
	total	1.104	100

Source: Smart City 2019 data set (N=1104).

As the qualitative data analysis shows, the perceived risks of the respondents towards the Smart City concept can be summarized into nine categories (see Figure 1).

Figure 1. Comments on perceived risks



Note: The number of codes is shown in the brackets.

First, respondents often express concerns about data protection and the sharing of personal data. Potential misuse of data and the possibility of influencing purchasing behavior and political positioning are criticized:

> *"With all the technologies presented, the question of data protection inevitably arises, which influences my judgement. If this were resolved, I could be more positive".*

Second, perceived dependence on technologies and their functionality is frequently mentioned by respondents. Criticism is often directed at the potential failure of power and internet, as well as system failures, which would result in possible helplessness:

> *"I don't like to rely completely on machines and systems, I don't think one should be too dependent on technology".*

In addition, criticism of technologization in general often appears in the respondents' comments. These are directed at the simplification of processes through smart technologies and a possible reduction in jobs:

> *"A man is created to move and think, it is not good if issues get resolved by themselves or by clicking a button or even more simply"*.

Some of the respondents criticize a possible loss of humanity, independent learning and thinking as well as a decreasing intelligence which is seen as a consequence of the technology use. In this context, the opinion arises that it is better for people to return to the "origin of being human" and remain physically more active, rather than being "trapped" at home:

> *"Not everything has to be digitalized […] otherwise nobody will ever leave the house again, because everybody can control everything via computer".*

Further, a supposedly higher consumption and higher costs were criticized. This refers to electricity consumption due to an increase in technologies and the associated acquisition costs as well as more electronic waste. Additionally, respondents also perceive potential security risks such as hacker attacks and manipulation. This is followed by the possibility of surveillance. Respondents criticize that data collection could have an influence on everyday processes.

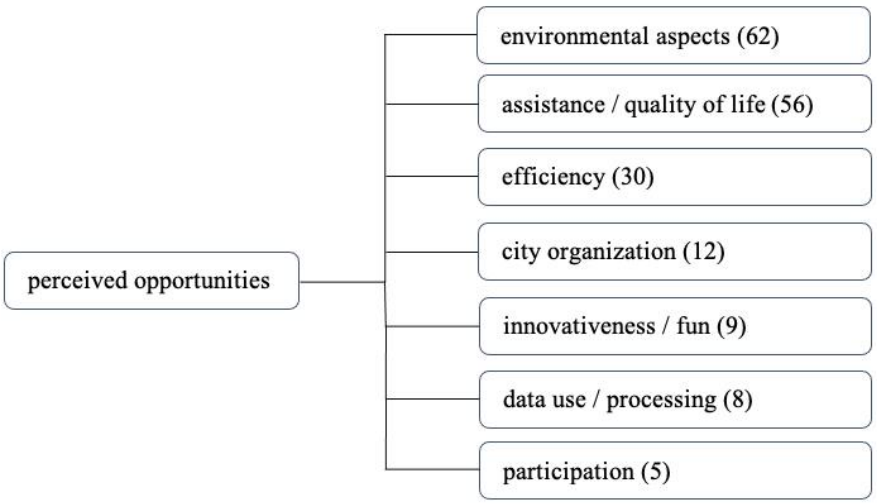
When evaluating the Smart City concept, respondents also express the risk of potential exclusion of certain persons or groups such as elder people. The focus is on the possession and adoption of the use of new technologies and possible social and geographical inequalities. A part of the respondents also sees negative health consequences due to the use of technology. According to them, this would lead to people becoming more stressed and to a decrease of the physical abilities of children. It is also assumed that there is a higher level of radiation (e.g., due to 5G) and that this in turn will damage health.

In contrast, there are several supporting comments of the respondents regarding the perceived opportunities of the Smart City concept that can be summarized in seven categories (see Figure 2).

An important issue for the respondents is the positive impact of smart technologies on the environment. The concept of the Smart City is seen as sustainable and resource-saving and a part of the respondents speaks of a possible reduction of the ecological footprint. They also wish for the city and environment to become cleaner and the air quality to improve due to the use of technologies:

" [...] technological solutions save resources, help us live a greener life".

Figure 2. Comments on perceived opportunities



Note: The number of codes is shown in the brackets.

The everyday use of technologies is supported by a part of the respondents, as they perceive a relief of everyday life, higher quality of life and personal time savings. This, in turn, would result from convenient planning and organization of activities with the help of technologies. Efficiency in terms of the use of resources such as energy, money and time in general is seen as positive and efficient problem solving is expected:

"It enables the resolution of problems more quickly and efficiently".

Some of the respondents argue that the Smart City concept would also contribute to improve city organization and a reduction in bureaucratic obstacles:

"The town (government) would more easily spot problems and resolve them".

Regarding data collection, respondents not only share their concerns, but also see opportunities such as a faster flow of information. There is also the desire for a better utilization of data already generated:

"It is so sad how much data is gathered today and not used widely [...]".

Further, some of the respondents mentioned innovativeness and fun in dealing with smart technologies as opportunities. The technologies presented are perceived as interesting and exciting and the respondents would enjoy trying them out:

"[It] would make urban life more interesting and fun".

Finally, the respondents also advocate an active participation in decision-making processes and the opportunity to provide feedback. One of the aspects mentioned is that the active participation of citizens means that there is less reason to complain about decisions so that the "[…] town becomes a people's town".

Discussion

Results show that there are significant differences in the level of knowledge and acceptance between the citizens of Leipzig and Tallinn regarding the Smart City topic (RQ1). These differences may be related to the fact that Leipzig is still in the early stages of smartification and strategic planning to become a Smart City while Tallinn already provides smart technologies and services to its citizens. Nevertheless, it should be noted that both groups have an average level of knowledge which is still expandable. On average, the citizens of Leipzig know four of the ten technologies presented, perceive seven as useful and would like to use five themselves. The citizens of Tallinn, on average, are familiar with five of the technologies presented, perceive seven as useful and would like to use six themselves. As the analysis shows, both citizens of Tallinn and Leipzig perceive a higher number of technologies as useful (PU) than they would actually use (BI). In addition, the results indicate that the majority of the smart technologies can still be perceived as useful, despite a relatively low level of knowledge of the respondents. However, the barrier of the BI to use the technologies themselves remains. It is assumed that overcoming this barrier is linked to strategic communication and therefore to the citizens' knowledge as well as to their attitude towards the Smart City concepts and smart technologies in general (RQ2).

As the data shows, approximately two-thirds of the respondents imagine that the technologies of the Smart City are easy to use and that their usage would make everyday activities more efficient. In result, almost half of the respondents would like to live in a Smart City. While the respondents consider the opportunities of the Smart City in their comments,

such as increased efficiency and sustainability, there is nevertheless a rather hesitant interest in living in a Smart City and adopting its technologies. Also, the respondents have paid less attention to the topic of participation and so far, do not perceive how important this aspect is as a Smart City's success factor. In regard to the Smart City concept which focuses on citizens' participation in city development processes, strategic communication as an agile communication process (Van Ruler, 2018) seems to be essential for this field of action. Citizens, however, first need to know about the opportunities for engaging Smart City initiatives. Therefore, overcoming the barrier of participation is linked to the transfer of knowledge and information and thus requires strategic communication concepts. Only if citizens become proactive and engage in dialogue with the city and decision-making processes, Smart City initiatives can succeed.

Furthermore, the results of the respondents' concerns give information about which aspects should be addressed in future strategic communication of Smart City initiatives. As uncertainty and perceived risk are components of the diffusion processes of new technologies (Rogers, 2003), strategic communication can be used to spread information addressing perceived opportunities and risks, in order to increase people's trust and acceptance. To achieve this, potential risks must first be eliminated or at least controlled. As the results show, on the one hand, it is important to ensure that personal data is protected from hacker attacks and is collected and processed only for the citizens' purpose. On the other hand, it is relevant to be prepared for catastrophes and to create alternative possibilities for the use of technologies in case of system or energy failures and to communicate these plans of crisis management transparently. Finally, in addition to a consequent transfer of knowledge and a specific persuasion effort, it is recommended to negotiate the use of certain technologies together with the citizens. In this way, challenges that innovation face, such as reservation, lack of connection or complexity, can be overcome.

A Smart City as a focal entity must communicate its goals in a clear strategic manner, taking into account the perceived risks of its citizens. As this study shows, security regarding the functionality of the technologies and user data are particularly important aspects that strategic communication should address. Furthermore, technology deniers should be convinced of the necessity of using technology in order to achieve the goals of the Smart City and live more sustainably and environmentally friendly. Finally, the participatory approach of the Smart City should be explicitly communicated and practiced. In this context, the participation and involvement of the citizens as well as the collective exchange of experiences can be seen as

important determinants in the diffusion process of smart technologies and to overcome the barrier of the intention to use them.

Limitations

Smart technologies are rather complex. Therefore, the survey could have benefitted from pictures or short videos to demonstrate the functionality of the technologies presented. Furthermore, as the comments of some respondents indicate, they would have liked to see a stronger focus on security and privacy issues. Such a broader presentation, however, would have increased the time needed to complete the survey which possibly would have had a negative impact on the cancellation rate.

A negative aspect related to recruitment is the targeting of Facebook groups and mailing lists, as well as recruitment via personal social networks based on pre-defined characteristics (e.g., age, education). Such a snowball principle is different from random sampling principles and represents a rather arbitrary selection. Consequently, the generalization of the results is affected. Additionally, it should be mentioned that not all social groups are active on the internet (e.g., older people). For this reason, the chosen recruitment of participants according to specific characteristics can be considered legitimate. Nevertheless, despite a high level of participation overall and the targeted approach, it was not possible to reach all social groups equally. Results show that people with a higher level of education were disproportionately represented, while the participation of people with a low level of education was rather low. Similarly, persons over 65 years of age were underrepresented.

Conclusion

This paper differs from previous research because it focuses on technologies that can be used in a Smart City and not just one, but ten technologies were evaluated by the respondents and discussed in relation to the qualitative data. The Smart City is a concept that focuses on the participation of people and innovation clusters in shaping the city aiming to build a value- and sustainability-oriented society. It is important to point out participation processes and to call on citizens to actively engage. Therefore, an important aspect for future Smart City initiatives are the demands on its citizens. The digitalization and restructuring of processes will only success if citizens accept and support it. To achieve this goal, a transparent exchange of information and a concrete concept for strategic communication between politics, economy and citizens is needed. It is important to involve all social classes and to create equal opportunities for the application of smart technologies. Likewise, skills in dealing with the

technologies of the Smart City should be trained in order to prevent the exclusion of, for example, elder people or people less interested in technology. Participation of citizens also includes the collective negotiation of the use of certain technologies. In doing so, peoples' fears and concerns such as data protection and security should be discussed openly in order to find adequate solutions.

It can be summarized that the acceptance and skills of the citizens are crucial factors that are responsible for the successful integration of technologies and the development of a Smart City. In the end, a city is only as smart as the people are willing to adopt its technologies and thus become smart people.

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