

How to manage a smart city brand image, taking into account residents' perspective?

Magdalena GRĘBOSZ-KRAWCZYK¹, Agnieszka ZAKRZEWSKA-BIELAWSKA²

Abstract: The objective of this paper is to assess the impact of brand values and their components on smart city brand image (SCBI) from the residents' perspective. The authors want also to formulate recommendations regarding the management of a smart city brand image in cooperation with inhabitants. Today, smart city branding is an important aspect of public management because it can facilitate better engagement with citizens, leading to a more successful implementation of public authorities' initiatives and consequently to smart city development. The research was conducted on 250 French respondents and a self-administered questionnaire was the research tool. This study makes it possible to indicate values and their components creating the smart city's brand image to properly manage a smart city brand in cooperation with inhabitants. We confirmed the positive impact of smart (SV), functional (FV), and emotional (EV) values on a smart city's brand image from the residents' perspective. Considering together the importance of these three categories of values for building the smart city's image, it should be noticed that on the first place, there are the smart values followed by the functional and emotional ones. The smart city's brand image is changing with residents' time living in a city. The longer residents live in the city, the stronger particular values impact a smart city's brand image. Taking into account the relational and participatory nature of the city's brand management, citizens – who have lived in a city for a long time or since birth – can be more involved in the cities. Research results concerning French citizens can provide references for other countries. The results of the study contribute to both the theory of city branding and smart city management as a part of modern public management. From the managerial perspective, our findings can be useful for smart cities' authorities in the management of the smart city brand.

Keywords: smart city, public management, city management, city brand image.

JEL: H83, M30, Z18.

DOI: <https://doi.org/10.24818/amp/2024.43-08>

¹ Professor, PhD, Lodz University of Technology, Faculty of Organisation and Management; Wolczanska 221, 90-924, Lodz, Poland; e-mail: [magdalena.grebosz@p.lodz.pl](mailto:magdalenagrebosz@p.lodz.pl); ORCID 0000-0001-8339-2270.

² Professor, PhD; Lodz University of Technology, Faculty of Organisation and Management; Wolczanska 221, 90-924, Lodz, Poland; e-mail: agnieszka.bielawska-zakrzewska@p.lodz.pl; ORCID 0000-0001-8182-3591.

Introduction

In the recent time, the smart city concept has become a very popular global trend, also in the area of public management (Zhu et al., 2022). Smart cities aim to improve its development and the quality of life of citizens with technological innovations and their implementation in urban lifestyle (Castelnovo et al., 2016; Cortés-Cediel et al., 2021). Taking into account the changes of the urban environment, economic growths, technological development, ecological movements as well as the stakeholders' requirements towards the city's authorities, more and more cities want to be 'smart' and meet the expectations of their residents, investors, tourists or other partners. Vitálišová et al. (2024) argue that transitioning a city into a smart city necessitates substantial contributions from politicians, city officials, residents, entrepreneurs, and various community groups within the city.

However, smart cities' authorities focus primarily on innovative solutions, often forgetting about issues related to the branding of the city's brand and its image in the eyes of different stakeholders, especially residents. However, a city cannot become smart only because of technology (Gil-Garcia et al., 2015; Nam & Pardo, 2011). The image of the city's brands plays an important role in attracting investors, tourists, employees, students or potential citizens and it is crucial in city management processes (Shuv-Ami, 2016; Viassone & Serravalle, 2018). Additionally, the city brand may represent a source of values that legitimise and support local smart specialisation (Pasquinelli, 2015). Therefore, the authorities have to satisfy the residents' expectations and create the sources of a value proposition adapted for smart city's brand image. One of the main challenges in smart cities lies also in citizen engagement on public decisions (Castelnovo et al., 2016; Cortés-Cediel et al., 2021; Przeybilovicz et al., 2022). Consequently, the smart city branding is an important aspect of public management because it plays a significant role in shaping perceptions, driving economic development by attracting investment and tourism, fostering community identity and pride, and enhancing the overall quality of life for residents.

Despite several studies concerning the issues of the place brand at national (e.g. Anholt, 2006; Fetscherin, 2010), regional (e.g. Zenker & Jacobsen, 2015) and city level (e.g. Anholt, 2006), the topic of the brand of smart city is quite rarely analysed in the literature (e.g. Huertas et al., 2021; Pasquinelli, 2015; Viassone & Serravalle, 2018; Yigitcanlar et al., 2015). However, even if the concept of the smart city has recently been more discussed in the literature along with the issues of city's brand management (Chan, 2019; Côme et al., 2019; Grebosz-Krawczyk, 2021; Kolotouchkina & Seisdedos, 2018; Cortés-Cediel et al., 2021; Androniceanu & Georgescu, 2023a; Androniceanu & Georgescu, 2023b; Androniceanu, 2023), this area of research is still evolving in the academic literature especially in context of the residents' engagement.

The research results (Grebosz-Krawczyk, 2021) show that the management of smart city brand image should be established on developing a competitive local identity of

a city brand based on strong differentiators. It is also important to implement the long-lasting initiatives and long-term brand strategy in collaboration with inhabitants and other stakeholders, and to communicate correctly with the use of tools of secondary and tertiary communication. Taking into account the significance of values and its components for the smart city's brand identity and image, as well as the role of residents underlined among others by Eshuis et al. (2014), Nam and Pardo (2011) or Kavartzis and Hatch (2013), the following research questions were formulated:

Q1: What values of the smart city brand image are crucial for the residents and should be underlined by local authorities?

Q2: Which components of these values hold the highest importance for residents in smart cities and should be encouraged by local authorities?

In the international literature, there is little research on the branding of smart cities. In this regard, we recognise a cognitive gap in the existing literature on smart cities brand management. Due to these arguments, the following topic was chosen.

The objective of this paper is to assess the impact of different brand values and their components on smart city brand image (SCBI) from the residents' perspective. This article can also bring some recommendations regarding the management of the smart city's brand image in co-operation with the city's inhabitants. Therefore, the paper contributes to the city's 'smartness' literature, and public management theory extending it about smart city branding.

1. Literature review

The smart city notion originated from various concepts concerning city's 'smartness' and is described with varying focus and content (Sheikhnejad & Yigitcanlar, 2020; Echebarria et al., 2021; Zhu et al., 2022; Orejon-Sanchez et al., 2022). In the literature, different terms to defined the city's 'smartness' were applied like: 'intelligent city' (Hall, 2000), 'knowledge city' (Carrillo, 2011; Yigitcanlar et al., 2008) or 'digital city' (Psomadaki et al., 2019).

Consequently, there are several definitions of the smart city. In the majority of publications, authors emphasise the role of technology and urban development in the concept of a 'smart city'. Consequently, smart cities are described as the municipalities using technological solutions to improve the management and efficiency of the urban environment (European Commission, n.d.). Guo et al. (2017) stated that a 'smart city' is urban development based on the information and communication technology (ICT) solutions to manage the city's resources and Peng et al. (2017) claimed that it is a city using a set of advanced technologies, such as wireless sensors, smart meters, intelligent vehicles, smartphones, mobile networks or data storage technologies.

The technology-driven perspective dominates in the literature and from this perspective, the smart city is defined as an advanced technology intensive city that connects people, information, and services (Mora et al., 2017). Some other

definitions connect the technological characteristics with human aspects (Bibri & Krogstie, 2017). Nam and Pardo (2011) strongly underline that the city's smartness should focus on a user perspective. This citizen-centric perspective is promoted among others by Albino et al. (2015) who stated that residents, workers, and service consumers in smart city shape this city through continuous interactions and activity, whereas Harrison et al. (2010) stressed that in the smart cities, the physical, IT, social, and business infrastructures are connected to leverage the city's collective intelligence. Caragliu et al. (2013) emphasised such characteristics of the smart city as the sustainable economic growth, a high quality of life, the natural resources' management and participatory governance, as well as the city's investments in human and social capital and the communication infrastructure. Other studies connect the role of human capital in developing smart cities with the improvement of environmental sustainability (Angelidou, 2017; Neirotti et al., 2014). Zhu et al. (2022) have introduced the concept of a happiness driven smart city (HDSC) guided by the principal aim of improving human happiness in the prevailing digital transformation brought by technology.

In the literature, the smart city concept is also associated with the advancement of Information and Communications Technologies (ICTs) (e.g. Sheikhejad & Yigitcanlar, 2020; Echebarria et al., 2021; Zhu et al., 2022; Orejon-Sanchez et al., 2022; Lazaroiu et al., 2022; Androniceanu, 2019). Consequently, the issues of the smart cities are frequently described in context of the city's resources, advanced technologies, public management or urban development (Albino et al., 2015; Carrillo, 2011; Hall, 2000; Harrison et al., 2010; Kola-Bezka et al., 2016; Peng et al., 2017). Mora et al. (2017) underlined that the use of ICTs increases opportunities for citizen participation, promoting empowerment, and facilitating the transformation of smart cities.

Giffinger et al. (2007) – based on the project conducted since 2007 by the Centre of Regional Science at the Vienna University of Technology – identified six main dimensions of the smart city. These dimensions create 6Ss that are: smart economy, smart mobility, smart environment, smart people, smart living, and smart governance. This concept joins technological development with the reduction of the environmental impact, rethinking the access to resources, the development of new forms of services and mobility, management of the energy and waste, as well as the development of citizen participation in city decisions. Similar six dimensions in modified form were proposed as elements of the smart city by Lombardi et al. (2012) who have investigated different aspects of urban life (industry, education, e-democracy, logistics & infrastructures, efficiency & sustainability and security & quality) and Caragliu et al. (2013), who developed a measurement system also based on six dimensions like: green city layer, interconnection layer, instrumentation layer, open integration layer, application layer, and innovation layer.

Based on these concepts, Attour and Rallet (2014) stated that the smart city promotes innovation (smart economy), invests in training (smart people), is well governed (smart governance), has a good quality of life (smart living) and good environmental

performance (smart environment) in addition to sustainable mobility (smart mobility).

Taking into account that place branding is the practice of applying branding strategy and other marketing techniques to the economic, political, and cultural development of cities, regions and countries (Ashworth & Kavaratzis, 2009; Kemp et al., 2012), we can state that smart city branding is a practice of applying branding strategy and other marketing techniques to the growth of the cities developed on the smart dimensions.

Nickerson and Moisey (1999) underlined that city branding is building up a relation between people and the image of their city. It is essential to increase the attraction of the city and to establish its recognition. According to Lucarelli and Berg (2011), city branding is the symbolic and intentional incarnation of all information related to a city in order to generate associations of ideas and expectations. Kavaratzis (2004) adds that city branding helps to achieve competitive advantage in order to increase inward investment and tourism, to develop the community, and to reinforce the local identity and the identification of the citizens with their city. In this context, smart city branding can help in creation and reinforcement of the city's smart qualities.

City branding should be based on building a unified and comprehensive brand identity that is transformed into strong brand image. The first research focused on the places' brand image concerned the tourist destinations (Echtner & Ritchie, 2003). The cities' brands – like other brands – distinguished name and associations with strong symbols, unique characteristics, and specific values (Bartikowski et al., 2009). Ashworth and Kavaratzis (2009) stated that name, logo, and slogan are not sufficient to create a city brand identity. Therefore, city brand identity should join physical and functional characteristics with historical heritage symbols, emotional and experiential characteristics (Frochot & Batat, 2013). The citizen participation in city branding can improve the specificity of the brand and integrate inhabitants' feelings concerning governance processes (Eshuis et al., 2014; Kavaratzis & Hatch, 2013).

The city's authorities have direct impact on creating city brand image among different stakeholders through proper creation and management of the brand's identity (Burmann et al., 2009). Proper brand image supports the establishment of partners trustworthiness (Alhaddad, 2015), promoted also by the development of word-of-mouth marketing. A significant aspect of development of the city's brand image is the improvement of social dialogue with residents. According to Aitken and Campelo (2011), the adoption of the paradigm of co-creation helps to reveal the ethos of the place in terms of meanings, symbols, and attributes that shape the city's brand identity. Participatory governance and citizen involvement are key concepts in many smart city frameworks (Albino et al., 2015; Caragliu et al., 2013; Castelnovo et al., 2016; Cortés-Cediel et al., 2021; Giffinger et al., 2007; Nam & Pardo, 2011). The results of research on citizen engagement in smart city governance in Brazil, the UK, and the Netherlands demonstrate that the roles undertaken by citizens are not static, and they participate in a dynamic mode that evolves and changes over time (Przebylłowicz et al., 2022).

Based on the existing place branding models (Aitken & Campelo, 2011; Balakrishnan, 2009; Cai, 2002; Hankinson, 2004; Hanna & Rowley, 2013; Kavartzis, 2004), six main dimensions of the smart city of Giffinger et al. (2007) as well as the own empirical research results conducted among the authorities of 35 European smart cities, Grebosz-Krawczyk (2021) stated that the identity of smart city brand should base not only on modern solutions used in the agglomeration, but also a specific narrative referring to the history, tradition, and culture of the city. Consequently, three types of values can be distinguished as a basis for the development of the smart city's brand image: smart values, emotional values, and functional values. This combination, while distinguishing the smart city on the map, provides the citizens and other stakeholders with unique functional, symbolic, and innovative advantages.

The concept of the smart city has emerged from recent developments in ICTs and their incorporation in city life (Albino et al. 2015). Ashworth and Kavartzis (2009), as well as Kapferer (1988) stated that innovation is nowadays an important element of the identity and image of the city brand. Consequently, taking into account that the smart cities are stimulated by new forms of open innovation (Mattsson & Sørensen, 2015), the components related to the smart values should be considered as new sources of value for the smart cities' citizens. Also, according to Côme et al. (2019) and Grebosz-Krawczyk (2021), the image of the smart city is created on the basis of the smart values which are composed of the smart city dimensions (i.e. smart economy, people, living, governance, environment, mobility), proposed by Giffinger et al. (2007). Each of these dimensions consist of three components. Thus, we hypothesise that:

H1: Smart values positively influence smart city's brand image.

We can observe that emotional values emerge and grow in importance. In short, emotional values can provide a richer source of competitive advantage than any functional value can (Delgado-Ballester & Fernandez Sabiote, 2015). Kavartzis (2004) and Cai (2002) stated that the framework of city's brand image should base on symbolic elements and should be preceded by existing organic image. According to Hankinson (2004) and Balakrishnan (2009), emotional values are fundamental for the place brand image and include the key components like city's vision, its historic core, as well as some an axiological dimension related with ethical and deontological principles. Pierce and Ritchie (2007) also stated that the community history, heritage, and culture are important components of city branding. Similar conclusions were formulated by Hanna and Rowley (2013) who underlined the importance of the brand core with its personality. The symbolic values help to express brand city's history, also through its authorities and citizens, advertising, and social values (Lewi, 1999). Therefore, the following hypothesis was formulated:

H2: Emotional values positively influence smart city's brand image.

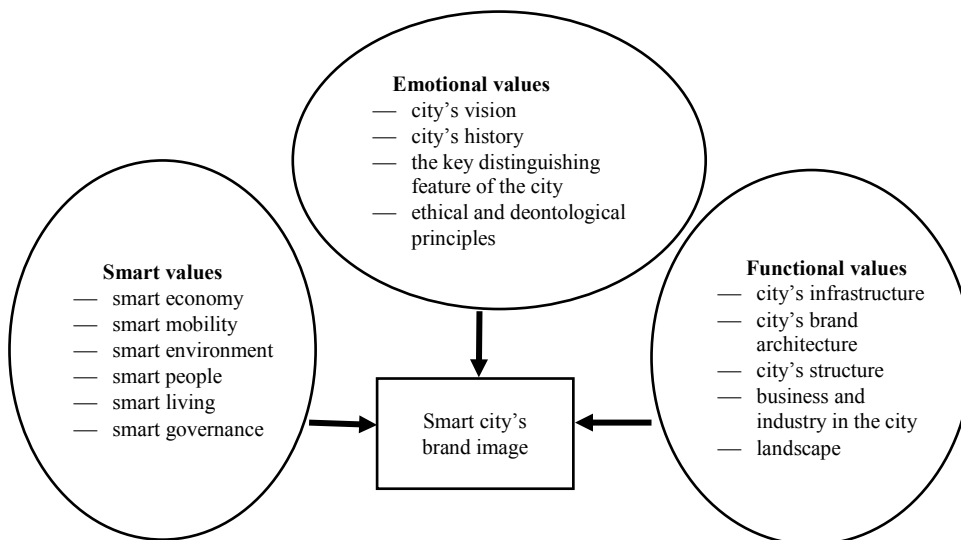
The general consensus existing in the branding literature suggests that functional values are the basic signal for consumers (Holt et al. 2004). According to Cai (2002)

and Kavartzis (2004), the functional elements build the foundation of the city's brand image. The functional values consists of those brand features that are tangible and related with rationality (Burmam et al., 2009). The functional values help to distinguish the city's brand image thanks to its resources (such as infrastructure, landscape, structure, industry, and business) as well as brand elements (Kavartzis 2004). Caldwell and Freire (2004) stated that the ways people perceive country, region, and city brands as tourist destinations differ. Countries are more often evaluated from symbolic perspective and regions and cities are assess based on the functional values. According to Hanna and Rowley (2013) and Cai (2002), the brand architecture is also an important component of the city's brand image. Elements of the brand architecture meant to inspire citizens and other stakeholders and make the city brand identifiable, memorable, and distinct from other cities, as well as to support the process of communication and build the desired brand identity (Macrae, 1999). In this way, functional brand values and their components have a fundamental impact on what brand image is created in the minds of potential recipients. Experiencing physical brand elements is also an important part of a complete brand experience (Brakus et al., 2008). Taking into account the above arguments, the third hypothesis was proposed:

H3: Functional values positively influence smart city's brand image

Taking together all distinguished values of the smart city's brand image and their components, a conceptual model presented in Figure 1 was proposed.

Figure 1. Conceptual model



Source: Own elaboration.

3. Research methodology

The survey was conducted in June 2023 on a sample of 250 French respondents – young residents of the smart city Nantes, using a self-administered questionnaire. A random selection was used (Groves et al., 2011). Nantes city was chosen as it is one of the pioneers of the smart city' concept in France and in Europe (Giffinder et al., 2007). The city has been promoting itself as a smart city for several years. Since 2016, the city has participated in the European research project H2020 mySMARTlife (My Smart Life, 2022), carried out jointly with Helsinki and Hamburg and focused on the implementation of innovative solutions in the field of digital technology, energy, and mobility. In consequence, Nantes intended to make full use of its city's heritage, to continue transforming the Nantes brand into a smart city brand.

First, we randomly selected 25 respondents to conduct a pre-test. The respondents evaluated the survey according to the content and relevance of the items, and their feedback required minor corrections to improve the intelligibility and readability of the questionnaire. The respondents were randomly approached during different days and time slots to reduce biases (Sakshaug et al., 2010). The main characteristics of respondents are presented in Table 1.

Table 1. Sample characteristics

Demographic descriptors	N	%
Gender:		
female	118	47.2
male	132	52.8
Time of living in a smart city:		
less than 1 year	49	19.6
1-5	79	31.6
over 5 years	74	29.6
since the birth	48	19.2

Source: Own elaboration.

The gender distribution of the respondents is relatively even, with a slight majority of men. Half of the respondents live in a smart city for less than five years and almost a quarter has lived there since birth.

We used the model of six main dimensions of smart city developed by Giffinder et al. (2007) and the smart city's brand management model proposed by Grebosz-Krawczyk (2021) to evaluate the importance of three main values and their particular components on the smart city's brand image. The questionnaire consisted of four questions including three types of them. At the beginning, the question concerning the perception of the Nantes image was asked (consisting of three statements). It was a dependent variable. A five-point Likert scale - with 1 = strongly disagree and 5 = strongly agree - was applied. The Likert scale was used because of the advantage of allowing questioning without systematic errors.

How to manage a smart city brand image taking into account residents' perspective?

Next, we proposed 27 items measuring the smart, functional, and emotional values of the smart city brand image which are independent variables. We used a five-point importance scale with 1 = very low and 5 = very high. An initial list of items (components of values) was created based on a review of literature related to the smart city concept, as well as the city branding. The items proposed by Giffinder et al. (2007), Côme et al. (2019), Hanna and Rowley (2013), Hankinson (2004), Balakrishnan (2009), as well as Kavaratzis (2004), were analysed, modified, and applied.

At the end, the respondents indicated characteristics including gender and number of years spent in the smart city. The multiple-choice responses scale was applied in the case of those characteristics.

In order to test the hypotheses and determine the impact of smart, emotional, and functional values on the smart city's brand image, we used multiple regression procedures (Cohen et al., 2014). To conduct statistical tests, we employed the Statistica package.

4. Research results and discussion

According to most respondents (85.2%), Nantes is perceived as a smart city. However, it should be noted that the longer someone lives in Nantes, the more he perceives the city as the smart one. It is proved not only by the mean or median value (Table 1) but also through results of the Kruskal-Wallis test ($\chi^2 = 22.17005$; $df = 3$; $p < .0001$). Due to gender, no statistically significant differences were found.

Table 2. Nantes as the smart city – respondents' opinions (in %)

	General N=250	time of living in Nantes			
		< 1 year N=49	1-5 years N=79	>5 years N=74	since birth N=48
Strongly disagree and disagree	2.4	18.37	17.72	12.16	6.25
Neither agree nor disagree	12.4	24.49	17.72	14.86	12.5
Agree and strongly agree	85.2	57.14	64.56	72.97	81.25
Mean	3.78	3.51	3.66	3.81	4.23
s.d.	1.11	1.00	1.06	1.18	1.09
Median	4	4	4	4	5
IQR	2	1	1	2	1

Source: Own elaboration.

In the residents' opinion, the most important components for the smart city's brand image are: smart living ($\bar{X} = 3.97$), smart economy ($\bar{X} = 3.89$), and smart mobility areas ($\bar{X} = 3.85$). Regional competitiveness ($\bar{X} = 4.18$), is in the inhabitants' perspective the most important item determining the city's brand image as smart. The lowest scores were received by indicators describing smart governance area, especially political awareness ($\bar{X} = 3.27$).

How to manage a smart city brand image taking into account residents' perspective?

Taking into account the functional and emotional values, it should be stated that the functional values are more important in creating the smart city's brand image than the emotional ones. Especially, the following components of the functional values are important for respondents: the city's brand architecture (symbol, logo, colours) and the city's infrastructure, respectively $\bar{X} = 4.10$ and $\bar{X} = 3.93$. On the other hand, the least significant component for the smart city's brand image are a city's history ($\bar{X} = 2.54$) and the ethical and deontological principles ($\bar{X} = 2.66$) which represent the emotional values of city brand image.

Considering together, the importance of smart, functional, and emotional values for building the smart city's image, it should be noticed that on the first place there are the smart values ($\bar{X} = 3.73$) followed by the functional ($\bar{X} = 3.57$) and the emotional ($\bar{X} = 3.08$) ones. Descriptive statistics, for both values creating the smart city's image as well as the image of Nantes as the smart city, with correlations between particular variables are presented in Table 3. All correlations are positive and statistically significant.

Cronbach's alpha was used to examine the internal consistency of particular variables because each variable consisted of a few items. Cronbach's alpha coefficients (α) for each factor ranged from 0.70 to 0.94 (Flury et al., 1988), indicating that all multi-item constructs were internally consistent. Hence, for the smart values $\alpha = 0.73$, for the functional values $\alpha = 0.81$, and for the emotional values $\alpha = 0.76$.

Table 3. Descriptive statistics and correlations between variables

Variables	SV	FV	EV	NSC
Smart values (SV)	1			
Functional values (FV)	0,339*	1		
Emotional values (EV)	0,699*	0,277*	1	
Nantes as the smart city (NSC)	0,501*	0,130*	0,395*	1
Mean (\bar{X})	3.73	3.57	3.08	3.78
s.d.	0.38	0.50	0.71	1.11

Note. N=250; s.d. – standard deviation; correlation is statistically significant at $p < 0.05$ (*)

Source: Own elaboration.

To test the hypotheses, the hierarchical multiple regression was performed. We developed five different models (Table 4).

The first model included only the control variables; the second model included the control variables and the smart values; the third model included the control variables and the emotional values; the fourth model included the control variables and the functional values and the fifth model comprised all the relationships, showing the effects of the control and all independent variables. The significance of the F statistic is acceptable for all the estimated models.

All values, analysed separately, have a direct and significant relationship with the brand image perception of Nantes as the smart city. In Model 2, smart values impact

Nantes smart city's brand image ($\beta=0.476$, $p<0.001$) confirming hypothesis H1. The emotional and functional values are also important to Nantes smart city's brand image, which is indicated in Models 3 ($\beta=0.138$, $p<0.05$) and 4 ($\beta=0.329$, $p<0.001$). Both H2 and H3 are therefore empirically supported. It is noteworthy that the emotional values have the weakest influence on Nantes brand image as a smart city.

Table 4. Results of the regression of the impact of values on the smart city's brand image

Variables	Dependent variable: Nantes as the smart city (NSC)									
	Model 1		Model 2		Model 3		Model 4		Model 5	
	β	t-value	β	t-value	β	t-value	β	t-value	β	t-value
Constant	3.110		-1.864		2.457		0.692		-1.836	
Control variables										
Gender	0.040	0.625	0.047	0.837	0.041	0.650	0.023	0.380	0.047	0.845
Time of living in Nantes	0.200***	3.156	0.104*	1.836	0.193***	3.073	0.153**	2.538	0.103*	1.186
Independent variables										
Smart values			0.476****	8.523					0.498****	6.054
Emotional values					0.138**	2.226			-0.030	-0.516
Functional values							0.329****	5.522	-0.015	-0.189
F	5.719***		29.135****		5.525***		14.432****		17.422****	
R2	0.044		0.262		0.063		0.150		0.263	
Adjusted R2	0.037		0.253		0.052		0.139		0.248	

Note. * $p < 0.1$. ** $p < 0.05$. *** $p < 0.01$. **** $p < 0.001$.

Source: Own elaboration.

In the case of the complete model (Model 5), the adjusted R2 shows a capability to explain the brand image of Nantes as a smart city of 24.8%. However, the explanation is higher in the case of considering smart values only (25.3%). Moreover, in the complete model 5, only the smart values are statistically significant ($p<0.001$). Therefore, in the next step, we checked which of the six dimensions of the smart values influence to the strongest degree the brand image of Nantes as a smart city. We performed a multiple regression (step-wise). An analysis of the impact of the smart values on the brand image of Nantes as a smart city included: smart economy, smart mobility, smart environment, smart people, smart living, and smart governance. We built six models adding one smart value to the following model. The results are presented in Table 5.

Table 5. Multiple regression (step-wise) – smart values and NSC –Nantes as the smart city

Model	β	t-value	F	R2	Adjusted Δ R2
Model 1 Smart economy	0.209****	3.365	11.323****	0.044	-
Model 2 Smart economy Smart mobility	0.194*** 0.251****	3.223 4.163	14.699****	0.106	0.059
Model 3 Smart economy Smart mobility Smart environment	0.199**** 0.035 0.336****	3.427 0.463 4.443	17.124****	0.173	0.064
Model 4 Smart economy Smart mobility Smart environment Smart people	0.107* - 0.001 0.301**** 0.242****	1.745 - 0.019 4.063 3.773	17.092****	0.218	0.043
Model 5 Smart economy Smart mobility Smart environment Smart people Smart living	0.085 - 0.007 0.298**** 0.162** 0.183***	1.396 - 0.094 4.080 2.334 2.830	15.666****	0.243	0.022
Model 6 Smart economy Smart mobility Smart environment Smart people Smart living Smart governance	0.083 - 0.014 0.251**** 0.117 0.141** 0.172**	1.368 - 0.199 3.360 1.649 2.137 2.502	14.380****	0.262	0.016

Note. *p < 0.1. **p < 0.05. ***p < 0.01. ****p < 0.001.

Source: Own elaboration.

The F statistic is significant for all the estimated models. The adjusted Δ R2 indicates that each next model better explains the influence of smart values on the smart city's brand image. Model 6, which includes all particular smart values, explains this influence of 24.3%, compared to the first model it is 20% more, and to the fifth model, it is 1.6 %. However, in Model 6 only three smart values are statistically significant, such as smart environment ($\beta=0.251$, $p<0.001$), smart living ($\beta=0.141$, $p<0.05$), and smart governance ($\beta=0.172$, $p<0.05$).

The strongest impact on NCS is held by the smart environment regardless of which other smart values it is analysed with. Smart mobility is significant only in case it is analysed together with the smart economy (Model 2). In other cases, this value is insignificant, and in the three last models, it is negative. Smart living affects NCS on a moderate level.

The size of the R2 suggests future studies to test for variables that significantly mediate the relationship between particular dimensions of the smart values and the smart city's brand image.

Our study makes it possible to indicate values and their components creating the smart city's brand image to properly manage a smart city brand in co-operation with inhabitants.

Firstly, we proved positive influence of smart values on smart city's brand image among its residents. Similar results – but from authorities' perspective – were obtained by Côme et al. (2019), who evaluated the smart values communicated on the websites of 18 French smart cities and Grebosz-Krawczyk (2021), who assessed the websites content of 90 cities from the European Smart Cities ranking and the importance of smart values in opinion of the representatives of 35 smart cities' authorities. This research also showed the importance of smart values. In opinion of young residents, the smart values strongly determined the image of the city. Within smart values, the smart environment has the strongest impact on smart city's brand image. It can be explained by growing importance of environmental values, especially for young people. Environment friendliness and reduction of the harmful impact of human activities on the planet is becoming an especially important value nowadays. Researchers indicate that, in the long run, the introduction of ethical values to brand identification can bring benefits such as improving brand reputation (Alwi et al., 2017). Chan et al. (2020) proposed four distinctive factors for the branding of a smart city: the quality of a smart society, energy consumption in an urban environment, smart city governance, and smart city livelihood. The results of these research conducted in Hong Kong showed that only the quality of a smart society and energy consumption in an urban environment were the determinants of a successful smart city brand considered by visitors. Our study confirmed the importance of the smart living, smart economy, and smart mobility dimensions. That partially support the results of Chan et al. (2020) conducted among visitors.

Secondly, we confirmed a positive impact of emotional values on the smart city's brand image residents' perception. The significance of emotional values for the city's brand image is underlined especially by researchers studying the image of touristic destinations (Anholt, 2006; Balakrishnan, 2009; Cai, 2002; Hankinson, 2007). The core of the city brand represents the identity of the place (Hankinson, 2004). Lloyd and Peel (2008) identified the symbolic perspective as appropriate in building the city brand, emphasising the need to articulate the brand's emotional potential. Pierce and Ritchie (2007) also stated that the community history, heritage, and culture are important components of city branding by providing a richer source of competitive advantage. The impact of emotional values was also indicated in the study among representatives of local authorities (Grebosz-Krawczyk, 2021).

Thirdly, our research showed a positive influence of functional values on the smart city's brand image among its residents. It is consistent with the results of other scholars like Hanna and Rowley (2013), Cai (2002), Kavaratzis (2004) or Caldwell and Freire (2004) in the area of place branding. De Chernatony and McWilliam (1990) underlined that the functional values of brands have the properties that allow

to recall significant benefits of a rational nature and distinguish themselves from competing offers. The functional values, and especially such components as the city's brand architecture and infrastructure, are according to Hanna and Rowley (2013), the key resources associated with a place that influence its brand identity and image, as well as the experience of a place by its stakeholders, including residents. Fourthly, considering all values together only the smart values affect the smart city's brand image. It can be explained by the growing popularity of the smart city's concept and young residents' need to live and work in a place with potential for development. It can also explain the growing role of smart values and its exposition on the smart cities' websites confirmed by Côme et al. (2019), as well as the growing role of smart governance often seen in smart city literature and referring to citizen participation (Caragliu et al., 2013; Giffinger et al., 2007; Lombardi et al., 2011). Additionally, new technologies are required to give citizens an opportunity to actively participate in public decisions as stated by Rodríguez Bolívar (2018). These findings did not confirm the research among the responsible for the smart city's brand management (Grebosz-Krawczyk, 2021) who in the first place put functional values followed by the emotional and smart ones.

Fifthly, the smart city's brand image is changing with residents' time living in a city. Those who have lived in a city for a long time or since birth, perceived the city more as smart. Moreover, the longer residents live in the city, the stronger particular values impact a smart city's brand image. It could be explained by their stronger engagement in the city's life. The smart city brands, like Nantes, support large innovative projects, universities, technology parks, modern enterprises, and cultural events, and consequently their residents can strongly feel the smart character of the city. Taking into account the relational and participatory nature of the city's brand management (Hanna & Rowley, 2013; Mora et al., 2017), citizens – who have lived in a city for a long time or since birth – can be more involved in the city's activities and know the directions of city brand management. These findings also confirm the research results of Przeybilovicz et al. (2022), who stated that the functions undertaken by citizens in smart cities are more and more dynamic.

5. Conclusions

The present study sought to answer the challenging questions regarding the issues in the studies concerning the management of the smart city's identity and image in the context of public management. Especially, we tried to answer the questions about values and their components affecting the smart city's brand image from residents' view. The complexity of the city branding process is a result of the diversity of its stakeholders, their different needs and interests. By strategically managing and promoting a city's image, public administrators can create an attractive and resilient urban environment that is a base of a smart city.

Consequently, an important element in building a smart city's brand image is the authorities' awareness of the place, the needs of internal stakeholders, as well as their perception of the city's brand image.

We proved the positive influence of the smart, functional and emotional values on the smart city's brand image among its residents and consequently we supported all three hypotheses. However, we observed the growing popularity of smart values affecting the smart city's brand image.

The results of the study contribute to both the theory of city branding and smart city management as a part of modern public management. From the place branding perspective, the scientific contributions expand the smart city's branding theory about residents' views. This approach is new because researchers have concentrated especially on the image of tourist destinations and the significance of the smart values for the city's brand image has not been considered so far. We indicted three innovative points. First, we identified three components of the smart city's brand image important for the city's residents such as the smart, functional, and emotional values. Second, we proved that the smart dimensions including smart economy, smart mobility, smart environment, smart people, smart living, and smart governance are crucial for residents in the perception of the city's brand image. Third, among those smart dimensions, the smart environment expressed through cleanliness and ecological awareness is the most important one. In turn, from the perspective of smart city management, our research brought some managerial implications in the context of smart city development. The local authorities who are responsible for the management of smart cities should be aware of what values are crucial for residents in the perception of the smart city's brand image. Moreover, to develop the smart city brand, residents should accept and co-create its values. This requires the formulation of effective communication strategies that motivate residents to participate in the city's life. The recognition of the smart city's brand image among its residents, especially through the most important smart values, allow local authorities to employ the relational and participatory character of the smart city brand management. Such management will contribute to developing the city and its brand image as smart.

It is important to delimit the contributions of this research properly. However, the limitations of this study create directions for the further research. The conclusions of this study were presented with the caveat as regards the limitations of the sample. The study was conducted among 250 residents of Nantes city. The research was limited to the young people representing only one smart city. Therefore, further research can be conducted on a bigger, representative sample. Secondly, we limited the research to French residents, so an interesting direction of further research could be making the comparative analysis in different European countries. The research results also showed that future studies can be conducted to test the relationship between particular dimensions of the smart values and the smart city's brand image.

Conflict of Interest Statement

The authors declare that the research was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

Acknowledgement

Not the case.

References

- Aitken, R., Campelo, A. (2011). The four Rs of place branding. *Journal of Marketing Management*, 27(9-10), 913-933. <https://doi.org/10.1080/0267257X.2011.560718>
- Albino, V., Berardi, U., and Dangelico, R.M. (2015). Smart cities: Definitions, dimensions, and performance. In *Proceedings IFKAD* (pp. 1723-1738).
- Alhaddad, A.A. (2015). Perceived quality, brand image and brand trust as determinants of brand loyalty. *Journal of Research in Business and Management*, 3(4), 1-8.
- Alwi, S. F. S., Ali, S. M., and Nguyen, B. (2017). The importance of ethics in branding: Mediating effects of ethical branding on company reputation and brand loyalty. *Business Ethics Quarterly*, 27(3), 393-422. <https://doi.org/10.1017/beq.2017.20>
- Androniceanu, A., Georgescu, I., (2023a). Digital competences and human development: a canonical correlation analysis in Romania. *Polish Journal of Management Studies*, 28 (1), 43-61. <https://doi.org/10.17512/pjms.2023.28.1.03>
- Androniceanu, A., Georgescu, I. (2023b). Public administration digitalization and government effectiveness in EU countries. *Central European Public Administration Review*, 21(1), 7-30. <https://doi.org/10.17573/cepar.2023.1.01>
- Androniceanu, A. (2023). The new trends of digital transformation and artificial intelligence in public administration. *Administratie si Management Public*, 40, 147-155. <https://doi.org/10.24818/amp/2023.40-09>
- Androniceanu, A. (2019). The social sustainability of smart cities: urban technological innovation, big data management, and the cognitive internet of things. *Geopolitics, History, and International Relations* 11(1), 110-115. <https://doi.org/10.22381/GHIR11120197>
- Angelidou, M. (2017). The role of smart city characteristics in the plans of fifteen cities. *Journal of Urban Technology*, 24(4), 3-28. <https://doi.org/10.1080/10630732.2017.1348880>
- Anholt, S. (2006). The Anholt-GMI city brands index: How the world sees the world's cities. *Place Branding*, 2(1), 18-31. <https://doi.org/10.1057/palgrave.pb.5990042>
- Ashworth, G., Kavaratzis, M. (2009). Beyond the logo: Brand management for cities. *Journal of Brand Management*, 16(8), 520-531. <https://doi.org/10.1057/palgrave.bm.2550133>
- Attour, A., Rallet, A. (2014). Le rôle des territoires dans le développement des systèmes trans-sectoriels d'innovation locaux: Le cas des smart cities. *Innovations*, 43(1), 253-279. <https://doi.org/10.3917/inno.043.0253>
- Balakrishnan, M.S. (2009). Strategic branding of destinations: A framework. *European Journal of Marketing*, 43(5-6), 611-629. <https://doi.org/10.1108/03090560910946954>
- Bartikowski, B., Merunka, D., Ouattara, A., and Valette-Florence, P. (2009). Les villes ont-elles une personnalité? *Revue Française de Gestion*, 7, 49-64.

- Bibri, S.E., Krogstie, J. (2017). Smart sustainable cities of the future: An extensive interdisciplinary literature review. *Sustainable Cities and Society*, 31, 183-212. <https://doi.org/10.1016/j.scs.2017.02.016>
- Brakus, J., Schmitt, B.H., and Zhang, S. (2008). Experiential attributes and consumer judgments. In B.H. Schmitt & D.L. Rogers (Eds.), *Handbook on Brand and Experience Management* (pp. 174-187). Edward Northampton: Elgar. <https://doi.org/10.4337/9781848446151.00022>
- Burmann, C., Jost-Benz, M., and Riley, N. (2009). Towards an identity-based brand equity model. *Journal of Business Research*, 62(3), 390-397. <https://doi.org/10.1016/j.jbusres.2008.06.009>
- Cai, L. (2002). Cooperative branding for rural destinations. *Annals of Tourism Research*, 29(3), 720-742. [https://doi.org/10.1016/S0160-7383\(01\)00080-9](https://doi.org/10.1016/S0160-7383(01)00080-9)
- Caldwell, N., Freire, J. R. (2004). The differences between branding a country, a region and a city: Applying the brand box model. *Journal of Brand Management*, 12(1), 50-61. <https://doi.org/10.1057/palgrave.bm.2540201>
- Caragliu, A., Del Bo, C., and Nijkamp, P. (2013). Smart cities in Europe. In R. Deakin (Ed.), *Smart Cities: Governing, Modelling and Analysing the Transition* (pp. 173-195). London: Routledge. <https://doi.org/10.4324/9780203076224>
- Carrillo, F. (Ed.). (2011). *Knowledge Cities: Approaches, Experiences and Perspectives*. London - New York: Routledge.
- Castelnovo, W., Misuraca, G., and Savoldelli, A. (2016). Smart cities governance: The need for a holistic approach to assessing urban participatory policy making. *Social Science Computer Review*, 34(6), 724-739. <https://doi.org/10.1177/0894439315611103>
- Chan, C.S. (2019). Which city theme has the strongest local brand equity for Hong Kong: Green, creative or smart city? *Place Branding and Public Diplomacy*, 15(1), 12-27. <https://doi.org/10.1057/s41254-018-0106-x>
- Chan, C. S., Peters, M., and Pikkemaat, B. (2020). Investigating visitors' perception of smart city dimensions for city branding in Hong Kong. *International Journal of Tourism Cities*, 5(4), 620-638. <https://doi.org/10.1108/IJTC-07-2019-0101>
- Cohen, P., West, S.G., and Aiken, L.S. (2014). *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*. New York: Erlbaum. <https://doi.org/10.4324/9781410606266>
- Côme, T., Magne, S., and Steyer, A. (2019). To be or not to be a smart city: An empirical study of valued innovations on the cities' website. *Gestion et Management Public*, 7(2), 73-101.
- Cortés-Cediel, M. E., Cantador, I., and Rodriguez Bolívar, M. P. (2021). Analyzing citizen participation and engagement in European smart cities. *Social Science Computer Review*, 39(4), 592-626. <https://doi.org/10.1177/0894439319877478>
- de Chernatony, L., McWilliam, G. (1990). Appreciating brands as assets through using a two-dimensional model. *International Journal of Advertising*, 9(2), 111-119. <https://doi.org/10.1080/02650487.1990.11107137>
- Delgado-Ballester, E., and Fernandez Sabiote, E. (2015). Brand experimental value versus brand functional value: Which matters more for the brand? *European Journal of Marketing*, 49(11/12), 1857-1879. <https://doi.org/10.1108/EJM-02-2014-0129>
- Echebarria, C., Barrutia, J. M., and Aguado-Moralejo, I. (2021). The Smart City Journey: A systematic review and future research agenda. *Innovation: The European Journal of Social Science Research*, 34(2), 159-201. <https://doi.org/10.1080/13511610.2020.1785277>
- Echtner, C., Ritchie, J.R.B. (2003). The meaning and measurement of destination image. *Journal of Tourism Studies*, 2(2), 2-12.

- Eshuis, J., Klijn, E.-H., and Braun, E. (2014). Marketing territorial et participation citoyenne: Le branding, un moyen de faire face à la dimension émotionnelle de l'élaboration des politiques? *Revue Internationale Des Sciences Administratives*, 80(1), 153-174. <https://doi.org/10.3917/risa.801.0153>
- European Commission. (n.d.). Smart cities. Retrieved May 18, 2023, from https://ec.europa.eu/info/eu-regional-and-urban-development/topics/cities-and-urban-development/city-initiatives/smart-cities_en
- Fetscherin, M. (2010). The determinants and measurement of a country brand: The country brand strength index. *International Marketing Review*, 27(4), 466-479.
- Flury, B., Murtagh, F., and Heck, A. (1988). *Multivariate Data Analysis*. Mathematics of Computation. Upper Saddle River: Prentice-Hall. <https://doi.org/10.2307/2007941>
- Frochot, I., Batat, W. (2013). *Marketing and Designing the Tourist Experience*. London: Goodfellow Publishers.
- Gil-Garcia, J.R., Pardo, T.A., and Nam, T. (2015). What makes a city smart? Identifying core components and proposing an integrative and comprehensive conceptualization. *Information Polity*, 20(1), 61-87. <https://doi.org/10.3233/IP-150354>
- Grebosz-Krawczyk, M. (2021). Place branding (r)evolution: The management of the smart city's brand. *Place Branding and Public Diplomacy*, 17(1), 93-104. <https://doi.org/10.1057/s41254-020-00167-2>
- Giffinger, R., Fertner, C., Kalasek, R., and Milanovic, N.P. (2007). Smart cities: Ranking of European mid-sized cities. Retrieved May 18, 2023, from http://www.smartcities.eu/download/smart_cities_final_report.pdf
- Groves, R.M., Fowler, F.J., Couper, M.P., Lepkowski, J.M., Singer, E., and Tourangeau, R. (2011). *Survey methodology*. New York, NY: Wiley.
- Guo, J., Ma, J., Li, X., Zhang, J., and Zhang, T. (2017). An attribute-based trust negotiation protocol for D2D communication in smart city balancing trust and privacy. *Journal of Information Science and Engineering*, 33(4), 1007-1023. <https://doi.org/10.6688/JISE.2017.33.4.10>
- Hall, P. (2000). Creative cities and economic development. *Urban Studies*, 37(4), 639-649. <https://doi.org/10.1080/00420980050003946>
- Hankinson, G. (2004). Relational network brands: Towards a conceptual model. *Journal of Vacation Marketing*, 10(2), 109-121.
- Hankinson, G. (2007). The management of destination brands: Five guiding principles based on recent developments in corporate branding theory. *Journal of Brand Management*, 14(3), 240-254. <https://doi.org/10.1057/palgrave.bm.2550065>
- Hanna, S., Rowley, J. (2013). A practitioner-led strategic place brand-management model. *Journal of Marketing Management*, 29(15-16), 1782-1815. <https://doi.org/10.1080/0267257X.2013.800901>
- Harrison, C., Eckman, B., Hamilton, R., Hartswick, P., Kalagnanam, J., Paraszczak, J., and Williams, P. (2010). Foundations for smarter cities. *IBM Journal of Research and Development*, 54(4), 1-16. <https://doi.org/10.1147/JRD.2010.2048257>
- Holt, D. B., Quelch, J. A., and Taylor, E. L. (2004). How global brands compete. *Harvard Business Review*, 82(9), 68-75.
- Huertas, A., Moreno, A., and Pascual, J. (2021). Place branding for smart cities and smart tourism destinations: Do they communicate their smartness? *Sustainability*, 13(19), 10953. <https://doi.org/10.3390/su131910953>
- Kapferer, J.-N. (1988). Maîtriser l'image de l'entreprise: Le prisme d'identité. *Revue Française de Gestion*, Novembre, 76-82.
- Kavaratzis, M. (2004). From city marketing to city branding: Towards a theoretical framework for developing city brands. *Place Branding*, 1(1), 58-73. <https://doi.org/10.1057/palgrave.pb.5990005>

- Kavaratzis, M., Hatch, M.J. (2013). The dynamics of place brands: An identity-based approach to place branding theory. *Marketing Theory*, 13(1), 69-86. <https://doi.org/10.1177/1470593112467268>
- Kemp, E., Childers, C. Y., and Williams, K. H. (2012). Place branding: Creating self-brand connections and brand advocacy. *Journal of Product & Brand Management*, 21(7), 508-515. <https://doi.org/10.1108/10610421211276259>
- Kola-Bezka, M., Czupich, M., and Ignasiak-Szulc, A. (2016). Smart cities in Central and Eastern Europe: Viable future or unfulfilled dream? *Journal of International Studies*, 9(1), 76-87. <https://doi.org/10.14254/2071-8330.2016/9-1/6>
- Kolotouchkina, O., Seisededos, G. (2018). Place branding strategies in the context of new smart cities: Songdo IBD, Masdar, and Skolkovo. *Place Branding and Public Diplomacy*, 14(2), 115-124. <https://doi.org/10.1057/s41254-017-0078-2>
- Lazaroiu, G., Androniceanu, A., Grecu, I., Grecu, G., and Negurita, O. (2022). Artificial intelligence-based decision-making algorithms, Internet of Things sensing networks, and sustainable cyber-physical management systems in big data-driven cognitive manufacturing. *Oeconomia Copernicana*, 13(4), 1047-1080. <https://doi.org/10.24136/oc.2022.030>
- Lewi, G. (1999). *La marque*. Paris: Librairie Vuibert.
- Lloyd, G., Peel, D. (2008). Functionalism and representationalism in contemporary urban agendas: A Scottish perspective on city-region branding. *Urban Research and Practice*, 1(1), 36-53. <https://doi.org/10.1080/17535060701795348>
- Lombardi, P., Giordano, S., Farouh, H., and Yousef, W. (2012). Modelling the smart city performance. *Innovation: The European Journal of Social Science Research*, 25(2), 137-149. <https://doi.org/10.1080/13511610.2012.660325>
- Lucarelli, A., Berg, P.O. (2011). City branding: A state-of-the-art review of the research domain. *Journal of Place Management and Development*, 4(1), 9-27. <https://doi.org/10.1108/17538331111117133>
- Macrae, C. (1998). Strategic brand management. *Journal of Brand Management*, 5, 457-459.
- Mattsson, J., Sørensen, F. (2015). City renewal as open innovation. *Journal of Innovation Economics & Management*, 16(1), 195-215. <https://doi.org/10.3917/jie.016.0195>
- Mora, L., Bolici, R., and Deakin, M. (2017). The first two decades of smart-city research: A bibliometric analysis. *Journal of Urban Technology*, 24(1), 3-27. <https://doi.org/10.1080/10630732.2017.1285123>
- Nam, T., Pardo, T.A. (2011). Conceptualizing smart city with dimensions of technology, people, and institutions. *ACM International Conference Proceeding Series*, 282-291. <https://doi.org/10.1145/2037556.2037602>
- Nantes, "Metropole et Ville." Retrieved May 22, 2023, from <https://metropole.nantes.fr/>
- Nantes, Hamburg, and Helsinki. "My Smart Life." Retrieved May 24, 2023, from <https://www.mysmartlife.eu/publications/>
- Neirotti, P., De Marco, A., Cagliano, A.C., Mangano, G., and Scorrano, F. (2014). Current trends in smart city initiatives: Some stylised facts. *Cities*, 38, 25-36. <https://doi.org/10.1016/j.cities.2013.12.010>
- Nickerson, N., Moisey, R. (1999). Branding a state from features to positioning: Making it simple? *Journal of Vacation Marketing*, 5(3), 217-226.
- Orejon-Sanchez, R.D., Crespo-Garcia, D., Andres-Diaz, J.R., and Gago-Calderon, A. (2022). Smart cities' development in Spain: A comparison of technical and social indicators with reference to European cities. *Sustainable Cities and Society*, 81, 103828. <https://doi.org/10.1016/j.scs.2022.103828>
- Pasquinelli, C. (2015). City branding and local SMEs: A smart specialisation perspective. *Symphony Emerging Issues in Management*, 1, 63-76. <https://doi.org/10.4468/2015.1.06pasquinelli>

- Peng, G.C.A., Nunes, M.B., and Zheng, L. (2017). Impacts of low citizen awareness and usage in smart city services: The case of London's smart parking system. *Information Systems and E-Business Management*, 15(4), 845-876. <https://doi.org/10.1007/s10257-016-0333-8>
- Pierce, S., Ritchie, B.W. (2007). National capital branding: A comparative case study of Canberra, Australia and Wellington, New Zealand. *Journal of Travel and Tourism Marketing*, 22(3/4), 67-78. https://doi.org/10.1300/J073v22n03_06
- Przebyłowicz, E., Cunha, M.A., Geertman, S., Leleux, C., Michels, A., Tomor, Z., Webster, C.W.R., and Meijer, A. (2022). Citizen participation in the smart city: Findings from an international comparative study. *Local Government Studies*, 48(1), 23-47. <https://doi.org/10.1080/03003930.2020.1851204>
- Psomadaki, O.I., Dimoulas, C.A., Kalliris, G.M., and Paschalidis, G. (2019). Digital storytelling and audience engagement in cultural heritage management: A collaborative model based on the digital city of Thessaloniki. *Journal of Cultural Heritage*, 36, 12-22. <https://doi.org/10.1016/j.culher.2018.07.016>
- Rodríguez Bolívar, M.P. (2018). Governance models and outcomes to foster public value creation in smart cities. *Scienze Regionali*, 17(1), 57-80. <https://doi.org/10.14650/88817>
- Sakshaug, J.W., Yan, T., and Tourangeau, R. (2010). Nonresponse error, measurement error, and mode of data collection: Tradeoffs in a multi-mode survey of sensitive and non-sensitive items. *Public Opinion Quarterly*, 74(5), 907-933. <https://doi.org/10.1093/poq/nfq057>
- Sheikhnejad, Y., Yigitcanlar, T. (2020). Scientific landscape of sustainable urban and rural areas research: A systematic scientometric analysis. *Sustainability*, 12(4). <https://doi.org/10.3390/su12041293>
- Shuv-Ami, A. (2016). A new market brand equity model (MBE). *EuroMed Journal of Business*, 11(3), 322-346. <https://doi.org/10.1108/EMJB-05-2015-0025>
- Vitálišová, K., Vaňová, A., Vavrušová, M., Turečková, K., and Nevima, J. (2024). Principles of smart governance in cities. *Administratie si Management Public*, 42, 173-189. <https://doi.org/10.24818/amp/2024.42-11>
- Yigitcanlar, T., Dur, F., and Dizdaroglu, D. (2015). Towards prosperous sustainable cities: A multiscalar urban sustainability assessment approach. *Habitat International*, 45(1), 36-46. <https://doi.org/10.1016/j.habitatint.2014.06.033>
- Yigitcanlar, T., Velibeyoglu, K., and Martinez-Fernandez, C. (2008). Rising knowledge cities: The role of urban knowledge precincts. *Journal of Knowledge Management*, 12(5), 8-20. <https://doi.org/10.1108/13673270810902902>
- Zenker, S., Jacobsen, B. (Eds.). (2015). *Inter-regional place branding: Best practices, challenges and solutions*. Cham: Springer International Publishing. <https://doi.org/10.1007/978-3-319-15329-2>
- Zhu, H., Shen, L., and Ren, Y. (2022). How can smart city shape a happier life? The mechanism for developing a happiness driven smart city. *Sustainable Cities and Society*, 80, 103791. <https://doi.org/10.1016/j.scs.2022.103791>