

# Impact of citizen's urban identity on the smart city technologies usage

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**Abstract.** Locality and identity associated with it retain their sociality and significance in the modern world. The “smart city” concept has institutionalized the transition to the information type society. Hence, the problem is to define the role of identity in the city's transition to the state of intelligence. Such concern is explained by the possibility to construct the urban identity and social space of the city as elements of intangible resources of development. The purpose of this article is to determine the relationship between the urban identity of citizens, their social activity and the use of smart city technologies. Hypotheses: the urban identity of citizens has an impact on the social activity of the citizen; citizens with a high level of urban identity use smart technologies to realize their social activity. The survey of 877 residents of Tyumen showed that the socially active part of the citizens with a high index of urban identity uses smart technologies to participate in the management of the city. The article presents a theoretical understanding of the urban identity of citizens. It analyzes the sociological study of the connection between urban identity and the implementation of the “smart city” concept.

## 1 Introduction

Countries are becoming more urbanized. Urbanism, in its turn, is becoming more intelligent. Smart urbanism is understood to be an increasingly dynamic interrelation between cities, the market, governance arrangements (at various scales) and data [2].

Smart urbanism was institutionally put forward by the “smart city” concept which is supported by representatives of business, government and science. Various institutions have adopted “smart city” programs and standards; they have initiated discussions on intelligence components and their manifestation in social life activity [1].

Currently, the “smart city” concept is characterized by a strong globalizing narrative which emphasizes the world cities as “best practice” models; by the desire to gradually improve the existing urban systems and processes; by the pronounced transformative governance agenda [8]; by a shift of emphasis from the technological component of the concept to the smart citizen as a goal and a condition for its achievement.

The key notion of the “smart city” concept insists on a condition to negotiate with the spatiality and the geography of place “through which the ‘unbound’ conceptual smart city becomes the ‘bounded’ enacted smart city” [8]

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Such a condition is capable of ensuring the organic integration of the “smart city” concept into the local context. The latter implies social space of the city, the key elements of which are identity, social activity, norms of trust, and solidarity of citizens. The implementation and effectiveness of the concept is largely determined by its transfer to the level of personal context, when it becomes part of everyday life of a particular person. This approach is broader than usual scaling of the usage of smart city technologies. The idea is to change the citizen’s attitude towards the events held in the city, his or her role and place in these urban processes, and the degree of his or her co-governance in the city development. The approach explains the aspiration to analyze the smart city via the urban identity of citizens and their usage of smart city technologies. As a result, we observe an attempt to understand how the state of being smart becomes an integral part of meanings rather than to understand the smart city as a given set of technologies whose promoters (problematically) assume certain deterministic effects on society [4].

How can the smart city citizen be characterized? Firstly, the smart citizen is an individual who possesses a high level of human capital and potential. Secondly, he or she is an active individual in civil and social life. Finally, the smart citizen is a person who is acutely aware of his or her identity via the attitude to the city.

The main contradiction, when implementing the “smart city” concept, lies in defining the degree of subjectivity of the individual and his or her ability to realize the interests, needs, and identity as well.

At the same time, the urban identity of the citizen may contradict the identity of the city. The identity of the city, in conditions of accelerating rates of life, is constantly affected by them. The identity of the city is rapidly transformed and adapted to these changes, which cannot but cause a conflict with the urban identity of the individual. However, the sociological point of view stipulates that all identities are subject for construction. The problem is in “who constructs collective identity, and for what, largely determines the symbolic content of this identity, and its meaning for those identifying with it or placing themselves outside of it. Since the social construction of identity always takes place in a context marked by power relationships” [3].

The construction of the identity of the city in isolation from the urban identity of the individual causes dissonance among important elements of the social space of the city. This dissonance has a negative impact and consequences both for the city and the people who live in it. Thus, on the one hand, the local context is included in the practice of stimulating smart urban development; on the other, debates on the nature and goals of intellectual urbanism are initiated; lastly, a changed vision of the urban future is presented [2].

Analysis of urban identity makes it possible to understand the hidden, implicit resources of the city stability and its development. Institutional identity reinforces the importance of the city governance development. In this regard, another research question arises: Is the urban identity of citizens (in general, the social city space via its norms and activity) a social institutional element of the smart city development? The answer to this question is affirmative. The usage of smart technologies in the urban environment without taking into account the nature of people's attitude to them causes disharmony among them [1].

Other research issues considered in this article are: Can we capture the relationship of identity, as an institutional element of influence, with the city intelligence? Can we understand how the city intelligence arises from the routine reproduction of the existing traditional urban identities of citizens or from the arising ones as a response to mobilize to new challenges and opportunities of our time? Can we trace the symbiosis of traditional and modern urban identities? In order to solve these issues, we should conceptually and empirically study the urban identity of citizens noting their active attitude to the city.

## 2 Meaning of the City

The theoretical basis for the study of identity is grounded on theories of social identity. The methodological basis for determining the nature of identity and identification of an individual are the ideas of M. Castells [3] and R. Jenkins [7].

Our attention is drawn to the emerging dialectics of similarity vs. difference and internal vs. external. It suggests that we should consider identity not via its difference, but via its paired characteristics. In this article, we adhere to the thesis that “the notion of identity involves two criteria of comparison between persons or things: similarity and difference” [7, 17].

For the purposes of the study, we selected indicators that characterize the urban identity of citizens from a perspective of the activity approach [7].

The urban identity of citizens, like the social space, is not static; both of them are constantly undergoing changes.

The urban identity of citizens is primarily affected by the accelerating and globalizing factor. The nature of modern urban identity is influenced by acceleration, challenge, adaptation, and the need to integrate into the flows of change. It had taken a lot of years to pass and a few generations to change before the modern identity took its shape. It was institutionalized and enshrined in norms and values by the society via the transfer of experience accepted by everyone. The transfer of experience was routine and it was clearly structured. Today, we can say that the increased volume and speed of relation, communication and information have transformed both the accumulation and transition of our experience. “The old identities which stabilized the social world for so long are on decline, giving rise to new identities and fragmenting the modern individual as a unified subject. This so-called ‘crisis of identity’ is seen as part of a wider process of change which is dislocating the central structures and processes of modern societies and undermining the frameworks which gave individuals stable anchorage in the social world” [11].

The individualized person designs experience for himself or herself, for the requirement of time and change. This, undoubtedly, determines the character of the modern identity of the citizen. It is designated as selective [7], situational [10], thin [12] and presentational one [6].

The defining features of modern identity are its situationality, constructability, and reflexivity to challenge and change in the society. The individual reflects and correlates himself or herself with other people, he or she tracks changes and reactions of others, constantly controls external self-presentation of other people during the process of constructing his or her “self”. Ultimately, these identity properties suggest that individual and collective identity is open to constant reassessment. Simultaneously, we are faced with the human identity which is constructed socially, historically and culturally [11].

The above theses logically lead us to the idea that the urban identity of citizens consists of two parts: traditional and situational (or thin, presentational). The traditional identity of citizens is characterized by their active attitude to the identity of the city they live in, to the image of the city, to the determination of their place and role in the city. The modern, changing, and integral part of the urban identity of citizens is manifested via indicators of their attitude and activity to the ongoing changes in the society as a whole; to the development targeting; to the smart technologies; to the changes in the identity of the city; to the changes in the nature of relations among citizens; to the increasing degree of individualization, fragility, and short-term ties.

## 3 Methodology

The analysis of the presence/absence of a tie among indicators of the implementation of the

smart city concept and indicators of the state of social space, namely the urban identity of citizens, was carried out on the basis of the sociological study results and a survey of respondents aged 18 to 70 in Tyumen, which is one of the “second tier” cities and the administrative center of one of the most successful regions of the Russian Federation. Second tier cities are cities that act as centers attracting resources and capital flows right after the federal centers and largest cities of the country. Tyumen is a multifunctional city with a population of 807.3 thousand people (as of January 1, 2020). The survey of its residents was conducted online via SurveyMonkey platform service. A total of 907 people were interviewed and 877 people were selected for the analysis. The target audience represents the population of Tyumen by sex and age. Fetch error does not exceed 3% per characteristic.

The type of urban identity was assessed using several questions:

1. Question "How do you feel about the city you live in?" allowed us to highlight migration moods (answer options: "I would like to leave") and a "thin" unstable connection with the city (answer options: "in General, I am happy that I live here, but I am not satisfied with many things", "I do not have special feelings for the city").

2. The level of traditional identity was assessed through the question "do you Agree with the following judgments" (the judgments are shown in table 2). The 5 point Likert scale was used for evaluation.

For five indicators that characterize the traditional type of identity (see table 2), we calculated the "urban identity" indices in such a way that 1 corresponds to "all completely agree", 0 corresponds to "all completely disagree". The indices were calculated using the formula =  $(0 * \text{"Strongly disagree"} + 0.25 * \text{"Rather disagree"} + 0.5 * \text{"and Yes and no"} + 0.75 * \text{"Rather agree"} + \text{"Strongly agree"})$ . Composite index of urban identity = the sum of all indexes divided by their number.

The index score less than 0.5 was assessed as a low level of traditionalist identity, from 0.51 to 0.8 – average, and more than 0.8-high.

3. Question "How would you describe your place in the city?" - this is a self-assessment of status in the urban community.

Social activity of citizens was assessed using questions: "How would you describe your participation in the life of the city?," "Do you Agree with the following judgments about the level of your participation in the process of managing the development of the city?" and the question about the types of social participation.

## 4 Results

The results of the study show a high identity of Tyumen citizens with their city (Table 1). 80% of the respondents perceive Tyumen as their home, almost 70% of them link their future with the city and they feel that it is close to them, however, only 46% of the respondents feel that they are close to the residents of the city.

We considered five indicators (Table 1) to calculate the “urban identity” index in such a way that “1” should correspond to “I Totally Agree”, “0” should correspond to “I Totally Disagree”. On the whole, the index comes to 0.71 which is quite high. For 31% of respondents, this index was more than 0.81 (we will consider them as adherents of the traditionalist type of urban identity). Almost half (49%) show a transitional identity and 20% show a low level of traditionalist identity.

The level of urban identity is influenced by the age of the Respondent and the number of years lived in this city. Predictably, the longer the Respondent lives in a city, the higher the level of urban identity, and the fact that young people feel less connected to the city than representatives of older age groups. (the Kruskal-Wallis test for independent samples was used for verification). Other socio-demographic characteristics are of little

significance.

**Table 1.** Level of Agreement with Judgments about the City. Identity Indices.

Judgments	I Totally Disagree %	I Rather Disagree %	Both Yes and No %	I Rather Agree %	I Totally Agree %	Index*
In my city, I really feel at home	1	3	16	29	51	0.81
Many things in my city remind me of my past	9	10	23	23	34	0.66
This city is really close to me	3	6	21	27	43	0.75
My future is closely linked to this city	5	7	21	28	39	0.73
I feel that I am close to the people of my city	7	14	33	27	19	0.59
<b>Urban Identity Index**</b>						0.71

Note: \*Indices were calculated as weighed averagely so that “1” should correspond to “I Totally Agree”, “0” should correspond to “I Totally Disagree”.

Calculation is done by the formula =  $(0 * \text{“I Totally Disagree”} + 0.25 * \text{“I Rather Disagree”} + 0.5 * \text{“Both Yes and No”} + 0.75 * \text{“I Rather Agree”} + \text{“I Totally Agree”})$ .

\*\* Urban identity index = sum of all indices divided by their quantity.

The data correlates with the answers to the question " how do You feel about the city you live in?". The majority of respondents are happy that they live here (64%) or "generally satisfied, although many things in the city do not suit" (25%). Indifferent or negative attitude to the city – 9% and 2%, respectively. The identity index is significantly higher in the group of respondents who are content with living in the city (Table 2).

**Table 2.** Urban Identity Index in Groups Highlighted in Reference to their city, average.

	How do you feel about the city you live in?			
	I am happy that I live here	in General. I am happy that I live here. but I am not satisfied with many things	I do not have special feelings for the city	I would like to leave
Urban Identity Index	0.76	0.64	0.50	0.53

Let us consider the correlation between the urban identity of citizens and their social activity. We used the parameters of self-assessment of their place in the city and participation in the city management, the attitude to cooperation with the local government for this purpose (Table 3).

A person's perception of the importance of his position in the city is more than a characteristic of his condition and capabilities, it is first and foremost a result of his actions and social activity. Most Tyumen residents consider themselves as ordinary citizens with little opportunity to affect the situation around (44%), while only 13% emphasize their importance and high status, 25% believe that they've implemented as professionals in the city.

The urban identity index varies significantly depending on the respondents' self-assessment of their place in the city (Table 3). Respondents, who characterize their position as active and the one being in demand, have a higher identity with the city. And vice versa, passive position and low self-esteem correlate with low identity with the city. This confirms

our hypothesis about the reciprocity of urban identity and social activity of citizens. An indicator of this reciprocity is the close relationship between urban identity and participation in the city life (Table 4).

**Table 3.** Urban Identity Index in Groups Compiled by Residents' Self-Assessment of their Place in the City.

Self-Assessment of Resident's Place in the City	Urban Identity Index, average
I am significant and I am in demand in the city	0.78
I have a high status in the city	0.74
I have fulfilled my creative abilities in this city as a person and as a professional	0.76
I am part of this city, but I am an ordinary citizen, I have minor influence in it	0.71
I am a responsible citizen	0.72
I cannot call myself part of the city, it is rather strange to me	0.48
I could not fulfill my creative abilities in this city	0.62
I am a minor fleck of dust in the city, nothing depends on me	0.58

**Table 4.** Urban Identity Index in Groups that Differ on their Inclusion in City Life.

Groups that Differ on their Inclusion in City Life	Identity Index, average
They participate in making decisions important to the city	0.78
They participate in making decisions in places where they reside and work	0.73
They do not participate in the city life	0.67
They neither participate nor see the need in doing it	0.64

Moreover, this relationship is seen not only at the level of the generalized index, but also at separate identity characteristics (Table 5). Respondents, who take part in solving citywide or local problems, feel that they are closer to the city and to its residents; their past and future are connected with the city, they feel at home in it. The level of involvement in the city life correlates with all indicators of urban identity, but the closest connection is with "I feel that I am close to the people of my city" indicator (Spearman correlation coefficient is 0.256 if the error is less than 0.0001). In other words, those respondents, who feel that they are, first of all, close to the residents of the city, show the highest social activity.

**Table 5.** Correlation of the Level of Participation in City Life and Separate Components of Urban Identity according to Spearman Criterion.

		In my city, I really feel at home	Many things in my city remind me of my past	This city is really close to me	My future is closely linked to this city	I feel that I am close to the people of my city	Urban Identity Index
Participation in city life	Correlation coefficient	0.110	0.124	0.161	0.080	0.256	0.195
	P-value	0.001	0.000	0.000	0.017	0.000	0.000

A small part of citizens takes part in solving urban and local problems of the city. Basically, they present "passive" participation forms which are illustrated in such judgments as "I have signed a petition or a written request to the authorities" (35%), "I myself have written a request or a complaint to the authorities" (20%), "I have donated money to a community organization dealing with problems" (15%), and some others.

About 20% of citizens are involved in constructive forms of social activity. 17% of them have tried to mobilize their neighbors, colleagues, acquaintances for an action or an event aimed at solving urban and local problems; 23% have participated in territorial assemblies of citizens; 13-15% have participated in social projects and environmental actions. However, those people, who take part in the city governance processes or who are focused on participation, identify themselves more strongly with the city and its citizens (Table 6).

**Table 6.** Urban Identity Index and its Dependence on the Respondent's Self-Assessment of the Level of his or her Participation in City Governance and Respondent's Attitude to Cooperate with City Authorities.

Respondent's Self-Assessment of his or her Participation in City Governance		Urban Identity Index, average
My opinion, position, wishes are taken into account when a city project, its problems, and other initiatives are solved	I disagree	0.68
	I agree	0.80
I am involved in joint projects development and in urban governance decisions	I disagree	0.69
	I agree	0.82
In a group of people or alone I can make decisions on separate city issues or its problems	I disagree	0.69
	I agree	0.77
Respondent's Attitude to Cooperate with City Authorities		Urban Identity Index, average
I am willing to cooperate with city authorities	I am ready	0.72
	I am not ready	0.69
Would you like to participate in the strategy development of your city?	Yes	0.73
	No	0.69

The form of social participation also matters. Thus, the respondents, who are included in constructive (conventional) forms of social activity, have a higher level of urban identity (Table 7).

**Table 7.** Urban Identity Index and its Dependence on the Form of Social Participation.

Forms of Social Participation	Actions mentioned below you have done at least once	Identity Index, average
Active (constructive) forms of participation	I have participated in the city hearings	0.73
	I have participated in territorial public self-governance	0.73
	I have participated in city development social projects	0.72
	I have participated in actions to solve the city problems	0.74
	I have tried to mobilize my neighbors, colleagues, acquaintances for an action or an event aimed at solving urban and local problems	0.73
Passive forms of participation	I have published a post regarding a social problem of the city	0.65
	I have signed a petition or a written request to the authorities	0.69
	I myself have written a request or a complaint to the authorities	0.68
Non-conventional forms of participation	I have participated in a protest	0.60

We do not observe a direct link between urban identity, social activity, and usage of smart technologies. Nevertheless, respondents, who take part in solving urban or local problems, more often use “smart technologies” in order to be included in city governance processes (Table 8).

**Table 8.** Usage of Technologies including Citizens in City Governance Processes and their Dependence on the Forms of Participation in the City Life.

		Participation in the city life		
		Participation in making decisions important to the city, %	Participation in making decisions in places where people reside and work, %	Non-participation %
Online voting platforms for house tenants	I use them	32	16	12
	I know about them, but I do not use them	28	19	12
	I do not know about them	40	65	76
		100	100	100
E-government (for complaints, letters, requests, etc.)	I use them	51	44	29
	I know about them, but I do not use them	23	36	41
	I do not know about them	26	20	30
		100	100	100
Bidding and outsourcing platforms	I use them	34	23	13
	I know about them, but I do not use them	30	25	19
	I do not know about them	36	52	67
		100	100	100

## 5 Conclusion

According to P. Bourdieu, the subject’s perception of the social world arises as a result of his or her subjective structuring, which is directly related to the identity of the individual. The individual’s structuring of his or her perception regarding the city and its identity determines the urban identity of the citizen.

The urban identity of citizens consists of two parts: traditional and situational (also thin and presentational). The traditional identity of citizens is characterized by their active attitude to the identity of the city, to the image of the city, to the determination of their place and role in the city.

The modern, changing, and integral part of the urban identity of citizens is operationalized via indicators of attitude and activity to the ongoing changes in the society as a whole, to the development targeting; to the smart technologies; to the changes in the identity of the city; to the changes in the nature of relations among citizens; to the increasing degree of individualization, fragility and short-term ties. The study of these indicators allows us to describe not only the nature of the urban identity of citizens, the relationship between its parts (traditional and situational), but also the social context of the city space, its connection with the new digital stage of society development.

The urban identity index of the citizens is high, which can testify to the fact that the social space of the city is well developed. The connectivity of the urban identity of the citizens with the intelligence of the city can be traced via their social activity.

The “smart city” concept has not yet become an everyday context of all the citizens. Only the socially active part of citizens with a high index of urban identity has included new smart technologies in their daily practice in order to be used in the city governance.

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## References

1. Z. Allam, Aligning technology and humanity, 1-29 (2020) DOI:10.1007/978-3-030-29800-5\_1
2. F. Caprotti, R. Cowley, *Trans. Inst. Br. Geogr.* **00**, 1–15 (2019) DOI:10.1111/tran.12284
3. M. Castells, *The Power of Identity. Second edition with a new preface* (Blackwell Publishing Ltd, 2010)
4. R. Cowley, S. Joss, Y. Dayot, *Urban Research & Practice* **11(1)**, 53–77 (2018) DOI: 10.1080/17535069.2017.1293150
5. C. Crouch, P. Le Galès, *Journal of European Public Policy* **19(3)**, 405–419 (2012) DOI: 10.1080/13501763.2011.640795
6. P.J. D’Ambrosio, *Time & Society* **28(3)**, 1061–1083 (2019) DOI: 10.1177/0961463X18787059
7. R. Jenkins, *Social Identity* (Routledge, 2008)
8. S. Joss, F. Sengers, D. Schraven, F. Caprotti, Y. Dayot, *Journal of urban technology* **26(1)**, 3–34 (2019) DOI: 10.1080/10630732.2018.1558387
9. R. Raven, F. Sengers, P. Spaeth, L. Xie, A. Cheshmehzangi, M. de Jong, *European Planning Studies* **27(2)**, 258-281 (2019) DOI: 10.1080/09654313.2017.1393047
10. H. Rosa, *Social Acceleration: A New Theory of Modernity* (Cambridge University Press, New York, NY, 2013)
11. G. Taylor, S. Spencer, *Social Identities: Multidisciplinary approaches* (Taylor & Francis, 2004)
12. K. Terlouw, *Geo Journal* **77**, 707–721 (2012) DOI: 10.1007/s10708-011-9422-x
13. Th. Therborn, *Journal of sociology and social anthropology* **16(1)**, 20-40 (2013)