

## CITIZENS' ENGAGEMENT IN A SOCIAL VALUE CO-CREATION WITHIN A SMART CITY – AN EMPIRICAL STUDY

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**Purpose:** This paper aims to present citizens' opinion on the severity of existing social problems such as exclusion of individuals with disabilities, poverty or discrimination. Further, the relationship between citizens' engagement in solving social problems and their demographic factors such as gender, age and level of education is examined. Engagement was defined as the experience of solving local social problems and the willingness to be involved in solving them in the future.

**Design/methodology/approach:** The pilot survey was carried out in 2021 using the CATI, CAWI interview method on a random sample of 420 citizens in the West Pomeranian region in the Republic of Poland. The Chi-square test for independence was conducted.

**Findings:** A Chi-square test of independence showed that there was no significant association between gender, level of education, marital status and experience in solving social problems. However,  $\chi^2$  showed that there was a significant association between generation and experience in solving social problems. A Chi-square test of independence showed that there was no significant association between, gender, level of education, marital status, generation, and willingness to involve in solving social problems.

**Research limitations/implications:** The pilot study has several limitations. First, the study's regional focus limits the generalizability of its conclusions. Secondly, the small sample size constrains the statistical power and robustness of the results. Future research should consider a comparative approach across multiple regions, enabling the examination of how local contexts influence perceptions and involvement in social problem-solving.

**Practical implications:** Presented research results can lead to making sustainable decisions by policy-makers interested in social value co-creation with citizens in order to build a smart city for current and future generations.

**Social implications:** This paper indicates which social problems are considered as most severe by citizens and in solution of which they want to engage.

**Originality/value:** The added value of the paper is gained knowledge on citizen's commitment to social value co-creation.

**Keywords:** social value co-creation, smart city, sustainability, citizen, citizens engagement.

**Category of the paper:** Research paper.

## 1. Introduction

Social value co-creation and smart city development are significant and up-to-date research areas. Smart city is a complex issue and can be defined as a city that places people at the center of development, invests in human and social capital, wisely manages resources thinking about future generations, integrates modern information and communication technologies into city management and emphasizes joint planning and citizen participation (Angelidou, 2015; Trinidad et al., 2017). Although the smart city concept has been the subject of much research, there is still no verified universal definition. One reason for this is multifaceted nature of the phenomenon under study, in which researchers and practitioners from many different fields are interested (Masik, Sagan, Scott, 2021; Yigitcanlar, Dur, Dizdaroglu, 2015). Depending on the area, different definitions highlight the importance of different areas of smart city creation (Yigitcanlar, Dizdaroglu, 2015; Mitchell, 2007).

Assuming that the goal of a smart city is to promote sustainable development and improve the quality of life of citizens through ongoing initiatives supporting innovation, competitiveness and attractiveness of the city, it should be noted that designing smart city requires taking into consideration current and future needs of all citizens (Joss, 2015; Berner, Amos, Morse, 2011). Thus, citizens should not only benefit from being a part of a smart city, but also engage in co-creation of social values by solving society's most acute problems (Meijer, Rodriguez Bolivar, 2016; Yamashita, 2018; Prahalad, Ramaswamy, 2004). Within this paper, co-creation is defined as undertaking activities with various market participants to implement better solutions (Misiak-Kwit, Wiścicka-Fernando, Fernando, 2021; Abhari, Davidson, Xiao, 2019). Such civic participation is regarded as a key mechanism for reshaping governance to ensure it becomes more transparent and aligned with citizens' needs, particularly within the framework of smart cities (Gil-Garcia, Pardo, Nam, 2016; Bovaird, 2007). The collaborative process of guiding urban societies toward shared objectives should be emphasized, as public value is generated through the citizens engagement (Hossain, Markony, Ahamed, 2016; Bull, Dooley, Mazhar, 2019). According to the literature value is collaboratively generated through the involvement of various actors (Farguhar et al., 2024). While building social value and implementing social innovations, citizens contribute to the creation of material and immaterial things considered socially desirable (Abubakar, Jahwari, Bakheet, 2024; Hamidi, Gharneh, Khajeheian, 2020; Satar, 2024). Social values, in turn, can be considered as common values for the whole society and beliefs considered important in a given society and resulting from behavioral norms (Dixit, Moid, 2022; Pati, Sutter, Garud, 2024).

Firstly, this paper aims to present citizens' opinion on the severity of existing local social problems. The social issues evaluated in the study included disability-related challenges, violence, criminality, poverty, unemployment, addictions (such as alcoholism or drug dependency), social exclusion (such as lack of access to resources), discrimination (including

age, gender, ethnicity, and religion), and homelessness (Khan, 2021; Phills, Deiglmeier, Miller, 2008; Szluz, Bozacka, 2017). The second aim of this paper is to examine the relationship between citizens' engagement in solving local social problems and their demographic factors such as gender, age and level of education.

## 2. Methods

The anonymous survey was carried out in 2021 using the CATI, CAWI interview method on a random sample of 427 citizens in the West Pomeranian region in the Republic of Poland. In light of the fact that this is a regional survey, it can be posited that the sample is representative (Bazarnik, Grabiński, Kąciak, 1992). The research frame was the Flow Research Centre database. The data obtained represented both nominal and ratio scales. Chosen sampling technic was cluster sampling.

In order to ascertain whether there is a relationship between citizens' engagement and their demographic factors, eight Chi-square tests for independence were conducted. Engagement was defined as both, the experience in solving local social problems and the willingness to be involved in solving them in the future. It is presumed that through their engagement, residents co-create social values.

In order to achieve the aim of the paper, two research questions were posed: Is there a relationship between citizens' experiences in solving local social problems and their demographic factors? Is there a relationship between citizens' willingness to be involved in solving local social problems and their demographic factors? The study considered four demographic factors, namely gender, level of education, marital status and age, which was categorized according to generational cohort. For each demographic factor, null ( $H_0$ ) and alternative hypotheses ( $H_1$ ) were formulated to test the hypothesis that these factors are independent of residents' engagement in social problem-solving. The following research hypotheses were proposed.

### Test I

$H_0$ : Gender and Experience in solving local social problems are independent.

$H_1$ : Gender and Experience in solving local social problems are not independent.

### Test II

$H_0$ : Level of education and Experience in solving local social problems are independent.

$H_1$ : Level of education and Experience in solving local social problems are not independent.

### Test III

$H_0$ : Marital status and Experience in solving local social problems are independent.

$H_1$ : Marital status and Experience in solving local social problems are not independent.

**Test IV**

H<sub>0</sub>: Generation and Experience in solving local social problems are independent.

H<sub>1</sub>: Generation and Experience in solving local social problems are not independent.

**Test V**

H<sub>0</sub>: Gender and Willingness to be involved in solving local social problems are independent.

H<sub>1</sub>: Gender and Willingness to be involved in solving local social problems are not independent.

**Test VI**

H<sub>0</sub>: Level of education and Willingness to be involved in solving local social problems are independent.

H<sub>1</sub>: Level of education and Willingness to be involved in solving local social problems are not independent.

**Test VII**

H<sub>0</sub>: Marital status and Willingness to be involved in solving local social problems are independent.

H<sub>1</sub>: Marital status and Willingness to be involved in solving local social problems are not independent.

**Test VIII**

H<sub>0</sub>: Generation and Willingness to be involved in solving local social problems are independent.

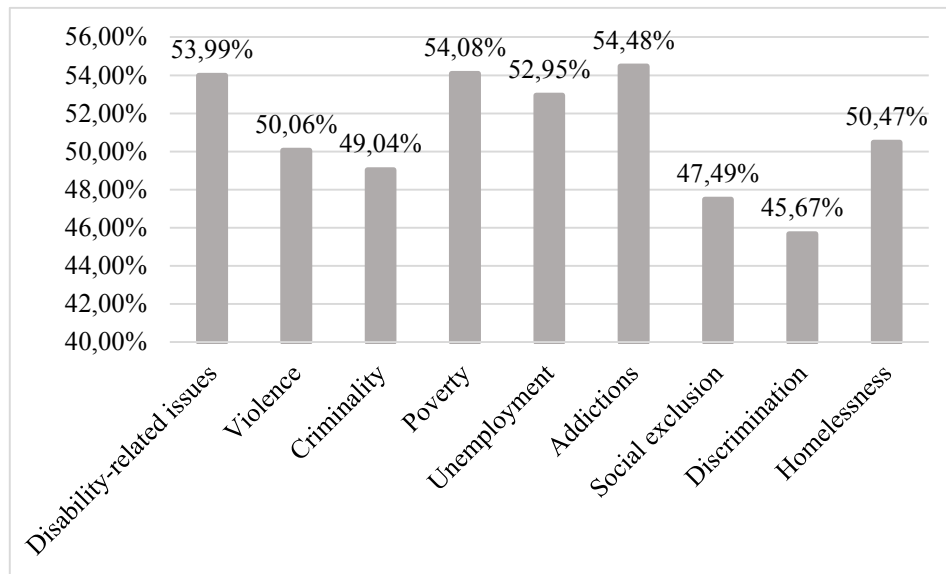
H<sub>1</sub>: Generation and Willingness to be involved in solving local social problems are not independent.

The research sample comprised 247 women (58%) and 180 men (42%). In terms of educational attainment, the majority of respondents had obtained a tertiary qualification (52%), or a secondary qualification (40%), with 6% having completed basic vocational education, 1% having completed lower secondary education, and 1% having completed primary education. The structure of residents by marital status was as follows - 26% were unmarried, 49% were formally married, 5% were divorced, 3% were widowed, and 17% were in a civil partnership. The survey sample by age was represented by 1% from the Silent Generation, 16% from the Baby Boomers, 31% from Generation X, 50% from Generation Y, and 2% from Generation Z.

### **3. Results**

Figure 1 presents the findings of a survey that sought to ascertain residents' perceptions of the severity of various social issues in the West Pomeranian region. Participants were requested to assign a rating to the intensity of each issue on a scale from 0 to 100, with 0 indicating the absence of the problem and 100 representing a very serious problem. This data provides insights

into public perceptions of the social challenges facing West Pomeranian region, highlighting which issues are viewed as more or less significant by local residents.



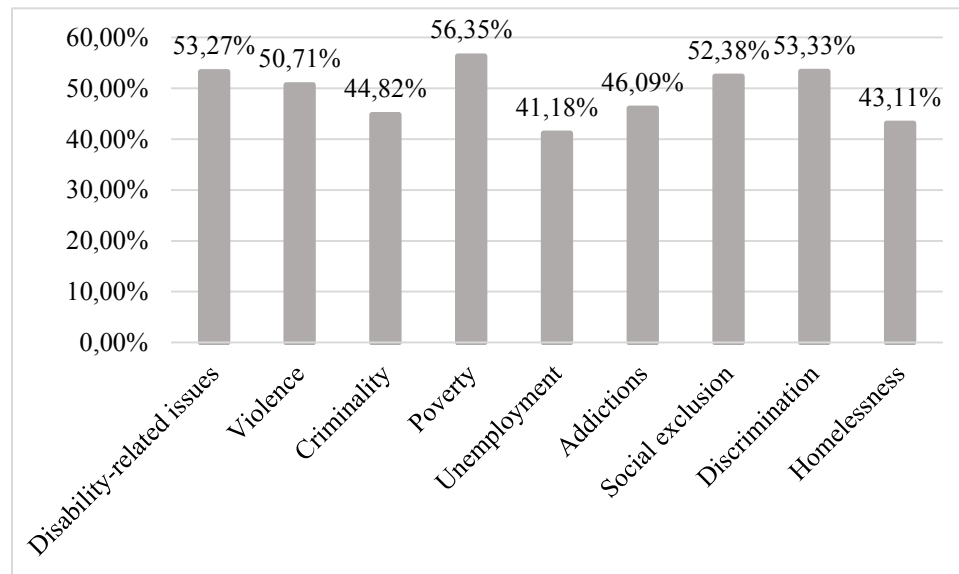
**Figure 1.** Severity of existing social problems.

Source: own study based on the survey.

The results indicate a moderate level of concern across all social issues, with perceptions of problem severity ranging from approximately 45% to 55%. The issue perceived to be the most significant was that of addiction, with a rating of 54,48%. This was followed closely by poverty (54,08%) and disability-related issues (53,99%). Additionally, unemployment was identified as a significant concern, with a rating of 52,95%. Other issues with ratings approaching the mean include homelessness (50,47%), violence (50,06%), and criminality (49,04%). Social exclusion and discrimination were rated slightly lower, at 47,49% and 45,67%, respectively, indicating that these are perceived as somewhat less severe in comparison to other issues. Overall, while all listed problems are perceived as present to a moderate extent, addictions, poverty, and disability-related issues are viewed as the most pressing concerns in the West Pomeranian region.

The following question was posed in order to ascertain the extent to which residents have engaged in addressing local social issues. Respondents were queried as to whether they had ever participated in initiatives or activities with the aim of solving local social problems. This question offers insight into the level of civic engagement within the region, particularly in the context of addressing social challenges at the community level. The results of the survey indicate that a minority of residents in the West Pomeranian region have participated in efforts to address local social issues. Indeed, only 19,91% of respondents reported experience in this area. This relatively low level of involvement suggests limited direct engagement with community-based social problem-solving initiatives among residents. Consequently, these findings may reflect either a lack of opportunities or motivations for civic participation in social issues within the region.

Furthermore, the findings of a survey investigating respondents' levels of engagement with addressing various social issues are presented (Figure 2). Participants were requested to indicate their level of engagement with specific social problems on a scale from 0 to 100, with 0 representing no involvement and 100 indicating a high level of involvement. The results provide an overview of the areas where residents have contributed efforts toward social problem-solving within their communities.



**Figure 2.** Experience in solving local social problems.

Source: own study based on the survey.

The findings demonstrate a range of degrees of involvement across the various social issues. The highest levels of reported engagement were observed in the areas of poverty (56,35%) and discrimination (53,33%), indicating that these issues were the focus of the most active participation from respondents. Additionally, relatively high levels of involvement were observed with regard to disability-related issues (53,27%) and social exclusion (52,38%). Moderate engagement was reported for violence (50,71%) and addictions (46,09%), indicating a notable but less intense focus on these areas. The lowest levels of engagement were reported for criminality (44,82%), homelessness (43,11%), and unemployment (41,18%). This indicates that respondents were less likely to have been involved in initiatives addressing these issues. Overall, the data highlight that poverty, discrimination, and disability-related issues are among the social problems where residents have been most actively engaged, while issues like unemployment and homelessness received comparatively lower levels of involvement.

Table 1 presents the findings of Chi-square tests conducted to investigate the relationship between citizens' experience in addressing local social issues and their demographic characteristics. The objective of the analysis is to ascertain whether there is a relationship between residents' experiences in addressing social issues and factors such as gender, level of education, marital status, and generation.

**Table 1.***Summary of the Chi-square test of independence – Experience*

Test ID	Chi-square test Statistic	df	$\alpha$	p-value	Observation	Decision
Test I Gender	0	1	0,05	1	p-value > $\alpha$	Fail to reject the null hypothesis
Test II Level of education	6,43	4	0,05	0,17	p-value > $\alpha$	Fail to reject the null hypothesis
Test III Marital status	3,49	4	0,05	0,48	p-value > $\alpha$	Fail to reject the null hypothesis
Test IV Generation	12,08	4	0,05	0,017	p-value < $\alpha$	To reject the null hypothesis

Source: own study based on the survey.

The results demonstrate that, with regard to the majority of demographic variables, no statistically significant relationship exists between experience in addressing local social issues and the aforementioned factors. Specifically, no statistically significant association was found between gender ( $\chi^2 = 0$ ,  $N = 427$ ,  $df = 1$ ,  $p > ,05$ ), level of education ( $\chi^2 = 6,43$ ,  $N = 427$ ,  $df = 4$ ,  $p > ,05$ ), marital status ( $\chi^2 = 3,49$ ,  $N = 427$ ,  $df = 4$ ,  $p > ,05$ ) and citizens' experience in solving local social problems. Therefore, the null hypotheses are not rejected, indicating that these factors are independent of experience in addressing social issues. Nevertheless, a notable association was identified between generation and experience in addressing social issues ( $\chi^2 = 12,08$ ,  $N = 427$ ,  $df = 4$ ,  $p < ,05$ ). This result leads to the rejection of the null hypothesis, indicating that generation is related to citizens' involvement in local social issues. In summary, while gender, education level, and marital status do not appear to influence social problem-solving engagement, generational differences do play a role, with varying levels of involvement across age groups.

It is therefore valuable to present data on the experience of citizens in solving social problems, categorized by generational cohort. Table 2 illustrates the number and percentage of individuals from each generation who reported involvement in local social issues, thereby offering insights into the relationship between generational identity and civic engagement. The generational groups are as follows: the Silent Generation (1928-1945), the Baby Boomers (1946-1964), Generation X (1965-1980), Generation Y (1981-1996), and Generation Z (1997-2012).

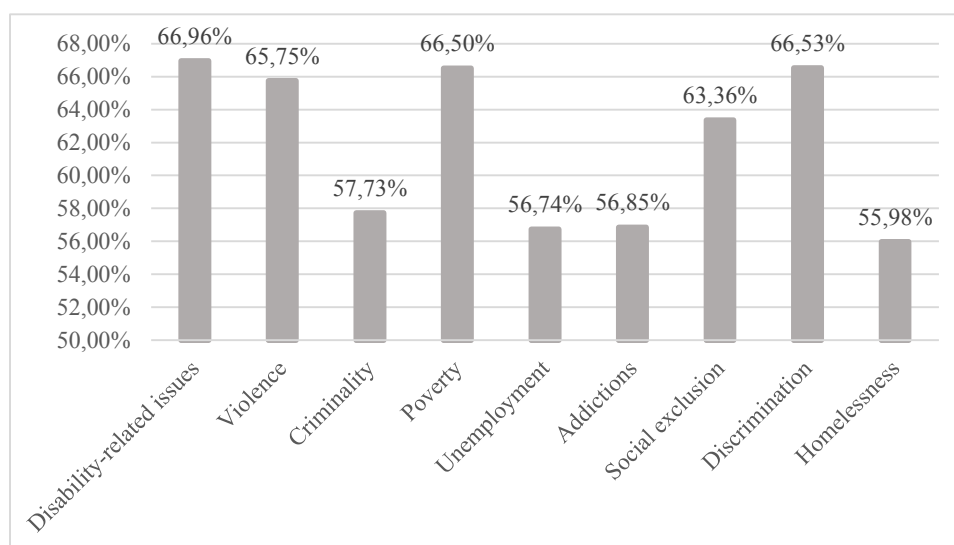
**Table 2.***Generation and experience in solving local social problems*

Generation	Experience in solving local social problems			
	Yes		No	
Silent Generation	1	50%	1	50%
Baby Boomers	22	31,88%	47	68,12%
Generation X	23	23,71%	74	76,29%
Generation Y	30	15,31%	166	84,69%
Generation Z	9	14,29%	54	85,71%

Source: own study based on the survey.

The data reveal notable differences in engagement levels across generations. The Silent Generation has the highest percentage of involvement, with 50% (1 out of 2 respondents) indicating experience in addressing social issues, though the small sample size should be considered. Baby Boomers show a lower level of involvement, with 31,88% (22 out of 69) reporting experience in social problem-solving. Generation X follows with 23,71% (23 out of 97) engaged in such efforts. Generation Y shows even less engagement, with only 15,31% (30 out of 196) reporting experience in social issue resolution. Finally, Generation Z has the lowest level of involvement, with 14,29% (9 out of 63) having participated in solving local social problems. Overall, these results indicate a generational trend in which older cohorts, particularly the Silent Generation and Baby Boomers, demonstrate higher levels of civic engagement in social problem-solving, while younger generations, including Generation Y and Generation Z, report lower levels of involvement. This trend may reflect generational differences in attitudes toward community involvement or access to opportunities for civic engagement.

Given the level of commitment demonstrated by respondents, it is beneficial to compare these results with their stated intentions. Accordingly, the study investigates the interest of residents to engage in the resolution of local social issues within their community. The term 'interest' is employed to signify the degree to which a problem is regarded as significant and the extent to which activities pertaining to this problem are planned to be undertaken. The initial stage of the study involved the administration of a general question to ascertain the participants' general readiness to engage in the resolution of local social issues. These issues included the promotion of positive changes for vulnerable groups, such as the elderly, children, and impoverished individuals. As evidenced by the preliminary results, 37,7% of respondents indicated a willingness to engage in these community efforts. Subsequently, participants were asked to indicate their level of potential involvement across specific social issues, rating each on a scale from 0 to 100, where 0 indicated no willingness to engage and 100 represented a very strong willingness. The results are presented in Figure 3.



**Figure 3.** Willingness to be involved in solving local social problems.

Source: own study based on the survey.



The data reveal varied levels of willingness to engage in solving specific social issues. The highest willingness was shown for disability-related issues (66,96%), discrimination (66,53%), and poverty (66,50%), indicating a strong commitment among respondents to support these areas. Violence also received a high level of potential engagement (65,75%), suggesting that safety-related concerns are a priority for residents. Moderate willingness was reported for social exclusion (63,36%) and criminality (57,73%), demonstrating that respondents are relatively open to addressing these issues, though with slightly less intensity. Lower but notable levels of willingness were observed for addictions (56,85%), unemployment (56,74%), and homelessness (55,98%), indicating that while these issues are of interest, they may be perceived as requiring more specialized or complex solutions.

Overall, the results suggest that residents are most inclined to engage in areas affecting vulnerable populations directly, such as disability, discrimination, and poverty, while issues like unemployment and homelessness, although acknowledged, elicit slightly less readiness for involvement. This distribution reflects residents' prioritization of certain social problems within the community, with a greater emphasis on inclusivity and direct support for marginalized groups.

Table 3 summarizes the results of chi-square tests conducted to examine the relationship between citizens' willingness to engage in solving local social problems and their demographic characteristics.

**Table 3.**

*Summary of the Chi-square test of independence – Willingness*

Test ID	Chi-square test Statistic	df	$\alpha$	p-value	Observation	Decision
Test I Gender	1,4	1	0,05	0,24	p-value > $\alpha$	Fail to reject the null hypothesis
Test II Level of education	6,47	4	0,05	0,15	p-value > $\alpha$	Fail to reject the null hypothesis
Test III Marital status	3,13	4	0,05	0,54	p-value > $\alpha$	Fail to reject the null hypothesis
Test IV Generation	5,33	4	0,05	0,25	p-value > $\alpha$	Fail to reject the null hypothesis

Source: own study based on the survey.

The Chi-square test of independence results show no statistically significant association between willingness to engage in social problem-solving and any of the demographic factors studied. Specifically, for gender ( $\chi^2 = 1,4$ ,  $N = 427$ ,  $df = 1$ ,  $p > ,05$ ), level of education ( $\chi^2 = 6,74$ ,  $N = 427$ ,  $df = 4$ ,  $p > ,05$ ), marital status ( $\chi^2 = 3,13$ ,  $N = 427$ ,  $df = 4$ ,  $p > ,05$ ), and generation ( $\chi^2 = 5,33$ ,  $N = 427$ ,  $df = 4$ ,  $p > ,05$ ), the p-values are all greater than the alpha level of 0,05. As a result, the null hypotheses cannot be rejected, indicating that each of these demographic factors is independent of the willingness to engage in solving local social problems. In summary, the analysis suggests that demographic characteristics such as gender, educational attainment, marital status, and generational cohort do not significantly influence residents' interest in engaging with social problem-solving efforts. This finding implies that

willingness to contribute to community-oriented social initiatives is distributed relatively evenly across different demographic groups in the population studied.

#### 4. Discussion

The studies conducted in the West Pomeranian Voivodeship offer a comprehensive insight into the perceptions of social problems held by residents, their prior involvement in addressing these issues, and their willingness to participate in future solutions. The respondents generally perceived social issues such as poverty, disability-related challenges, discrimination, and homelessness as being of moderate severity, with scores ranging from 45% to 55%. Additionally, issues such as addiction and unemployment were also perceived as significant, though to a somewhat lesser extent.

These perceptions indicate that residents are aware of the existence of a range of social challenges within their community, with particular concern for vulnerable populations and economic stability. This aligns with previous studies that highlight the awareness of social challenges among urban populations in Poland, where similar sentiments regarding social issues have been documented. Kebza (2018) discusses the socio-economic dynamics in the West Pomeranian region, emphasizing the disparities that contribute to social challenges, which resonates with the findings of the current study regarding residents' perceptions of social problems.

The willingness to become involved in the resolution of local social issues was also examined. Notwithstanding the historically low levels of engagement, a greater proportion of residents (37,7%) indicated a willingness to participate in addressing local social issues. This interest was particularly strong in areas related to disability, poverty, and discrimination, with ratings above 65%. Lower, yet notable, willingness was also expressed for tackling homelessness and unemployment. These results indicate a latent potential for civic engagement, especially in areas affecting vulnerable groups, if opportunities and support mechanisms are put in place. This finding is consistent with broader trends observed in urban studies, where community engagement is often linked to the perceived severity of social issues. In the literature, the importance of community involvement in addressing socio-economic conditions is noted, suggesting that increased awareness can lead to greater civic participation (Bąk et al., 2021).

Upon examination of actual engagement, the results indicate relatively low involvement, with only 19,91% of respondents reporting experience in activities aimed at solving local social problems. This limited engagement suggests the existence of potential barriers to participation, such as a lack of access to initiatives, an insufficient level of support for civic involvement, or other social factors that may inhibit active community participation. Similarly, according to

research results from Canada, where the implementation of smart city initiatives in small, rural, and remote communities was discussed, the actual participation rates were low, indicating a need for more structured support systems to facilitate engagement (Spicer et al., 2019). They emphasize the importance of collaboration between municipalities to enhance control over the smart city development process and ensure that data is managed according to local needs. Moreover, the integration of technology in facilitating citizen engagement can serve as a bridge to overcome these barriers, fostering a more inclusive environment for participation (Bolívar, 2018).

The findings from the West Pomeranian Voivodeship serve to illustrate the potential for social value co-creation to be an integral element of smart city development. The concept of social value co-creation suggests that residents can collectively influence the development of solutions that address the needs of their communities, thereby creating value not only for themselves but also for the wider population (Zwick, 2023). In the context of smart cities, this engagement contributes to the creation of a dynamic and responsive urban environment that prioritizes inclusivity and addresses a range of social challenges, including poverty and discrimination.

The study revealed that residents were acutely aware of the gravity of local social issues and demonstrated a notable inclination to engage in efforts to address these challenges, particularly in domains affecting vulnerable communities, such as disability, poverty, and discrimination. This interest reflects a readiness to contribute to initiatives that align with the principles of social value co-creation, which suggests that residents view themselves as stakeholders in their community's well-being. However, the low actual engagement rate indicates that this potential remains largely untapped. This reflects a broader trend in urban studies where the potential for civic engagement is often underutilized due to systemic barriers. Fostering an inclusive environment that encourages participation is essential for the successful implementation of smart city initiatives (Baran et al., 2022).

It is of the utmost importance to bridge the gap between willingness and actual engagement if smart city development is to be effective (Preston et al., 2020). The concept of a smart city is not merely an advanced technological one; it is also grounded in principles of participatory governance and social inclusivity. In this context, the willingness of residents to engage represents a valuable, yet underutilized, resource for driving socially responsive urban development. The effectiveness of smart city initiatives can be significantly influenced by regulatory environments, with the important role of policy framework in facilitating citizen engagement (Pratama, 2018). By creating more accessible, visible, and supportive pathways for residents to participate in social problem-solving, municipalities could better harness this civic energy. This approach would align with the concept of a smart city as a collaborative ecosystem, where technological and social resources are mobilized to meet the needs of all citizens, both current and future.

## 5. Summary

A Chi-square test of independence showed that there was no significant association between gender, level of education, marital status and experience in solving social problems. However,  $\chi^2$  showed that there was a significant association between generation and experience in solving social problems. A Chi-square test of independence showed that there was no significant association between, gender, level of education, marital status, generation, and willingness to involve in solving social problems.

This study examines social problem perceptions, involvement, and interest in the West Pomeranian Voivodeship. It employs a comparative analysis to elucidate the relationships between these variables. These findings collectively indicate a discrepancy between the perceived gravity of social issues, actual involvement, and the expressed intention to engage in community initiatives. Although residents are aware of the existence and severity of social challenges, their low levels of past involvement are at odds with their stated interest in future engagement. This discrepancy suggests that, although residents are aware of social issues and are open to contributing to solutions, more targeted efforts are required to translate this willingness into action. Providing accessible engagement opportunities and addressing barriers to participation could help bridge this gap, enabling the community to more effectively address social problems in the West Pomeranian Voivodeship.

The added value is gained knowledge on citizen's commitment to social value co-creation. Problems, that are considered as most severe by citizens, are addictions, poverty, disability-related issues and unemployment. Among social problems that have highest engagement (analyzed as involvement and willingness to involve) are poverty, disability-related issues and discrimination. In contrast, least level of engagement was noted for homelessness, unemployment, addictions and criminality.

Thus, results can lead to making sustainable decisions by policy-makers interested in social value co-creation with citizens in order to build a smart city for current and future generations. The findings indicate a potential avenue for the West Pomeranian Voivodeship to cultivate a more engaged community through the implementation of initiatives that facilitate social value co-creation. Reinforcing the support for resident involvement in social problem-solving would not only address the current issues but also promote the development of a sustainable, inclusive smart city environment that is continuously responsive to the evolving needs of its population.

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