

Article

Exclusion and Cooperation of the Urban Poor Outside the Institutional Framework of the Smart City: A Case of Seoul

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Abstract: Although information and communication technology (ICT) has recently revolutionized human settlements, its allocation and availability have not been evenly distributed globally. Consequently, the urban poor have often been excluded from government-driven smart city projects due to their inability to access and utilize ICT. Instead, the urban poor have attempted to forge an alternative smart city-making pathway outside institutions, in collaboration with radical social groups. Thus, this article examines the nature of the development of poor urban communities in their alternative smart city-related practices by exploring changing power dynamics and social infrastructure across the boundaries of smart city institutions. The case study of Seoul demonstrates that the urban poor can build a unique social infrastructure through radical intermediary intervention, which can improve their communal autonomy and construct a self-governing system, albeit within constraints. This article also argues that radical organizational transition can deprive these populations of opportunities to engage in various smart city-related practices, particularly those driven by the public and private sectors with speculative motives, while little or no qualitative growth of their communal autonomy has occurred within the institutional framework. Therefore, this article criticizes the double-edged ambivalence of the alternative smart city-making pathway for the urban poor, where their right to the smart city remains unachieved, despite their radical approach contributing to genuinely humanizing smart urbanism.



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Keywords: alternative smart city-making; digital divide; social infrastructure; the right to smart city; smartness

1. Introduction

The fabric of contemporary cities and human settlements is mediated by information and communication technology (ICT) and other technological systems. Castells [1] captured this idea using the concept of an informational city constructed in a complex interplay between two types of space: places and flows. The space of places is the traditional physical world of neighborhoods, where people's experiences and activities are organized around the confines of their locality [2]. The space of flows is a nonphysical world that links separate locations through electronic communication connecting activities and people in distinct geographical contexts. Such competing logics of the space of places and flows are foundational for the development of a "smart city". Fundamentally, a smart city does not simply appear in virtual networks but is transformed at the interface between physical and electronic interactions across the combined space of places and flows. However, although it facilitates the transformation of smart cities, ICT does not guarantee smartness because it does not automatically make people think or act smartly [3–5]. This indicates that a true smart city cannot be powered only by the universal development of ICT, but also by the growth of place-based communities and networks that can adapt and exploit ICT, thereby creating their own ways of living in a digitally built environment. In this light, smartness not only refers to knowledge of the efficiency paradigm for city services but, more importantly, points to the intelligence or mind of neighborhood communities that can capitalize on the paradigm shift for their local reality [6]. This calls for consideration of how people

can think and act smarter by not only using a universal concept of digital infrastructure (hard elements), such as broadband networks and cloud computing platforms, but also a place-based and contextualized idea of social infrastructure (soft elements), such as collective identity, intelligence, and people's capabilities. Particularly, as a non-digital and non-universal element, social infrastructure provides a basis for the emotional and cognitive modes of local connections, and interactions that can help build collective forms of digital capacities in communities [7–9]. Hence, constructing social infrastructure is crucial because it forms a key part of the smartness of cities, which underpins humanistic approaches to digitalization in urban processes.

However, the diffusion of digital and social infrastructure largely remains uneven at all scales [10], thereby creating a digital divide between those with access to ICT and those without [11–14]. As it encompasses technical and financial abilities to utilize available ICT, the digital divide is related to individuals and their characteristics: income and education levels, occupation, gender, and ethnicity [15,16]. Considering such intrinsic features, the digital divide generates an unbalanced supply and consumption of digital information or resources, thereby worsening inequality and injustice in everyday urban life [17,18]. This means that the digital divide can negatively influence the economic, social, political, and personal capabilities of urban populations, particularly in deprived areas. Thus, the digital divide is a complicated non-binary notion because it is no longer only a matter of access to ICT [19,20]. Although the gap in access to ICT has gradually been narrowed, different economic and social disparities have widened it in terms of the motivations, aspirations, and will to benefit from ICT [21]. The urban population in deprived areas has been unable to maximize the use of ICT, despite its improved access to ICT.

Therefore, the digital divide must be examined beyond the limited dimension of physical accessibility. Recent academic attention has been paid to various dimensions of the digital divide: people's substantive capabilities to convert ICT's advantages into concrete and tangible outcomes in their everyday practices [22–25]. For example, in studies of community development, multiple dimensions have been assessed to explain ICT use among vulnerable urban populations, such as those with low incomes or the elderly [26–28]. However, the multiple digital divide has barely been explored in terms of city-making practices within the institutional framework of a smart city. This subject warrants investigation, to obtain a more nuanced understanding of the complex influences of these institutional frameworks on the transformation of social and political capabilities of the urban poor. Using multiple dimensions of the digital divide can help to identify the complex dynamics behind their alternative smart city-making practices.

This article aims to explore multiple dimensions of the digital divide affecting the urban poor across institutional boundaries of the smart city framework, and to examine cooperation and exclusion in neighborhood improvement process, by investigating a set of collective identity, intelligence, and capability data underpinning community-based practices. By doing so, this article can provide the basis for identifying the nature of the development of poor urban communities within their alternative smart city-making practices, through a dynamic analysis of the changing power relations and social infrastructure behind the practices. Hence, it aims to fill the research gap by addressing the following questions: (1) How do the urban poor build a social infrastructure outside the institutional framework of a smart city? (2) Can building a social infrastructure contribute to the sustainable development of poor urban communities in practice? To address these qualitative questions, a case study was conducted to identify how the urban poor can build a social infrastructure outside institutions, and how a social infrastructure can affect their community-based activities within institutions.

The remainder of this paper is structured as follows. Section 2 discusses the digital divide as a factor affecting the development of social infrastructure in deprived urban areas. This section also focuses on the conceptualization of the right to the smart city, by combining it with the notion of counter-hegemonic change in the digital context. Section 3 presents the methodological framework of this study. Section 4 explores the background

of the case study and analyzes its alternative smart city-making practices by scrutinizing changing power dynamics and social infrastructure. Section 5 highlights the double-edged nature of the development of poor urban communities across institutional boundaries. Section 6 concludes by outlining the study's outcomes and limitations.

2. Conceptual Framework

2.1. Institutional Framework of Smart City and Digital Divide in South Korea

South Korea (hereinafter Korea) has led technology-driven smart city initiatives with institutional support since the early 2000s. The Ubiquitous City Construction Act (hereinafter the U-City Act) was established in 2008 to resolve transport, environmental, and health-related issues in large cities [29]. Based on the new Act, the national project "Comprehensive Master Plan on U-City" was launched, with financial support from the Ministry of Land, Infrastructure, and Transport. The project aimed to advance official guidance, regulation, and evaluation of the planning, construction, and management of U-City, thereby creating a new institutional framework for smart cities [30]. Between 2009 and 2013, approximately KRW 55 billion (USD 45 million) was invested to develop concrete strategies to foster new growth models and disseminate them through pilot studies in over 70 new towns nationwide [29]. During the national project, many local governments were able to develop ICT-based infrastructure, for example bus information systems, automated waste collection systems, and intelligent video surveillance systems, in their new development areas.

However, the U-City project began to plateau in 2014, when the overall tone of urban development policies changed from property-led redevelopment to community-based regeneration. This was because the new ICT-based infrastructure was made possible by substantial taxes on property-led redevelopment gains [31]. Therefore, the U-City Act was reformed and renamed the Smart City Promotion Act (hereinafter the Smart City Act) in 2017. Unlike the U-City Act, the Smart City Act encouraged the inclusion of more diverse stakeholders by promoting the participation of not only large tech companies but also small-medium sized enterprises, and emphasizing the improvement of social infrastructure and its digital and physical infrastructure. The aim of the new Act was to provide a legal basis for creating more local smart city strategies or programs at different scales. On the basis of the Smart City Act, many local governments have attempted to improve their old downtowns and develop new towns by integrating ICT with new urban regeneration frameworks, such as smart urban regeneration [32–34]. An example of this is the Seoul Metropolitan Government (SMG). In Seoul, a sustainable smart city scheme was established in 2017, and the Urban Digitalization Action Plan was established in 2019 [35]. In this new institutional context, the SMG has striven to localize the Smart City Act by introducing novel ideas such as smart governance, smart administration, smart living, and smart people, underpinning social infrastructure in its planning [36,37]. Consequently, Seoul has seen a growing number of new small to medium sized neighborhood improvement practices associated with ICT, such as urban living labs or crowdsourced digital platforms, in the new framework of smart urban regeneration [35].

However, such smart city regeneration approaches remain patchy and marginal in Korea's mainstream planning because the Smart City Act mainly aims to achieve sustainability and efficiency through the introduction of a digital technology system that can promote economic growth. In Korea, the Smart City Act defines a "smart city as a sustainable city where various city services are provided based on city infrastructure constructed by converging and integrating construction technologies, and ICTs to enhance its competitiveness and livability" [38]. Central to the smart city is the creation of a developed urban area that uses digital technologies and data to provide efficient services and solve persistent problems in daily life. Accordingly, digital elements are naturally foregrounded, whereas non-digital elements, such as collective norms, values, and knowledge, are easily overlooked in the mainstream framework of a smart city. Individuals and communities unwilling to conform to smart standards or incapable of doing so may be excluded from smart city construction, because of the existing economic and social disparities in the digital context of policy

implementation: the digital divide [36,39,40]. Korea is one of the best-connected countries worldwide, with high-speed Internet networks where broadband reached 86% of households in 2020, and its Internet penetration rate stood at 96.5% in 2021 [39,40]. Although the broad dissemination of smart devices has improved Internet access, traditional information have-nots still lack the ability or skill to utilize smart functions and obtain improved information [41]. This signifies that the digital divide in Korea involves not only quantitative adoption of digital devices but is also associated with their qualitative use. This qualitative aspect of the digital divide points toward its emotional or intangible dimensions, such as motivations, aspirations, and people's willingness to gain advantages from digital-related urban policy implementations. Given this, the digital divide here is a matter of existing economic and social disparities influencing smart city-related practices, particularly in deprived urban neighborhoods.

Such multiple dimensions of the digital divide are reproduced across the institutional boundaries of smart city-related practices driven by the government and its technocratic apparatuses [40,42,43]. This demonstrates that central to the digital divide is the top-down approach to policy innovation that would often prevent traditional information have-nots from active engagement in new policy implementation, while requiring them to be equipped with administrative skills. Hence, in the government-driven smart city framework, urban communities should emerge that remain powerless under top-down participatory mechanisms. Considering this, the power dynamics underlying powerless smart city-related practices must be conceptualized as an alternative to government-driven smart city projects. Hence, attention is paid to governance, which is a "structure" or "mechanism" in which power is managed, because it represents an architecture of institutions drawn from but also beyond government, i.e., non-governmental institutions of the powerless [44]. For a conceptual foundation, the following section briefly explores ideas of counter-hegemonic change and the right to the city in the digital context.

2.2. Counter-Hegemonic Change and the Transformative Right to the Smart City

The concept of hegemony was first formed in the Marxist context of the conflict of interest between the bourgeois (dominant class) and the proletariat (subaltern class). According to Gramsci [45], hegemony is a type of domination based primarily on the consent of dominant groups rather than on leader coercion and exerted force. Domination is produced by those who develop their own principles, rules, and norms, and is reproduced as common-sense values. Hence, central to hegemony is the dominant group's manipulation of the value system, which determines the beliefs and attitudes of each individual. Likewise, Gramsci distinguished between political society and civil society; the former is the realm of force while the latter is the realm of consent. He argues that "consent is not the spontaneous outcome of free choice; consent is manufactured, albeit through extremely complex mediums, diverse institutions, and constantly changing processes. Furthermore, the power to manufacture consent is not evenly distributed in society" [42]. This suggests that civil society is not a sphere of freedom but of hegemony, with consent that is manufactured, as opposed to coerced, by those with power, i.e., the dominant groups.

However, Gramsci pointed out that civil society has revolutionary potential, "disabling the coercive apparatus of the state, gaining access to political power, and creating conditions that could give rise to a consensual society wherein no individual or group is reduced to a subaltern status" [42]. Such revolutionary potential generates a "counter-hegemony" against the dominant value system. Counter-hegemony can be defined as the process by which people develop ideas to challenge dominant norms, values, and beliefs that exist outside of the individual and affect individual behaviors. As a result, a counter-hegemonic shift occurs while the previous hegemony is deconstructed and a new hegemony in the interests of subaltern groups is rebuilt. Moreover, a counter-hegemonic change entails the formation of horizontal alliances seeking to build a broad network structure against the old hegemonic historical bloc. Horizontal alliances include bottom-up organizations, such as community-based organizations, trade unions, human rights groups,

and professional associations. While strategically intervening in the dominant value system, horizontal alliances make existing power dynamics flexible and adaptable to domination, subordination, resistance, and emancipation beyond fixed power relationships. In this light, counter-hegemonic change is seen as a delicate balancing act between co-option by the dominant groups and subversion by the dominated.

Such concepts of hegemony and counter-hegemony provide a useful philosophical basis for interpreting progressive approaches to the spatial practices of cities [43,46–49]. Lefebvre [46] conceptualized socio-political dynamics in spatial production processes by analyzing hegemony in modern times. He introduced the concept of the right to the city against capitalist production of space by exploring the political aspects of urban space produced by a bureaucratic capitalist system. For him, the right to the city is not only a right to access what already exists in the city, but also a right to change it (*ibid.*). This implies that the concept does not merely refer to individual liberty to access the resources embodied in cities. Rather, it includes a multitude of rights, among them the right to differ, the right to participate, and the right to change how the city grows and develops. In this respect, the right to the city is about the ability to exercise “a collective power to reshape the processes of urbanization” [50]. Based on the Gramscian concept of counter-hegemony, the right to the city can form the basis for alternatives to dominant power relations in the creation of new urban spaces.

In the context of the smart city, the Lefebvrian conception extends beyond the right to access smart devices or services in cities; it is extended to the right to (re)produce them, creating new social relations among those who participate in smart city creation across its institutional boundaries. This novel understanding of the Lefebvrian approach is linked to “the right to information” [51], which is a holistic approach to improving the quality of everyday life in a digitally built environment by combining the spaces of places and flows through the complex intersection of human settlements and ICT [2,11]. People are more concerned with what they can do with the information they have rather than the information they can access. Accordingly, the concept enables us to move beyond the production of things in space toward the production of space, in a new knowledge society using ICT. This new mode of the right to information resonates with what has recently been put into the spotlight: the right to a smart city, where people can control the urbanization process and institute new modes of urbanization by promoting alternative and more cooperative models of communal service provision against digital capitalism [5,52,53]. The smart city here does not refer to a municipality equipped with ICT-based infrastructure provided by official institutions. It goes beyond the use of ICT and includes the optimization of non-digital elements of collective identity, intelligence, and capability of people. Therefore, the exact meaning of the right to the smart city is significantly associated with citizen-centric digital transformation, beyond Vanolo’s [54] term “smartmentality”, by rejecting government-driven smart city construction. In this sense, central to the right to the smart city here is the promotion of unproductive, unpredictable, informal, and spontaneous dimensions of urbanity against cybernetic control and post-political order [55–57]. However, such a new form of the right to the smart city does not necessarily guarantee socially just and politically inclusive production of space, because technology is never neutral but can be used socially and politically for different purposes [52]. For example, as argued by Shaw and Graham [51], the right to the smart city is easily challenged and threatened by large tech companies, such as Google, Facebook, and Amazon, or governmental bodies in cooperation with such companies, which may lead to technology monopolies. Consequently, counter-hegemonic changes for a more inclusive smart city-making may stall because the power dynamics remain unchanged, relying on the code, consent, and control of those rooted in and driven by digital capitalism rather than community mobilization.

This issue has become more evident in deprived urban neighborhoods, where residents are more vulnerable to digital capitalism, leading to deterioration of the emotional and intangible dimensions of the digital divide [53,58,59]. In this sense, Lefebvre’s revolutionary ideas in the digital context call for consideration of the three distinctive and successive

elements of civic rights:(1) the right to reclaim ICT from digital capitalism, (2) the right to build a self-governing system to (re)produce ICT-based services; and (3) the right to establish long-term shared ownership and utilization of ICT-based services away from digital capitalism. These three modes of civic rights and the multiple levels of the digital divide can be conceptually combined to draw a comprehensive development structure of the right to the smart city. The diagram below illustrates a conceptual framework of the transformative right to the smart city, articulating the notions of counter-hegemonic change and the digital divide (Figure 1).

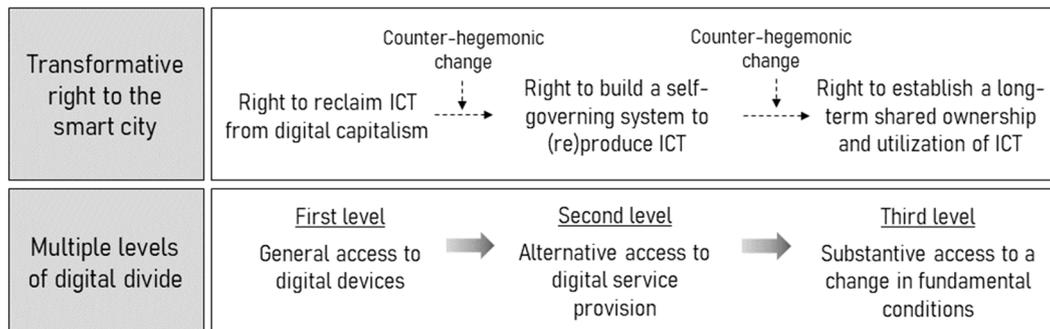


Figure 1. Conceptual framework of the transformative right to the smart city. (Source: author).

The diagram above reveals that for the urban poor in Korea, general access to digital devices can be obtained by securing the right to reclaim ICT with support from non-state and non-profit organizations beyond the influence of technology monopolies. Such a progressive approach would encourage them to pursue the right to build a self-governing system to (re)produce the reclaimed ICT. This new right can address the second level of the digital divide by creating alternative access to digital service provision. While having a more radical disposition, it is transformed into the third right, to establish long-term shared ownership and the utilization of ICT to advance revolutionary counter-hegemonic power away from digital capitalism. However, such transformative rights to the smart city do not necessarily bridge the third level of the digital divide: emotional and intangible dimensions of people’s motivations, aspirations, and willingness, because they fail to fill the existing economic and social gaps across the city, instead widening the gap. Such a conceptual framework can help with a more nuanced and analytic understanding of the changing power dynamics and social infrastructure constructed through small to medium sized smart city-related practices as alternatives to government-driven large-scale smart city projects.

3. Methodology

This study aimed to examine the nature of the development of poor urban communities in their alternative smart city-related practices, by exploring the transformation of their power dynamics and social infrastructure across the boundaries of smart city institutions. Thus, a qualitative case study approach was taken to capture knowledge and truth socially constructed in a real-life setting [60]. Attention was paid to identifying not only simple facts or details but also “social facts” [61], such as collective norms, values, or beliefs that exist outside the individual and affect individual behaviors. Social facts are central to an in-depth and multifaceted understanding of community activities among urban populations in deprived areas. Hence, the Dongja-dong area in Seoul (DJA) was used as a case study. DJA is one of the most deprived neighborhoods in Seoul, with conflicts between the government and local residents in approaches to smart city-making practice, allowing us to observe the transformation of local power dynamics and social infrastructure within community-based activities outside institutions.

Two data collections were used to conduct the qualitative research: documentary collection and in-depth interviews. A documentary collection method was used to identify

data that had already been collected and to review general issues regarding alternative approaches to government-driven smart city projects. Collected documents included codes of laws, national statistics, national and regional planning guidance, public policy papers, community reports, and academic journals. Each document was carefully reviewed as a repository of social facts [61]. Second, an in-depth interview method was employed to conduct intensive individual interviews with a small number of key informants, to explore their perspectives on alternative approaches in deprived urban neighborhoods [62]. A snowball sampling technique was used to access potential candidates for in-depth interviews because many potential interviewees were reluctant to participate. For example, although the purpose of the study was fully explained, some community workers declined official interviews. This may be because they were sensitive to official interviews about contested issues with non-governmental actors, such as the present researcher. Forty-three interviews were conducted throughout the snowball sampling process. However, conducting interviews with those from the public sector was not possible. The meaningful in-depth interviews included seven key local actors, comprising community organizers, community leaders, and local residents, rather than any public officials. Despite the limited number of in-depth interviews, their reliability, robustness, and representativeness were enhanced [63] by cross-checking previously generated findings from documentary sources and informal information from casual interviews with various local actors. Each in-depth interview was conducted in a semi-structured format with open-ended rather than formalized questions, to enable richer discussions with those involved in co-planning, co-financing, and co-managing alternative community activities [64]. Narrative data from the interviews provided complementary information that could not be captured from the documentary collection. All interviews took between 30 min and 120 min and were organized by assigning identification codes for the privacy and anonymity of the interviewees (see Appendix A for details).

4. Case Study: Dongja-dong Outside the Government-Driven Smart City

4.1. Dongja-dong with Physical, Economic, Social, and Digital Deprivation

South Korea was under authoritarian control during the 1960s to the 1980s. The regime promoted labor-intensive industries, such as textiles and garments [65] and mobilized large cities, such as Seoul, for rapid export-oriented industrialization, which caused an influx of laborers from the countryside and increased the housing supply for new laborers [66]. DJA is located next to Seoul station, one of the largest terminal stations for national railway lines and a major station on the city metro lines. Given its excellent transportation network, DJA accommodated those who were hunting for daily labor or temporary visitors who sought cheap accommodation [67]. Most houses in DJA were low-rise dosshouse types with an array of small partitioned single rooms (*ibid.*).

Entering the 1990s, a series of market-driven housing redevelopments, combined with the state's aspirations for beautification and modernization, were carried out in inner-city areas across Seoul, then the 1997 Asian financial crisis resulted in business failures and bankruptcy [68,69]. Such macro levels of socio-economic change caused massive evictions and subsequent homelessness (*ibid.*). However, DJA remained unaffected because it was not on the redevelopment list due to its low profitability. This was due not limits on new reconstruction imposed by its maximum building height of up to 20 m with five stories (interview: Community Organizer 1-a, 2019). Subsequently, low-cost accommodation in DJA remained unchanged and it accommodated evictees or homeless people. As such trends continued, DJA became popular as one of the areas where the most vulnerable people could afford to live (Figure 2).



Figure 2. Location and Images of DJA. Source: Map (Google Maps), Photos (by author, 2019).

Compared to the other areas in Seoul, DJA has relatively high levels of physical, economic, social, and digital deprivation. Overall deprivation in DJA can be briefly reviewed using demographic statistics from official surveys of Jjokbang village. “Jjokbang” refers to a tiny single room with less than 10 sq m of floor space [67], which is a typical residence type in DJA. Seoul has five major Jjokbang villages: Donui-dong, Changsin-dong, Namdaemun-5ga, Yeongdeungpo, and Dongja-dong [70]. The Jjokbang village in DJA is a medium-sized neighborhood with approximately 1000 residents. Like the other Jjokbang villages, DJA has a distinctive demographic structure (Table 1).

Table 1. Multiple Deprivation Figures in DJA. Source: [71] and interview (Community Organizer 2-b, 2022).

	Basic Livelihood Security Recipient Proportion	Registered Disabled Proportion	Aged Population Ratio (Aged 60 Years or Older)	Smartphone Penetration Rate	Internet Penetration Rate
Dongja-dong	55.1%	16.1%	48.6%	85%	30%
Seoul average	2.4%	3.9%	19.0%	91%	88%

First, it has a high proportion of beneficiaries of the National Basic Livelihood Security Program, which provides financial support to individuals whose earnings are below the minimum cost of living. As of 2015, the figure in DJA surpassed 50%, whereas the average figure in Seoul was only 2.4%. Furthermore, the DJA has several registered residents with disabilities. More than 15% of people in DJA were registered as disabled in 2015, whereas the average figure in Seoul was lower than 4%. The proportion of the elderly population in DJA is high. Although roughly 19% of the population in Seoul was aged 60 years or older, the figure in DJA was almost 50%. Despite such socioeconomic deprivation, little difference was observed in the smartphone penetration rate between DJA and Seoul (85% and 91%, respectively). This was because the National Basic Livelihood Security Program provided beneficiaries with discounted electronics rates (interview: Community Organizer 2-b, 2022). However, national programs do not cover private Internet access. The Internet penetration rate in the DJA was approximately 30%, while the average rate in Seoul exceeded 80%. Despite having their own digital devices, the urban poor in DJA struggled to make effective use of ICT-based services. Ultimately, DJA is one of the most deprived neighborhoods in Seoul, with digital deprivation and socio-economic deprivation.

Institutional efforts have been made to promote redevelopment around the DJA to prevent further deprivation. For example, in 2010, the SMG allowed the reconstruction of

existing buildings in DJA by easing the height restriction for new buildings from 20 m (five stories) to 90 m (18 stories) [71]. This was in line with a market-driven redevelopment plan for Seoul Station and its surrounding area (ibid.). Furthermore, in 2013 the SMG introduced a smart city project called “art-and-tech village” in collaboration with a large tech company called Korea Telecom. The project’s plan was to convert the old DJA Jjokbang into new cultural workshops equipped with ICT-based services. However, such institutional attempts were unsuccessful because of the resistance of the Jjokbang residents. Cooperating with diverse civic society organizations, Jjokbang residents continue to campaign against the government-driven redevelopment proposed by online platform businesses and traditional construction firms (interview: Community Organizer 2-b, 2022). Nonetheless, DJA remains a safe and affordable neighborhood for those experiencing physical, economic, social, and digital deprivation in Seoul.

4.2. Power Dynamics behind Community-Based Practices in Dongja-dong

In opposition to the proposed redevelopment, Jjokbang residents have made collective efforts to foster and sustain their communal lives in DJA. One collective effort is to facilitate the co-production and co-management of the desired communal services. Central to the collective effort was the intervention of a radical social group called the Dongja-dong area sarangbang (DJA sarangbang). The DJA sarangbang is a self-funded civic organization that aims to support Jjokbang communities against potential redevelopment in DJA. The main role of the organization is to promote the collective capabilities of the residents by helping them experiment with their own communal service provision in cooperation with other radical social groups, such as Homeless Action or the Korean People’s Solidarity Against Poverty, rather than solely relying on the public sector. Thus, it is important to examine how the power dynamics behind communal service provision have changed through intermediary intervention and how this has affected the collective identity, intelligence, and capabilities of Jjokbang residents and their social infrastructure. The diagram below shows the changing governance arrangements through intermediary interventions in communal service provision (Figure 3).

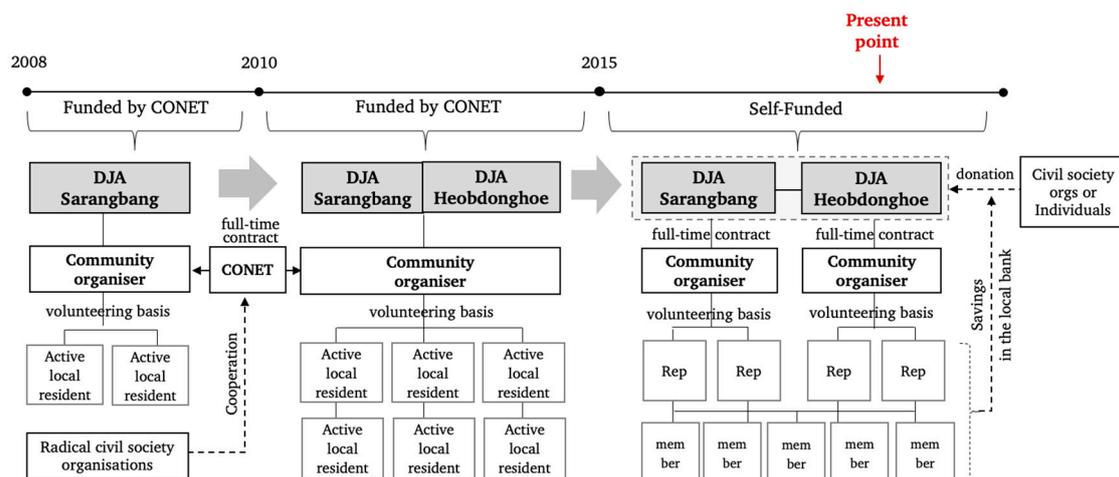


Figure 3. Changes in intermediary governance arrangements in DJA. Source: author.

The DJA sarangbang first emerged in 2008, when a civil rights activist settled in the DJA and started to organize the initiatives of Jjokbang residents. The activist was a staff member of the Community Organization Information Network (CONET), a radical civil society organization that educates vulnerable citizens and fosters their autonomy. As a full-time worker in CONET, the activist was sent to DJA to enlighten Jjokbang residents and promote their collective capabilities by challenging the dominant market- or state-led redevelopment happening around DJA. According to an interview (interview: Community Organizer 1-b, 2019), the activist formed the DJA sarangbang as a small intermediary

platform for local communication. By organizing diverse gatherings, such as potluck lunches and information-sharing meetings, the activist promoted the DJA sarangbang as a place where residents could discuss personal interests or difficulties and identify common issues in DJA. It appears that early DJA sarangbang focused on identifying a shared domain of interests and needs among Jjokbang residents.

Since 2010, the focus shifted to dealing with the shared issues identified in practice. The DJA sarangbang restructured its internal organization to take substantial practical and effective actions. For example, residents were unable to obtain loans or debit cards, or to open accounts at commercial banks due to their low credit scores. To address such problems, the DJA sarangbang decided to establish an alternative local banking system. For its operations, in 2010 the DJA sarangbang created a new internal organization called the Dongja-dong area hyeobdongheo (DJA hyeobdongheo). Unlike commercial banks, the DJA hyeobdongheo took the form of a community-based credit union through which any Jjokbang resident could make a deposit and obtain a loan, regardless of their credit history.

Another common issue is that most Jjokbang buildings are not well equipped with cooking facilities. Hence, many Jjokbang residents often made instant meals instead of home cooking meal. Correspondingly, the DJA sarangbang formed another internal organization called the Dongja-dong area sikdorak (DJA sikdorak) to run a communal kitchen where Jjokbang residents could eat affordable home-cooked lunches. During this period, the DJA sarangbang grew by expanding its scope of work and responsibilities. However, CONET remained the primary source of financial resources for the DJA sarangbang, and the community organizer was an employee hired by DJA sarangbang.

In 2015, a significant change transpired in the fiscal mechanism and the organizational configuration of the intermediary structure. First, the DJA hyeobdonghoe was repositioned in parallel with the DJA sarangbang. Two community organizers were recruited and assigned to the DJA sarangbang and hyeobdonghoe. This led to the emergence of a particular intermediary organization with a pair of teams organizationally separated from each other: the DJA sarangbang and hyeobdonghoe. This change happened because the DJA hyeobdonghoe gained prominence as the demand for local banking services increased. After the local banking system stabilized, CONET discontinued its financial support in DJA. Instead, the intermediary organization began to self-fund community activities using deposits in the local bank and donations from charities or individuals.

This progressive organizational transition enabled a more radical approach by Jjokbang residents towards neighborhood improvement. For example, when the SMG attempted to introduce the ICT-based art village plan, the DJA sarangbang and hyeobdonghoe brokered its cancellation. The intermediary organization encouraged residents to digitize their local banking system together with radical civil society organizations while capitalizing on their improved financial autonomy. Despite such progressive changes, intermediary intervention remains contested because DJA sarangbang and hyeobdonghoe have rarely been considered official counterparts of the SMG in DJA. Hence, Jjokbang residents have often come into conflict with government-driven smart city frameworks, while intermediary-led community practices have taken place outside these institutions.

5. Analysis and Discussion: Exclusion and Cooperation of the Urban Poor in Alternative Smart City-Making Practices

5.1. Intermediaries Inside versus Outside the Institutional Framework

In the case of DJA, the intermediary intervention became a platform to improve the quality of life of the Jjokbang community. However, the DJA sarangbang was not seen as an official counterpart to the SMG in DJA. Instead, an official intermediary partner called the Seoul Station Jjokbang counselling center (hereinafter, Seoul Station Jjokbang center) emerged. The Seoul Station Jjokbang Center began as part of the organization of a social service department in the Yongsan local authority in 2001 [71]. As its prominence increased, the center was handed over to the regional government (SMG) in 2013. Since then, the SMG has commissioned non-profit organizations to operate the Seoul Station Jjokbang

center and provide local residents with various social welfare services, such as medical aid, employment support, legal advice, food supplies, and basic necessities. Hence, it is hardly surprising that the SMG tended to communicate directly with the Seoul Station Jjokbang center for important decision making in the DJA. As a result, the DJA sarangbang was excluded from the decision-making processes around planning or managing publicly funded smart city-making practices affecting the Jjokbang community, as pointed out by a Jjokbang resident.

“SMG proposed a smart city project to beautify the built environment, such as streetscape improvement or interior renovation with matching funds by Korea Telecom and SMG. What upset us most was a plan to transform into a so-called art and technology village by converting old jjokbangs into new places for young artists. We neither wanted nor needed such things, but that was what they planned, for some reasons . . . The proposal was eventually cancelled due to our constant campaigning against it. Instead, in 2014, Korea Telecom opened a cultural complex equipped with ICT-based services, such as digital laundry and IPTV rooms, managed by the Seoul Station Jjokbang center. Since that point, I think the sarangbang and the Jjokbang center have started to drift apart.” (Interview: Local Resident 2, 2019)

While acting as an official partner of the SMG, the Seoul Station Jjokbang center can secure its position by joining various partnerships with the public and private sectors for neighborhood improvement projects in DJA. Official partnerships enabled the Jjokbang center to build a large pool of volunteers from neighborhood schools, supermarkets, and hospitals, because the Jjokbang center is considered a legally registered body that can sign multiple memoranda of understanding with external corporations, such as law firms and telecommunications companies. However, the reasons for external partners' participation must be examined. Several interviews (Community Organizer 1-a, 2019; Community Organizer 2-a, 2019; Local Resident 1, 2019) suggested that partner schools and hospitals encouraged their students or staff members to volunteer in DJA to earn credit for mandatory community service. This implies that external actors were involved in the partnership with a personal stake rather than with full commitment to combatting local problems in DJA. Hence, local problems are likely to remain unsolved, and the mobilization of external resources to address these problems remains tokenistic in nature. Under these circumstances, the DJA sarangbang, as a non-official partner, was given no formal or substantive opportunity to combine voluntary external resources with their radical local demands.

“In fact, large corporations like Korea Telecom or Hyundai Motors were reluctant to sponsor us (the DJA sarangbang and hyeobdonghoe), because we couldn't issue legal documents for their tax exemption benefit, for example, through the CSR (Corporate Social Responsibility) program. As a result, we've been naturally excluded from many smart city projects involving the private and public sectors.” (Interview: Community Organizer 2-a, 2019)

This confirms that intermediary intervention for smart city making also remains outside the institutional domain because it has no official or legal status in relevant urban partnerships in DJA. This signifies that the involvement of radical social groups prevents Jjokbang residents from building new relationships with external actors in the implementation processes of smart city plans or traditional city renewal schemes. However, in this context of exclusion, radical intermediary intervention also indirectly contributes to community development by promoting cooperation for physical and digital service provision. This indicates that intermediary intervention forms the basis for expanding Gramsci's horizontal alliance with wider progressive social forces by employing diverse informal counter-hegemonic practices. Thus, the following section presents the analysis of the cooperation of Jjokbang residents in the intermediary-led community practices outside institutions.

5.2. Intermediary-Led Alternatives at the Margins of Welfare

Many vulnerable Jjokbang residents live in DJA, including low-income people, older people, people who are disabled, and those who live alone. Hence, they often struggle

with social isolation or economic poverty at welfare margins. Although the SMG recently launched several digital services for these people, such as digital laundry and IPTV rooms, such institutional support does not solve fundamental problems. Correspondingly, the DJA sarangbang made alternative efforts to encourage Jjokbang residents to co-produce and co-manage communal services to improve the quality of their communal and personal lives. For example, while the alternative local bank was operating, a community-based credit union was established and its members were allowed to access an emergency loan service of up to KRW 500,000 (roughly USD 420) without any conditions, despite persistently low credit ratings. This local banking system can only cover basic services, such as deposits, withdrawals, and loans to a limited extent. However, such basic services may have benefited vulnerable local populations struggling with debt problems that can lead to a vicious cycle of poverty. In this respect, the radical intermediary intervention here served to form trust-based communities and promote the qualitative development of community initiatives in DJA. A similar intermediary intervention was found in the DJA sikdorak, which provided residents with affordable home-cooked lunches.

“I’ve lived in a Jjokbang for a long time. It’s a very tiny single room with neither a private toilet nor a kitchen, so it’s difficult for me to eat home-cooked meals . . . I couldn’t afford to eat out every day. But, I’ve got another option for lunch since the DJA sikdorak was launched in DJA. For only KRW 1000 (USD 0.8), I can enjoy a proper home-cooked meal with steamed rice, hot soup, two to three side dishes, and a dessert in the DJA sikdorak . . . Plus, if I have no cash for some reason, they let me pay them back later or just skip the fee. It’s not just me, but many others in DJA. This makes me feel that I can have a warm-hearted lunch with family or relatives”. (Interview: Local Resident 1, 2019)

It is noteworthy that the DJA sikdorak is run by locals and has not been contracted to an external food service company, i.e., the staff members are all locally resident volunteers. This system is possible because a group of residents takes turns performing volunteer work using donated funds or food from civil society organizations or individuals. Interestingly, such collective experiences have triggered the emergence of similar community-based services in DJA, such as furniture repair, cleaning, and funeral services. As many Jjokbang residents have no close family, such community-based services provide the basis for securing personal benefits and expanding their collective intelligence. Hence, this co-production of communal services improves communal autonomy outside institutions. In a digital context, local initiatives can broaden their scope while welcoming new members from outside the DJA, made possible by promoting practical information sharing and improving the sense of belonging by enhancing online and offline communication among the local population. Particularly, the DJA sarangbang encouraged them to stay digitally connected by providing free Wi-Fi in its communal areas, such as the sarangbang lounge and local kitchen. Given that the local Internet penetration rate was around 30% and smartphone penetration rate was 85%, the free Wi-Fi provision was beneficial because it allowed better electronic communication via smartphones.

“Last year, I moved to SMG-managed public rental housing in another area. It has a larger room equipped with more facilities such as a private bathroom and a sink. But, since moving in, I’ve been mentally distressed. My flat is the only public rental housing, while others are private rental or owned houses. I’ve never tried to get along with my new neighbors, because they looked like they were from the middle or upper class. It is likely that it’s only me that receives basic livelihood security money in this apartment . . . Alternatively, I’m still in touch with my friends in DJA through online chat rooms. When they access the free Internet in the sarangbang lounge, I can get them updated about me while hearing their news as well . . . For me, DJA is a spiritual home, although it’s physically far from where I actually live now, so I often come by DJA or communicate with them online at least because the people here let me feel a sense of belonging. We are just alike.” (Interview: Former Resident 1, 2019)

This implies that along with the quantitative expansion of community members, a qualitative development of community initiative also occurred through the improvement

of alternative electronic communications, although within limits. Interestingly, the DJA sarangbang recently started a regular workshop on how to use various smartphone functions, and provide free Wi-Fi (interview: Community Organizer 2-b, 2022). Furthermore, it has computerized its accounting system, streamlining the process of year-end settlement for those who donated to Jjokbang village and members of the local bank's credit union (ibid.). This means that the radical organizational transition has mitigated the second level of the digital divide by securing the right to a self-governing system of co-planning, co-financing, and co-managing digital services. That is, a counter-hegemonic change transpired through an alternative digital service provision, which contributed to building a unique social infrastructure with radical collective intelligence and identity outside the institution. Such change can be seen as a transformative process toward a "genuinely humanizing urbanism" [72] or a more emancipatory and empowering urban community in a deprived area, albeit outside the institutional framework of a smart city. Essentially, the change was an attempt to secure the right to citizen-centric digital transformation beyond smartmentality [54], by rejecting government-driven smart city construction.

5.3. Community Development Vulnerable to Digital Capitalism

However, the counter-hegemonic change remains improvised, provisional, and tactical because the new digital service provision has not been achieved through the administrative networks of the SMG but with support from radical social groups. The radical horizontal alliance served to maintain the self-governing system, but their practices were still viewed as unauthorized, unofficial, or unlicensed. This suggests that the alliance is no more than a group of minorities outside the government's legitimate remits, while the Seoul Station Jjokbang center officially represents the local voice. In this context of counter-hegemonic change, Jjokbang residents' communal autonomy can grow only within the limited network closure outside the institutional framework of the smart city. Accordingly, such community development has deprived the local population of opportunities to enter official partnerships and access government-led smart city-related practices, such as the establishment of a computerized accounting platform.

"In fact the DJA hyeobdonghoe was not a legally registered cooperative. The SMG has asked us to register so that it can officially fund or support us through its computerized system. However, once we are legally registered, we are no longer allowed to provide finance-related services, including our local banking service. For us, the alternative local bank was not something negotiable: it was essential. Moreover, SMG funding required so many administrative affairs we could hardly manage . . . So we had no option but to give up the benefits of having statutory status and maintain the banking service outside of the legal framework. As a result, we've been naturally excluded from recent digital-related projects supported by the public and private sector." (Interview: Community Organizer 1-a, 2019)

The radical intermediary intervention created a local environment where residents can enhance their digital skills and practices and shape their collective identity, intelligence, capability, and radical social infrastructure. This enabled them to feel a stronger sense of shared ownership in their neighborhoods through their own physical and digital service provision. However, the established social infrastructure is fragile and easily threatened by external forces driven by digital capitalism, because it is not supported or protected by official institutions. For example, the SMG published its 2025 Seoul Urban Regeneration Strategic Plan in 2015. This strategic plan provides an overall direction for the regeneration of major areas in Seoul, including the Seoul station zone next to DJA. In 2017, for the Seoul station zone, a detailed action plan was proposed to regenerate its neighboring areas and revitalize its local economy. Despite not being a direct target, DJA gained attention from speculative but legitimate investment agencies or developers with the expectation of spillover effects from the Seoul station redevelopment.

"A couple of years ago, SMG announced a development plan around Seoul station, including renovation of local heritage sites, modernization of traditional markets, promotion of tourist accommodation and so on . . . I think the new plan motivated the landlords

in DJA. Last year, two Jjokbang buildings were converted into commercial accommodation managed by Airbnb while one was sold to an investor seeking to open a brand-new unmanned hotel". (Interview: Community Organizer 1-b, 2019)

Such a wave of redevelopment is the result of coordinated design by a group of landlords acting collectively, together with various speculative forces, to promote large-scale housing redevelopment in the DJA.

"A few months ago, a launch ceremony for a redevelopment union nearby was organized. Since then, the union's members have had regular meetings every week and have put up a banner that reads 'For a better living environment in DJA'. I tried to sit in on the meeting, but it was impossible, because it was a member-only meeting. I found that the meetings were led by a group of landlords to promote large-scale housing redevelopment, together with housing markets and constructors . . . With hindsight, they were planning to redevelop DJA as a digitally-serviced apartment complex for young professionals working around Seoul station . . . What is worse is that the union will undergo an administrative procedure for this redevelopment, once it is agreed by the majority of its members" (interview: local resident 1, 2019).

This signifies that speculative redevelopment can emerge with collective agreement and legal permission in DJA. Under the name of a "better living environment," it can possibly eliminate local places such as tiny single rooms (jjokbangs), communal kitchens (sikdorak), common rooms (sarangbang), or local bank offices (hyeobdonghoe). Hence, from residents' perspectives, such a new redevelopment could erode their existing personal and communal lives in DJA by encroaching on the places where they live, gather, and interact. In this process, the existing communal culture in DJA will be threatened by decline or extinction. The SMG's overall direction encourages the private sector to participate in redevelopment activities with the aim of local economic growth. Unsurprisingly, partnership among speculative forces is regarded as positive, as it is willing to support and comply with the strategic plan of the SMG that promotes "digitally-friendly redevelopment" of the Seoul station area. The Jjokbang residents took no legal action against the hegemonic power of the partnership rooted in digital capitalism. However, they can make their voices heard by protesting with support from radical social groups.

Therefore, while the alternative approach has reinforced the radical form of social infrastructure underpinning emergent community-based practices, the social infrastructure has made it difficult for the urban poor to engage in various smart city-related practices, particularly those driven by the public and private sectors with speculative motives. Thus, the more actively the urban poor participate in their radical community practices, the more they are excluded from decision making within official smart city construction. In this sense, a certain dilemma exists in which the genuine growth of community autonomy is advanced outside the institutions, whereas improved autonomy hinders access to the institutional framework of the smart city. The result is that the urban poor are limited in securing their right to establish a sense of "long-term" shared ownership of their alternative physical and digital service provision, as part of their neighborhood improvement process. Although the qualitative development of poor urban communities has been achieved, their right to citizen-centric digital transformation remains unrealized. Such consideration implies that the substantive right of the urban poor to the smart city can be gradually undermined, while the established counter-hegemonic power against the dominant system of smart city construction has become precarious. This critical point is central to the development of poor urban communities through radical intermediary interventions across the institutional boundaries of Seoul's smart city framework.

6. Conclusions

This article examines the nature of the development of poor urban communities in their alternative smart city-making practices, by exploring the changing power dynamics and social infrastructure behind the practices within and outside the institutional framework of a smart city in Seoul. The analysis shows that radical intermediary intervention served

to build a unique social infrastructure and secure the right to a self-governing system of co-planning, co-financing, and co-managing digital service provision at the margins of welfare. By capitalizing on the self-governing system, Jjokbang residents can maintain flexibility in their organic community activities, while remaining free of the SMG's rules and norms. Such an organizational transition provides the basis for the development of a more autonomous mode of community initiative within the neighborhood improvement process. Hence, by reinforcing the radical form of social infrastructure, various hands-on education opportunities and technology applications, such as computerized accounting systems, can be introduced to create an alternative smart city-making pathway, although within limits.

This article also argues that the radical organizational transition resulted in fewer opportunities for community initiatives to enter an official partnership with the SMG, thereby preventing access to partnership-driven smart city projects. This means that the initiatives may experience little or no qualitative growth in communal autonomy beyond a small circle of radical social groups, and they may struggle to expand their associational membership to those within the smart city's institutional framework. Unsurprisingly, established communal autonomy has become more vulnerable to the hegemonic power of developers and investors who support and comply with the strategic plans of the SMG, aiming to redevelop DJA within official institutions. This vulnerability is considered a potential digital capitalist threat to the poor urban community, where the non-statutory status of their self-governing system has been slowly overridden by statutory digital monopolies, serving to gradually encroach on their alternative smart city-making pathway.

In this sense, a balance between hegemonic and counter-hegemonic forces has not been achieved to sustain alternative smart city making, although the counter-hegemonic force has created a local platform for the inclusion of more emancipatory and empowering urban communities, albeit outside the institutional framework of the smart city. This article argues that there exists a double-edged ambivalence to alternative smart city-making pathways for the urban poor, where their right to the smart city remains unachieved, and their radical approach contributes a step further toward genuinely humanizing smart urbanism. The findings contribute to an improved understanding of existing smart cities in inner-city areas [73], while underlining the importance of citizen-centric digital transformation through the optimization of non-digital elements beyond the smart mentality [54], applied in the neoliberal practices of smart cities.

This article has covered a single case of alternative smart city making in a deprived area of Seoul, instead of a wide range of deprived urban neighborhoods in Korea and other countries. Future study should expand the scope and provide a more encompassing framework to better understand the challenges and opportunities faced by the urban poor in emergent smart city-related practices, by situating them within a broad discourse on "digital exclusion and inclusion" [74,75] in urban processes worldwide.

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Appendix A. List of Interviewees

Sector	Identification Code	Affiliation	Interview Date	Duration (Hours)
Intermediary Sector	Community Organizer 1-a	DJA hyeobdongheo	4 January 2019	1
	Community Organizer 1-b		6 January 2019	2
	Community Organizer 2-a	DJA sarangbang	6 Janu 2019	0.5
	Community Organizer 2-b		14 April 2022	1.5
Community Sector	Local Resident 1	Local community leader in DJA	4 January 2019	1.5
	Local Resident 2	Current resident in DJA	4 January 2019	1.5
	Former Resident 1	Former resident in DJA	4 January 2019	1.5

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