The Smart Cities Controversy

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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Introduction

In a smart city, digital processing systems use data from distributed sensors in fixed sites and in moving vehicles to automate and optimize city services. Smart city systems track and manage routine operations; in so doing they also monitor people and vehicles. The leading proponents of a "smart city future" are the technology companies that sell the necessary equipment and manage smart city operations, including IBM, Cisco Systems, and Siemens. Smart cities are controversial. Critics include Adam Greenfield, author of *Against the Smart City*, and Charter for Compassion. In 2010, a smart city initiative in Vienna was among the first to apply networked digital technology to manage city operations (Buntz, 2016). Singapore, Helsinki, Zurich, Oslo, Amsterdam, New York, and Seoul are among the top smart cities today (Lai, 2022). If current trends continue, the market for smart city technology may reach $7 trillion by 2030 (Hawkins, Versace, & Abssy, 2022).

Proponents contend that smart city systems improve city services and operational efficiency, thereby saving money and improving residents' quality of life. Critics, however, warn that smart cities tend to bypass representative processes, diminish accountability for public services, collect and monetize personal data, and serve private companies and investors to the detriment of public interests.

Review of Research

Ziosi, Hewitt, Juneja, et. al. (2022) claim the smart city concerns are "network infrastructure, with the corresponding concerns of control, surveillance, and data privacy and ownership; post-political governance, embodied in the tensions between public and private

decision-making and cities as post-political entities; social inclusion, expressed in the aspects of citizen participation and inclusion, and inequality and discrimination; and sustainability, with a specific focus on the environment as an element to protect but also as a strategic element for the future." Yiftachel (1998) argues that urban planning's well-documented progressive potential should be understood as being structurally accompanied by a more sinister dark side. He develops a conceptual framework that delineates four principal dimensions: territorial, procedural, socioeconomic, and cultural, each with a capacity to influence intergroup relations. Ryan and Gregory (2019) contend that conflicts of interest and bias, economic pressure, inequalities, and privacy are the major ethical concerns of smart cities.

All fit the sociotechnical nature of this paper by discussing the ethics surrounding smart cities and urban planning, and their impact on society. While collectively the papers cover ethical concerns of smart cities and the various dimensions of life that urban planning affects, this paper extends the conversation by outlining the strategies proponents and opponents of smart cities use to advance their agendas. Many of the concerns detailed in the papers are shared with this paper.

How Advocates of Smart Cities Advance Their Agendas

Companies promise smart cities will deliver prosperity. IBM on their vision of smarter cities claims, "The opportunity presented by smarter cities is the opportunity of sustainable prosperity. Pervasive new technologies provide a much greater scope for instrumentation, interconnection and intelligence of a city's core systems. Around the world, leading cities are putting in place smarter systems" (IBM, 2015). The Welding Institute (TWI) claims smart cities "improve operational efficiency, share information with the public and provide a better quality of government service and citizen welfare" (TWI, 2022). The McKinsey Global Institute (MGI)

finds in one of their reports titled *Smart cities: Digital solutions for a more livable future*, that "cities can use smart technologies to improve some key quality-of-life indicators by 10 to 30 percent—numbers that translate into lives saved, fewer crime incidents, shorter commutes, a reduced health burden, and carbon emissions averted" (MGI, 2018). Terms like "prosperity," "improved quality-of-life," and "sustainability" are what are most often used by the tech companies to sell the idea that smart cities will have a significant, beneficial impact to society. On the surface, these terms seem to outline the goals of each of these smart city visionaries.

Companies instill a sense of urgency in the transition to smart cities. IBM claims, "As cities face these substantial and interrelated challenges, it becomes clear that the status quo – business as usual – is no longer a viable option. Cities must use their new power to become smarter. They must act now, using new technologies to transform their core systems to optimize the use of limited resources" (IBM, 2015). Siemens claims, "cities worldwide are facing significant and increasing impacts from anthropogenic climate change – and buildings and traffic are key contributors. There's no alternative to becoming more sustainable, comprehensively decarbonizing, and using natural resources more responsibly – especially to maintain a city's long-term reputation and competitiveness" (Siemens, 2015). Nokia on how smart city technology offers paths to sustainability states, "digitalization brings new ways to connect people and workplaces, accelerate the shift to more sustainable business practices and measure environmental impacts with greater intelligence built into the entire operation. There is no green without digital" (Nokia, 2022). London Premier Centre, a UK training provider whose client base involves many technology companies states in an article that smart cities are "essential for the future, especially with research saying that 68% of the earth's population will live in urban cities by 2050, so smart cities are no longer an option, with all their sustainable solutions and

development for life quality clean energy" (London Premier Centre, 2022). Thales Group claims in response to "why do we need smart cities," in accommodating population growth in cities over the next several decades, "smart city technology is paramount to success and meeting [environmental, social, and economic sustainability] goals." (Thales Group, 2022). Oracle states in a press release that "for city officials, the pandemic proved that smart city programs are imperative," citing that "65% of city leaders noted the biggest lesson learned during the pandemic was just how crucial smart city programs were for their future, 43% learned the importance of operational continuity and agility, 37% of city leaders said COVID-19 highlighted the need to invest more in upgrading core infrastructure" (Barron, 2021). Companies often cite sustainability concerns as a core reason why the smart city initiative is so urgent. The common rhetoric is that smart city systems are the necessary step in optimizing efficient usage of limited resources, and thus, securing our future. Companies, then, are making use of the climate change issue to expedite the transition to smart cities.

Companies implant a sense of perfection in the transition to smart cities. Dell Technologies claims that "technology is powering transformation in urban environments around the world. From circular economies built around sustainable energy consumption, to seamless engagement between community and government, discover the possibilities of tomorrow's digital cities, today" (Dell, 2017). Continental Corporation USA, a subsidiary of Continental AG of the automotive industry, claims that "as urban areas continue to increase in population density, the automotive industry will need to adapt to this changing landscape. From Continental's cruising chauffeur automated highway technology, to autonomous shuttles in the city, and intelligent infrastructure to assist any connected vehicle – many new technologies will work together to create a seamless mobility system" (Continental, 2021). Active Solutions, a security

IoT company, states, “with the 30,000-foot view that comes from data, leaders can deploy their resources more efficiently and effectively. The city of the future will retain constituents by offering a higher quality of life through the seamless integration of smart city technology” (Active Solutions, 2020). Japanese multinational conglomerate, Hitachi, includes in their *Vision of the Smart City* handbook, “telecommunication systems play a very important role in the infrastructure of smart cities. A plethora of networked devices interact to provide safe, convenient and environmentally conscious new services. Residents in smart cities can enjoy their lives using these services, seamlessly and without being aware of the existence of the networks” (Hitachi, 2012). Terms like “seamless,” “convenient,” and “without compromise” are often used by companies to ensure the public that these systems will not inconvenience their daily routines – a tactic convincing citizens to allow the implementation of these systems so long as they cannot distinguish change. Keeping these technologies out-of-mind and out-of-sight is another goal of these smart city initiatives.

Companies claim ethical data usage and collection. Regarding their edge AI platform for solving city challenges, Microsoft claims “Azure Percept is a comprehensive end-to-end edge AI platform with pre-built models and solution management, as well as Zero Trust security measures, to safeguard models and data” (Bernard, 2021). Ericsson argues that automation of data analysis enables ethical usage of data in stating, “automating the data analysis process could enable ethical management of large sums of data. Differential privacy (‘DP’) focuses on describing the patterns of groups within a dataset while withholding information about the individuals within it. This approach originated in academic research, ensures a higher security threshold and enables companies to gain insights more safely” (Herrera, Russo, & Gaboardi M, 2022). Schneider Electric states in their data privacy policy, “Schneider Electric and its

subsidiaries are committed to taking commercially reasonable technical, physical, and organizational measures to protect personal information against unauthorized access, unlawful processing, accidental loss or damage, and unauthorized destruction…access to personal information is provided to our staff for the sole purpose of performing their job duties. We sensitize our employees on proper use and handling of personal information" (Schneider Electric, 2023). In an effort to gain public trust, companies share how they are solving privacy challenges. This may be in the data collections process, the usage of sensitive data, or the secure storage of sensitive data.

How Critics of Smart Cities Advance Their Agendas

Critics claim smart cities will threaten democracy. Adam Greene makes the argument in his book, *Against the Smart City*, that smart cities push a thoroughly technocratic vision that is dedicated to the needs of watchfulness from the above – a prerogative of administration. He goes on to say that the smart city offers a lifestyle of consumption, convenience, and security but only for a select few (Greene, 2013). Rebecca Williams (2020) states that "because 'smart city' tech is applied to a given neighborhood, it shares the potential for discrimination rife in urban planning and public safety history and also a new power of extending those inequities to the digital worlds term that many have coined as 'digital redlining'. She continues by stating, "potential harms that flow from disproportionate use or disparate community impact include loss of opportunity, economic loss, and social determinants (dignitary harms, constraints of bias)" (Williams, 2020). Rachel Keeton (2015) states that "the planned towns and cities we now see coming up across Asia and Africa are almost exclusively for the wealthy. Unlike their socialist European forebears of the 20th Century, these developments are initiated, planned and built by the private sector, which means, simplistically: they are profit-driven. The altruistic ambitions of the previous

century's architects and town planners have been abandoned for new tools that only serve those who can afford them." She states further, "this exclusionary city-making exacerbates spatial segregation and leads to fragmented demographics. This in turn leads to higher crime rates and heightened social tensions" (Keeton, 2015). Activist Sunita Narain states at a panel regarding a smart city development in Delhi, India, "I called it Lutayan (Lutneys) Delhi. This is India's biggest gated community. Smart city was a good idea. But you (government) decided to invest in its own area which is already very clean... it is creating a huge difference between this (developed area) and the rest of the world. This idea is creating a global view that we should only ensure cleanliness of our backyard" (Narain, 2016). One major concern is that administration – governments or companies with the access to smart city big data – may become the ruling authority and influence society to their will. Another shared concern is that smart cities favor the wealthy, further segmenting society which may lead to more issues.

Critics claim smart cities threaten the right to privacy of citizens. In discussing privacy concerns, Brad Smith states "the entire concept of smart cities lies in data collection. That is, the collection of data in every facet of a city, from traffic to pedestrians to crime to education, and the list goes on…how can citizens maintain a right to privacy when their privacy in itself is constantly being threatened, if not destroyed entirely" (Smith, 2020). Naveen Joshi at Allerin claims "Smart cities constantly collect large volumes of data using cameras and sensors for numerous applications such as traffic monitoring and safety... constant camera surveillance will lead to the establishment of a 'big brother'-esque surveillance state. Also, continuous data collection helps government authorities understand every aspect of their citizens' lives." He also mentions "data security is another major issue that is associated with collecting data for smart cities. Large data vaults are prone to various cyber-attacks" (Joshi, 2019). Sidewalk Labs, a

subsidiary of Google, shutdown a smart city Toronto smart city project during the COVID-19 pandemic. Leading up to the cancellation, they experienced significant backlash for their data collection practices. Roger McNamee, a prominent investor that was among the leadership of this project, sent a letter to the Toronto City Council asking to abandon the project due to his privacy concerns. He states in his letter, "the 'smart city' project on the Toronto waterfront is the most highly evolved version to data of what Harvard professor Shoshana Zuboff calls 'surveillance capitalism'… Google's goal is to increase efficiency by converting all human experience into data, using that data make behavioral predictions that it can sell to marketers, and then using its algorithms to nudge human behavior in directions that favor its business…it will claim the right to exploit the data it collects in any way it sees fit" (McNamee, 2019). Nathan Daniels (2022) argues, "the huge amounts of data these cities collect and process pose serious privacy risks. These include, among others, the following: Facial recognition can be used to track innocent civilians, smart meters give unprecedented information about households and their appliances, smart devices could (accidentally) spy on people in their own homes, self-driving cars need to collect and share a lot of data on our exact location and 'transport habits,' smart transportation systems can track passengers' movements, social credit systems can serve to shame people and make their lives unnecessarily difficult, even because of minor violations" (Daniels, 2022). Surveillance, spying, and unethical data collection are major concerns for critics and believe companies will make use of the data in self-serving ways, taking full advantage of citizens' privacy.

Critics claim smart cities will result in the loss of skills and jobs. Prasanna at APlusTopper argues that "since the citizen of these smart cities will rely almost entirely on electronics and networks, they will lose autonomy in their decision-making and could become

incompetent. They would not be able to react appropriately in a scenario where these tools are not usable" (Prasanna, 2022). Ryan and Gregory (2019) argue that "while there is a widespread promotion of Safety Instrumented System (SIS), there is concern that the technology may replace humans in many areas of the smart city. Many people fear that SIS will replace customer service, driving, and factory jobs within the coming decade…smart cities need an intellectual infrastructure to deploy SIS, becoming hubs for technological innovation and advancements, which may subsequently lead to a 'brain-drain' in rural areas" (Ryan & Gregory, 2019). Dr. Tina Kempin Reuter (2020) argues smart cities "often lead to less meaningful and impactful citizen participation" and that "software-based and computational forms of participation do not have the same implications on quality of life, community-building, and sense of belonging as face-to-face interactions" (Reuter, 2020). Sennett (2013) argues that "the risk is that new technologies might repress the inductive and deductive processes people use to make sense, for themselves, of the complex conditions in which they live. The smart city would then become a stupefying smart city" (Sennett, 2013). Michael McGuire shares a similar sentiment in stating, "we cease to have to 'work out' how to use and interact with the city and it is at that point where what he calls 'stupefaction' begins. But rather than stupefaction—which implies mere bewilderment or a (temporary) loss of sense, I argue that there may be deeper and longer lasting impacts. The smart city may stultify far more than it stupefies—that is, it may so actively denude and erode our traditional capacities to use urban space that its citizens (literally) become stupid" (McGuire, 2018). Critics suggest that the lack of complexity that individuals will need to bear in solving challenges may lead to incompetence, and that this over-reliance on smart systems may lead to the complete loss of skills. Some even fear that a significant portion of the workforce will become unemployed as a result of implementing these new systems.

Critics claim smart cities primarily serve the interest of its vendors which is to maximize profits. Dr. Tina Kempin Reuter argues "smart cities hand over an increasing number of public functions to private actors who compete for highest profit instead of pursuing the greater good" (Reuter, 2020). An excerpt from an earlier quote by Rachel Keeton stating "these developments [smart cities] are initiated, planned and built by the private sector, which means, simplistically: they are profit-driven. The altruistic ambitions of the previous century's architects and town planners have been abandoned for new tools that only serve those who can afford them," similarly highlights the profit-driven motive (Keeton, 2015). Adam Greene argues in his book, *Against the Smart City,* that "the notion of the smart city in its full contemporary form appears to have originated within these businesses, rather than with any party, group or individual recognized for their contributions to the theory or practice of urban planning," with reference to IBM, Cisco and Software AG, all of whom profit from big municipal contracts (Greene, 2013). Charter for Compassion argues that smart city schemes are inflexible and deterministic, and will stimulate commodification and data monetization (CFC, 2013). The critics' concern arises from the fact that these companies are driven primarily by profits, and not the greater good of the public.

Conclusion

Smart cities are highly controversial. Vendors of smart city technology make up the majority among the advocates of smart cities. They attempt to convince the public of a smart city future by promising prosperity, seamless integration, and ethical standards in data collection and usage, while highlighting the urgency of its adoption in securing the future. Critics attempt to dissuade the smart city initiative by emphasizing its threat to democracy and privacy, the potential loss of skills and jobs, and dishonest, profit-driven motives of its vendors. Further work

in assessing the validity of these claims on both sides would offer substantive conclusions on determining the place smart cities should have in society.

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