Social Acceptance of Smart City Projects: Focus on the Sidewalk Toronto Case

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INTRODUCTION

In recent years, the movement toward implementing smart city projects has gained momentum around the world (Camero and Alba, 2019; Cugurullo, 2020; Toli and Murtagh, 2020). For example, in Copenhagen (Denmark), big data is used for energy management and technological innovations (Bjørner, 2021; Ipsen et al., 2019). In Barcelona (Spain), information technology mitigates the serious problem of insufficient parking space (Lanza et al., 2016; Sotres et al., 2019).

While these initiatives have gained momentum, there remains some major challenges: One is the issue of social acceptance of the projects. Specifically, there have been scattered cases where citizens have negative attitudes toward smart city projects and those business operators, including company and government officials (e.g., Ji and Chan, 2020; Keymolen and Voorwinden, 2020; Shimizu et al., 2021b). Factors associated with the degree of social acceptance include trust in business operators and the perceived risk, benefit, necessity, and fairness (e.g., Iliopoulos et al., 2020; Kim et al., 2019; Shimizu et al., 2022; Sonnberger and Ruddat, 2017). The lack of trust in the business operators significantly impacts on the decline in social acceptance (Corsini et al., 2019; Julsrud and Krogstad, 2020; Shimizu et al., 2021a). We undertake a detailed examination of the relationship between trust and social acceptance of smart city projects.

PURPOSE AND METHODS

We focus on the case in Toronto, Canada (called Sidewalk Toronto) as one of the representative examples where a lack of trust led to strong citizen opposition. Sidewalk Toronto is a large-scale smart city project by Toronto Waterfront Revitalization Corporation (Waterfront Toronto), which selected Google's sister company, Sidewalk Labs, as the development partner. Waterfront Toronto and Sidewalk Labs aimed to implement smart city in a section of the Waterfront area (i.e., Quayside). There are two main reasons for selecting Sidewalk Toronto as the focus of this research. First, Sidewalk Toronto has been extensively discussed in previous studies as a representative example of a large-scale smart city project whose decline in social acceptance may have caused its cancellation (e.g., Keymolen and Voorwinden, 2020; Tenney et al., 2020; Zhang et al., 2022). Second, although Sidewalk Toronto is a public utility, the development involved the sister company of Google, a global data giant with a head office outside of Canada. When a company strongly pursues its own interests, people generally become suspicious of a project and have difficulty trusting it (e.g., the company is deceptive; Bhattacharjee et al., 2017; Silver et al., 2020). In addition, there might be a distrust that the individual data acquired from Quayside would be misused or leaked to an unspecified audience by Sidewalk Labs, further reducing social acceptance. Therefore, we focus on Sidewalk Toronto case and examine the relationship between trust in business operators and social acceptance.

TABLE 1 | Summary timeline of the Sidewalk Toronto case.

Date (m/d/y)	Event
3/17/2017	WT launched a call for business operators to develop Quayside
10/16/2017	Sidewalk Labs became a partner company
2/2/2018	Sidewalk Labs announced a public engagement plan
3/20/2018	The first roundtable was held
5/2/2018	The Canadian Press published an opposing article on Sidewalk Toronto
5/3/2018	The second roundtable was held
8/14,15/2018	The third roundtable was held
10/5/2018	Muzaffar resigned from the Digital Strategy Advisory Panel
12/8/2018	The fourth roundtable was held
2/15/2019	Sidewalk Labs was criticized for trying to reduce taxes/costs
2/25/2019	#BlockSidewalk began an opposition campaign toward Sidewalk Toronto
4/16/2019	CCLA filed a lawsuit against the governments and WT
6/24/2019	WT released a draft of Sidewalk Labs MIDP
10/31/2019	WT announced compliance with all laws and data will remain in Canada
5/8/2020	Sidewalk Labs withdrew from Sidewalk Toronto

Note. WT, Waterfront Toronto; CCLA, Canadian Civil Liberties Association; MIDP, Master Innovation and Development Plan.

Our assessment of Sidewalk Toronto details the history of interactions between the business operators and citizens to determine the impact of a lack of trust on the decline in the social acceptance. We also discuss what points should be considered by business operators of smart city projects to enhance the social acceptance. A case study provides a valuable opportunity for assessing the contextual background with a wide range of mediating variables (George and Bennett, 2005; Noble and Smith, 2015). Therefore, a case study analysis is the appropriate method to use in this research. We reviewed the data from various sources, such as press releases, online reports, and academic papers that addressed the case of Sidewalk Toronto. Specifically, we examined a wide range of materials published by the government, Waterfront Toronto, Sidewalk Labs, the citizens' group #BlockSidewalk, the human rights group Canadian Civil Liberties Association (CCLA), and the media, such as the Canadian Press. Meanwhile, methodological limitations will be described later. In this study, we provide a new perspective for studies that aim to broadly identify the determinants of social acceptance of smart city projects in a variety of fields such as environmental science, urban planning, and psychology.

DETAILS OF SIDEWALK TORONTO

The following section details Sidewalk Toronto and the relationship between business operators and citizens in this project, and the timeline of events is presented in **Table 1**. On March 17, 2017, Waterfront Toronto launched a call for business operators to develop Quayside. Sidewalk Labs was selected as the development partner. Specifically, the goal of this project was to create a city that is both sustainable and expected to grow economically by using the latest technology throughout the region, including advances in housing and mobility (Sidewalk Labs, 2021). In addition, the project aimed to capture and utilize a wide range of individual data, including the citizens' daily travel routes and usage history of

public facilities (Sidewalk Labs, 2021). On February 2, 2018, Sidewalk Labs announced the public engagement plan and held its first roundtable on March 20, 2018. Citizens at the meeting expressed opinions such as "data collection should be transparent and based on sufficient consensus (Waterfront Toronto, 2020)." On May 2, 2018, the Canadian Press published an opposition article to Sidewalk Labs' plan. The article argued Canadians risk that their individual data will be collected under laws outside Canada (The Canadian Press, 2018a). However, during the second (May 3, 2018) and third (August 14 and 15, 2018) roundtables, very limited responses were given to the citizens regarding the management of data containing personal information (Boisvert, 2018; Wylie, 2018).

Subsequently, the resignation of Saadia Muzaffar from Waterfront Toronto's Data Strategy Advisory Panel occurred on October 5, 2018 (The Canadian Press, 2018b). Saadia Muzaffar strongly criticized Sidewalk Labs for not adequately discussing the topic of data management at the roundtables. At the fourth roundtable held on December 8, 2018, citizens expressed their concerns and lack of understanding of the operation of the non-profit organization managing the data (Waterfront Toronto, 2020). On February 15, 2019, the Canadian Press published an article criticizing Sidewalk Labs for its efforts to reduce property taxes/development costs and to receive some profits from rising land prices, instead of investing money in their proposed Light Rail Transit (i.e., the new form of energy-efficient tram transportation; The Canadian Press, 2019a).

Considering the above issues, the #BlockSidewalk began opposition activities on February 25, 2019. On April 16, 2019, the CCLA filed a lawsuit against the national, provincial, and municipal governments and Waterfront Toronto. On June 24, 2019, Waterfront Toronto released a draft of the Master Innovation and Development Plan (MIDP), which was produced by Sidewalk Labs. The MIDP included a policy to expand the project's implementation area and Waterfront Toronto expressed some concerns over the expansion policy (The Canadian Press, 2019b). On October 31 2019, Waterfront Toronto announced that all the individual data will be stored in Canada and that Waterfront Toronto will comply with all existing and future laws (Waterfront Toronto, 2019). However, Waterfront Toronto's attempts to appease community sentiment were in vain. On May 8 2020, Sidewalk Labs withdrew from Quayside, stating the COVID-19 pandemic delayed the project and caused it not to be profitable anymore.

DISCUSSION

Trust and Social Acceptance of Sidewalk Toronto

The vital relationship between trust in business operators and social acceptance of Sidewalk Toronto can be summarized as follows. Initially, it is believed that there was distrust that the individual data, including the citizens' daily travel routes and usage history of public facilities (Sidewalk Labs, 2021), would be misused or leaked to an unspecified audience by Sidewalk Labs, the sister company of Google. Next, as the project gradually progressed, the following three concerns were considered to have arisen. The first concern

involved data management. Citizens were concerned that the individual data acquired by Quayside would be stored in the U.S. (where Sidewalk Labs is based) and Canadian laws would no longer apply. The second concern involved the execution processes. Citizens were concerned that Sidewalk Labs did not provide sufficient and sincere answers regarding data management. The third concern involved monetization methods. Citizens were concerned that Sidewalk Labs may be able to influence public authority over its policies, as demonstrated by its requests to reduce property taxes/development costs and expand the project's implementation area. As a result of these major concerns, the original distrust in Sidewalk Labs seemed to amplify, further reducing the social acceptance of the project. The mechanism by which trust in business operators and concerns by citizens interact should be examined in more detail in future research.

How to Increase the Social Acceptance of Smart City Projects

An important strategy for enhancing the social acceptance of smart city projects is to increase the trust in business operators. As suggested by many previous studies (e.g., Corsini et al., 2019; Julsrud and Krogstad, 2020; Shimizu et al., 2021a), trust is strongly related to social acceptance, and business operators should strive to gain trust from the citizens. Additionally, the lack of trust was related to diverse concerns by the citizens (data management, plan execution processes, and monetization methods). Therefore, we suggest the following three strategies to effectively increase social acceptance. The first suggestion is to handle individual data in a rigorous manner, following the laws of the citizens' country. Business operators should ensure that the data is effectively managed within a framework that is safely protected by the laws of the local country, irrespective of that of other countries.

The second suggestion is to implement projects transparently. The perceived integrity of business operators is significantly associated with higher levels of trust (Bronfman et al., 2012; Kitt et al., 2021). When a large amount of personal information is obtained and utilized in smart city projects, trust between the business operators and citizens is very important for a smooth implementation. Therefore, it is important for business operators to respond with integrity and not ignore the citizens' concerns. In addition, monitoring and disclosure of all activities of the business operators by a third-party organization may also contribute to increasing social acceptance.

The third suggestion is to ensure an appropriate scope of public authority by the business operators. When a business operator has an excessive public authority, it is easy for citizens to be concerned that the project implementation will proceed to benefit only the operator. Unlike solitary localized public works, smart city projects are often large-scale and are closely associated

with the daily lives of many citizens. Therefore, it is important to moderate the rights of the business operators to limit their authority. In addition, if the operators are strongly pursuing their own interests, the citizens can form negative attitudes toward them (Bhattacharjee et al., 2017; Silver et al., 2020), and become concerned that the benefits enjoyed by citizens may be greatly reduced.

Limitation and Future Directions

We did not conduct interviews with multiple stakeholders, such as the citizens of Toronto. Interviews with a variety of stakeholders would provide more meaningful data to investigate their subjective responses and should be conducted in the future. In addition, we excluded the information that is not available on the official websites of each stakeholder. Moreover, our survey was limited to a single case study, Sidewalk Toronto. Focusing on one case study can be problematic: Researchers are more likely to focus on a case with particular and/or rare outcomes which are not general representative cases (George and Bennett, 2005; Noble and Smith, 2015). Accordingly, future assessments should compare the case of Sidewalk Toronto with other smart city projects to improve the generalizability of our findings.

We focused on Sidewalk Toronto, where the lack of trust in the business operators declined the social acceptance of the project. To increase the social acceptance of smart city projects, the results indicate that business operators should rigorously handle individual data, transparently implement projects, and provide an appropriate scope for the public authority. This research provides new perspectives for a wide range of research areas (e.g., environmental science, urban planning, and psychology) that aim to enhance the social acceptance of smart city projects. This research is also meaningful for business operators who work with the community. Future research will compare a variety of cases using interviews with citizens residing in cities with failed/successful smart city projects.

AUTHOR CONTRIBUTIONS

YS, SO, TH, and KK contributed to the conception and design of the study. YS wrote the first draft of the manuscript. YS, SO, TH, and KK contributed to manuscript revision, read, and approved the submitted version.

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