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Trust and the Smart City:

The Hong Kong Paradox

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ABSTRACT: Based mainly on a Hong Kong-wide survey carried out in March-April 2021, while also drawing on a round of stakeholder interviews from July 2020 to December 2021, the article interprets the linked phenomena of trust and the smart city in the specific context of the Hong Kong Special Administrative Region. In the main body of the article, four angles are used to understand facets of trust-smart city relations, centred on characteristic trust, trust and technology, the role of intermediaries, and trust in government. The main findings of the survey centre around the data trust paradox (of high support for technology in a low-trust environment), the social impact of trust and mistrust (strongly correlated with age and political affiliation), and trust in the smart city as a weathervane of trust in government. Factors such as a digitally literate population, a decades-long investment in technology, and a substantial record of delivery provide solid reasons to believe that a strategic-technical narrative on the smart city might succeed where others have failed to convince.

KEYWORDS: trust, smart city, Hong Kong, data, technology, narrative.

Introduction

The article endeavours to interpret the linked phenomena of trust and the smart city, focusing on the public support for the smart city in a context of diminished public trust in Hong Kong. The main data source is that of a territory-wide, randomised telephone survey with a sample size of n. 808 among Hong Kong residents, conducted by the Public Opinion Research Institute (PORI) in March-April 2021.[1] We also refer, where appropriate, to the corpus of 25 oral and written semi-structured interviews from July 2020 to December 2021, organised on the basis of a purposive sample, as well as to government documents, written statements, and the rich literatures on both trust and the smart city.

Why link trust and the smart city? Trust (and its corollary mistrust) lies at the heart of debates regarding contemporary governance, including in its urban dimensions. The Organisation for Economic Co-operation and Development (OECD) (2017: 3), for example, has argued that "governments cannot function effectively without the trust of citizens, nor can they successfully carry out public policies, notably more ambitious reform agendas." A smart city (sometimes known as the digital city) refers to a city that uses information and communication technologies (ICT) to enhance the quality and performance of urban services. Rather than primarily involving a narrow set of technical issues, debates over the smart city get to the heart of the public sphere, as they involve issues of public trust (in data processes and outcomes), transnational learning, co-construction, and ethical dilemmas. In other words, the smart city is enmeshed in the dynamics of a trust-technology nexus, both in general terms and in specific places such as Hong Kong.

Following from the OECD's 2017 report cited above, one central argument developed in this article is whether public acceptance of policy requires a form of "thin trust." Newton (2007: 394) defines "general social trust" as having an impersonal quality because "much social interaction is between people who neither know one another nor share a common social background." Expanding upon Newton,

1. The target population was Cantonese-speaking Hong Kong citizens aged 18 or above. Data was collected from a random sample of 808 respondents. The survey period was from 24 March to 16 April 2021. The survey was based on a random sample, with attitudinal questions formulated in a standard 1-10 format (to provide continuous data), along with nominal or ordinal scales for the demographic data (generation, gender, income, social class, trust profile, positional types). The weighting method was rim-weighted, according to figures provided by the census and statistics department. The gender-age distribution of the Hong Kong population was determined from the "midyear population for 2020," while the educational attainment (highest level attended) distribution and economic activity status distribution came from *Women and Men in Hong Kong – Key Statistics* (2020 Edition).

we reformulate thin trust as a belief that the equity, transparency, and neutrality of a public policy lies at its foundation as a public good (Stafford, Cole, and Heinz 2022). Thin trust is diffuse; it is closer to confidence (Earle and Siegrist 2008) than interpersonal trust, in that it represents a general statement of benevolence towards government in the abstract. There is an implicit contrast with thicker forms of interpersonal trust, based on individual relationships. Thin trust strengthens the acceptability of public policy, especially in the field of trust-enabling technologies (Xu et al. 2014) that require the active participation of consumers in sharing data. Public acceptability raises issues as broad as trust in technology (its ease of use, will it work?), trust in the digital environment (issues of accountability, privacy, security, and confidentiality of data), experiences with digitalisation (are citizens protected from arbitrary algorithms?), and finally attitudes towards providers (do people trust companies, or governmental authorities with their data?).

Drawing upon the rich trust-based literature, we argue that levels, properties, and types are of particular relevance for understanding trust in general, and the linkage between the trust-technology nexus and the smart city in particular. Levels are understood as being individual, intermediate, and institutional (Zmerli and Newton 2011), while the properties associated with trust are those of honesty, benevolence, and competence (Whiteley et al. 2016). The main focus of this article is to investigate types of trust. Adopting a multiple-method and multi-level approach to understanding trust and the smart city, we argue that there are four types of trust in terms of interaction with technology in general, and the smart city in Hong Kong in particular: (i) characteristic trust, (ii) data trust, (iii) trust in the intermediaries of the smart city, and (iv) trust in government. The article's main finding is that the smart city reflects deeper attitudes towards the Hong Kong public authorities, forming the trust paradox that characterises Hong Kong: the residents of the Special Administrative Region display high support for technology in a low-trust environment. Before discussing the findings of our survey pertaining to each of the four levels of trust, the next sections discuss the peculiar relationships between trust, technology, and the smart city in the literature and in the context of Hong Kong.

Trust and the smart city: Defining a relationship

Across the social sciences, trust has long been identified as an essential component of social, economic, and political life. Since the 1990s, as Newton (2007: 342) notes, there has been an "explosion of interest" in the concept driven by its perceived decline and reengagement with concepts of social capital (Putnam 1993; Fukuyama 1995; Seligman 1997; Braithwaite and Levi 1998; Warren 1999; Hardin 2002; Uslaner 2002; Zmerli and Hooghe 2011). Trust is perhaps one of the most contested and nebulous concepts within contemporary academic research. Levi (Newton 2007: 343), noted that trust "is not one thing and it does not have one source; it has a variety of forms and causes." For current purposes, trust ought to be understood as a generic term to describe dynamics taking place at different levels of analysis. The trust literature allows a fairly precise operationalisation, especially relating to the three levels of trust of Zmerli and Hooghe (2011): individual, intermediate, and institutional. Each type of analysis carries a distinctive contribution and the stakes of each are high: psychological wellbeing, civil society, trust in government.

For its part, smart city is an essentially contested concept, open to contrasting interpretations, epistemological underpinnings, and methodologies. The term "smart city" was first employed in the book entitled *The Technopolis Phenomenon* in 1992 (Gibson, Kozmetsky, and Smilor 1992), and it has been used in different contexts ever since (Patrão, Moura, and Almeida 2020). At its inception, it was employed in the United States to present the increasing application of information and communication technology (ICT) in modern urban infrastructures in the 1990s. Smart city appears as an umbrella definition (Patrão, Moura, and Almeida 2020). In a narrow sense, the smart city is centred around the presence of ICT, which is used to enhance efficiency and address city development challenges, including safety and ageing populations (Akande et al. 2019; Sharifi 2019; Patrão, Moura, and Almeida 2020). Broader definitions (Dameri 2012) place citizens, quality of life, and human value in the smart city concept, in addition to pure technology. Smart city is indeed multifaceted, and thus until now there is still no general agreement and standard definition of the term (Albino, Berardi, and Dangelico 2015; Sharifi 2019; Patrão, Moura, and Almeida 2020; Sharifi 2020).

Understanding the smart city invites the use of plural perspectives and mixed or multiple methods. One strand of the literature uses orthodox hypothesis testing approaches to endeavour to explain the core characteristics of the smart city (Hartley 2021). Smart city is not the preserve of quantitative analysts, however. A recent conference organised around the trust and the smart city project in Barcelona[2] illustrated the diversity of methodological approaches adopted, including longitudinal interview-based case studies in the field of waste management and urban design in Israel,[3] participant observation on the use of smart apps in market trading practices in Indonesia,[4] and critical perspectives in the tradition of post-structuralism.[5] Smart city is a multifield domain that is particularly apposite for literature review to identify the sources of the smart city concept and address the eventual gaps in the literature (Ruhlandt 2018; Twizeyimana and Andersson 2019). Indeed, such is the attention given to smart city in 2021 that the sub-field of smart city indexes is thriving (Sharifi 2019; Patrão, Moura, and Almeida 2020). These approaches are all legitimate for understanding the complex object of the smart city; to varying degrees, they also raise the question of what the smart city narrative leaves out.

Trust, technology, and the smart city in Hong Kong

We distinguish between trust-enhancing and trust-enabling technology (Wong and Chu 2020). Trust-enhancing technology lies in the realm of public policy and includes attributes such as

2. Alistair Cole and Émilie Tran, "Panel on Trust in the Smart City," *International Conference of Public Policy*, Barcelona, 8 July 2021.
3. Lahat Lili and Regev Nathansohn, "A Bottom-up Perspective on Smart City Initiative: Trust, Distrust, and Citizenship Regime," *International Conference of Public Policy*, Barcelona, 8 July 2021.
4. Arif Budy Pratama, "When Trust Coexists with Mistrust: The Immediate Effect of Smart Technology Utilisation in Traditional Market Levy Payment on Trust in Urban Governance," *International Conference of Public Policy*, Barcelona, 8 July 2021.
5. Ali Abu-Yasein, "Smartwashing Displacement: Israel's Silicon Wadi, Jerusalem's Palestinians, and the Ethical Perplexities of Smart City Inc.," *International Conference of Public Policy*, Barcelona, 8 July 2021.

transparency, openness of government, and freedom of information, while trust-enabling technology requires input by citizens. The Hong Kong vision has mainly been of the trust-enhancing variety. Public trust is accorded (or not) as a judgement on the purpose of government in developing and deploying technology. Hence the importance of coherent narratives around the smart city, necessary to convince the public of the government's benevolent intentions.

A belief in technology comes as close as any other to representing a consistent story or overview of the history of the Hong Kong Special Administrative Region (HKSAR). There has been an embrace of digitalisation as a governmental project since the inception of the Special Administrative Region. A case in point is Hong Kong's Octopus card, a smart card used in the region's passenger transportation system since 1994, deemed a success story of the e-cash payment system (Chau and Poon 2003). The history of the smart city development case in Hong Kong can be traced back to the initial Digital 21 Strategy of 1998 (Holliday and Kwok 2004). In 2006, the HKSAR government introduced the One-stop Government Portal – GovHK, an internationally recognised portal that won critical and professional acclaim (the Best-in-Class Award [Government] in the Interactive Media Awards in 2011, 2012, 2014, 2015, and 2016; the Standard of Excellence Award in Web Marketing Association's Web Award in 2012, 2014, 2015, 2016, and 2017) (Manoharan et al. 2020). The Hong Kong Government is regularly the recipient of awards for the best practice of government to business (G2B) services, including the Electronic Service Delivery Scheme (ESD), which provides 38 different public services through 11 governmental agencies.[6] Many examples of good practice were provided in interviews, as well as in the literature. One historic example was the website for the Environmental Impact Assessment ordinance (EIAO) by the Environmental Protection Department (EPD). An interactive map of Hong Kong was introduced on the website for the information of designated projects, allowing the community to submit comments (Sinclair, Peirson-Smith, and Boerchers 2016).

In December 2020 the Hong Kong Government published the second edition of *The Smart City Blueprint for Hong Kong* (original December 2017).[7] The blueprint proposes measures to build Hong Kong into a world-class smart city and makes recommendations with regard to six major smart areas of mobility, living, environment, people, government, and economy. With regards to smart city ranking, the picture is rather mixed. According to the Spanish IESE Business School's Cities in Motion Index, Hong Kong ranked 27th in the world in 2017 and rose to 10th in 2020 amongst 174 cities and 80 countries around the world, effectively becoming the 3rd in the Asia-Pacific region, after Tokyo and Singapore.[8] The Smart City Observatory's Smart City Index, however, placed Hong Kong 37th in 2019, 32nd in 2020 and 41st in 2021. In the digital domain too, Hong Kong's performance varies greatly from one indicator to another. Hong Kong ranked 2nd in the World Digital Competitiveness Ranking 2021; the Digital Intelligence Index of December 2020 ranked the HKSAR third after Singapore and the United States in terms of progression of the digital economy. When it comes to digital trust, however (defined "as the leap of faith and the confidence that causes users to exercise a choice to interact, transact, and consume online"), the picture is more mixed. Out of 42 economies, the HKSAR ranks 2nd for digital trust behaviour (consumer use of technology, social media, e-commerce, and mobile payments), and 3rd for digital trust experience (quality of user experience in the digital trust environment), but it ranks only 20th for digital trust environment (accountability, privacy, and security), and a low 34th position for digital trust attitudes (how citizens, givers of trust, feel about their experiences with digitalisation).

To sum up, the Hong Kong Special Administrative Region is a highly digitalised global economy and its residents are overwhelmingly digital consumers; however, that does not mean that Hong Kong residents necessarily trust the digital environment in which they live and work. Our survey suggests the opposite. We argue that whereas Hong Kong residents adhere to the vision of a smart city, they do not trust the HKSAR government because of overarching ethical considerations, as Ip and Cheng show in this special issue. Hong Kong policymakers who have to implement the smart city vision find themselves in a low-trust state (Hartley and Jarvis 2020), making their task extremely complex.

Hence the very object of investigation – trust and the smart city – is underpinned by a conundrum, whereby generally positive attitudes towards the smart city are mediated by more divided views towards smart city intermediaries, first and foremost public authorities in which trust is generally low. Is trust in technology more powerful than the underlying mistrust in the Hong Kong government? If so, the Hong Kong SAR government would be right to promote a potentially consensual "apolitical" narrative of the technological public good. Insofar as it has difficulty embodying what it sets out to describe, smart city is not especially heuristic, as it blurs other, more fundamental dynamics. If so, what are these dynamics? What is really going on that is blurred by the smart city? We return to this question in the conclusion after exploring how the layers of trust inform attitudes to the smart city in Hong Kong.

Trust and the smart city: Levels of analysis

Smart city is unlikely to mobilise the first type of interpersonal, or primary trust. It is true that some researchers have conceptualised and measured trust in technology as if the technology were human. They have measured technology trust using the human-like trust constructs of integrity, ability/competence, and benevolence (Wang and Benbasat 2005; Vance, Elie-Dit-Cosaque, and Straub 2008). Even if we accept the mainstream position that trust does not exist between humans and technologies (Friedman, Khan, and Howe 2000; Schneiderman 2000), the individual level nonetheless makes sense both in direct (relationship to technology) and indirect (attitudes towards providers or public authorities) terms. Individuals are concerned by questions of data trust and literacy. The rate of adopting new technologies varies among different segments of society. Integrating new technologies in the daily management and operations

6. Shailendra C. Palvia and Sushil S. Sharma, "E-government and E-governance: Definitions/Domain Framework and Status around the World," *International Conference on E-governance*, https://www.researchgate.net/figure/Palvia-and-Sharma-Framework-for-e-Government-versus-e-Governance_tbl1_268411808 (accessed on 13 May 2022).
7. "HK Smart City Blueprint," https://www.smartcity.gov.hk/node/1.html (accessed on 2 August 2021).
8. "Cities in Motion Index Survey," *Cities in Motion Blog Network*, 27 October 2020, https://blog.iese.edu/cities-challenges-and-management/2020/10/27/iese-cities-in-motion-index-2020/ (accessed on 29 October 2021).

of civic functions – a core component of smart city development – is becoming a global trend. While sociodemographic, attitudinal, and contextual factors all affect citizens' acceptance of the use of new technologies in the age of the smart city, there has been little analysis of the development of the smart city from the trust perspective. This article aims in part to analyse how trust, mistrust, and demographic factors affect citizens' understanding and acceptance of smart city technologies in Hong Kong in the areas of recent smart technologies, including LeaveHomeSafe, Smart Lampposts, 5G, and governmental apps such as iAM Smart.[9]

At one level removed, intermediate trust is appraised at the level of the community and service providers. Who delivers digital public services? Can they be trusted? How far do groups in civil society invest themselves (or not) in the theme of smart city? What is the attitude towards the providers of public services? This delivery dimension links with the property of *trustworthiness*, which usually refers to honesty, integrity, and benevolence and is taken in the literature as an adequate descriptor for these three dimensions (Mayer, Davis, and Schoorman 1995: 717-20; Fisher, van Heerde, and Tucker 2010). It is tested in the survey by questions about public (HKSAR government, local authorities), private (firms), and hybrid (public-private partnership, nongovernmental organisation) providers. These questions enquire not just whether government is entrusted with this sphere, but also whether there are strong reservations about nonlocal companies providing digital services connected with the smart city, or indeed about all providers and types of provision. Doubts about trustworthiness can be associated with other survey questions alluded to below, such as those on data security and privacy. This dimension also encompasses discussion of smart government, insofar as public administration is the main provider of smart city services. Indeed, *trustworthiness* also provides the prism for reconstituting salient themes of the interviews that were conducted from July 2020 to December 2021 as part of the project. In general, interlocutors were very unwilling to engage with ideas of Hong Kong's past, present, and future in the context of the events – the 2019 movement against the extradition bill, the 2020 National Security Law – that provided the backdrop for our empirical data collection.

Finally, our third level of analysis concerns whether trust (or mistrust) in the smart city is a proxy for other, more fundamental beliefs, such as mistrust of government. Why might the smart city *not* be trusted? Could this be explained by distinct characteristic-based trust profiles? Is it linked to processes of data trust (or processes of datafication of society) that follow from the application of smart technologies and apps? Or is data trust quite simply an epiphenomenon: in this interpretation, the forces of trust and mistrust articulated in relation to the smart city are fundamentally expressing other dimensions of social and political life. This effort of interpretation is important, as it has the capacity to define the object in distinct manners, namely: trust or mistrust in *technology per se* (does it work?); trust in providers (are they *trustworthy*?); trust/mistrust in technology as *process* (does it endanger or guarantee liberties)?

Trust and the smart city: Findings from Hong Kong

The article is organised in a way that investigates four levels of trust in terms of interaction with technology in general and the smart city in Hong Kong in particular: (i) characteristic trust, (ii) data trust, (iii) trust in the intermediaries of the smart city, and (iv) trust in government.

Level 1: Characteristic trust

In the literature, characteristic-based trust is underpinned by social similarities, such as ethnicity or gender. Zucker (1986: 63) affirms: "The greater the number of social similarities, the more interactants assume that common background expectations do exist, hence trust can be relied upon." In the survey, respondents were asked whether they trusted members of their family, friends, and neighbours, as well as people with another nationality, different religious beliefs, and those met for the first time. Trust in family members was strongest, followed by trust in peers (a phenomenon decreasing with age). Trust in neighbours was more divided, the younger age cohorts displaying a deeper level of mistrust. Trust in people with another nationality is a non-issue for most Hong Kong residents. Hong Kong residents confirmed their open reputation in these answers. In this scheme religion is not important, as there is a large tradition of tolerance. And there is no particular opposition to people one meets for the first time. Characteristic trust per se does not appear to be driving broader attitudes to the smart city, and any extrapolations must be interpreted with caution. There appear to be no striking differences according to gender, professional occupation, income, religious belief, or locality, although age, place of birth, and political loyalty did appear to be significant indicators in some respects.[10]

There appear to be no significant relationships between general trust profiles and support for the development of Hong Kong as a smart city, however, at least as measured by the question: "How much do you support or oppose developing Hong Kong into a smart city?" The main predictors (of support for developing Hong Kong into a smart city) lie elsewhere. In terms of the linear regression analysis undertaken (see Table 1), the main predictors of support for developing Hong Kong into a smart city (the dependent variable) were mainly related either to qualities of the smart city[11] or to dimensions of the smart city blueprint.[12] As for the only explicitly trust-centred question appearing in the stepwise regression analysis, there was a negative correlation between support for the development of the smart city and the right to protect personal privacy[13]. In the dataset, there is a correlation between support for the Hong Kong government and development of the smart city in Hong Kong.[14] The older age cohorts (more than

9. iAM Smart is the name of the governmental app that provides individuals with a single digital identity and authentication method to obtain online government services (e.g., driving licence) and conduct commercial operations (e.g., payment for government services).
10. Age and political loyalty are referred to in a number of the subsequent tables. Interestingly, those born in Hong Kong were much more likely to mistrust the HKSAR government than those born in mainland China (48.80% for the former, 21.50% for the latter).
11. In the stepwise regression, explanatory value is accorded to the propositions "Smart city will save time," "Smart city will save money," and "Smart city will allow the opening up of the electricity market." Technology-focused questions also appear as predictors ("Advantages of technology outweigh the disadvantages") as did specific apps (LeaveHomeSafe app) and support for civil society providers.
12. The smart city blueprint programs also appeared in prominent position, in order: smart government, smart people, smart economy, and smart living.
13. We observe a negative correlation (-0.121***) between [Q8e] Right to protect private privacy and [Q5] Support for the development of Hong Kong into a smart city.
14. We found a positive correlation (0.629**, significant at the 0.01 level, two-tailed Pearson correlation) between [Q7a] Trust in the Hong Kong government and [Q5] Support the development of Hong Kong into a smart city.

Table 1. Support for developing Hong Kong into a smart city: Stepwise regression analysis

Variables	1	2	3	4	5	6	7	8	9	10	11	12
Constant	3.093*** (0.158)	1.682*** (0.183)	0.929*** (0.201)	0.324 (0.216)	0.039 (0.220)	1.000** (0.345)	0.971** (0.340)	0.947** (0.337)	0.863* (0.336)	1.001** (0.339)	0.907** (0.339)	0.983** (0.340)
Make city safer	0.648*** (0.025)	0.444*** (0.028)	0.396*** (0.027)	0.321*** (0.029)	0.270*** (0.030)	0.252*** (0.030)	0.238*** (0.030)	0.185*** (0.034)	0.181*** (0.033)	0.188*** (0.033)	0.187*** (0.033)	0.164*** (0.035)
Importance of smart government		0.378*** (0.032)	0.275*** (0.033)	0.263*** (0.032)	0.231*** (0.032)	0.226*** (0.032)	0.196*** (0.032)	0.188*** (0.032)	0.182*** (0.032)	0.180*** (0.032)	0.133*** (0.032)	0.155*** (0.033)
Importance of smart people			0.241*** (0.032)	0.210*** (0.031)	0.189*** (0.031)	0.211*** (0.031)	0.177*** (0.032)	0.162*** (0.032)	0.148*** (0.032)	0.148*** (0.032)	0.154*** (0.033)	0.135*** (0.032)
Technology brings more good than harm				0.201*** (0.032)	0.182*** (0.031)	0.184*** (0.031)	0.172*** (0.031)	0.155*** (0.031)	0.137*** (0.031)	0.146*** (0.031)	0.141*** (0.031)	0.131*** (0.031)
Save time					0.156*** (0.033)	0.167*** (0.032)	0.16*** (0.032)	0.151*** (0.032)	0.142*** (0.032)	0.142*** (0.032)	0.143*** (0.031)	0.124*** (0.033)
Right to protect personal privacy						-0.121*** (0.034)	-0.144*** (0.034)	-0.134*** (0.033)	-0.133*** (0.033)	-0.133*** (0.033)	-0.14*** (0.033)	-0.15*** (0.033)
Importance of smart economy							0.134*** (0.031)	0.141*** (0.031)	0.135*** (0.031)	0.141*** (0.031)	0.131*** (0.031)	0.134*** (0.031)
Importance of technology to cope with pandemic								0.091** (0.027)	0.085** (0.027)	0.095*** (0.027)	0.085** (0.027)	0.080** (0.027)
Willingness to NGOs									0.085** (0.032)	0.098** (0.032)	0.092** (0.032)	0.082* (0.032)
Opening electricity market to promote smart grid										-0.065* (0.025)	-0.066** (0.025)	-0.066** (0.025)
Importance of smart living											0.088* (0.035)	0.087* (0.035)
Save energy												0.069* (0.032)
R Square	0.555	0.647	0.681	0.703	0.715	0.721	0.730	0.736	0.739	0.743	0.745	0.748
Adjusted R Square	0.554	0.646	0.679	0.700	0.712	0.718	0.727	0.732	0.735	0.738	0.740	0.742
Standard Error	1.792	1.597	1.521	1.469	1.441	1.425	1.403	1.390	1.382	1.375	1.368	1.363
F	684.437	502.404	388.059	322.123	272.610	234.293	209.823	188.575	170.310	155.592	143.366	132.732
Significance	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N	550	550	550	550	550	550	550	550	550	550	550	550

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Source: Hong Kong Public Opinion Research Institute, Trust in the Smart City Survey, 30 April 2021.

65 years old) trust the Hong Kong government, and support the development of the smart city.[15] On the specifics of the smart city, finally, there is a relationship between trust profiles, age, and certain attitudes: notably, those interviewees who trust their neighbours and people whom they meet for the first time tended to agree more with the statement that "Smart city will make the city safer."[16]

Finer-grained analysis of the survey suggests some other relationships: there are negative correlations between trust in friends and the delivery of services by Chinese companies,[17] as well as a mistrust of the LeaveHomeSafe app, while trust in neighbours correlates strongly with support for provision of services by civil society associations.[18] Friendship networks appear to sustain peer group influences, especially amongst the youngest cohorts, who, at the time of the survey, expressed mistrust of governmental smart apps and the influence of mainland companies. In terms of trust, these positions can

15. There was a less powerful positive correlation (0.139**, significant at the 0.01 level, two-tailed Pearson correlation) between [DM3gp_Agegp] Age and [Q5] Support the development of Hong Kong into a smart city. More powerful was the positive correlation (0.305**, significant at the 0.01 level, two-tailed Pearson correlation) between [DM3gp_Agegp] Age and [Q7a] Trust in the Hong Kong government.
16. There is a positive correlation (0.221**, significant at the 0.01 level, two-tailed Pearson correlation) between [Q6d] Smart city will make the city safer and [Q13c] Trust in neighbours. If the interviewees trust their neighbours, they tend to agree more with the statement that smart city will make the city safer. The correlation coefficient is one of the few statistically significant positive correlations between trust positions and smart city attributes.
17. We observe a negative correlation (-0.19) between [Q13b] Trust in friends and [Q7e] Trust in Chinese companies; and another negative correlation between [Q13b] Trust in friends and support for the LeaveHomeSafe app (-0.066). Neither are statistically significant, however. In contrast, there is a strong positive, statistically significant correlation (0.661**) between support for Chinese companies and the LeaveHomeSafe app.
18. There is a positive correlation (0.224**, significant at the 0.01 level, two-tailed Pearson correlation) between [Q13c] Trust in neighbours and [Q7g] Provision of smart city services by NGOs.

be mapped against other attitudes – but there are no really distinctive trust types based on trust profiles. This conclusion strengthens the argument that attitudes towards technology in general and smart city in particular are not a simple translation of impermeable characteristics of trust. On the other hand, the ensuing analysis demonstrates that the factors of age and political loyalties are important nodes for understanding broader attitudes related to trust and the smart city.

Level 2: Data trust

Our survey reveals strong correlations between the values of thin trust (defined as general trust in government and the effective implementation of policies); perceptions of the importance of smart city components, and the support for developing Hong Kong into a smart city (a governmental policy).

Table 2. Thin trust, smart city components and support for the development of Hong Kong as a smart city: Pearson correlations

	[Q1a] Thin trust	[Q1b] Trust in experts	[Q3a] Smart mobility	[Q3b] Smart living	[Q3c] Smart environment	[Q3d] Smart people	[Q3e] Smart government	[Q3f] Smart economy	[Q5] Support for Hong Kong as a Smart city
[Q1a] Thin trust	1	0.249**	0.368**	0.182**	0.329**	0.137**	0.354**	0.132**	0.353**
N	806	802	804	804	804	804	805	803	804

Source: Hong Kong Public Opinion Research Institute, Trust in the Smart City Survey, 30 April 2021.

While there is a indicates general support for the development of Hong Kong into a smart city, public opinion did not grasp the smart city blueprint, the centrepiece of the smart city policy. In our survey, we asked the question: speaking overall, how well do you understand the contents of this smart city blueprint? Fully 41% of the sample did not understand the question at all, and only 8% ventured a positive answer. On the basis of a 1-10 scale, the mean was only 2.6, signifying a very low understanding of the official governmental statement (see Table 3).

The survey illustrated an apparent paradox. There was little comprehension of the concept of the smart city as defined in the HKSAR blueprint. Nevertheless, there was also a constant position in favour of most of the component dimensions of the blueprint (mobility, living, people, and environment, a bit less concerning government and economy). This apparent contradiction nonetheless directly poses a challenge for a technical public discourse: a proud record in the field of digital services does not automatically transform itself into a convincing public message. The conclusion of one interviewee (HK13, 22 February 2021) was that "We need to have narratives that keep educating people on how tech can create real meaning for citizens."

In a recent article, Hartley (2021) reports the findings of a survey (n. 1,007) into public trust in and political legitimacy of Hong Kong smart city initiatives in the period leading up to the introduction of the National Security Law. The study finds that trust in smart city mechanics and governance associates positively with support for smart cities. It also revealed a moderately high level of confidence in the potential benefits of smart cities. On the other hand, the survey disclosed concerns about privacy and participation opportunities that resonate with our own findings. Smart public services assume a widespread public acceptability of and engagement with technology. The survey we commissioned demonstrated a highly specific relationship to technology. Hongkongers appeared at ease with the new technologies (as measured by the response to questions on 5G, mobile apps, and the general belief that technology is a force for progress). This fits the evidence – for example, from the Cities in Motion Index Survey (see note 8) – that Hong Kong is one of the most connected places in the world. Unsurprisingly, a majority of respondents (over 50% of respondents, with 17% "strongly agree") considered that technology brings more good than harm.

Table 3. Trust and technology questions: Means and standard deviations

Trust questions	Mean	Standard deviation	Interpretation/curve
"Technology brings more good than harm."	6.6	2.4	Widespread public acceptability of technology.
"I welcome it if the government collects my personal data to improve its service."	4.3	3.4	M-shaped distribution. A majority objects to the idea that government collects personal data, even if it is for good reason.
"Everyone should have the right to protect personal privacy."	8.9	1.8	Almost all Hong Kong citizens believe they should have the right to protect personal privacy.
"It is acceptable to me that service providers collect my personal data to improve services provided to me."	4.5	2.8	M-shaped distribution. A majority have a negative view of this statement, but it remains more acceptable than government collecting data.
"If it is possible to use the same account to log in to online services of different government departments, I would like to register for it."	5.4	3.2	There are three clusters: those with no strong opinions; those who will not use the online services under any circumstances, and a similar number of citizens who consider the single account as an incentive to use online services.
"Using smart technology to collect data will infringe my privacy."	6.0	2.9	The question expresses a majority concern that using smart technology will infringe privacy.
"How satisfied or dissatisfied are you with the development of electronic identity card?"	4.9	2.7	Electronic identity does not polarise opinion in the same way as other "governmental" apps.

Source: Hong Kong Public Opinion Research Institute, Trust in the Smart City Survey, 30 April 2021. These options are all drawn from this survey. The higher the mean, the more support is offered to the proposition. The larger the standard deviation, the more distinct positions can be identified in the data.

Though generally favourable to technology, public opinion was more divided in relation to applications of technology that involve public authorities. Opinion was deeply split on whether to use the LeaveHomeSafe app, developed by the Hong Kong government as part of the anti-Covid-19 tracing process. The territory-wide survey also revealed that public opinion was divided on the merits of the single digital identity (iAM Smart) and the electronic identity (ID) card. Most citizens had no strong opinions towards the single digital account as the determining factor for using online services, but one group of citizens would not use the online services under any circumstances, and a similar number of citizens were actively enthusiastic, valuing convenience above considerations of privacy. Likewise, the principle of the electronic ID card was considered neutral by a central group (29%), but the measure also raised strong opposition from a minority of citizens (14% declaring they strongly disagree with the electronic ID card). Among the most dissatisfied Hong Kong citizens were those between 18 and 29 years old (more than 40%), those holding a bachelor or postgraduate degree (more than 27%), and those who politically identified themselves as localists (more than 53%).

Let us look in more detail at two controversial – and emblematic – measures: the LeaveHomeSafe application, part of Hong Kong's endeavour to cope with the Covid-19 epidemic, and smart lampposts. Consistent with the focus on age and political loyalty, the survey revealed sharp divisions in relation to the two key variables of age and political orientation. There was a significant positive correlation between the LeaveHomeSafe app and age group.[19] The older the interviewees were, the more important they believed it was to use the LeaveHomeSafe app to cope with the epidemic. Young age cohorts (18-24, 25-34, 35-44), the more educated (the holders of bachelor and postgraduate tertiary degrees) (more than 43%), and those aged 18 to 34 years old (more than 50%) were less likely to consider the LeaveHomeSafe app important. Above all, there was a clear political cleavage, whereby respondents with pro-establishment views believed the LeaveHomeSafe app was very important, but localists were vigorously opposed (around 60% of the localists considered the LeaveHomeSafe app to be unimportant). Without falling into the trap of overinterpretation, the youngest age cohorts were the least likely to trust the government, while pro-establishment voters were clearly driven to support governmental policies, in the field of health and more broadly.

Opinion was even more spectacularly divided in relation to smart lampposts. Part of the government's smart city initiative, smart lampposts is meant to measure traffic conditions, weather information, and air quality data, as well as monitor illegal dumping and provide free Wi-Fi services. Survey respondents from the pro-establishment camp strongly supported the installation of smart lampposts, while respondents from the pro-democracy and localist camps strongly opposed it. There was a significant positive relationship, moreover, between smart lampposts and age group, indicating the higher the age, the more supportive residents were of smart lampposts. In contrast, well-educated interviewees in the younger age cohorts were much less supportive towards smart lampposts.

While these two emblematic policies provoked clear political cleavages, there was a more widely diffused sense of opposition to the government collecting personal data (much more so than in the case of private companies). In the statements about privacy, the most obvious and consistent opinions of Hong Kong citizens were that, although technologies produced more benefit than harm, everyone should have the right to protect their personal privacy. There was strong opposition to the idea that the government might collect personal data, even to improve public services. The great bulk of citizens believe they all have "the right to protect personal privacy in all circumstances," a firm statement strongly supported by 88% of respondents. This statement had the highest mean and the lowest standard deviation of any of the data trust questions, indicating that almost all citizens believe they all have the absolute right to protect personal privacy.

In a variation of this question, the survey asked whether respondents would welcome the idea that the government should collect data to improve its services. The similar pattern of opposition calibrated in part to age reemerges, but the most significant finding related to political identification; only those respondents identifying themselves as pro-establishment agreed with the statement, indicating a much more diffuse sense of unease/mistrust faced with central data collection.

These latter findings (cleavages based on age and political orientation) are linked to the overarching question of trust and the smart city. One informed observer recalled the difficulties with smart lampposts, emblematic of these concerns:

> I was involved in the smart lampposts technical ad hoc committee. Smart lampposts have a lot of things. They call it a smart furniture of the city. With smart lampposts, we can take care of a lot of information that we have never had a chance to collect before. But people just don't trust the system, they just don't trust that you are so transparent or open to them. We have everything ready, but the trust is one important element that is missing. I did not anticipate that. Trust is so important at this moment. (Interview HK06, 18 November 2020)

The questions addressed in this section all point in the same direction: that of a concern for personal privacy, a general mistrust of government (more deeply rooted than that of nongovernmental providers), and a suspicion about the uses the government might make of data, a fear not fully extending to other intermediaries of the smart city.

Level 3: Trust in the intermediaries of the smart city

The third trust dimension involves trustworthiness, especially as apprehended via the intermediaries of the smart city that are the public (HKSAR government, local authorities), private (firms), and hybrid providers of smart city services. Trustworthiness typically refers to the qualities of honesty, integrity, and benevolence and is taken in the literature as an adequate descriptor for these three dimensions (Mayer, Davis, and Schoorman 1995; Fisher, van Heerde, and Tucker 2010).

19. There is a positive correlation (0.269**, significant at the 0.01 level, two-tailed Pearson correlation) between [Q4] LeaveHomeSafe and [Q13c_DM3b_Agegp] Age group.

Table 4. Trust in governmental authorities and the smart city: Means and standard deviations

Question	Mean	Standard deviation	Interpretation
Trust government (in general) to implement policies	7.0	2.8	Thin trust: a belief in equity, transparency, and neutrality of a public policy lies at its foundation as a public good. A general statement of benevolence towards government in the abstract.
Experts know the best	5.2	2.5	Trust and confidence in advisers and experts.
Trust HKSAR government to develop the smart city	4.6	3.2	Public opinion is steeply divided, with the strongest positions around strong distrust (21%) and the median position (23%). A third, smaller group (9%) expresses maximum trust in government.
Trust Legislative Council to develop the smart city	4.1	3.1	The structure of public opinion is very similar, except that the Legislative Council is the most distrusted institution (22% "distrust very much").
Trust district councils to develop the smart city	4.5	2.7	The district councils also demonstrate a low level of support, though it is higher amongst the youngest age cohorts and those with localist or pan-democratic beliefs.

Source: Hong Kong Public Opinion Research Institute, Trust in the Smart City Survey, 30 April 2021. These options are all drawn from this survey. The higher the mean, the more support is offered to the proposition. The larger the standard deviation, the more distinct positions can be identified in the data.

What do we expect to find? In terms of trust *in providers*, more generally, the questions aimed to ask not just whether government is trusted in this sphere, but also whether there are strong reservations about specific providers or types of provision. The following sequential order is established in the survey (from highest to lowest levels of trust): community organisations and civic associations, locally-funded companies, foreign-funded companies, public-private partnerships, district councils, the HKSAR government, Chinese-funded companies, and the Legislative Council. Table 5 presents an overall picture whereby Hong Kong residents broadly support the role of community and civic organisations in the field of smart city services, but are much more divided in relation to mainland Chinese companies (for the private sector) and the role of government (in terms of public provision).

Table 5. Trust and mistrust in community organisations and NGOs in delivering smart city services: Means and standard deviations

Question	Mean	Standard deviation	Interpretation
Trust locally funded companies to develop the smart city	5.3	2.4	In terms of trust and distrust, Hong Kong citizens have no settled views on locally funded companies.
Trust Chinese-funded companies to develop the smart city	4.2	3.1	Chinese-funded companies are more divisive, with opinion structured into two equal clusters of extreme distrust or no particular viewpoint.
Trust foreign-funded companies to develop the smart city	5.0	2.3	Hong Kong citizens are neutral towards foreign-funded companies.
Trust community organisations and NGOs to develop the smart city	5.4	2.2	Citizens veer towards expressing trust in community organisations and NGOs.
Trust public-private partnership to develop the smart city	4.7	2.7	Attitudes towards public-private partnerships are influenced by broader attitudes towards government.

Source: Hong Kong Public Opinion Research Institute, Trust in the Smart City Survey, 30 April 2021. These options are all drawn from this survey. The higher the mean, the more support is offered to the proposition. The larger the standard deviation, the more distinct positions can be identified in the data.

Looking at the mean and the standard deviation measures, it can be observed that organisations related to politicians, governments, and the mainland usually have lower means and higher standard deviations, which suggests the lasting consequences of the last decade of social movements in Hong Kong. Citizens in general have no specific view of locally-funded companies either in terms of trust or distrust. They are benevolent and generally neutral towards foreign-funded companies. In contrast, Chinese-funded companies are subject to more controversy and division. The result shows two equal clusters: those expressing distrust and those with no particular view towards Chinese-funded companies.

There were also sharp distinctions on political grounds for support or opposition to public-private partnerships. While localists deem these to be quasi-governmental (hence not worthy of trust), pro-establishment supporters demonstrate majority trust (because these are guaranteed by the government). Hence, that leads us to discuss the findings of our survey on the fourth and last level of trust, that is in the government.

Level 4: Trust in the government

Trust in public authorities and providers rests upon a paradox. The basic precept that the smart city requires a diffuse "thin" trust is

clearly supported in the survey (Table 1 and Table 2). The values of thin trust (trust in government and effective policy implementation and perceptions of importance of the six smart city components) (Newton 2007; Stafford, Cole, and Heinz 2022) are all significant factors in influencing support for developing Hong Kong into a smart city. If this proposition supports the legitimacy of government in general, there are serious doubts about the legitimacy of the Hong Kong government.

Trust and mistrust in government has spurned a vast literature that surpasses the current exercise (Stafford, Cole, and Heinz 2022). The decline of trust in government everywhere has become a dominant narrative within both the contemporary academic literature and the media. Evidence for the perceived crisis in trust is frequently provided by national and international surveys: for example, the 2020 Edelman Trust Barometer reported a "trust paradox" where strong economic performance was accompanied by a stagnation of trust in key institutions, such as government and the media.[20] Furthermore, the coronavirus pandemic that swept over the world from early 2020 refocused attention on trust – both in terms of the impact of the presence or absence of trust for governmental policy responses and the impact of the pandemic on existing levels of trust (Devine et al. 2020; Scraff 2020; Jennings et al. 2021).

The distrust of Hong Kong residents towards the SAR government is fairly clear, in this and other surveys[21] (Hartley 2021). Trust in the government of Hong Kong was recorded to be very low during the 2019 protests against the anti-extradition bill (anti-ELAB), though it has recovered somewhat as the Covid-19 crisis has worn on.[22] We guide the reader to the dense published literature on the events in 2019-2020 (Chung 2020; Jones 2020; Lee 2020; Lee et al. 2020; Yeoh 2020; Zamecki 2020; Lüqiu 2021; Stott et al. 2021). Further to PORI's polls on people's trust in the HKSAR government, our study has revealed that citizens distrust the Legislative Council more than the Hong Kong government itself. We might draw the conjecture either that this dissatisfaction relates to the weight of contextual variables of the 2019 anti-ELAB movement and aftermath, and the growing clout of the Chinese Communist Party-state, the role of specific individuals, and the removal of the opposition members; or that it reflects a minimal view on the functioning of the Legislative Council in this field (of the smart city) and its lack of visibility. A similar structure of distrust – fractured on lines of age and political orientation – is demonstrated in the case of the district councils. How do we interpret the apparent mistrust towards the district councils? Is this because their powers have been hollowed out? Or because of the record of the councils elected in 2019? Or because district councils would not typically carry out these sorts of services?

Discussion and conclusion

The main findings of the survey centre around the data trust paradox (whereby there is high support for technology in a low-trust environment), the social impact of trust and mistrust (strongly correlated with age and political affiliation), and the status of public trust in the smart city as being an epiphenomenon (or as an empty signifier).

In relation to the first of these findings, the core question is whether trust in technology is more powerful than the underlying mistrust in the Hong Kong government. In their distinction between trust-enabling and trust-enhancing technologies, Wong and Chu (2020) rightly conclude that the success of the former depends on constructing convincing narratives. The consensus from the interviews was of the absence of a genuinely joined-up narrative. For one interviewee, for example:

> The narrative is overwhelmingly tech-driven, but we do not reflect on the meaning of technology in the context of all this smart city development. We need to have a purpose, we need to have a framework, so that policymakers, and importantly, the citizens, can understand the purpose of where we are broadly going into, and how technology can impact our life (HK 13, 22 February 2022).

Such a question appeared to have been integrated by the HKSAR government itself, which promoted a potentially consensual narrative of the technological public good. Public trust is not an absolute obstacle to government action and governance capacity, as demonstrated by the case of the management of Covid-19. Covid-19 represents a systemic "wicked problem" that is far more sensitive to securitisation narratives (and the security-driven consensus these imply) than the smart city, a multifaceted, amorphous, and essentially contested concept. Insofar as it has difficulty embodying what it sets out to describe, smart city is not especially heuristic, as it blurs other, more fundamental dynamics.

What are these dynamics? The survey revealed the social impact of the trust-mistrust nexus, played out in the continuing social divisions in Hong Kong society. The main body of the article adopted a multi-level (and multiple method) approach to understanding trust and the smart city. Although profiles based on *characteristic trust* did not provide many pointers for the more complex issues of datafication, age and political loyalty emerged as important intervening variables, whereby the mechanics of the smart city were viewed through the prism of broader issues of public trust and loyalty towards (or opposition to) the Hong Kong Special Administrative Region government. *Data or digital trust*, second, revealed the (paradox) whereby Hong Kong residents were simultaneously ultra-connected and adept at technology, yet mistrusting towards governmental applications and control over data freedom. Third, views towards intermediaries reaffirmed the distinction between governmental and nongovernmental providers; there was considerable controversy over the use of personal data and frank opposition to the government collecting data, even to

20. "2020 Edelman Trust Barometer Spring Update: Trust and the Covid-19 Pandemic." https://www.edelman.com/research/trust-2020-spring-update (accessed on 8 June 2021).
21. PORI (Public Opinion Research Institute), "People's Trust in the HKSAR Government," https://www.pori.hk/pop-poll/government-en/k001.html?lang=en (accessed on 20 October 2021).
22. According to the rolling survey carried out by PORI (see note 21), in February 2020, only 14.2% of Hong Kong citizens trusted their government, while 75.9% expressed distrust. From May to December 2020, the numbers of distrust fluctuated between 49.4% (lowest) to 62.9% (highest). In 2021, the percentages of trust remained always above 30% while the numbers of distrust never exceeded 53.5%. Even though the government managed to increase the numbers of trust, it remained highly distrusted by the public throughout the pandemic.

improve the delivery of its own services.

Beyond the relationship between trust and technology, the elephant in the room is the question of trust in government. The final and principal conclusion is that smart city ought not primarily to be explained in terms of technological preferences, but rather as a reflection of deeper attitudes towards the Hong Kong public authorities. Mistrust in the (motives of) the Hong Kong government helped to shape the responses to key questions about the use of smart city technology in the survey: the sensitive questions about government apps (LeaveHomeSafe), types of infrastructure (smart lampposts), and programmes (electronic ID, iAM Smart) were, at least in part, seen through the prism of deeper attitudes towards the public authorities.

The question of trust in government raises major challenges of communication and public narrative. What are the most effective public narratives in a context of broad mistrust, where government can still be helpful? We argue elsewhere (Cole et al. 2023) that the capacity of a narrative to confer meaning draws upon three criteria: its originality (degree of endogeneity), its sincerity (internal validity and trustworthiness), and its extension (its ability to provide a convincing account to the outside world for social phenomena). How should the trust-smart city interface be pitched within an unfavourable habitat of governance where trust in government remains continuously low, and coherent narratives are hard to come by? The smart city narrative is not particularly original; one former minister (HK10, interview 7 January 2021) confided, "If we go back a number of years to the first smart city plan, it was written by Price Waterhouse Coopers – this is an ongoing habit of the Hong Kong administration." On the other hand, it has been consistently (and sincerely) pursued since the creation of the HKSAR government. It builds upon a digitally literate population, a decades-long investment in technology, and a substantial record of delivery. These factors provide solid reasons to believe that a strategic-technical narrative might succeed where others – "national security," "patriots governing Hong Kong" – have failed to convince. It has a better chance than any other.

In terms of extension, in the opinion of one interviewee, "Smart Hong Kong needs to carry the message that a clear narrative is necessary of why Hong Kong needs to transform into a smart city or what may happen if Hong Kong fails to become a smart city." Resolving the trust-technology conundrum requires officials to take into account the evidence presented in this article that citizens need to be reassured about issues of data-enabled trust, that their data must be protected, and confidentiality ensured. Under these conditions, smart city, articulated as a set of "neutral" and "technologically benevolent" instrumentalities, might help to deliver some bounded results that would otherwise be more difficult to achieve given a low-trust environment. Though trust in the HKSAR government is limited, the survey suggests a thinner form of trust in technology exists; the challenge for government is not only to convince the public of its benevolent intentions, but also to ensure the engagement of citizens, which is central for the success of the smart city project. Finally, simple messages are essential; any government would be well advised to talk more about the outcomes – of zero carbon by 2050, for example – than about the technical gadgets and tools of the smart city.

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