Trust and the Smart City

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Hong Kong, consistently ranked as one of the world's leading smart cities, is undergoing a period of disruptive change.[1] While still shaped fundamentally by the "one country, two systems" arrangement, Hong Kong is increasingly integrated into the political (Liaison Office) and economic (Greater Bay Area, GBA) logics of mainland China (Ho and Tran 2019). The "dynamic zero-Covid approach" has also significantly impeded Hong Kong's place branding as "Asia's World City," with the relocation of corporations to cities that have adopted a back-to-normal outlook, and the exodus of tens of thousands of residents. These counter-winds were captured by a territory-wide survey and a purposive sample of interviewees, selected at a specific point in the recent history of the Hong Kong Special Administrative Region (HKSAR), namely that of the transformation of the hybrid "one country, two systems" arrangement and the emergency politics of the post-National Security Law era.

In the midst of this turbulent period, in December 2020, the HKSAR Government released the second edition of the *Smart City Blueprint for Hong Kong 2.0*.[2] The first edition of the *Smart City Blueprint for Hong Kong* dates back to December 2017 and set out 76 initiatives, whereas the second edition puts forth 130 proposals that aim to enhance and expand existing city management measures and services. The missions are to raise the quality of life, attract the capitalisation of businesses, promote social inclusion of the elderly, and make the city more environmentally friendly. The subject matter – smart city – might appear peripheral in comparison to the epochal shifts mentioned in the first paragraph. But it is central to the claim that the HKSAR administration has had a distinctive legitimacy throughout its short history, a claim restated during the 2019-2020 events.

In this editorial, we address the central question of this special feature: why link trust and the smart city? Identifying common themes across the various articles, we conclude in the value of interpreting the smart city through the prism of trust and distrust, not least as the starting point for considering how to rebuild the trust that, according to the OECD (2017), must underpin public policies and notably more ambitious reform agendas.

Smart city: Between technical instrument and urban narrative

The term "smart city" has been used in different contexts since the 1990s, when it was first employed by Gibson, Kozmetsky, and Smilor (1992) in the United States to describe the use of ICT (information and communication technologies) applications in modern urban infrastructures. The smart city is multi-faceted, and there is no general agreement and standard definition of the term (Caragliu, Del Bo, and Nijkamp 2011; Albino, Berardi, and Dangelico 2015; Sharifi 2019).

The smart city lies somewhere between a material fact and an urban narrative. It is *primarily material*, in the sense that it refers to precise policy programmes and infrastructure associated with the digitalisation of public services. This prevailing understanding is the one, for example, that underpins the Hong Kong Government's *Smart City Blueprint*. Most definitions refer to information and communication technology (Nam and Pardo 2011; Cocchia 2014; Albino, Berardi, and Dangelico 2015; Camero and Alba 2019; Sharifi 2019; Patrão, Moura, and Almeida 2020). At some point, scholars and stakeholders started to identify and address the importance of people, and this wider point of view places citizens, quality of life, environmental sustainability, and human value in the smart city/ smart society concept, in addition to pure technology (Nam and Pardo 2011; Dameri and Rosenthal-Sabroux 2014; Govada, Spruijt, and Rodgers 2016). Following the pioneering work of the Vienna University of Technology, there is general agreement on six smart city dimensions – economy, environment, governance, living, mobility, and people – an extensive definition that encompasses the standard elements of the smart city concept (Caragliu, Del Bo, and Nijkamp 2011; Manville et al. 2014; Camero and Alba 2019) and that has been adopted by the European Commission (Giffinger et al. 2007).

The smart city is also an *urban narrative* (Patterson and Monroe 1998). Smartness is a city vision, as much as the description of a set of technical programmes (Cole and Payre 2016). In terms of official

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Hong Kong Government policy, the smart city is presented in terms of technological prowess and promoted as an exercise of city branding (Chan, Peters, and Pikkemaat 2018). According to this definition, the smart city is primarily technological. Smart city idealists describe cities as abstract technical processes that can be optimised using sensors, data, and algorithms. The big data variant of the smart city in particular emphasises smart governance by implementing sensors for data collection to manage society and improve city services (Cavada et al. 2014; Grenslitt 2020). The frame is captured by the "tech goggles" metaphor used by Green (2019). Tech goggles cause their devotees to perceive complex, normative, and deeply political decisions as reducible to objective, technical solutions. Such visions are routinely those of policymakers – in our case the HKSAR administration. However, such a purely technical vision raises major questions of ethical standards, trust, and transparency that are discussed in the article by Ip and Cheng.

The *smart sustainable city* is an alternative framing to the purely technology-focused one. The terms "smart" and/or "sustainable" reflect well the broader international debates over the smart city (Govada, Spruijt, and Rogers 2016; Chan, Peters, and Pikkemaat 2018; Sharifi 2019). In her work on trust and smart energy transitions in Hong Kong, Mah (2022) describes energy transitions as a mix of technical accomplishment and citizen buy-in by close association and participation. The former can be exemplified by the energy firm China Light and Power (CLP) in the process of installing smart meters for all its customers to encourage energy saving. The latter can be seen through CLP's third phase pilot, 2018-2025, that involves about 26,000 households joining a demand-response programme. The main vision, however – the HKSAR government's Climate Action Plan 2030+ and the goal of carbon neutrality by 2050 – surpasses the narrow technological frame of the mechanics of implementation. In this special feature, Cheung et al. implicitly contrast the form of local, proximity-based trust based on citizen engagement they identified in their work on the Sai Kung district of Hong Kong, and the far more distrusting attitudes towards regional integration into the Greater Bay Area. Upscaling might have some advantages in terms of economies of scale and integration into the regional smart energy grid, but raises major issues of trust in government and providers.

Smart city is an essentially contested concept, open to contrasting interpretations, epistemological underpinnings, and reflexive methodologies. We adopt an interpretation of the smart city that spans the harder and softer dimensions, whereby the former describes the urban infrastructure and system such as buildings, energy grids, mobility, and water management, while the latter designates cultural and social aspects such as education, policy innovations, governance, and social inclusion (Neirotti et al. 2014; Albino, Berardi, and Dangelico 2015). 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 public-private interactions, transnational learning, public debates, and ethical dilemmas: in sum, all matters of interdisciplinary social scientific inquiry.

Recent developments of smart cities, as for example in Europe (Julsrud and Krogstad 2020), in the United States (Schmidt and Manley 2020), and in China (Li 2021), have heightened both scholarly and public attention to the issues of trust and distrust as fundamental prisms for understanding public policy acceptability (Galdon-Clavell 2013). The three articles of this special feature each engage with different elements of this debate: mapping attitudes and types of trust via results of a survey (Cole and Tran), providing an ethical roadmap for comparing various smart city initiatives in Hong Kong (Ip and Cheng), and engaging in multilevel analysis of smart energy, involving Hong Kong and the broader Greater Bay Area (Cheung et al.).

Why trust and the smart city?

Through linking trust with the smart city, the special feature is concerned with the equity, transparency, and neutrality of public policy; the perceived benefits (connectivity) and possible harm (health, data transmission) of digital technologies applied to the city; the reception of smart city service providers (domestic, foreign, new market players, established interests); the role of regulation and government; the data security consequences of new technologies, and the potential for new forms of citizen trust and engagement. These questions of trust are applied to the smart city as a form of hybrid governance, taking Hong Kong as the focal point. There ought to be no easy assumptions relating to trust and urban governance. The feature proposes to address these issues by combining analyses rooted in specific intellectual traditions: namely, those of public opinion, the policy sector, and political philosophy.

Trust has long been identified as an essential component of social, economic, and political life. It is best understood as a generic term to describe dynamics taking place at different *levels* of analysis (interpersonal, social, and collective), in relation to core *properties* (honesty, benevolence, competence) and in association with *key related concepts* such as confidence, vulnerability, risk, and community (Rousseau et al. 1998; Uslaner 2002; Newton 2007; Newton and Zmerli 2011; Stafford, Cole, and Heinz 2022). A number of common linked themes emerge in these articles that underscore the pertinence of the trust perspective for understanding the smart city. We focus on five of these, as they each combine levels of analysis that are germane to much writing on trust, with fundamental properties adapted to technology.

First, that of *trustworthiness* (in actors, providers, outcomes). Trustworthiness refers to honesty, integrity, and benevolence and is taken in the literature as an adequate descriptor for these three dimensions (see especially Mayer, Davis, and Schoorman 1995: 717-20; Fisher, Van Heerde, and Tucker 2010). It is one of the few concepts that can span all three levels of Newton and Zmerli (2011) analysis (interpersonal, social, and institutional) and capture core properties such as honesty, benevolence, and integrity. In their article, Cole and Tran treat trustworthiness essentially as a question about providers, whether public (HKSAR government, local authorities), private (firms), or hybrid. Such public trust is also the subject of Cheung et al.'s analysis in this special feature of energy providers and public utilities in the Greater Bay Area. Trustworthiness assumes the form of a relationship: between individuals (via interpersonal ties) and, by extension, in relation to more abstract entities such as technology (public or private), utility providers, and institutions.

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 of civic functions – a core component

of smart city development – is becoming a global trend. In their paper, Cole and Tran 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 iAMSmart. Such concerns are also approached via the deliberative survey reported in the article by Cheung et al.

Most Hongkongers have an affinity for technology (confirmed in the PORI survey), but the majority displays an even more deeply rooted mistrust of government, creating a conflict. Such findings are consistent with those presented by Cheung et al. In the deliberative panel, participants were asked to rate on a scale of 0 to 10 their perceptions of the trustworthiness of the (China) National Government, the Guangdong Provincial Government, the Hong Kong Government, and Hong Kong electricity companies (in relation to whether respondents would trust these parties collecting their household energy information). Hong Kong citizens exhibited an extremely low level of trust in the different levels of government, compared to a relatively high level of trust towards the electricity companies, the sole entities trustworthy in terms of collecting personalised household electricity data. The major contribution of Cheung et al. is the argument that an appreciation of risk underpins the degree of public trust in smart energy policies. Support for moving towards more integrated GBA energy solutions was filtered by an appraisal of the *risks* involved: namely price volatility, energy reliability, cost overrun, data privacy, and environmental damage. Although trust in the Hong Kong Government was not high, it was far greater than in the Chinese National Government or the Provincial Government of Guangdong.

Doubts about trustworthiness can be associated with other survey questions, such as those on data security and privacy. Interestingly, in the four focus groups held in December 2021 as part of the data collection, privacy was not deemed to be a central concern for the mainland group, which expected transgressions of privacy to be more likely to occur with private companies than the government; exactly the reverse was true for the Hong Kong dominant group, for whom privacy is a cardinal concern, protected by the Personal Data Privacy Ordinance (PDPO).

The second recurrent dimension is that of *trust and technology*. Wong (2022) makes the distinction between trust-enhancing and trust-enabling technology. Trust-enhancing technology lies in the realm of public policy and includes attributes such as 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, so its success requires trust in the purpose of the technology. 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 benevolent intentions of the government. In a subtle distinction, trust-enabled technologies assume that good-quality data is provided by citizens in a trustworthy setting. For the smart city is a data-driven city; it requires trust in the uses of data, such as respect for privacy, confidentiality, and consent. The promise of the smart city is, however, dependent upon the information and data collected from sensors from personal devices and environmental sensors installed by the city government. For Ip and Cheng, such data and its related

algorithms are not morally neutral (O'Neil 2016; Eubanks 2018; Susskind 2018). In their article, they argue that the development of smart cities could be morally problematic due to their pervasiveness, opacity, and diffused accountability. Second, the operation of smart cities is mostly opaque to the persons whose data are being collected. Individuals usually have very little idea about how these algorithms work. In other words, residents of smart cities are living in a "black-box society" (Pasquale 2015). Finally, the use of algorithms in smart cities might obscure the accountability of organisations for the harms they inflict on individuals.

There is a long-standing tradition of technical innovation in governmental services in Hong Kong. There is also a persistent mistrust in government instruments, in terms of their motives (who collects citizens' data?), competence (who has the ability to deliver technical services?), and integrity (will public authorities respect data privacy?). Controversy surrounded the Octopus smart card system when it was launched as early as 1997, and initiatives such as Smart Lampposts have been decried more recently. In their article, Cole and Tran present the paradox of the trust-technology gap. While the project focus groups identified technology as the driving force underpinning the smart city, the survey findings demonstrated how difficult it is to construct any narrative (in the form of a legitimising discourse) given the degree of citizens' miscomprehension of the Hong Kong Government's smart city blueprint. For their part, Ip and Cheng consider the best practices in this sphere and the ethical criteria that ought to be used to evaluate smart city programmes. The solid record of the Hong Kong government in the domain of open data was signalled in interviews, and its "open government" approach appeared consistent with the core public value dimensions of e-government (Twizeyimana and Andersson 2019). Although e-government in Hong Kong might be adopted as an efficiency-enhancing tool for accomplishing defined purposes, interviews uncovered some doubts about the sincerity of the smart city narrative.

Third, trust, transparency, and related issues such as data privacy and confidentiality are key relationships in the public policy and management literature. In public policy analysis, the relationship between trust and transparency (especially in terms of organisational accountability) is central to literature in social science (Heald 2006; Hood 2007; Grimmelikhuijsen and Welch 2012). Transparent processes require neutral organisational bodies (e.g. governing boards or agencies), policies based on open data, and fair processes (consent-driven, transparent, and equitable). Such standards and technologies are the critical building blocks of effective data governance (Panian 2010).

From the perspective of Ip and Cheng, smart cities make surveillance more pervasive. Classical surveillance involves targeted scrutiny of groups and individuals in specific spaces such as prisons, schools, or hospitals. People are often aware that they are being watched (in Bentham's classical panopticon). However, in smart cities, the use of networked technologies to monitor mobile devices and the ability to aggregate fragmented data allows surveillance to take place anywhere. Data generated from daily urban activities is constantly collected, stored, and analysed by city governments, engineers, and researchers. Confronted with these challenges, Ip and Cheng assess the ethical implications of four different smart city initiatives in Hong Kong – the use of facial recognition systems, the

Smart Lampposts Pilot Scheme, the Free-flow Tolling System, and Electronic Health Records Sharing System – from the perspective of relational egalitarianism (whereby social institutions must be structured to offer robust protection against domination and the state – and its agents – must not enjoy arbitrary power over its citizens). Their analysis suggests that there are various moral risks that a particular smart city initiative may fall short of relevant normative requirements depending on their levels of voluntary participation and transparency.

Fourthly, our next question concerns whether data trust (or mistrust) 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)?

Finally, the three articles refer to the need for trust-building. Can trust be definitively lost, as a result, for example, of the social movements in Hong Kong in 2019-2020? Or can it be restored by deliberate action? Such a complex debate lies beyond this editorial. Evidence from these three articles provides matter for reflection in terms of building or restoring trust in the digital era. In the field of energy, for example: is there a form of collective, social learning in the field of smart energy meters? Do inhabitants learn how to be efficient in terms of energy by being taught new practices? If so, rebuilding trust must occur through engaging communities in smart energy transitions. Cheung et al. and Ip and Cheng identify the need to develop a trust-based, ethically robust standardisation framework to guide the creation, collection, processing, use, and sharing of smart city-related data. Finally, per Cole and Tran, close attention is needed to issues such as data security, confidentiality, and transparency in order to avoid exacerbating public distrust, which is high across all levels of government. As Cheung et al. conclude in their article: "Given the nature of Hong Kong's polity and politics, the political tension associated with the complex interplay between central-local relationships and cross-city competition would likely remain an issue difficult to address for years to come."

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