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# The state-led platformisation of financial services: Frictionless ecosystems and an expansive logic of "smartness" in Singapore

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# THE STATE-LED PLATFORMISATION OF FINANCIAL SERVICES: FRICTIONLESS ECOSYSTEMS AND AN EXPANSIVE LOGIC OF "SMARTNESS" IN SINGAPORE


## Abstract

This article explores the role of the state in driving the platformisation of industry, and in doing so offers a counterpoint to scholarship that focusses on the exploitative effects of private sector-led platformisation. That scholarship views platformisation as the latest incarnation of neoliberal urbanism, with the profit-maximising tendencies of the private sector driving the proliferation of platforms throughout everyday life. Notwithstanding, there remains a need to consider alternative models of platformisation. Drawing on 31 interviews with architects of Singapore's Smart Nation initiative, we consider the state-led platformisation of financial services. We argue that state-led platformisation can open up marketplaces to new forms of innovation, customer value creation, and competition through the creation of data ecosystems that are built on openness, trust and transparency. This flattens the distinctions between regulator and regulated, and between competitor and collaborator, and foregrounds the role of platforms in driving the transformation of industry.



## Keywords

Platform urbanism, state-led platformisation, financial services, smart cities, Singapore.

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## Introduction

This article explores the role of the state in driving the platformisation of industry. In doing so it offers a counterpoint to scholarship that focusses on the exploitative effects of private sector-led platformisation. Platforms have recently emerged as an interface that mediates the proliferation of digital data on the one hand, and the new forms of value that can be derived from 'processing, managing, operationalising, commodifying and controlling this data' (Caprotti and Liu 2020a: 1) on the other. Critical scholarship has considered how, as governance structures and citizens alike come to rely on platforms as 'fixes for the deficiencies and inefficiencies of cities' (Sadowski 2020: 45), so too are they becoming 'progenitors of inevitably dystopian urban futures' (Leszczynski 2020: 189). These criticisms draw on the assumption that the platformisation of urban environments is the latest incarnation of neoliberal urbanism, with the profit-maximising tendencies of the private sector driving the proliferation of platforms into ever-more walks of urban life. Problematic is the operational autonomy that comes from private sector-led platforms being 'black boxes due to the proprietary nature of algorithms, the secrecy of corporate ownership structures, and the emphasis on confidentiality and privacy in the venture capital industry' (Fields et al. 2020: 462), coupled with the fact that they are often 'too big to control, too new to regulate, and too innovative to stifle' (Graham 2020: 453). Whilst these criticisms offer insight into the evolving relationship between cities, data, and capitalist exploitation, so too are they limited in empirical and conceptual scope, and thus blind to the more generative effects of platformisation on industry-government relations. There is, therefore, a need to overcome the "domination" of the discourse by 'the platform as company' (Richardson 2020: 458) and to consider alternative models of platformisation.

The model we consider is the state-led platformisation of financial services. Our argument is that state-led platformisation can open marketplaces up to new forms of innovation, customer value creation and competition through the creation of data ecosystems that are built on openness, trust and transparency. The "ecosystem" metaphor is well-rehearsed within financial geographies, and encompasses a sense of interconnection and interdependence between and beyond firms, the private and public sectors, and the state and industry (Langley and Leyshon 2023). Evoking the ecosystem can therefore help flatten the conceptual distinctions between regulator and regulated, or competitor and collaborator, and thus foreground the role of the platform in driving the transformation of industry. Importantly, the processual nature of platform*isation* also emphasises the ways in which platforms are not predetermined in their orchestrations and effects, but are collaborative ways of doing things that have the potential to transform the relationship between "data" and "value" in the pursuit of more equitable – as well as variously more competitive, efficient, innovative, or even profitable – urban futures. It is in this capacity that platforms are 'not mere technical entities; they represent a unique socio-technical imaginary for enacting urban space and relations' (Lee et al. 2020: 117; see also Sadowski and Bendor 2019). Our focus on financial services is a response to the need for research to consider the ways the public and private sectors work together to drive innovation through processes of platformisation. As Lai (2018: 286) argues, research needs to consider the

> strategic ways in which the state actively mobilizes institutions and firms to adopt and enact financialization scripts for political-economic purposes. This kind of state-led financialization emerges from the normative influence of the state in the everyday business practices of firms and implies a co-constituted production of acceptable business practice by firms and states.

Foregrounding the agency of the state in nudging industry to enact a vision of techno-financial futurity provides a rejoinder to many pre-existing discourses of platform urbanism. Importantly, it also advances and connects two recent strands of work in financial geography. The first embraces the state as a 'vital and strategic actor in financial markets' (Lai 2023: 1) in ways that transcend the command-control mechanics of regulation and policy. As actor, the state is imbued with a capacity to 'shape processes and outcomes in ways that cannot be explained without incorporating and analysing the state as vital in shaping financial relations, transactions, institutions and their geographical outcomes' (Lai 2023: 3). Simply, there is a need to consider how the state plays an integral role in shaping the financial geographies, industries and futures in which it is implicated. The second pertains to the role of the platform in driving the technologisation of financial services, and its defining role in the development and proliferation of financial technologies, or FinTech (after Haberley et al. 2019; Lai and Samers 2021; Langley and Leyshon 2021; Wójcik 2021). In this schema, platforms have been studied as 'digital infrastructures and data flows enclosed and controlled by 'BigTech' firms' (Langley and Leyshon 2023: 2), with the private sector bias articulated here coming to dominate discussions of the platformisation of financial services. Notwithstanding such bias, it has also been recognised that 'the sovereign-territorial geographies of financial regulation and international competition… shape how FinTech platform regulation proceeds in different national settings' (Langley and Leyshon 2023: 4). This raises the question of *how* the state might work to balance the apparently divergent benefits of competition, equitability, innovation, risk-taking and politico-economic stability through the logics of platformisation. Connecting these two strands of work, our intervention is to advance pre-existing understandings of the *state-led* platformisation of financial services.

Our empirical focus on Singapore – a city-state with a single layer of government – provides an opportunity for us to offer a vision of what country-wide state-led platformisation can look like. Presenting a departure from existing analyses of the role of platforms in driving innovation in key *subnational* financial centres like London, New York, Shanghai, or Shenzhen, we instead consider how platformisation can be imbued with the logics of national development in ways that strike a productive balance between citizen- and industry-centrality. With this sense of balance in mind, the Singapore case enables us to 'move beyond binary analyses of either corporate visions and market-making around the smart city, *or* state-led initiatives' (Caprotti and Liu 2020b: 2, emphasis added) and to explore instead how the 'particular dynamics of platform ecosystems entangle private and public organisations as well as citizens' (Barns 2020a: 19). These entanglements can reveal an understanding of "smartness" that goes beyond the technological idiosyncrasies of the digital. Specifically, data-centricity triggers new forms of relationality that bring the state into close conversation, purported alignment, and even collaboration with markets, industry and citizens alike (after Caprotti and Liu 2020a). Adding further value to our empirical case is the fact that it draws on interviews conducted with some of the most senior public- and private-sector architects responsible for developing Singapore's financial services platforms. These include civil servants responsible for leading Singapore's Smart Nation initiative, and CXOs of DBS Bank – the bank at the leading edge of digital financial transformation in the city-state and beyond. In this vein, the interviews provide insight into how data can transform the relationship between the public and private sectors, and gesture towards potentially transformative technologies of finance, and an expansive logic of "smartness" in Singapore.

**Platformisation and evolving logics of value**

The end of the first decade of the twentieth-first century ushered in a new paradigm of urban development. As governments, industries and societies came to terms with the fallout from the global financial crisis, so too did cities start to become reconfigured alongside new logics of value creation and capture. These logics started to look beyond finance capital by embracing data as a new form of currency that is proliferating in response to the growing penetration and embedding of digital technologies throughout everyday life (Sadowski 2019, 2020). Digital data have created opportunities for cities and industries to be transformed, but so too have they caused deep-rooted problems of urban inequality, exploitation, access and injustice to become amplified and reified. These problems stem from the outsized role of the private sector – and of digitally-native tech companies in particular – in supporting city administrators and governments to become "smart" whilst pursuing profit and thus entrenching the neoliberal logic that has come to define many recent processes of urban transformation. Problematic is the fact that outsourcing to the private sector has caused cities around the world to 'become less interoperable and fall into vendor lock-in' (Jeong et al. 2020: 1), which leads to digital data being harnessed for unilateral value creation rather than for the common good. This has led to conceptual blind spots in scholarly understandings of the data-driven city, as 'market efficiency and financial logics justify the growing dominance of private-led interests in smart city development', whilst at the same time the discourse has 'obscure[d] the strategic role of the state in pushing citizens, firms, households and institutions towards 'smartness'' (Tan 2021: 4). Private sector interests are assumed to be dominant and exploitative, the public sector is assumed to be weak and non-interventionist, and the result is that data is understood to be an increasingly enclosed – not open – resource (Anttiroiko 2016).

The two subsections that follow provide recourse to these narratives and biases. First we engage with recent work on platform urbanism and identify the centrality of the platform in driving urban change. Second we focus on the transformation of the financial services industry in data-rich environments. In both subsections we identify the underplayed role of the state in driving platformisation, and in making the financial services ecosystem "frictionless", respectively.

### *The centrality of the platform in driving urban change*

Much has been written about platform urbanism in the past two years or so. Much of it is critical, and reflects a bias towards understanding platformisation as a private sector-led interest. This subsection provides an overview of these critiques, before highlighting the need to disrupt the narrative by embracing alternative models of platformisation. With this in mind, the uniqueness of platforms is often defined in relation to their antecedents: the pipeline. Pipeline modes of operation include relatively fixed structures that provide a linear sequence of products and services for their customers. Value is derived from controlling as much of the supply chain as possible, and thus exerting control over the "pipe". Platforms are not linear or sequential: they are multimodal and focus on 'aggregating resources, facilitating interaction, and focusing on ecosystem value' (Anttiroiko 2016: 2). Platforms encourage the centralisation and thus channelling of hitherto fragmented datapoints and data *users*, the aim being to create new forms of value and urban becoming. Accordingly, platforms

> simultaneously afford differential levels of openness, access, and service – depending on who or what is using them and what access rights and privileges they are granted. This brings service providers, users, and third-party complementors together in quite

> asymmetrical ways. It permits a fixed core to interact with a variable periphery linked together via interoperable data relationships (Lee et al. 2020: 119).

Platforms thrive on the logic of participation. Whenever a user engages with a platform, they become a datapoint that helps incrementally strengthen the power of the ecosystem whilst creating value for the platform owner (Lee et al. 2020). This pattern of extracting data and then leveraging it to produce value can lead to exploitative outcomes, with these outcomes driving many critiques of private sector-led platformisation. For example, Graham (2020: 453) has argued that the "conjunctural" nature of platforms enables them to 'exert immense power over local economic geographies' by mediating interactions in space in ways that lead to them 'concentrating reward' whilst 'abdicating responsibility'. Sadowski (2020: 2) emphasises the speed and scale of platforms, and how, by facilitating direct connections to and interactions with users, they enable 'rapid scaling-up via network effects and venture capital' which in turn makes them 'more antagonistic to government regulations and incumbent industries'. Lee et al. (2020: 118) emphasise how the precondition needed for platforms to thrive – data saturation – amplifies longstanding concerns about 'platform surveillance and the manipulation of people's everyday data'. Barns (2020a: 174) considers how the proprietary nature of many platform models precipitates the emergence of data enclosures that tend to be privately owned, even though the public sector stands to benefit considerably from 'freely flowing data assets'. Empirically speaking, each of these critiques can be observed in the much publicised failure of Alphabet to revitalise a precinct in Toronto through its Sidewalk Labs initiative. Not only does Alphabet's intervention in urban redevelopment reveal the extent to which it – and companies like it – 'see the city as a platforming opportunity' (Barns 2020a: 174), so too does it reveal the problems that emerge

from data governance and the dominance of private sector interests in shaping the terms and outcomes of urban development.

These critiques warn of the dangers of private sector-led platformisation. Through these warnings, they reveal the importance, and the hitherto marginalised role, of the state in shaping processes of platformisation, and its role in driving co-operation, collaboration and value creation in ways that foreground the public good. Whilst there has been much debate around the extent to which governments should intervene in platform formation (Anttiroiko 2016), a key challenge is to 'articulate the appropriate policy frameworks needed by governments to facilitate investment in data-driven services that are aligned to the strategic priorities of a city' (Barns 2020a: 173). The difficulty of answering this challenge is found in the fact that government-led interventions are often targeted at the micro- (not city-, and certainly not national-) scale, through the creation of bottom-up solutions to specific problems. Notwithstanding, platformisation creates a connective interface through which different stakeholders with different claims and interests come together to shape urban futures. Whilst it is clear that an unchecked, market-oriented approach can have deleterious effects on cities, citizens, and economic value creation and circulation more broadly, so too is it less clear what sort of solution might work for what sort of city-state pairing. Embracing the primacy of the state in driving and regulating platformisation can, however, call into question the generalisability of these critiques, whilst gesturing to the capacity for state-led platformisation to reengineer the city as a more dynamic, open, and transparent construct that establishes the conditions for public *and* private, rather than just private, good.

***The interventionist state and financial services innovation***

Financial services has long been recognised as one of the most globally oriented of industries, but it has also struggled to move from pipeline to platform models of operation. Recently, the disruptive emergence of FinTech has caused traditional players to reconsider their business models and how they engage with customers, competitors and regulators. For example, the idea of "open" banking, which has taken root in some parts of Europe, involves banks sharing customer data in ways that turn themselves into platforms. Whilst this has galvanised innovation in the financial services industry, it is industry-led with the state being confined to its traditional regulatory role. Yet, as innovation becomes more tech-dependent, and as financial power becomes more diffuse, there is a need for centralised state actors to create stability and trust in the ecosystem, and spur market development in more interventionist ways (Lai 2018; Lai and Samers 2021). Often, however, this need remains unrealised as the state and its institutions are typically cast by leading industry voices as obstructing innovation through the over-regulation of industry. In itself, this reveals a sense of distinction between the regulat*ors* and the regulat*ed*, and has, for example, been attributed as a cause of generally low adoption rates of mobile payments solutions throughout the world. In particular, the 'availability of many payments alternatives [like cash], the dominance of conservative banks due to regulation regarding bank licences, a lack of innovative capabilities and strategic behavior' (Guo and Bouwman 2016: 147) have caused national payments ecosystems to be fragmented, disconnected, and thus less-than-viable infrastructures of financialisation. As Brandl and Dieterich (2021: 10) put it

> an effective (domestic) payment system depends heavily on the collaboration of the nationally organized networks of commercial banks and infrastructures that are run by central banks. This close collaboration of private and public actors through payment

> infrastructures contributes to the maintenance of the expectation regarding the stability of money.

In other words, the state needs to play an integral role in creating the terms of competition and collaboration. Whilst this principle holds true in a general sense, it has taken on greater meaning in the contemporary world of data saturation and the platformisation of financial services. The state can create the 'infrastructure that enables transactions with as little friction as possible, i.e. without costs and risks' by enabling 'fragmented actors [to] come together to compete' thus creating 'decentralized encounters [that] are based on a (financial) infrastructure that must be as frictionless as possible, i.e. centralized' (Brandl and Dieterich 2021: 8). What Brandl and Dieterich (2021) evoke here is a paradox of centralisation and decentralisation: if diverse actors are going to come together to compete in decentralised ways, then a centralised state infrastructure (or platform) is needed to enable these encounters. In this view, state-led centralisation is a necessary precondition for ecosystems to become "frictionless". In itself, this foregrounds the need for understandings of competition and collaboration to evolve beyond the idea that platforms render cities and marketplaces 'frictionless for the operation of, and accumulation of capital by, the platform' (Leszczynski 2020: 202), and to embrace more open-ended understandings of frictionless marketplaces as well. This need rests on the vision of a financial services platform as a 'horizontal collaboration among firms primarily brokered through digital technologies' and thus 'built with openness in mind' (Som and Ram 2019: 84, 86). Apparent is the fact that these characteristics do not emerge organically, as they go against the models of competition that many financial institutions are used to. Accordingly, the need for the state to orchestrate the platformisation of financial services becomes all the more important amidst the digital transformation of society and industry.

Recent work has started to explore the possibilities of what state-led platformisation of financial services might look like, and the outcomes it might trigger. Building on the premise that the financial geographies of FinTech must consider 'policies and key infrastructure… for supporting technological innovation, the development of technology-based labor markets (not only relating to banking and finance), and the availability of venture capital and private equity' (Lai and Samers 2021: 734), research has considered how the regulatory ethos of the state has come to shape the operation of FinTech platforms. Illustrating these ideas is Langley and Leyshon's (2023) comparative analysis of the political economy of FinTech platforms in China and the UK, which shows how in each country the state and its regulatory frameworks plays a leading role in managing the furtherance of platform power, albeit in very different ways. In China, the growth of the FinTech economy is shown to reflect 'one manifestation of a deep synergy between financial market liberalisation and an authoritarian state' (Langley and Leyshon 2023: 1). This is, however, an evolving synergy that has shifted from a laissez-faire approach to FinTech regulation, to a more interventionist stance that strives to reign in the unchecked growth and proliferation of the platform economy. Contrariwise, in the UK the relationship is shown to be more collaborative and co-operative, with FinTech platforms 'being incorporated into extant regulatory regimes… to adapt these regimes in ways that seek to improve the outcomes of financial markets for a disparate range of stakeholders, including consumers and incumbent financial interests' (Langley and Leyshon 2023: 2). Through such incorporations, an 'innovation-friendly financial regulation regime which promotes consumption and competition alongside stability' (Langley and Leyshon 2023: 2) is forged to ensure compliance and participation in the public good.

The value of the China-UK comparison is that it helps us position the Singapore case somewhere in-between these two regimes of state-led, or at least state-shaped, platformisation. The Singapore state might be understood as similar to China insofar as it is highly interventionist in its approach to regulation, which raises questions about levels of public participation, who defines what the public "good" is, and how it is achieved. In the same breath, it might also be understood as similar to the UK case in that it does not direct the terms of regulation *to* industry, but instead works with it to innovate in ways that ensure the buy-in of multiple, diverse, and sometimes competing, stakeholders. Treading this middle-ground reveals a new modality of state-led platformisation that is implicated in broader ideological narratives surrounding the realisation of the vision of the Smart Nation.

**Singapore's state-technology-industry nexus**

Since the formation of the Republic of Singapore in 1965, the state has played a central role in shaping and guiding the country's social and economic development (Huff 1994). Moreover, since the early 1980s, technology has been actively harnessed as a means to 'propel the country to the next stage of its development' (Joo et al. 2020: 23). In 2014 the digital transformation of society, government and industry was formalised in the launch of the Smart Nation initiative. This 'mega-digitalisation push' (Joo et al. 2020: 19) has been all-encompassing in scope and ambitious in its goal to harness digital technologies to effect sweeping change. In terms of financial services, the Smart Nation has seen the state construct a national e-payments infrastructure that 'focuses on openness, accessibility and interoperability while integrating the legacy payments system' (Tan 2021: 7; see also Ng 2017). This infrastructure has coalesced into several centralised payment solutions that enable, for example, direct real-time interbank transfers through the creation of the Fast and

Secure Transfers (FAST) system in 2014, peer-to-peer transfers using just a mobile or national identification number through the creation of PayNow in 2017, and the streamlining of payment options in 2018 with the creation of the Singapore Quick Response Code (SGQR). These state-led drivers of innovation in financial services are largely a response to the fact that Singapore is a city-state with a single layer of government, which can, therefore, circumvent the 'territorial politics and fragmented metropolitan governance' (Kitchin and Moore-Cherry 2021: 1913) that hinders initiatives in many other cities. Importantly, the state has also attempted to spur demand for these innovations:

> By proclaiming that digital payments drive the financial and digital inclusion of individuals and businesses… the state has largely framed barriers to the adoption of e-payments as problems of access and digital competencies. By lowering the costs of hardware and software (e.g. subsidised internet and smartphone access) and equipping citizens with the relevant digital literacy skills, it is hoped that they will be able to quickly adjust to an era of rapid digitalisation (Tan 2021: 8).

The desire to overcome barriers to adoption through tangible interventions has been approached through close collaboration with the private sector. This multi-pronged approach has proven to be necessary, given Singapore society's general reluctance to succumb to the financialisation of everyday life. As Lai (2017: 914) observes, the 'consumption of insurance and investment products remains relatively low compared to developed economies like the USA, UK and Australia', and even things like digital payments solutions have received tepid reactions from customers. In many respects, this has cemented the mutually supportive relationship between the public and private sectors – between state and (the financial services) industry – as 'national economic growth strategies… have positioned the

financialisation of households and firms as being an integral to the growth of the banking and insurance sectors, and for financial centre development' (Lai 2017: 918). Against this backdrop of state-led innovation and consumer-led friction, the recent COVID-19 event has proven to be a fillip for financial services development. Under COVID-19 conditions, the 'physical handling of cash pos[ed] as a potential virus transmission risk' meaning 'digital payments have become important in the urgent transition to a cashless society' (Tan 2021: 1). In Singapore, strictly enforced safe distancing measures in public areas and hawker centres specifically dovetailed with the Monetary Authority of Singapore (MAS) urging individuals and businesses to embrace digital finance and e-payments as a way to combat the spread of the virus. In this sense, the behavioural economics of personal finance intersected with public health initiatives in a way that has spurred the ongoing financialisation of society and business.

Close and mutually beneficial public-private partnership and innovation are a defining feature of the Singapore case. Notably, the state has long had close ties with one of Singapore's largest local banks – DBS – having helped establish it in 1968, and through one of its sovereign wealth funds, Temasek Holdings, remains a majority and controlling shareholder today. Coinciding with the launch of the Smart Nation initiative, since 2014 DBS has taken steps to reinvent itself as a digital bank. The success of this reinvention is reflected by the fact that in 2016, and then again in 2018, global finance magazine *Euromoney* named DBS the World's Best Digital Bank, lauding it as "an institution in which every part of the business is being enriched by a challenging process of willful digital disruption" (cited in Siew et al. 2021: 40). As incumbent CEO Piyush Gupta stated in a public interview: "banks have forever found it really hard to keep pace with technology because they are stuck with old core banking legacy systems. In many cases, they are fifty years old or more. It's all hard-

coded" (cited in Skinner 2020: 2). To facilitate DBS's transformation, Gupta increased technology expenditure from S$700 million to S$1 billion a year, and took inspiration from American "Big Tech" firms to see how they transformed their technology stacks (Skinner 2020). Subsequently, DBS became an early adopter of the cloud, and 'systematically sequenced its application migration from being cloud-ready to cloud-optimized and, eventually, to cloud-native' (Siew et al. 2021: 44). Whilst these achievements are impressive, and by now well-recognised, lacking is an appreciation of how organisational transformations are effected alongside broader based, and state-led, *industry* transformation.

**The state-led platformisation of financial services in Singapore**

The subsections that follow draw on qualitative data generated through in-depth interviews with (mostly senior) stakeholders representing both the public and private sectors who have been responsible for implementing the Smart Nation vision and the transformation of DBS. Interviews started in April 2021 and concluded in April 2022. In total, 27 interviews with 31 stakeholders were conducted. An interpretive framework was used for both data collection and analysis, with interviews being semi-structured according to key topics. These included: the relationship between the state (and its ministries/agencies) and industry; the origination of ideas regarding digital transformation; countries and companies used for comparison/benchmarking; and the role of citizens in high-level decision-making. This article draws on a subset of these interviews: eight interviews with representatives of GovTech and SNDGO (the Smart Nation and Digital Government Office) – both public sector organisations – and five interviews with key personnel at DBS. GovTech and SNDGO are the two organisations within the Singapore government that are responsible for driving the Smart Nation agenda. Across all three organisations, most of our interviews were with the most

senior stakeholders, which included CXOs (including CEO of DBS, Piyush Gupta), the Permanent Secretary of SNDGO, Managing Directors and Group Heads. For GovTech, we also sampled more junior employees including entry-level Data Scientists and Software Engineers. Not captured were the voices of everyday citizens or users of the platforms developed by the state. Whilst undoubtedly important in evaluating the extent to which these platforms are citizen-centric or not, this cohort was out of scope for the project, which is part of a global comparative study of smart city development. A separate, citizen-centric study nonetheless provides a compelling opportunity for further research.

Many of the interviewees were conducted by all authors, and most were conducted by at least two. All interviews were audio recorded after informed consent was obtained, fully transcribed, and then sent to the interviewee to edit for factual accuracy, redact any sensitive content, and ultimately approve for analysis and eventual publication. Given the seniority of most of our interviewees, they were also given the option to be named personally, to be identified as representatives of their organisation, or to be anonymised. This gave us a rich dataset that offers unique insight into the architects of Singapore Smart Nation initiative, and DBS's transformation. It provides, in other words, insight into Singapore's state-led platformisation of financial services from the architects of change themselves.

***Creating alignment, vision and trust in the ecosystem***

The ecosystem is the guiding organisational milieu for smart cities, platforms, and the digital transformation of the financial services industry. It is, in other words, the organisational logic of the digital age, as it emphasis interconnection and interdependence between otherwise discrete entities. Importantly, the spatial contingencies of ecosystems can be seen to define

the ways in which they operate, how they are structured, and their overall effectiveness (Caprotti and Liu 2020a; Odendaal 2022). Singapore, by virtue of its city-state status, island geography, and single layer of government, is a context that lends itself to horizontally and vertically integrated ecosystems. As Ng Chee Khern, the permanent secretary of SNDGO, put it, "I have difficulties understanding how people navigate three, four, five layers of government, and how responsibilities and power are spread out into these different levels of government… Smart cities [in these cases] are essentially municipal services, very localised". Chee Khern contrasts the Singapore case to most other smart cities in the world, which are politically layered – and thus diffuse in terms of power – and thus territorially delimited in their ambits. Singapore, on the other hand, is not politically fragmented and can therefore afford to be more expansive in its vision of the smart city. Kok Ping Soon, the CEO of GovTech explained that "because we are small, because we are one [political] unit, we are unified… When the mission is very clear, I think people kind of fall in line quite quickly". Whilst sentiment like this might be read as political posturing, it was echoed by private sector stakeholders as well. Piyush Gupta, CEO of DBS, told us how "we are small enough to bring everybody together. Other countries can't do that… We are a 5 million person country, we've got a progressive public sector, we can actually get people to work together".

The ability to "actually get people to work together" is a benefit that cannot be underestimated. Most other cities that strive to become "smart" are fragmented along ideological, industrial, and other lines. Yet, as Oomens and Sadowski (2019: 486) note, 'in order to grow, internal alignment of partners in these [smart city] projects is crucial to progress'. Without this alignment, ecosystems will become insular and self-limiting because "everybody's trying to do different things", as Raof Latiff, the Managing Director of DBS's Institutional Banking Group, put it. Alignment creates trust, and trust creates an open

ecosystem through which data can flow between different actors, meaning higher-order objectives can be pursued. As Piyush observed, "if you can't create trust, then I can assure you that you will have a lot more frictions than we've had". Whilst trust here refers to the willingness for different, and potentially competing, actors to collaborate in ways that create synergies amongst them, the idea of trust takes on a bigger meaning in the Singapore context. Importantly, trust refers to the relationship between the public and private sectors as well, with many private sector players claiming to trust the Singapore government's role in creating a stable and equitable environment through which business can be conducted. As Paul Cobban, the former Chief Transformation Officer of DBS, explained:

> Singapore ha[s] some guaranteed continuity of government, where they don't have to worry too much about winning the next democratic election… No other country, certainly in the Western world, that I am aware of, has the ability and confidence to invest for the long term to the same extent… So, for me, that's the big difference… The MAS [Monetary Authority of Singapore] is such a pragmatic, forward-thinking regulator that enables us to do things that in other markets we still can't.

Singapore's political stability enables the government to formulate, invest in, and enact a long-term vision for the future. This is a vision that is realised through close collaboration with key private sector partners, like DBS. As Paul went on to explain, the value of having a "clear, vivid picture of the future" is that it "creat[es] a climate for change" that enables public and private sector stakeholders to "get things moving". Expanding these ideas further, Piyush shared how trust is also created in relation to what the government does *not* allow as much as what it *does* allow. Opening up the financial services sector to FinTech companies, for example, was done in a measured and partial way – "they didn't throw it open" – the

reason being to ensure "financial systemic stability". Paul echoed this sentiment, believing that such a disciplined approach to regulation was "very careful and thoughtful… very impressive" and is designed to "increase the competition in the field for the benefit of customers, but they will not put the stability of the economy at risk". Piyush went on to explain how this close and trusted relationship between public and private sector actors, and the ecosystems they create, is particularly evident in the financial services industry. As he put it, "the public and private sector actually cooperated to make the infrastructure available to get ahead very quickly… [We are] leveraging how to use the government's assets and our digital identity and make that available to the [wider] banking system". Indeed, it is through the public-private nexus that state-led platformisation unfolds.

***State-led platformisation through the public-private nexus***

A unique characteristic of the Singapore case is the proactiveness of the government, and its role in orchestrating trusted ecosystems of public and private sector players. These ecosystems are not limited to specific products or initiatives, but also fuel larger-scale platformisation initiatives. These are initiatives based on the opportunities and benefits that aggregating multiple datapoints can yield. State-led platformisation reflects, in many respects, the ideas that "it is quite in the DNA of the Singapore government in wanting to use technology", that "the progress of Singapore's economy… is driven by the government", and that "historically the private sector has looked to the government in terms of thought leadership" (Chee Khern). Accordingly, the public sector sets the vision and direction for where it, and its private sector counterparts, should invest. This is an important counterpoint to many existing discourses of platformisation. For example, Graham (2020: 453, emphasis added) laments the fact that platforms 'control urban interactions whilst remaining

*unaccountable* through a strategic deployment of 'conjunctural geographies' – a way of being simultaneously embedded and disembedded from the space-times they mediate', whilst Lee et al. (2020: 116) demonstrate how a weak public sector can cause city administrators to become ''locked in' to specific corporate products and interests, and thereby 'locked out' from alternatives'. This is less apparent in Singapore, where Piyush conceded that "the public sector leads and everybody else follows. That is the Singapore paradigm… the best and the brightest get streamed into the public sector [so] they're used to setting up the policy frameworks and setting direction". Important to note, however, is the collaborative ethos that underpins these initiatives. The public sector might lead, but it does so in collaboration with its private sector counterparts. As Ping Soon put it:

> The way we work with industry is to have the industry develop *with* us. There's a difference between with us and for us. When it is for us, we are largely doing project management. With us is, look, I have my developers, you have your developers, can we bring our developers together to work on a project, and that is what is happening. This is what we call co-development work.

The emphasis on co-development means that innovation ecosystems might be directed by the public sector, but they are realised through collaboration with industry. This is in stark contrast to both the US, for example, where 'ecosystems are created around big, multinational players such as Google, Amazon, Facebook and Apple', and Europe where the difference is one of scale, with ecosystems built around 'smaller and agile companies' (Robert et al. 2017: 3). Whilst state-led platformisation in Singapore sidesteps this issue, so too can it be seen to (further) centralise and consolidate decision-making power within the government. It enables, in other words, the state to position itself at the centre of 'technology-

enabled organizational arbitrage' which is 'usually made possible by the control that platform providers gain over markets in the process of enhancing their efficiency' (Haberley et al. 2018: 169). Critical insight like this is valuable, but so too must it be contextualised for its applicability to be fairly evaluated. In Singapore, our private sector interviewees typically embraced such state-centricity, mainly because for ecosystems to have maximum impact, they need to balance innovation with reach. Achieving this balance can lead to the larger-scale distribution of products and services throughout society. In this vein, Piyush described ecosystems as a "muscle you have to build", before offering an example of payment app PayLah! As he described it, "PayLah! today is the go-to place for two million Singaporeans… we created a whole bunch of services so that we can orchestrate people having to come to us to do whatever they want". To achieve this scale, DBS worked not just with organisations like the Ministry of Finance, but also, perhaps surprisingly, the Ministry of Education. As Piyush explained:

> one ecosystem we decided to create was with the school industry. We worked with the Ministry of Education and we agreed that we wire up a lot of the primary schools, so kids, instead of getting pocket money in cash, now they get pocket money from the parents account straight into an internet device we give them. And the internet device, they can go and actually pay for stationery, for food, for the canteen, and so on. And in doing that, we gave the parents line of sight to what the kid is using the money for. We built a fitness application into that, we created a parents community where parents can talk to each other, we created a community where we can then start providing them with online tuition services. We orchestrated an ecosystem for education.

What started out as a payment ecosystem evolved to become a platform through which a range of education-related services could be offered to parents and their children. In other instances, the state has played a much more central role in driving platformisation into key areas of strategic development. The advantage that the state can bring to the platform is enabling access to large and diverse datasets that might otherwise be fragmented and/or siloed. With such advantage, so too does the potential for state overreach become more apparent. Overreach has been widely studied in China, where, for example, the creation of a Social Credit System (SCS) to 'manage, monitor and predict the trustworthiness of citizens, firms, organisations, and governments' is enabled by 'centralising data platforms into a big data-enabled surveillance infrastructure' (Barns 2020a: 175). Whilst the SCS might be an extreme example, other, more subtle forms of state encroachment into the operations of business and society abound. Langley and Leyshon (2023: 7) are candid in their assertion that the regulation of FinTech platforms in China has 'increased political control over the financial sector as a whole' and has 'also extended into other areas of life which the CCP wishes to control in the interests of social order'. In terms of FinTech at least, such control includes the development of a centralised settlement system that must be used to ensure all transactions are visible to regulators.

Whilst it is important to be mindful of the potential for overreach that emerges from state-led platformisation, so too is it important to recognise the transparency with which state-centricity plays out in Singapore. Indeed, the orchestrating role of the state is one of the advantages of the Singapore case, given that 'creating coherent, harmonized data sets [is] an even greater challenge in a fragmented city-region composed of multiple jurisdictions' wherein 'public bodies may be operating quite independently of each other, producing, using and curating data in diverse ways with little incentive to coordinate technical approaches or

share data' (Kitchin and Moore-Cherry 2021: 1914). Two products – SGFinDex and SGTraDex – illustrate the advantage that Singapore has in this regard. SGFinDex is an initiative conceptualised and driven by GovTech and MAS, but developed in partnership with, and operationalised through, the local ecosystem of banks. As Ping Soon explained:

> With your [the customer's] consent, [SGFinDex] pulls together all your financial information from all your different bank accounts in Singapore – I think there are seven or eight banks [involved] – pulls together information from CPF [Central Provident Fund], from IRAS [Income Revenue Authority of Singapore], and gives you your financial health situation… It is precisely because the government is a trusted party that we can facilitate this sharing of data across competing banks. Individual banks would not want to do it, but because we have the convening power, we provide the technical infrastructure and the trusted environment, we are able to facilitate, and provide that infrastructure to enable the provision of this SGFinDex service… If you think about it, that whole infrastructure to allow sharing of information across different competing parties facilitated by a trusted third party.

Being a "trusted third party" enables GovTech to develop a platform that enables otherwise competing institutions to collaborate on a project that is for the apparent benefit of the individual citizen. Indeed, the very vision of platform-oriented models of operation is that they enable 'people [to] gather to communicate and share ideas, utilize open data and other resources, and co-create solutions to both utilize development opportunities and solve perceived problems' (Anttiroiko 2016: 6). In this vein, SGFinDex draws on multiple government databases – CDP [The Central Depository], SRS [Supplementary Retirement Scheme], CPF, IRAS – and banking providers to create a shared data platform. Piyush

described SGFinDex as being “like our version of open banking” as “you can pull from the government databases, you can pull from each other, you can create a common balance sheet, and then the banks, or any provider, can provide you with budgeting, financial planning and distinct tools”. An important point of distinction from the open banking model, however, is the intervening role of the state in co-designing the platform and ensuring collaboration amongst competitors. Also important is that fact that the citizen is claimed to be at the centre of such an initiative: it is not a project that is citizen-*led*, but one that is touted as being citizen-*centred*. Indeed, it is this citizen-centricity that aligns with the ideology of the Smart *Nation* initiative. What is claimed to be good for the citizen is good for Singapore, and what is claimed to be good for Singapore is good for its citizens. Whilst the fact remains that any sort of platformisation ‘is not complete without citizens or local residents, who are supposed to participate in innovation processes through platforms’ (Anttiroiko 2016: 2), the idea of citizen centricity can perhaps best be interpreted as a vision and standard that the state establishes, and must therefore work towards fulfilling. It provides, in other words, a benchmark against which accountability can be measured.

Our point is that the logic of citizen-nation-state interoperability that is so evident and dominant in Singapore transcends the limited value of consumer-oriented products and services – personal financial services in the case of SGFinDex – and include macro-level economic drivers as well. In this vein, SGTraDex is a similar initiative to SGFinDex insofar as it relies on the state as a “trusted third party” to aggregate otherwise disparate and siloed datasets. SGTraDex is designed to make the backbone of Singapore’s economy – trade – easier and more efficient. It is, as Raof put it, “basically a collaboration of a number of people and influential organisations” coming together to solve the problem that

> you can send barrels of oil in a few weeks, but it takes months to do documentation. That didn't make any sense. How do we figure this out? One of the biggest hurdles in trade is that data is fragmented. The issuing bank of an LC [Letter of Credit] and the receiving bank of an LC have different states of information. Shipping carriers have different pieces of information. The port has a different piece of information. The customer has a different piece of information. And then the supplier has got the actual invoice. It's all over the place. So, one of the things that Singapore TraDex does… we built this Common Data Infrastructure [CDI] for all parties in the supply chain – the buyers, the sellers, the shippers, the port, the carriers – all can now put information into a single database called CDI, which is part of the Singapore TraDex. This is government – this is MAS, this is IMDA [Infocomm Media Development Authority] – bringing all these things together.

In this case, the government leverages its role as trusted intermediary to build an infrastructure that can amalgamate information from different parties in the pursuit of more efficient, and thus frictionless, processes. The centripetal role of the state in bringing these parties together to cooperate in a way that brings synergies for trade is something that few smart city administrators located in other countries would be able to do. Political fragmentation would likely obstruct the need to overcome organisational siloes, and the national-level prioritisation of areas of strategic importance might be lacking. The fact is that 'like most technologies and policies', the development of the smart city 'must contend with existing contexts, unexpected barriers, insufficient resources and a multitude of delays, detours and dead ends' (Sadowski 2021: 3). Whilst these contentions do exist in Singapore, the difference is that it is a context that is setup in such a way that it can overcome them with relative ease. In overcoming these problems, state-led platforms like SGFinDex and

SGTraDex gesture to the benefits that arise from pursuing a more expansive logic of "smartness".

### *An expansive logic of "smartness"*

Whilst the logic of "smartness" that permeates many smart city initiatives around the world rests on the benefits that can be gleaned from an expansion of the real-time knowability of a city, more efficient feedback loops and intervening processes, and more predictive analytics, in Singapore it transcends the technologies that are used to make cities "smart". Instead, it is a logic that is being used to forge new forms of public-private collaboration that will establish the terms of working through the digital transformation that drives the transformation (or disruption) of industry, government, society, and the city. State-led platformisation is one manifestation of this logic. As Ping Soon explained: "[we want] the developers or the industry to develop on us, on the things that we do… we create a very trusted environment. We are a party who competitors out there will feel comfortable working with". The platforms that the state orchestrates strive to create an environment of collaborative openness and innovation. That the state is located at the centre of these platforms means it can 'mediate and co-ordinate between different stakeholders… the two(or multi-)sides of the market' (Van Der Graaf and Ballon 2019: 367), and thus retain a degree of regulatory control over how innovation unfolds, and how it might implicate Singapore as an economy and a nation. The advantage of this, as Raof put it, is "you bring a government institution between [competitors] to bring something together, then it works because information… is available centrally. So people who want to provide services can be more creative and come up with competitive solutions". Interesting here is how levelling the playing field of competition is believed to lead to *more* competitive products and services, as competitiveness is no longer

indexed to exclusive access to data, but the quality of an idea. Piyush explained this point further:

> If I just do digitisation by myself, it doesn't work. I need everyone in the banking system to digitise as well, if not I can't do instant payments. I need the central government to digitise, if not I can't pull from the databases. I need to be able to create a regulatory architecture which says what data is OK, what is not OK, what is not crucial. So I need lots of people to digitise at the same time, so you have to collaborate if you're going to be able to impact and scale. On the other hand, I'm also competitive. So, how do I make sure that I create a collaborative thing without selling the crown jewels? And that's not easy.

In this sense, smartness is about commodifying some aspects of Singapore's financial services infrastructure – and thus flattening the playing field – which in turn puts pressure on its stakeholders to forge new forms of competitive differentiation. This is a logic that speaks to the good of the industry, of the economy, and of the citizen: it is not one that serves the interests of one player only. It is in this capacity that platforms *can* lead to a 'rethink of 'industry'' (Van Der Graaf and Ballon 2019: 367), albeit not so much in terms of organisational transformation, but more in terms of how industry relates to the state, and how individual organisations work together through evolving practices of collaboration and competition. Whilst platforms like SGFinDex and SGTraDex speak primarily to financial services stakeholders, it is a model that can be replicated. For example, Raof spoke of the benefits that could be accrued from integrating hitherto fragmented parts of the healthcare ecosystem – the hospitals, clinics, and insurance providers across both the public and private domains – into one healthcare platform. Like with trade, the problem now is that "they all

want ecosystem in some ways, but it is not connected… if you speak to any of them, they will struggle to give you a smart city or a Smart Nation agenda or plan" (Raof). It is the state that provides the bigger ideological framing, which is then realised through its role in the platformisation of key services. But this logic transcends individual industries, and speaks to the bigger vision of realising what a genuinely "smart" city – or Smart Nation in the Singapore case – is, or could be. Jimmy Ng, DBS's Chief Information Officer, gestured to this in his observation that

> to be a smart city, you have got to have smart finance, smart construction, smart transport – smart everything. For us to be able to be part and parcel of this ecosystem, it is a breathing and living organism of how we then interact in the work that we do in DBS. If you see it from a broader perspective, we are connected into this, we are helping our construction corporate clients to enable some of this digitalisation… The transformation cannot just happen in one industry, the transformation has to be cascaded everywhere.

Jimmy's point is that smartness does not operate in silos, and if it does, then it is a limited and partial view of what genuine "smartness" could be. It is a view that looks beyond public-private, public-public, and private-private distinctions and reconceptualises a way of working that is at once *less* and *more* competitive, and which does things for the bettering of the whole, not the individual parts. Put differently, smartness in Singapore is about subjecting the individual player – whether it is a citizen, a government ministry, or a company like DBS – to a bigger and more integrative vision of the future. It is an avowedly integrationist vision that draws strength and purpose from being embedded in an innovation ecosystem that is rooted in collaboration, which in turn 'increases the value of their innovations and create[s]

synergies and network effects that improve their competitive advantage' (Anttiroiko 2016: 7). The question of whether such competitive advantage serves the purpose of the state, the nation, the citizen, the consumer, the private sector, or of capitalism more broadly is secondary to the value it creates as a driver of *progress*. As Jimmy went on to explain

> I believe that as we move along, all this transformation that you will see bubbling up at different sectors will then converge into this whole notion of a Smart Nation. I don't think Smart Nation is something that you can do top-down, but the ability for each industry to be able to bubble up their own innovation in an ecosystem which is interconnected, and the government has a role to play in terms of promoting that, in terms of adoption and setting up certain infrastructures that may not be investment friendly for everyone to participate.

The balance between top-down infrastructural investment – or state-led platformisation – and bottom-up innovation creates an environment of inclusive participation. It is an environment that is unique to Singapore in that it is enabled by technology, but is rooted in a much more profound sense of mutual co-operation and respect between different industry and governmental actors. It is, in other words, the peopleware of governance that is deployed to bring the hardware and software to life in a mutually beneficial way. The peopleware stems from being invested in the vision of the Smart Nation, and manifests as personal and organisational sacrifices in order to bring about the changes that are needed. Raof gave an idea of what is meant by this when he recalled how, when building SgTraDex, he would "have Saturday meetings with the CEO of DBS, PSA [Port of Singapore Authority], IMDA. On a Saturday morning [we would] come together to sign on paper that we are going to do this. That is amazing. I mean, you don't get that everywhere". Raof is right: you do not. Yet,

this is exactly what makes Singapore such a prototypical example of how state-led platformisation can reveal a "smarter" vision of a more progressive urban future.

## Conclusions

Whilst this article has intentionally advanced an argument in favour of state-led platformisation by drawing on the Singapore case, we also recognise the limitations of our case study. In many respects, the key methodological strength of this article – our access to senior public and private sector stakeholders – is also its key weakness, as the voices of everyday users of these financial services platforms are not captured. What we have advanced, then, is an understanding of how platforms can – and *do* – work best at the level of technological design and the development of organisational trust and collaboration. In this vein, we recognise the danger of 'presum[ing] the efficacy of the power of platforms and overlook[ing] what power fails to do: its blind spots, limits and resistances' (Bissell 2020: 103), and that research into platformisation – whether private or public sector-led – should 'remain alert to different registers of socio-spatial experience, encompassing but also extending beyond ontologies of control and appropriation' (Barns 2020a: 20). This is particularly true in Singapore, where, as disclosed earlier, strategies of financialisation have been met with resistance by the general public. State-led platformisation may have smoothened the way for productive state-state, state-private, and private-private digital developments, but a latent sense of friction remains. Just as the COVID-19 event smoothened the way for an enforced behavioural shift within Singapore society, it is reasonable to expect friction to increase in the months and years ahead. In this vein, as much as platforms like SGFinDex offer a prototypical example of what a well-designed and integrative platform can look like and achieve, so too does such a narrative obfuscate the politics of translating such

sophisticated financial planning and management tools to society. In a study of state-sponsored financial literacy events in Singapore, Lai (2017: 914) warns how 'financial planning becomes a form of biopower' whereby society is 'mobilised through state-sponsored narratives emphasising individual responsibility, normalisation of risk in financial management, and calculative assessment of life goals'. Whilst the extent to which the state-led platformisation of financial (and other) services is a proxy for biopolitical control over individuals and businesses remains to be seen, it presents an important avenue for research to explore.

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