



Public sector innovation in a city state: exploring innovation types and national context in Singapore

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ARTICLE INFO

Keywords:

Public sector innovation types
Innovation typology
National context
Singapore
Systematic review

ABSTRACT

The purpose of this study is to deepen our knowledge of the typology of public service innovation (PSI) and the role of national context within the context of Singapore, a less studied but highly pertinent context. To accomplish this, our study uses two different methodologies. First, we conduct a systematic review to understand the national context of Singapore. We then utilise [Chen et al. \(2020\)](#)'s recent typology to uncover the innovation configuration in the country. To achieve this, our second dataset consists of an analysis of 148 innovations from the United Nations Public Service Award (UNPSA) between 2008 and 2017. The content analysis identifies that Singaporean innovations prioritised consistently an operation focus during the period studied, while the locus shifted from internal to external after 2011 elections. We argue that the new typology is robust to classify innovation in the public services. We also formulate propositions how Singaporean national context influences the innovation types and in which government functions innovations emerge.

1. Introduction

Governments have sought to promote innovation within their public services, while scholars have attempted to identify the nature of public service innovation (PSI) (e.g. [Moldogaziev and Resh, 2016](#); [Demircioglu and Audretsch, 2017](#); [van der Wal and Demircioglu, 2020](#); [Fuglsang and Hansen, 2022](#); [Arundel et al., 2019](#); [Kuhlmann and Rip, 2018](#); [Vassallo et al., 2023](#); [Gofen et al., 2023](#)). However, the role of national context remains understudied despite the influence of differences in the administrative, social, political, economic, technological and temporal contexts of each country that affect different innovation types ([Cinar et al., 2022b](#)).

Innovation types and typology schemes as classification systems represent a significant line of research in the PSI literature ([Walker, 2006](#); [Wu et al., 2013](#); [De Vries et al., 2016](#)). Recently, [Chen et al. \(2020\)](#) have criticised the use of private sector concepts and the internal orientation of existing classifications and subsequently developed a new innovation typology based on the criteria of innovation locus and innovation focus. Their call to investigate the applicability of this new typology in the Asian context informs the rationale for our study. This is further informed by [van der Wal and Demircioglu \(2020\)](#) and [Cinar et al. \(2022b\)](#) calls to study innovation in different contexts, including Asia, to

understand the role of national context in PSI.

We adopt [Chen et al. \(2020\)](#) typology to analyse PSI in Singapore. Singapore is particularly relevant to study PSI because of its unique context of the economically developed, innovative and developmental city-state. The Global Innovation Index (GII) identifies Singapore as a top country in terms of both innovation inputs and outputs ([WIPO, 2021](#)). It is also ranked highly in knowledge intensive employment and in terms of government R&D investment ([Wong, 2022](#)). Singapore has successfully transformed its national innovation system since the 2000s ([Parayil, 2005](#)). Similarly, Singapore has initiated significant public service innovations in the areas of ageing and healthcare ([Haseltine, 2013](#); [Chan, 2017](#)), education ([Ng, 2007](#)), law enforcement ([Ng and Ang, 2011](#)), public finance ([Teo and Wong, 2005](#)) and transportation ([Quirapas Franco et al., 2018](#)). On the other hand, given its soft-authoritarian political context and a meritocratic administrative system that emphasizes top-down approaches to public order, economic growth ([Abdullah and Kim, 2020](#); [Tan, 2008](#)), and innovation ([Wang, 2018](#)), Singapore presents an interesting case for studying PSI.

This study aims to achieve the following two research objectives. First, to understand the nature of PSI and particularly the focus and locus of innovations introduced in less-known context and in doing so to validate a recently proposed typology ([Chen et al., 2020](#)). Second, to

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deepen our understanding how national context can influence PSI, and particularly the focus and locus of innovations and government functions where innovations emerge. To accomplish these objectives, we first conduct a systematic literature review to understand national context elements of Singapore. Second, we analyse 148 innovations from Singapore submitted to United Nations Public Service Award (UNPSA) scheme between 2007 and 2017 and uncover the innovation types configuration and how national context plays a role in this configuration.

In doing so, this study aims to make at least two major contributions to the literature. First, our systematic review of past academic publications synthesizes the empirical research to understand the national context elements in Singapore. Our analysis and discussion based on the systematic review and data from the UNPSA scheme enables us to provide fresh evidence from a less studied context to uncover the role of diverse national context elements on PSI configuration and build upon Cinar et al. (2022b), where a dominance in Western contexts exists (De Vries et al., 2016; Mussagulova, 2021; Suzuki et al., 2020; van der Wal and Demircioglu, 2020). Second, we provide evidence to validate that the new typology proposed by Chen et al. (2020), demonstrating that it is robust and applicable to other contexts.

The remainder of the article is structured as follows. In the following section, we define PSI and provide a chronological background of PSI innovation typologies. Subsequently, we present our theoretical framework. Following this, we detail the data source for our study, UNPSA, the coding procedure and limitations. Then, we present our findings on the national context elements of Singapore and coded innovation types. Finally, we discuss our results and the role of national context in PSI, and formulate propositions. This article ends with future research directions and conclusions.

2. A chronology of public service innovation typologies

PSI is defined in this article, as the adoption, creation or development of ideas, objects and practices that are new to the unit of adoption (Chen et al., 2020; Demircioglu, 2020; Vassallo et al., 2023). The development of innovation typologies has been a significant line of research in PSI literature (see Table 1) and it has allowed researchers to generalise the findings of PSI literature across different contexts (Korac et al., 2017). The innovations differ in their characteristics as they provide solutions to complex problems, hence the distinction between innovation types is vital to conceptualize the complex content of PSI (Walker, 2006).

The first innovation typology of PSI was introduced by Damanpour and Evan (1984) and Damanpour (1987). They proposed three innovation types: technological, administrative and ancillary. Organisational innovations emerged in two forms: Technological and administrative process innovations. Ancillary innovations refer to any innovation that requires cross boundary activities outside the public sector organization (PSO). Walker (2006, 2008) studied this typology whilst also adding service innovations as a new type. Osborne (1998) took a different approach and attempted to distinguish a scale of four innovation types based on the different levels of novelty of innovation and the target users from most innovative to least innovative: Total, expansionary, evolutionary and developmental. At one extreme total represents new services and new needs of the society (i.e., radical or breakthrough innovation), whilst at the other end developmental refers to improved existing services for existing users (i.e., incremental innovation) (Osborne, 1998). Later, Walker et al. (2002) also utilised this typology.

Hartley (2005) identified four additional types of innovation: Rhetorical innovation (new policy discourse), Governance innovation (new citizen participation methods), Strategic innovation (new strategic objectives), Position innovation (new customers) in addition to the accepted three dimensions (product, process and organisational). Concurrently, the EU funded research project on PSI, PUBLIN was conducted between 2003 and 2006 (Koch and Haukness, 2005). This resulted in the development of a more detailed typology of PSI,

Table 1
Public service innovation typologies.

Damanpour and Evan, 1984; Damanpour (1987) Osborne (1998)	1. Technological innovation 2. Administrative innovation	3. Ancillary innovation
Walker (2006)	1. Total innovation 2. Expansionary innovation	3. Evolutionary innovation 4. Developmental innovation
Hartley (2005)	1. Product or Service innovation 2. Organisational process innovation	3. Technological process innovation 4. Ancillary innovation
Windrum (2008)	1. Product or Service innovation 2. Process innovation 3. Position innovation	4. Strategic innovation 5. Governance innovation 6. Rhetorical innovation
Wu et al. (2013)	1. Service innovation 2. Service delivery innovation 3. Administrative or organisational innovation	4. Conceptual innovation 5. Policy innovation 6. Systemic innovation
Arundel and Huber (2013)	1. Service innovation 2. Technological innovation 3. Management innovation	1. Collaborative innovation 2. Governance innovation 3. Communication innovation
Gonzalez et al. (2013)	1. Product or service innovation 2. Process innovation	4. Policy innovation 3. Collaborative innovation
Bloch and Bugge (2013)	1. Product innovation 2. Process innovation	3. Organisational innovation 4. Communication innovation
Torugsa and Arundel (2016)	1. Product innovation 2. Process innovation 3. Service delivery innovation	4. Administrative innovation 5. Conceptual innovation
Bugge and Bloch (2016)	1. Policy innovation 2. Service innovation 3. Service delivery innovation	4. Communication innovation 5. Bricolage innovation 6. Systemic innovation
De Vries et al. (2016)	1. Product or service innovation 2. Administrative or Technological process innovation	3. Governance innovation 4. Conceptual innovation
Chen et al. (2020)	1. Mission innovation 2. Policy innovation 3. Management innovation	4. Partner innovation 5. Service innovation 6. Citizen innovation

consisting of six innovation types: Services, service delivery, administrative or organisational, conceptual, policy and systemic. The latter three types reflect the unique characteristics of the public service domain. Conceptual innovation refers to the development of new world views that challenge assumptions that underpin existing service products, processes and organisational forms` (Windrum, 2008, p.9). Systemic innovation captures `new or improved ways of interacting with other organizations and knowledge bases`. Policy innovation `changes the thought or behavioural intentions associated with a policy belief system` that consists of the policy instruments, the shared understanding or problematization of the challenges and rules for policy interactions (Windrum, 2008, p.10).

The MEPIN study (Bloch and Bugge, 2013) surveyed Nordic PSOs and followed the typology of the Oslo Manual (Organisation for Economic Co-operation and Development, 2005): product, process, organisational and communication innovations. While this study identified differences between Denmark, Norway, Finland, Iceland and Sweden, it failed to discuss the role of context in depth. In the same year, the Innobarometer Survey (European Commission, 2011) included three similar main innovation types: New service, organisational and communication innovations. Respectively, the most frequent innovation types identified were: (1) new service, (2) new service or interaction

methods, (3) new methods to promote the organization and activities, (4) new supporting systems for the organization. The survey failed to capture systemic, governance and social characteristics of PSI. In terms of the factual context of this study, differences were uncovered between EU countries regarding PSI types. However, neither the original report nor subsequent studies that utilised this data (see Arundel et al., 2015; Clausen et al., 2020), investigated the divergence and context specificity of the typology.

In the context of China, Wu et al. (2013) studied the PSI innovation typology, benefitting to some extent from the widely accepted typology of service, technological process and administrative process. In addition, the authors distinguished between collaborative innovation and governance innovation. The first originates from ancillary innovation and adopts a joint, holistic and inter-organisational approach, also recognised by Borins (1998). The latter mainly aims to deal with citizen participation, transparency and accountability.

In sum, PSI typologies have been proposed and studied for almost four decades. Although all these studies attempt to develop a common understanding of PSI, most of them originate from the private sector innovation literature. Specifically, the typologies did not reflect public value creation processes and the growing interest in collaborative innovation in the public services. Therefore, we adopt Chen et al.'s (2020) recent innovation typology that provides more comprehensive and holistic picture about the nature of innovations. The following section will elaborate on our conceptual framework.

3. Conceptual framework

3.1. A typology based on innovation locus and focus

Chen et al. (2020) recently criticised the use of private sector typologies, as well as the internal orientation of existing typologies, arguing that this fails to capture the characteristics of innovations related to collaborative innovation. The new typology originates from Moore (1995) seminal Public Value concept to reflect the *focus* of value creation processes of authorisation, institutionalisation and operations. Three innovation foci they developed can reflect these processes: strategy, capacity, operation. Chen et al. (2020, p. 1682) argued that “the authorization process ensures that an organization’s mission reflects the desires of legitimate political authority and defines the type of services offered. To maintain its capacity, an institution seeks to improve its administrative procedures and relationships with partners. To ensure mission effectiveness, an organization seeks to improve its operating value”. The *locus* of the value creation captures the organization (internal) and its interactions with the eco-system (external). The external locus has particular importance to reflect recent growing interest in collaborative PSI. Accordingly, they identified six different types of innovations:

1. *Mission Innovation* is the organisational adoption of a new paradigm or purpose to clarify the existential duty of a PSO. This paradigmatic change can include the foundation of a new organization with a new mission as well, like the Space and Moon mission by the NASA in the United States (Kattel and Mazzucato, 2018). Mission innovation has an internal focus for the authorizing process of public value creation and led by managerial or political mandate, rather than interactions with external stakeholders. The new air safety paradigm of ‘Single European Sky’ by the European Aviation Safety Agency (Ongaro and Ferlie, 2020) is one example of a mission innovation.

2. *Policy Innovation* is a complex innovation type that is well established in the literature. The policy innovation diffusion literature defined this simply as adopting a new policy (e.g., immigration enforcement, smoking bans) and has studied the diffusion factors among American states (Berry, 1994). This line of research has spread to other countries (e.g. Zhang and Zhu, 2019; Yi et al., 2018). However, the PSI literature defines policy innovation differently; considering the entire policy process. First, Windrum (2008) focused on policy learning to

solve wicked problems. Second, advocates of the collaborative PSI focused more on collaborative governance along with interactive platforms to solve societal problems (e.g., Sørensen and Torfing, 2019). They cited the *Local Task Committees* from the Danish local government context as a policy innovation, where local councillors can interact with citizens and community groups through a novel platform. Chen et al. (2020) also pointed out that the aim of policy innovation is to solve wicked problems via expanding internal strategic missions to external environment. This entails new political agendas and the external authorizing strategy processes which introduce new benefits or obligations for citizens or organizations. *Taiwan’s Bookstart Programme* which aims to improve children’s literacy in their early years is an example of national policy innovation (Liu, 2021).

3. *Management Innovation* is a well-established innovation type in the literature, as it is closely related to the previously discussed process innovation. Chen et al. (2020, p. 1684) defined it as any innovation to institutionalise organisational capacity internally to produce public value through ‘the introduction of new management practice, process, structure, or technique’. They also noted management innovation has two dimensions: technological and administrative. Management innovation examples range from the adoption of novel treatment units in hospitals (Piening, 2011) and *Managing for Results* performance systems (Wang and Yeung, 2019) to AI based decision-making tools (Ranerup and Henriksen, 2019).

4. *Partner Innovation* has an external locus to enhance the organisational capacity through the external institutional resources (Chen et al., 2020). This focus has been discussed by the typology literature for some time. Walker (2006, p. 314) underscores the ‘working across borders’ nature of ancillary innovation. Partner innovation also shares many similarities with collaborative innovation affiliated to other PSOs, businesses and NGOs (e.g., Wu et al., 2013). Contracting out child protection services to NGOs (Moore and Hartley, 2008), inter-governmental emergency response networks (Wu et al., 2013) and public-private health networks (Gallouj et al., 2013) are all regarded as partner innovations.

5. *Service Innovation* has been utilised in a number of PSI typologies. Osborne (1998) defined it as the introduction and delivery of new services, and reflects new services, new users or a combination of them. Chen et al. (2020, p. 1683) emphasized that service innovation is associated with a primarily operational offering and is ‘within the capability of the focal organization’. Thus, service innovation, such as electronic medical prescription services, has an internal locus.

6. *Citizen Innovation* is a new innovation type introduced by Chen et al. (2020) to emphasize the external orientation and distinguish collaboration with citizens, and it can illustrate the growing interest of PSOs in co-creation (see Voorberg et al., 2015). Whilst citizen innovation can be compared to governance innovation, there are a number of differences. Wu et al. (2013), influenced by the good-governance literature (e.g., Hood, 2007), listed three distinct characteristics under governance innovation: the management of democratic institutions, citizen participation and anti-corruption approaches. On the other hand, De Vries et al. (2016, p. 153) focused on governance networks, and defined governance innovation as ‘Governance practice that attempts to enhance the self-regulating and self-organizing capacities of policy networks’. In comparison, Chen et al., (2020, p. 1682) conceptualisation of citizen innovation focused on solving PSO’s ‘operations problems’ and thus engaged citizen ideas & resources through co-creation/co-production. The empowerment of older people and their carers to select personalised care provision (Flemig and Osborne, 2019) is an example of co-production-based citizen innovation. There are also a significant number of cases of citizen innovations for co-design of urban spaces (e.g., Nambisan and Nambisan, 2013). The novel crowdsourcing applications to gather citizen ideas and feedback (e.g., Hameduddin et al., 2020; Mergel, 2015) can be exemplified as citizen innovation.

3.2. National context

Within the broader public and business management literature, the context refers to external settings, or social, economic, political, and administrative characteristics that can affect a phenomenon or outcome (Bamberger, 2008; Pollitt, 2013). Overall, context would be inside of the organization, such as demographic (e.g., gender and age), or outside of the organization, such as organisational (e.g., types of organizations and work location) and national context (Demircioglu, 2020). As Kovala (2014, p.159) states, we must theorize the context because the 'context is both starting point and end of analysis at the same time', 'contexts are often invisible', so we should make visible how the context affects the outputs and outcomes that we analyse. Similarly, Pollitt (2013) suggests the importance of conceptualising context and clarifying the level of analysis. O'Toole and Meier (2015) point out that the political context (e.g., separation of powers, federalism, corporatist process, and performance appraisal), environmental context (e.g. the complexity, turbulence, and munificence of environment), and internal context (e.g. goal clarity, centralization, and professionalism) impact organisational performance. They argue that this context theory framework is 'neutral, in the sense that it can be used in conjunction with numerous management theories... [and] a route toward understanding the general and also the contingent aspects of public management' (O'Toole and Meier, 2015, p. 253). Therefore, their framework is applicable to PSI in general and this study in particular, because political, environmental, and internal context can affect innovative activities, including types of innovation.

Several PSI studies have investigated the influence of organisational level context (e.g., Demircioglu, 2020) and organisational external environment level context (e.g., Walker, 2008; Korac et al., 2017). Some studies also investigate how demographic context such as gender may impact the implementation of innovations (Demircioglu, 2020; Lapuente and Suzuki, 2021). These studies find that demographic, organisational, and external environment context affect the implementation and success of innovations, such as some agencies being more innovative than others. Nevertheless, the role of national level context in PSI remains underexplored in the PSI literature (De Vries et al., 2016) despite the importance of national context to economic development, performance and innovation (Ballot et al., 2015). Understanding the national context is vital because administrative, political, and economic context may impact the implementation and types of innovation that this study analyses.

Fortunately, a few recent studies have aimed to address this research gap. Analysing the context of Japan, Italy, and Turkey, Cinar et al. (2022b) recently proposed a conceptual framework of the national context which consists of five context elements: (i) *The administrative context* is related to the structure of public administration in the country and machinery of central, regional and local government (Pollitt, 2013). Decentralised contexts and local governments are regarded more suitable for co-creation and collaborative PSI (Ferlie, 2021, Cinar et al., 2022a). In tandem, New Public Governance is associated with the collaborative and externally oriented innovation (see Hartley et al., 2013).

(ii) *The political context* reflects the party-political nature of public services. Political actors at different levels of government can facilitate innovation (Sorensen et al., 2021; Scott, 2021). PSI necessitates decisions to allocate resources that are bounded by power relations (Osborne and Brown, 2011) and the existing power relations can influence the typology (Cinar et al., 2022b).

(iii) *Economic & Technological context* is related to macroeconomic features, the level of economic development in the country as well as the technological capabilities and knowledge accumulation through R&D in the public and private sector. The literature reports mixed results for resource availability. On one hand austerity and cutbacks can drive innovation to do more with less (Khanal, 2022; Van der Voet, 2019), on the other hand, an abundance of resources within an economic growth context can facilitate innovation (Bernier et al., 2015). With regard to

technological context, the literature suggests that the level of technological capabilities in the public sector and private sector of a country are closely related to technological administrative innovations (Cinar et al., 2022b).

(iv) *The social context* consists of socio-demographic factors; social movements and social inequalities. The social context can serve as a challenging context for PSI to address. For example, an ageing or booming population, alongside international migration, are regarded as problematic social context elements for PSI to deal with (Demircioglu and Vivona, 2021). Further, the level of urbanisation forms an important social context element as urban and rural areas each necessitate different PSI types (Cinar et al., 2022b).

(v) *The temporal context* provides a time dimension to all national context elements to conceptualize and explain temporal relationships. Cinar et al. (2022b) posit that significant events such as disasters or financial crisis can challenge deeply embedded values and trigger PSI. Further, temporal reform trajectories should also be regarded as elements of the temporal context (Ongaro et al., 2021).

In this study, we will utilise this conceptual framework of the national context to apply it to a less known, but highly relevant context: Singapore. Considering the scarce empirical data and literature on national context, we aim to develop propositions in our discussion section based on this context framework and our findings.

4. Methodology, data, and coding procedure

The first step of our analysis was a systematic review of the academic articles per-reviewed and published between 1992 and 2022 to understand national context elements of Singapore. To understand the context where PSI emerges, we set our search words broadly and in addition to our first set of search terms¹ for innovation we included a second set of search terms² referring to recent change trends, such as: New Public Management, reform, governance, co-creation, modernisation, smart city, artificial intelligence, and big data. We utilised Web of Science and this search returned 1054 results published between 1992 and 2022, covering a total of a thirty-year period. Our inclusion criteria required that the article should specifically provide evidence on a specific national context dimension of our conceptual framework, published in a peer-reviewed academic journal and written in English.

Following Cinar et al. (2019), firstly we screened the title and abstracts of each article, and subsequently included 271 peer reviewed articles which provided information about the administrative, political, economic, technological, social and temporal context of Singapore. These were then read in full. Finally, 32 articles were included for the analysis that matched our inclusion criteria (see Fig. 1). The data extraction process followed an abductive approach. Initially, Cinar et al. (2022b) five main elements of context were utilised as a foundation for our coding book in a deductive approach. Through content analysis, the first and second authors coded relevant information on Singapore and developed our coding book further inductively, in line with the recurring themes under main context elements. Following Gullmark and Clausen (2022), we adopted an interpretivist approach to synthesize the elements of the context in Table 2 and utilised these to understand and to discuss the national context of Singapore through a narrative synthesis.

¹ TS = (innov*) AND TS = (municipal* OR "public administrat*" OR "public organi\$ation*" OR "public management" OR government* OR "public service" OR "local government*" OR "e-govern*" OR governance OR "public sphere" OR "public sector" OR administrative*) AND TS = (Singapor*)

² TS = ("New Public Management" OR "NPM" OR "reform" OR "governance" OR "co-creation" OR "modernis*" OR "smart cit*" OR "artificial intelligence" OR "AI" OR "big data") AND TS = (municipal* OR "public administrat*" OR "public organi\$ation*" OR "public management" OR government* OR "public service" OR "local government*" OR "public sphere" OR "public sector" OR administrative*) AND TS = (Singapor*)

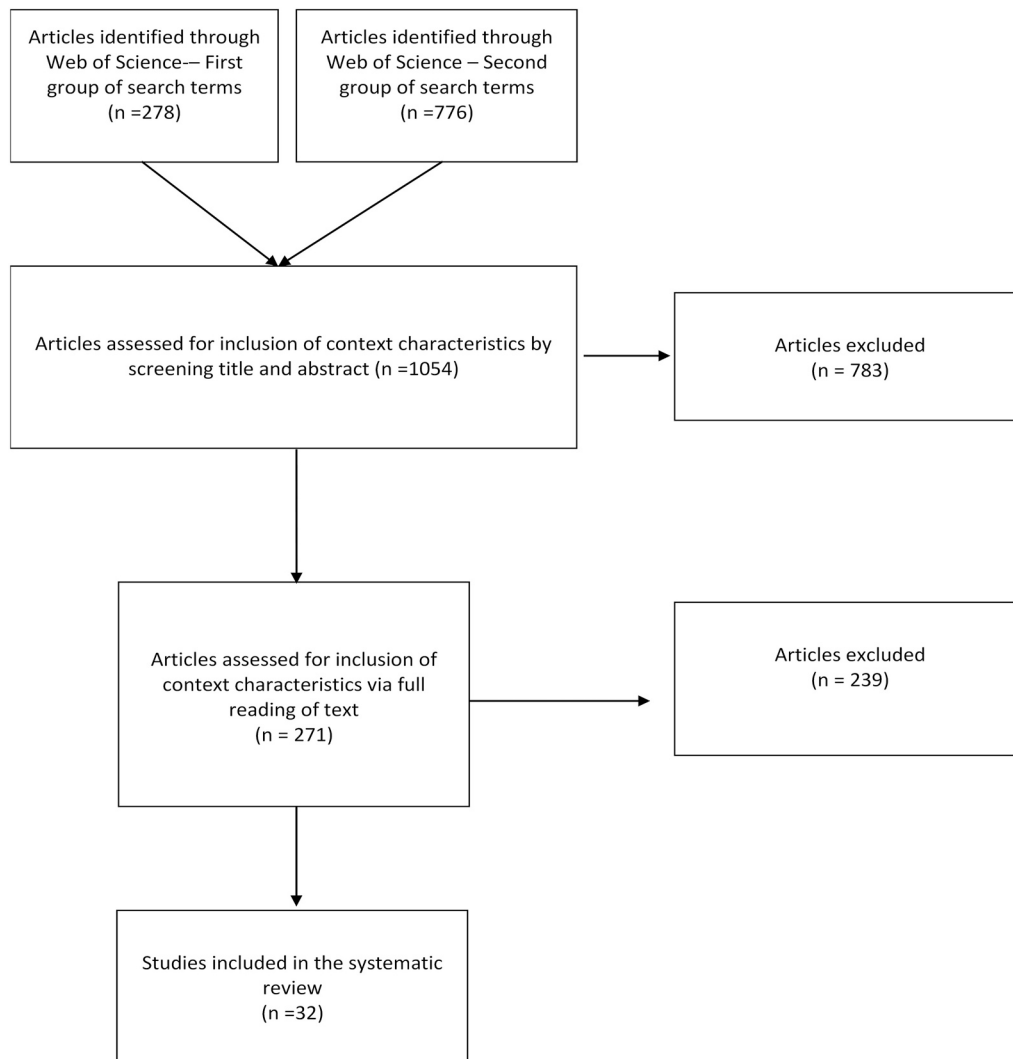


Fig. 1. The systematic review process.

The second step in our analysis utilised UNPSA, which is a similar awards scheme to IAGP award scheme analysed by Chen et al. (2020), to apply the new PSI typology in the selected Asian context. UNPSA, founded in 2003, is a global public service award scheme which aims to facilitate innovation and best practices internationally. UNPSA publishes and accepts structured online application forms, which require information about the problem, initiators, the innovation content, stakeholders, obstacles and outcomes. The UN initially published general information on the awards and application forms of award-winning initiatives as reports (e.g., United Nations, 2007). Since 2007, applications that passed two rounds of evaluation have been published on a database.³ Singapore is one country that has submitted a significant number of applications since 2008. We coded the entire population of these 148 innovations between 2008 and 2017.

A significant number of prior studies have used similar databases due to their advantages (e.g., Sanger and Levin, 1992; Borins, 2014; Demircioglu and Vivona, 2021; Cinar et al., 2021; Cinar et al., 2022b). First, the awards schemes ask for the evidence for the novelty of the submitted case. Second, it requires information about the details of the innovation process activities. In addition, one question addresses both challenges and the success of the innovation. Third, the scheme assessed the self-reported outputs and benefits, as well as the transferability and

sustainability of the submitted innovation. UNPSA has been calling initiatives from a broad range of policy domains as well, which may increase the diversity of innovations. For these reasons, UNPSA cases are relevant to test the applicability of the novel typology by Chen et al. (2020). In sum, these awards provide useful, in-depth, and insightful information about the nature of innovation within submitted innovations, which impact our understanding and typology of innovation.

Content analysis was adopted as the method to evaluate and code the content of UNPSA applications from Singapore. We followed the coding protocol by Chen et al. (2020).⁴ To ensure comparability, *the core of innovation* was investigated in each case and each innovation was coded to a single category. Thus, the innovation types are mutually exclusive.

The third author coded 20 cases initially to test the coding procedure. The results were discussed in a meeting and the suitability of the coding procedure was agreed. Subsequently, the first and third authors coded all of the cases independently, and 85 % of inter-coder reliability was achieved. A full agreement on the coding was reached, after the disagreements were discussed and remedied through further meetings and joint coding.

³ <https://publicadministration.un.org/en/UNPSA>

⁴ See their supplementary material: https://www.tandfonline.com/doi/suppl/10.1080/14719037.2019.1645874/suppl_file/rpxm_a_1645874_sm3396.pdf

Table 2
Context elements identified through the systematic review.

Main national context categories	Detailed national context elements of Singapore	Primary studies
<i>Political context</i>	<ul style="list-style-type: none"> Soft- authoritarianism under the ruling party (PAP) since the independence in 1965 A significant interplay between political and administrative system, as prominent PAP members originate from civil and military service and form a technocratic government Pragmatism as an ideological rhetoric to maintain the economic growth and one-party state through adopting what works best Political mandate for social order and social control via social policies such as housing policy, immigration policy and crime prevention policy Blurred boundaries between the public and private sector in Singapore that allows collaboration and knowledge transfer A progressive approach to solicit the individual views 	<p>Clammer (1997); Hamilton-Hart (2000); Tan (2012); Nasir and Turner (2013); Abdullah (2020)</p> <p>Tan (2008) Tan (2008, 2012)</p> <p>Clammer (1997)</p> <p>Hamilton-Hart (2000); Wang et al. (2015); Ho et al. (2016)</p> <p>Goh (2001), Abdullah (2020)</p>
<i>Administrative context</i>	<ul style="list-style-type: none"> Developmental state Emphasis on public service excellence No urban-rural divide and hence less complex government Learning driven top-down approach Meritocracy through talent management and professionalism Interest in NPM inspired reforms and innovations Collaborative governance, co-production and design thinking attempts under the shadow of hierarchy Successful anti-corruption agencies 	<p>Haque and Puppim de Oliveira (2021) Guan (1997); Nasir (2018)</p> <p>Abdullah and Kim (2020); Quah (1995); Poocharoen and Lee (2013); Haque and Puppim de Oliveira (2021) Aoki (2015); Haque and Puppim de Oliveira (2021) Poocharoen and Ting (2015); Lee et al. (2017); Gómez-Carmona et al. (2019); Han (2019); Dresel et al. (2020) Quah, 1995, Quah, 2017; Hira and Shiao (2016) Guan (1997); Tan (2012)</p>
<i>Economic & technological context</i>	<ul style="list-style-type: none"> Lack of economic mass, limited human and natural resources due to the small city state Investment in human capital through education and health policies High R&D budgets allocated Reliance on foreign direct investments Interventionist innovation policy Capabilities on information technology developed over decades Public housing is <i>infrastructural and symbolic insertion of the ideas of continual economic progress</i> Income gap widening 	<p>Nasir and Turner (2013); Wong (2007)</p> <p>Ho et al. (2016); Ang-Tan and Ang (2022) Breznitz and Ornston (2018)</p> <p>Haque and Puppim de Oliveira (2021); Tan and Taeihagh (2021) Quah (1995); Chan et al. (2008); Chan and Al-Hawamdeh (2002) Goh (2001);</p>
<i>Social context</i>	<ul style="list-style-type: none"> Multiracialism- <i>micromanagement of ethnic relations and ethnic-based policies</i> 	<p>Tan (2008); Nasir (2018) Nasir (2018)</p> <p>Goh (2001); Chang et al. (2017)</p>

Table 2 (continued)

Main national context categories	Detailed national context elements of Singapore	Primary studies
	<ul style="list-style-type: none"> Four ethnic-based Community Self-Help Groups (SHGs) to support the underprivileged Public housing run by the Housing Development Board (HDB) is at the centre of social context High level of Confucian cultural values alongside a preference for democracy defined in terms of social equity and good governance rather than liberty and democratic procedures A risk society to mitigate external and internal risk against social order Ageing population 	<p>Clammer (1997) Tan and Taeihagh (2021)</p>
<i>Temporal context</i>	<ul style="list-style-type: none"> Public Service for the 21st Century (PS21) administrative reform PAP received lowest share of the votes ever at watershed 2011 elections and <i>pledged to make adjustments to the system</i> The government launched the Smart Nation initiative in 2014 to transform public services digitally and to support businesses for digital transformation 	<p>Guan (1997); Yeo et al. (2015); Lee et al. (2017)</p> <p>Nasir and Turner (2013); Lee et al. (2017); Abdullah (2020)</p> <p>Kong and Woods (2018); Dresel et al. (2020)</p>

5. Results

This section reports and discuss two distinct analyses. First, with using the systematic review of the academic publications, we uncover the following context elements on PSI: The administrative context, the political context, the economic & technological context, the social context and the temporal context. Second, we report the configuration of innovation types coded through the analysis of applications to UNPSA.

5.1. Systematic review on the Singaporean context

Table 2 displays the results of our systematic review and contextual elements under the political, administrative, economic & technological, social and temporal contexts. Singapore is a small city-state, and its size presents both enabling and challenging administrative and economic context conditions for PSI. Guan (1997, p 167) identified the challenges as ‘[l]ack of economic mass, limited human and natural resources, and little influence on external events.’ One of the most distinguished context characteristics of Singapore is that the conservative People’s Action Party (PAP) has ruled the country since its independence in 1965 through a soft authoritarian parliamentary republic system (Clammer, 1997; Abdullah, 2020). The challenging conditions listed above have been portrayed by the Singaporean government and historically ruling party as significant threats against the nation and country to build a national identity and development agenda (Tan, 2012). However, Guan (1997, p. 167) suggests that these contextual elements also provide enabling conditions: ‘government is less complex, that citizens are potentially easier to mobilize, and that they are potentially able to react faster’. They also offer the potential advantage of faster learning and decision-making in response to problems and crisis (Abdullah and Kim, 2020).

First, considering the political and economic & technological context further, the developmental states model historically relies on foreign direct investments (Breznitz and Ornston, 2018). To attract foreign investment, the government invests heavily in human capital through

education, innovation and health policies, and studies point out that innovations in Singapore are mostly government and top-down led (Wong, 2007; Abdullah and Kim, 2020; Tan and Taeihagh, 2021). As a result, Singapore has consistently become one of the highest ranked countries for private sector innovation (Ang-Tan and Ang, 2022). These efforts include the establishment of flagship universities, such as the National University of Singapore, with significant financial resources to fund them (Wong, 2007). Compared to other countries globally the relative R&D spending in private and public sectors has been at high levels (Ang-Tan and Ang, 2022).

Likewise, the Singapore government has created many science parks while focusing on knowledge-based economy and R&D investment. The government has invested heavily in public sector research which could increase not only economic development, but also the efficiency and innovativeness of public and private organizations (Ho et al., 2016; Wong, 2007). Singapore aims to be an early-adopter of technological innovation trends, such as smart cities and digital transformations introduced as nation-wide strategies for over a decade. For instance, the 'Smart Nation' initiative was launched to transform government, economy and the society digitally (Dresel et al., 2020). The Singapore government has also focused on the development of robots and AI systems in healthcare and transportation (Tan and Taeihagh, 2021). However, there are critiques that the initiative faces significant challenges due the tensions between to the expanded control of government through data & technology and the bottom-up and co-creation-based nature of smart digital transformation (Kong and Woods, 2018).

Our systematic review also revealed the interplay between temporal, administrative and political contexts, as identified by Pollitt (2013) and Cinar et al. (2022b). This provides enabling context conditions for PSI: Reforms, organisational changes and innovations have been inherent in the Singaporean public sector for the last 50 years, and historically the government has aimed to make the public sector both more efficient and innovative (Guan, 1997; Yeo et al., 2015; Aoki, 2015). Many government reforms and innovation attempts (such as 'PS21') aim to achieve a high quality of public services, along with transforming bureaucratic culture to become more innovative (Guan, 1997; Yeo et al., 2015). Singapore's government has already implemented e-government related innovations for several decades and invested in public sector delivery technologies (Chan and Al-Hawamdeh, 2002; Chan et al., 2008). This is enabled by the administrative context, to help fund research and collaborate with the private sector (Brenzitz and Ornston, 2018). Finally, recent studies (e.g. Nasir and Turner, 2013; Lee et al., 2017; Abdullah, 2020) suggest that the temporal context of 2011 elections, when PAP received lowest ever share of the votes, led to more participative approaches inspired by New Public Governance concept (such as policy experimentation, co-creation, knowledge transfer and cross-sector collaboration).

This consistent adaptability has been accomplished by the pragmatic political context informing the discarding of old policies & methods, and the immediate adoption of *what works best*. Tan (2012, p.73) quoted Lee Kuan Yew's International Herald Tribune interview: "*We are pragmatists. We don't stick to any ideology. Does it work? Let's try it and if it does work, fine, let's continue it. If it doesn't work, toss it out, try another one. We are not enamoured with any ideology*". Lee Kuan Yew as the founding Prime Minister of Singapore ruled the country between 1959 and 1990 but remained in the cabinet until 2011 (as a Senior Minister between 1990 and 2004 and then Minister Mentor between 2004 and 2011). Singapore government has adopted a top-down approach, but 'soft' style of governance, where greater state control of society is imposed through rule of law and multiracial diversity and public order are upheld against individual freedom (Nasir and Turner, 2013; Nasir, 2018; Abdullah and Kim, 2020).

Despite the top-down feature of the political context, public and private organizations interact with each other frequently, and knowledge and technology transfer across sectors is common (Ho et al., 2016; Wang et al., 2015). Singapore started its own market-based reforms (or

New Public Management [NPM]) associated and innovation oriented public sector reforms relatively early in 1980s (Aoki, 2015). NPM style reforms in Singapore were related to management innovations, such as performance-based budgeting, in the 1990s to increase the institutional capacity of PSOs. Since this time similar reforms were adopted and institutionalised in various government sectors (Aoki, 2015). For instance, the staff performance management system in Dutch Royal Shell Plc was studied and adopted in the human resources (HR) domain in Singapore's public sector to make the HR more innovative and adaptable. Thus, HR practices resemble those of private sector counterparts, likewise government employees' salaries correspond with the private sector (Poocharoen and Lee, 2013). This led Hamilton-Hart (2000) to suggest that the boundaries/distinction between the public and private sector in Singapore is more blurred, such that a clear difference between public and private sector almost does not exist.

Nevertheless, the relationship between public and private sectors is asymmetric, and the government can determine the power relations. As Tan (2008, p. 15-16) argues, "[w]ith numerous statutory boards and government-linked companies (GLCs) dominating the local economy, Singapore is a country run like a corporation and the state is elitist and oligarchic". The relationship between state and citizens is also asymmetric, favouring public order through social control instead of individual freedom (Clammer, 1997). However, controlled public initiatives, such as Community Self-Help Groups, to support underprivileged groups play an important role in the delivery of public services (Nasir, 2018). Similarly, there has been a growing interest in improving the quality of the public services and developing administrative capacity through the adoption of neoliberal policies based on technological innovation (Quah, 1995; Haque and Puppim de Oliveira, 2021). There is also evidence of recent attempts to harvest citizen co-production (e.g., Lee et al., 2017; Gómez-Carmona et al., 2019; Han, 2019; Dresel et al., 2020), but studied networks are dominantly government led and funded (Poocharoen and Ting, 2015), which points to the asymmetric relationship and the *shadow of bureaucracy* (Han, 2019). In addition, as Tan (2008, p. 12) posits 'the political formula dictates that the government ultimately knows better, so that even with increasing consultation with the public, it must have the final say on everything from personal conduct to sexual behavior to artistic value'. This suggests that the government is not only dominant in the economy, but also for social life as well.

The administrative and political contexts in Singapore have shown a strong interplay because bureaucracy is closely related to the ruling party PAP, which has held office since 1959. In addition, a significant number of important PAP figures came from the bureaucracy (Tan, 2008). Another important characteristic of the administrative and political contexts is that Singapore's public organizations and public sector employees strive to be considered highly competent, efficient, and effective as a political mandate (Guan, 1997). The political will for meritocracy is considered to be one major reason for the focus on the high quality of public service (Tan, 2008; Poocharoen and Lee, 2013). In this meritocratic system, only the best and brightest are accepted to the public sector after competitive education and exams. The public sector competes with the private sector to hire the most qualified, talented, and educated people. According to all three of Singapore's prime ministers, a key for their success is the application of meritocratic principles to all organizations and institutions (Quah, 2017). This includes providing scholarships to the best and brightest students to study overseas, offering a variety of training, alongside other opportunities to be promoted or transferred within the public sector (Poocharoen and Lee, 2013). These principles also apply to the choice of parliamentary candidates and PAP leadership prefer successful members of bureaucracy to be elected and to serve in a technocratic government (Tan, 2008).

Whilst the meritocratic system provided so many benefits to low-income families in early years, it has been also criticised since the 1990s as, whilst being egalitarian, it has also become elitist in recent decades (Tan, 2008). Additionally, the high level of competition induced

arrogance, desperation, and self-centeredness in society because the society and the system has been obsessed with “success”, which is mostly measured by test scores (Tan, 2008). Therefore, each of these technological, economic and innovation advancements are not without their costs.

With regard to social context, Singapore is a multi-racial (ethnic Chinese, Malays, Tamils/India, and many others), multi-lingual (English, Mandarin, Malay, and Tamil) and multi-religious (i.e., Buddhist, no religion, Christian, Islam, Taoist, and Hindu) society. While school students must learn two languages (English and their mother tongue), English is the common language of administration, education, and business (Guan, 1997). This social context interplays with the political context. These diverse values gathered under the umbrella of Confucian values, combined with economic development, good governance, and the national identity of Singapore (‘Singapore Identity’), are of greater importance than individual liberty (Chang et al., 2017). Social harmony and social order are crucial elements of the Singapore government (Clammer, 1997). However, Nasir and Turner (2013) and Nasir (2018) both question the social harmony and Singaporean identity, and posit that the Malay population suffers from underprivileged socioeconomic conditions, suggesting that not all ethnic groups may be satisfied with government’s social policies. Clean and green urban spaces alongside minor crime and zero tolerance for corruption also represent the government’s approach to social order (Clammer, 1997; Quah, 2017).

Public housing, administrated by *Housing Development Board (HDB)*, has been at the centre of the social context and the social control agenda, as most of the population lives in the public housing blocks rapidly built between 1960s and 1980s. The success of Singapore’s housing policies historically has increased ownership of public housing from 9 % to over 80 % between 1959 and 2016 (Quah, 2017). The public housing and HDB forms an interplay between the political, economic, social contexts in Singapore, as it is regarded ‘as an infrastructural and symbolic insertion of the ideas of continual economic progress, guided freedom and national unity across racial and social groupings, which the government sees as crucial to the country’s survival in the next few decades’ (Goh, 2001, p.1601). Further to social context elements, the overall perception is that corruption and bribery were dominant during the initial years of the Republic, but effective policies including social engineering to change values have produced significant improvements (Hira and Shiao, 2016; Quah, 2017). However, Clammer (1997) criticizes such social policies as imposing social control over society for the sake of security and defines Singapore as a ‘risk society’. There is also evidence that inequality and the income gap is still widening, particularly among the ageing Singaporean population (Nasir, 2018).

5.2. UNPSA data analysis results

Our subsequent analysis drew on a separate dataset investigating the

Table 3
The institutions submitted the innovations.

Institution Name	Frequency	Percentage
Ministry of National Development	32	21.6
Ministry of Communications and Information	24	16.2
Ministry of Finance	20	13.5
Ministry of Home Affairs	15	10.1
Ministry of Manpower	14	9.5
Ministry of Health	10	6.8
Ministry of Education	7	4.7
Ministry of Environment and Water Resources	7	4.7
Ministry of Law	7	4.7
Ministry of Culture, Community and Youth	4	2.7
Ministry of Transport	4	2.7
Ministry of Trade and Industry	2	1.4
Ministry of Defence	1	0.7
Ministry of Social and Family Development	1	0.7
Total	148	100.0

configuration of innovation types through a content analysis of the UNPSA applications. Table 3 presents the institutions from which the innovations were submitted to uncover the government functions that each of the innovations were developed for. The distribution of coded innovation types and their focus and locus is provided in Tables 4, 5 and 6, whilst Appendix 1 displays examples of each type of innovation coded.

Innovations originate from a variety of institutions in Singapore. A closer look at the institutions reveals that boards and agencies under Ministry of National Development responsible for the land-use planning and infrastructure development government functions submitted the highest number of innovations. These agencies include the Housing and Development Board, the National Parks Board, the Urban Redevelopment Authority, the Building and Construction Authority. The second highest number of innovations was submitted by Ministry of Communications and Information, the ministry to coordinate and oversee the development of the information and communications technology, media and design sectors, public libraries, and information and public communication policies. The Infocomm Media Development Authority which is responsible for the digital transformation of businesses, workers & communities and National Library Board are the two agencies that submitted these innovations.

Third, the Ministry of Finance submitted 20 innovations originating from its agencies and boards such as the Inland Revenue Authority and the Accounting and Corporate Regulatory Authority. Fourth, the Ministry of Home Affairs presented 15 innovations coming from the Immigration & Checkpoints Authority, the Singapore Civil Defence Force (emergency services), the Singapore Police Force and the Singapore Prison Service. Fifth, the Ministry of Manpower responsible for the workforce, employment relations and social security funds submitted 14 innovations. This finding shows the majority of the innovations were submitted from the government functions, which have been historically crucial in the political, economic and social context of Singapore.

The coding of innovation types reveals that *service innovation* that focuses operational value through an internal orientation was the most frequently reported innovation type in Singapore. These innovations were primarily new digital services. These included digital tax return forms on the MyTax Portal introduced by the Inland Revenue Authority, employment licence and visa application systems under the Employment Pass and the e-Visitor Programme by the Ministry of Manpower and Ministry of Interior Affairs, the Electronic Invoices Initiative by the Accountant-General’s Department, the Wireless@SG project by the Infocomm Media Development Authority as well as open-data platforms, for example the Enhancing Transparency project by Urban Redevelopment Authority, which provides data on house prices, meteorological and environmental conditions.

Whilst policy, management and citizen innovations show similar frequencies, *policy innovation*, with a strategy focus and external locus, was presented as the second most frequent type. Coded policy innovations include new political agendas to solve wicked problems in public housing, health, finance and employment policy domains. Examples are new workplace and safety regulations, social welfare regime

Table 4
The distribution of innovation types in Singapore over years.

Innovation types	Year period		Total (148)
	Period 2008–2012 (n = 81)	Period 2013–2017 (n = 67)	
Mission innovation	9.88 %	0 %	5.41 %
Policy innovation	14.81 %	23.88 %	18.92 %
Management innovation	18.52 %	13.43 %	16.22 %
Partner innovation	14.81 %	20.9 %	17.57 %
Service innovation	29.63 %	19.4 %	25 %
Citizen innovation	12.35 %	22.39 %	16.89 %
Total	100 %	100 %	100 %

Table 5
The focus of innovation over years.

Innovation focus	Year period		Total (148)
	Period 2008–2012 (n = 81)	Period 2013–2017 (n = 67)	
Strategy	24.69 %	23.88 %	24.32 %
Capacity	33.33 %	34.33 %	33.78 %
Operation	41.98 %	41.79 %	41.89 %
Total	100 %	100 %	100 %

Table 6
The locus of innovation over years.

Innovation focus	Year period		Total (148)
	Period 2008–2012 (n = 81)	Period 2013–2017 (n = 67)	
External	41.98 %	67.16 %	53.38 %
Internal	58.02 %	32.84 %	46.62 %
Total	100 %	100 %	100 %

changes, housing upgrading programmes, novel agendas on environmental protection & sustainability, as well as health & safety frameworks that introduced new benefits for workers and new obligations for employers. These policy innovations were introduced in the public service areas that have been historically crucial for Singapore government. For instance, the Overseas Testing Scheme was introduced by the Building and Construction Authority, as an obligation to train and certify foreign workers before they received their visas.

Third, PSOs in Singapore collaborate with other PSOs and firms through *partner innovations* externally in order to expand capacity. This accounts for around 18 % of innovations (Table 2) and developed new relationships and networks with other PSOs, businesses and NGOs. For example, the Health Sciences Authority (a regulatory agency) collaborated with hospitals and research centres to develop a network infrastructure for the collection, storage, and analysis of DNA samples from patients while providing financial support.

Fourth, externally oriented citizen innovations aim to produce more operations value through gathering citizen feedback, such as the Design Singapore initiative by Ministry of Communications & Information, as well as through the co-production of services, such as the Yellow Ribbon Community Project by The Community Action for the Rehabilitation of Ex-offenders (CARE) Network. This is reflected in the prioritisation of initiatives submitted to UNPSA such as REACH ('reaching everyone for active citizenry @ home') to engage with citizens and citizen groups. This platform allows citizens to communicate with policy makers, including from social media and WhatsApp. Importantly, the flagship initiative of the government after 2011 elections, 'The Our Singapore Conversation (OSC)' was submitted to UNPSA. This initiative hosted many focus group sessions; each including 50 to 150 participants from diverse citizen groups. In these focus groups ministers, political appointees, and bureaucrats discussed the issues that citizens were facing. Subsequent to this face-to-face engagement, the OSC also surveyed 4000 citizens about their expectations of the government. Furthermore, the government funds or supports non-profit organizations such as 'Participate in Design (www.participateindesign.org).' Founded in 2013, collaborating with government agencies, it engaged with close to 60,000 residents to design over 45 public spaces.

Fifth, coded *management innovations* with an internal orientation and capacity focus revealed new managerial practices, such as customer relationship management (for example iCARE Customer Relationship Management System by the National Environment Agency), new organisational structure (for instance a new education academy under the Land Transport Authority) and new tools (such as School Cockpit to manage student data by Ministry of Education). Finally, internally oriented *mission innovations*, with a strategy focus, were the least common

type of innovation coded. An example of this type comes from the Institute of Technical Education, the national provider of Vocational & Technical Education services, which introduced a transformation initiative to expand the scope of its mission and change the public image of vocational education.

Overall, these findings uncover that the *innovation focus* was directed towards operation (42 %) compared to capacity (34 %) and strategy (24 %). This indicates that Singaporean PSOs sought to improve their operating value more through service and citizen innovations compared to developing new capacities and authorizing new missions and policy agendas. Further, the *innovation locus* was more external (54 %) than internal (46 %) in Singaporean cases. Hence Singaporean PSOs attempted to engage with more outward-looking innovative processes.

To explore the influence of 2011 elections, we also examined the difference between pre- and post- 2011 elections. To consider the response lag, we analysed two periods: 2008–2012 vs 2013–2017. The analyses presented in Tables 5 and 6 reveal that the focus of innovation remained stable when the two periods are compared. However, the locus of innovation changed substantially. In particular, submitted innovations had more internal orientation between 2008 and 2012, the locus shifted significantly and externally oriented innovations account for two third of applications between 2012 and 2017.

6. Discussion and propositions

The identified substantial shift to external orientation, within the submitted innovations to UNPSA after 2012 is arguably surprising as the political context of Singapore has been regarded as soft-authoritarian and social control centred, thus lacking some democratic values (Nasir, 2018; Nasir and Turner, 2013). Nevertheless, our systematic review revealed recent evidence of the government aiming to be more proactive in implementing policy experimentations with citizens, design thinking, initiating pilot projects, and encouraging knowledge transfer from different sectors (Poocharoen and Ting, 2015; Lee et al., 2017; Gómez-Carmona et al., 2019; Han, 2019). Thus, we argue that Singapore's soft-authoritarian and pragmatic political context, coupled with the administrative context of meritocracy, have historically enabled the country to cultivate a dynamic approach, adopting global best practices as well as developing unique solutions and reforms (Parayil, 2005; Haseltine, 2013; Chan, 2017; Ng, 2007; Ng and Ang, 2011; Teo and Wong, 2005; Quirapas Franco et al., 2018; Wong, 2022). In particular, this has allowed the government to explore the next "what works best" to overcome the disappointing results of 2011 general election when the PAP government received a historic low of 60 % of the votes (Abdullah, 2020).

Whilst there has been a debate on a change in the political context in Singapore for a long time, as Goh (2001, pp. 1600-1601) noted 'the government is taking measures to replace an older authoritarian and paternal political model with one in which there are carefully guided avenues for public debate and the expression of individual opinions', this led to a limited number of top-down steered citizen participation models, such as the community self-help groups based on the major racial groups (Nasir, 2018). Similarly, the introduction of NPM style reforms has facilitated market mechanisms and collaboration with firms and other government agencies for research projects (Hamilton-Hart, 2000; Aoki, 2015; Wang et al., 2015) to an extent. However, our findings illustrated that the 2011 elections served as a final cornerstone for a significant change. This temporal context also corroborates with a wider global growth in the popularity of collaborative governance, co-creation and network governance (Lee et al., 2017). Hence, an external orientation was identified as the most pragmatic approach for innovations. However, this external orientation in Singaporean innovations emerged under the shadow of hierarchy and is still dependent on the top-down policy steering (Han, 2019). We need to return back to Lee Kuan Yew's pragmatic quote to understand how these dynamic changes were introduced while maintaining the core priorities of citizen trust and

satisfaction, economic growth and public order: “We are pragmatists. We don’t stick to any ideology. Does it work? Let’s try it and if it does work, fine, let’s continue it. If it doesn’t work, toss it out, try another one” (Tan, 2012, p.73).

The emphasis towards an *operation focus* is also consistent with the historical political context of pragmatism, thus aiming to provide high-quality public services to increase and maintain the material well-being of citizens (Tan, 2012; Abdullah, 2020). Our finding that there is no significant change in the focus of innovation (Table 5) shows the pragmatic political elites still consider that Singapore has a clear and well-established mission and strategy. This is defined by the economic context of the developmental state to survive under limited resources, the administrative context of the corruption free meritocracy to run the machinery of government efficiently (Haque and Puppim de Oliveira, 2021), as well as the political and social contexts of the public order and social control to keep the diversity of the nation together under the Singaporean identity (Clammer, 1997). Hence, Singaporean innovations submitted to the UNPSA have a greater orientation towards an operation focus to ensure the effectiveness of this mission and strategy through improving the operational value as opposed to strategy focused innovations targeting authorizing processes. Further, this finding also supports Chen et al.’s (2020, p.1682) argument on the operation focus and its relationship with mission: ‘To ensure mission effectiveness, an organization seeks to improve its operating value’. Finally, the technological nature of the operation focused service innovations is also consistent with the technological, temporal, political contexts, surfaced as e-government and administrative reforms pursued since 1980s (Guan, 1997; Chan et al., 2008; Yeo et al., 2015) and recent subsequent digital transformation attempts (Kong and Woods, 2018; Dresel et al., 2020).

Furthermore, our finding that the responsibilities of innovation owner institutions mainly cover public housing, land development, construction, information & communication technology, finance, employment & workforce and law enforcement government functions is aligned with Chen et al.’s (2020, p.1682) argument on strategy focus: ‘the authorization process ensures that an organization’s mission reflects the desires of legitimate political authority and defines the type of services offered’. This finding identifies that the government functions provided are dependent on the city nature and economic context, where these government functions listed above are historically crucial for the developmental state (Clammer, 1997; Chan et al., 2008; Breznitz and Ornston, 2018). Thus, we suggest that the low frequency of strategy focus can also be attributed to the well-established government functions defined by the political context, and the government did not feel a pressure to redefine these government functions through strategy focused innovation.

The existing literature lacks sufficient empirical data to generate specific theory-based hypothesis on the role of different national contexts on PSI. This led us to draw upon our findings and the above discussion to formulate two propositions that contribute to the PSI literature. These propositions offer the potential to be generalised by future studies analysing the role of national context among a larger set of countries. Our propositions are based on our findings on focus and locus of innovation -which are the main analytical frames of Chen et al.’s (2020) typology configuration- combined with the results of our systematic review.

Our finding that an external orientation in PSI is prioritised since 2011 (Table 6) by Singapore’s soft-autocratic and pragmatist political and administrative contexts provides controversial evidence to the collaborative PSI and co-creation literature, which considers collaboration to be associated with democratic governance (Ansell et al., 2021). Collaborative PSI and co-creation, both of which underpin Chen et al.’s (2020) rationale for introducing the external orientation argument and specifically the citizen innovation type, have previously been associated with the New Public Governance (NPG) paradigm and Western contexts such as Nordic countries. NPG posits that the public sphere should be governed through networks instead of bureaucracy and markets (Pollitt,

2013).

However, our findings in Singapore reveal a growing interest in external orientation, collaboration and co-creation within a state governed by the elites of the ruling party, bureaucracy and business circles where public-private sector boundaries are blurred. Moreover, the concepts of collaborative innovation & co-creation are operationalised in a top-down steered way, rather than forming bottom-up governance mechanisms to govern through networks. This is different to the adaptation of NPM paradigm inspired innovations in some Western contexts, such as France and Germany (see Pollitt and Bouckaert, 2017), as in the case of Singapore the adaptation is intentional and pragmatic to select the best means to maintain the status-quo of the existing missions and strategies related to the soft authoritarian regime, developmental state, public order and meritocracy. Thus, any reference to NPG in Singapore is rhetorical and gestural. Recent research in governance literature (e.g. Schlauffer, 2021; Nie and Wang, 2022) identified a surprising and growing interest in citizen participation within authoritarian political contexts. We argue this attempt referred to as *authoritarian or cosmetic responsiveness* (Kornreich, 2019; Wang and Han, 2023) can explain the high interest in external orientation in Singapore. This also corroborates Scott (2021) observation from Hong Kong that the political context of a strong leader is key to facilitate innovation at national level, however, technological innovation was utilised to justify the authoritarian status-quo in the political context.

We also found that the temporal context of 2011 political elections influenced PSI as the government began to explore the next fit-for-purpose means, that is an external orientation, to maintain the political status-quo. Whilst such election turnouts and government changes are frequent in democratic political contexts, unsuccessful elections are significant for soft-authoritarian political contexts. The relatively low electoral vote reflects deteriorating trust in the regime (Miller, 2015) which is much more important than the dissatisfaction with the ruling party in a democratic political context. Hence, an external orientation is more important to maintain the trust in the regime and comply with the second part of Lee Kuan Yew’s suggestion: “If it doesn’t work, toss it out, try another one.”. This approach and discourse can be conceptualised by historical institutionalism theory, which posits that such critical junctures can trigger a major change (Thelen, 1999). The specific temporal dimension in Singapore also supports Cinar et al.’s (2022b) suggestion that significant events, such as financial crisis periods, natural disasters and public scandals, can challenge deeply embedded values and trigger PSI. Finally, contexts are intersecting, hence a conjunction of multiple contexts shape outcomes of policies (Pollitt, 2013). Therefore, the following proposition regarding the intersection of temporal and political and contexts is developed:

Proposition 1. Where a soft-authoritarian and pragmatic political context is combined with a temporal context when a low electoral vote is present, this is positively associated with the cosmetic adoption of the external orientation of NPG and co-creation related PSI.

Our findings on a consistent operation focus is clearly related to the emphasis on the excellence of public service operations within political and administrative contexts of Singapore. Borins (2018) regards populist political contexts as hostile to innovation. However, our findings provide fresh evidence to Cinar et al.’s (2022b) suggestion that political contexts with a pragmatist or populist perspective can be conducive to innovation. Innovations that provide better service quality and ensure citizen trust from a clientelist perspective are prioritised. This also intersected with the meritocratic administrative context, as recent meta-analysis (Oliveira et al., 2023) uncovers that there is an association between merit principles and government’s operational performance. Further, our finding on the relatively moderate focus on capacity can be attributed to the existing high administrative and technological capabilities of the PSOs in Singapore that already achieved sufficiently by 2008, where the PSOs did not feel the need or pressure to improve on these capacities significantly. This corroborates Cinar et al.’s (2022b)

observation that economic & technological contexts, with low technological capabilities, can result in more technological process innovations in order to improve the capacities radically and to address the technological gap. Hence, we argue that economic & technological and administrative contexts, where high existing capabilities are present, lead PSOs to maintain these capabilities through a moderate capacity focus in PSI. Further, our finding that the focus of innovation remained stable between 2008 and 2017 (Table 5), whilst the locus changed significantly (Table 6), reveals that the focus of innovation is more path dependent relying on the embedded legacies and structures of operations excellence, citizen trust and high capabilities developed over decades. This formula for public service provision has worked effectively over many years as a legacy (Guan, 1997; Haque and Puppim de Oliveira, 2021). Hence, the pragmatic political and administrative contexts of Singapore reinforce the first part of Lee Kuan Yew's suggestion to continue with what works: "Let's try it and if it does work, fine, let's continue it.". The stability in innovation focus while the shift in innovation locus supports Greve et al. (2020) (p.705) finding that some public sector reforms emerge as "gradual institutional change, being characterized by layering, pragmatism and adaptation". Accordingly, the following propositions are developed:

Proposition 2a. Pragmatic and soft-authoritarian political contexts with an emphasis on the material well-being of citizens and on the continuity of the regime are positively associated with an operation focus.

Proposition 2b. An economic and technological context characterized by high technological capabilities, combined with a meritocratic administrative context, moderates the focus towards capacity-related innovation types to maintain existing capabilities.

Proposition 2c. In the presence of these contexts (see Propositions 2a and 2b), the focus of PSI is more path dependent because strategic priorities, advanced capacities and operations excellence are institutionalised over decades. Meanwhile, the locus is more prone to change, considering the global legacy of NPG and the convenience of its cosmetic adoption.

7. Conclusion

This study has made two significant contributions: innovation typology and the national context. First, our analysis and findings contributed to the typology of PSI literature (Osborne, 1998; Walker, 2008; Wu et al., 2013; De Vries et al., 2016). Whilst there is a need to develop a common understanding of a vocabulary to classify innovative activity in public services, a commonly accepted agreement on innovation types does not exist. Our findings revealed that the recent novel typology proposed and illustrated in the U.S. context by Chen et al. (2020) can effectively capture PSI activity systematically through its focus and locus dimensions in a relatively different context for PSI literature, namely Singapore. Hence, our findings support that it can serve as a theoretical foundation to measure PSI and can be used to develop a shared understanding of PSI.

Our second contribution is to provide new evidence to uncover the role of national context in PSI, where a lack of studies in non-western, particularly Asian, contexts is evident (van der Wal and Demircioglu, 2020). Our findings demonstrate that the locus of innovation has shifted significantly from internal to external whilst the focus of innovation has remained stable as primarily on operation within the interplay of semi-authoritarian and pragmatic political context, meritocratic administrative context, and temporal context of the 2011 elections in Singapore. Externally oriented innovation based on selective ideas of NPG & co-creation and service innovation were utilised to increase service quality, to gain citizen trust and electoral votes. In this regard, the primary aim was to ensure the effectiveness of the political agenda, that is to maintain the status-quo of the developmental state and

social order. As the theoretical understanding on the role of national context in PSI is limited, this led us to develop propositions based on our in-depth descriptive case analysis of Singapore. Our propositions can provide preliminary insights into why and how the national context elements can influence innovation focus and locus. They can also provide additional evidence for the recent national context framework by Cinar et al. (2022b). Future studies should test these propositions in Singapore and other countries.

Regarding the policy and managerial implications, policy makers and public managers should consider the contextual differences (e.g., administrative, political, social, and economic) in different countries. For instance, policy makers in soft-authoritarian political contexts should aim to facilitate a combination of innovation types to facilitate external orientation. In addition, policy makers should understand that the national context consists of complex elements and there is an interplay between them. Further, the national context is dynamic rather than static and there is a need to understand the temporal context in the development of the innovation portfolio. Public managers in soft-authoritarian and meritocratic contexts should consider the importance of the temporal context of national reform policies and their organisational innovation portfolio should be aligned with the temporal reform agenda.

This study has certain limitations and presents avenues for future research directions: First, because Singapore has unique context characteristics, the generalisability of the findings in other national contexts can be limited. We utilised Singapore as a rich case study to provide initial insights utilising its unique national context characteristics. More studies are needed to develop a theory on the role of national context in PSI and our propositions can be utilised to set related research questions. Our findings can provide insights to understand other countries where the political and administrative systems resemble Singapore to some extent. Related to this, whilst the systematic review results point out the guided social order and Confucian values, the coding of innovation types did not identify a clear relationship between social context and the focus and locus of innovation. Future studies should adopt cross-country data collections to investigate the role of national context comparatively specifically the role of social context in PSI.

Second, like other studies of innovation champions and innovation awards above, this study focuses only on successful innovations. The diverse themes called by the UNPSA call procedures and simple online submission system can help to reflect the diversity of the PSI activity in the studied country to identify the innovation types and their configuration (see Cinar et al., 2022a). However, the composition of PSIs that are less successful or failed innovations (which are not reported) may be different from those submitted to UNPSA. This constitutes a limitation our study shares with the previous PSI literature that relies on self-reported information provided by the innovators. For example, Arundel and Huber (2013) finds that successful PSI are typically overreported due to lack of objective measures. However, measuring private sector innovations are relatively straightforward, such as R&D spending or number of patent applications, have been utilised for this purpose. Thus, future studies may aim to measure innovative activity more objectively including analysing failed innovations in the public sector and should examine the distribution of innovations further across diverse political contexts.

Finally, and closely related to the previous limitation, as Chen et al.'s (2020) typology itself does not include an analytical dimension for the degree of novelty of the innovation. Thus, we are unable to analyse how innovations are novel or radical and their relative impact in the long term. Singapore's national economic development since independence in 1965 has evolved rapidly from initially copying the public administrative practices of the British colonial administration towards adapting pragmatically what works best solutions from other contexts and then to initiating original innovations. For example, the introduction of multi-language policies, the National Service, and creation of Housing Development Board and mass production of housing with ethnic quota

system in those housing blocks are novel and radical innovations (Lee et al., 2017). Thus, future research that investigates the novelty or radicalness of innovations through a longitudinal analysis, including tracking the same innovations over decades while collecting new dataset, as doing so can provide interesting lessons for developing countries as well evaluate how innovations evolved in Singapore. Despite these limitations, we believe that this study provides significant insights via drawing a chronological background of innovation typologies, testing a new innovation typology in a unique context and formulating new propositions on national context and PSI.

Funding

This work was supported by the Lee Kuan Yew School of Public Policy (LKY School), National University of Singapore, Academic Research Support Fund (FY20: N-603-105-658-001). Authors views and arguments do not represent LKY School or Singapore government's views.

Appendix A

Appendix 1

Coded examples from the application forms

Innovation Types	Innovation Title	Quote
Mission innovation	Transformation in the Institute of Technical Education	'The goal was to radically reform the content, quality and image of vocational education, and to reposition ITE into a world-class education institution. This was operationalised through Three Blueprints, creating Three Waves of Transformation, with a vision and desired outcomes for each wave of reforms.'
Policy innovation	The Selective En bloc Redevelopment Scheme (SERS)	'The Selective En bloc Redevelopment Scheme (SERS) was introduced in 1995 as part of the Government's Estate Renewal Strategy for old public housing estates. Under SERS, selected old sold flats with redevelopment potential are acquired under the Land Acquisition Act for redevelopment to optimize land use.'
Management innovation	www.map.gov.sg	'Planned on a whole-of-government approach, www.map.gov.sg was developed as a common integrated map service for government agencies. Started as a pilot project by the Singapore Land Authority (SLA), www.map.gov.sg provides a detailed "base map" that other agencies could use to mash up their own data on their websites through the use of Application Programming Interface (API). These APIs are a set of functions where one can include in any webpage and they can be used to call spatial data from the SLA servers and display them on a map on the calling webpage.'
Partner innovation	Engaging Multiple Stakeholders to Reduce Adverse Drug Reactions	'Prior to the initiative, it was difficult to undertake studies of pharmacogenomics associations of adverse drug reaction locally because there were insufficient numbers of cases at any one healthcare institution. Health Sciences Authority successfully coordinated a multi-institutional collection, collaborated with scientists to analyse the samples and evaluate cost-effectiveness, and held consultation sessions with relevant stakeholders to elicit input and address implementation issues.'
Service innovation	Inland Revenue Authority of Singapore E-services	'MyTax Portal offers a plethora of e-services for taxpayers, such as allowing them to pay their taxes and view their tax assessments and statement of accounts online. In particular, the hallmark of myTax Portal is the new e-filing system for Individual Income Tax.'
Citizen Innovation	Our Singapore Conversation	Objective "Our Singapore Conversation" (OSC) was announced by Prime Minister Lee Hsien Loong in August 2012 as a nation-wide conversation exercise aimed at getting Singaporeans to come together to discuss the kind of future we want, and how we could create a home with "hope and heart".

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* Included in the systematic review.

CRedit authorship contribution statement

Emre Cinar: Conceptualization, Project administration, Methodology, Formal analysis, Writing – original draft. **Mehmet Akif Demircioglu:** Conceptualization, Funding acquisition, Formal analysis, Writing – original draft. **Ahmet Coskun Acik:** Formal analysis. **Chris Simms:** Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

We have shared the data link as a footnote.

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