City-as-a-Platform: Towards citizen-centred platform governance

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Abstract

This paper discusses the forms and social implications of citizen engagement in government-sponsored participatory innovation platforms designed to serve urban economic renewal. Discussion starts with a review of smart city discourse, which in the context of economic development policy translates into cities' need to support innovativeness by creating smart environments, including facilitated participatory innovation platforms. Platform thinking is gaining prominence in economic renewal as it enables the utilisation of collective intelligence that emanates from the diversity of citizens and other stakeholders involved in local innovation processes. Real-life examples of urban platformisation discussed in this paper include enabler-driven innovation platforms and living labs in two Finnish cities, those of Helsinki and Tampere. Discussion centres on three cases, which involve different target groups in participatory innovation processes: Helsinki Living Labs (users), Demola (students) and Koklaamo (residents). Platforms are used to support both urban revitalisation and economic development, of which the former is based primarily on representative and the latter on instrumental mode of participation. If participatory platforms become a norm in local governance, it will mark a transition from party politics, expert dominance and siloed bureaucracy to public engagement which supports citizens' efforts to produce local public services and to build their own city. In the Nordic welfare society context democratic culture, welfarism and redistributive policy provide support to the emergence of participatory innovation platforms by strengthening social inclusion, taming the growth machine, and easing the tensions between pro-growth and anti-growth coalitions. To summarise, the challenge to cities in different societal contexts is to find locally adjusted ways to facilitate platformisation, and through platform-based citizen engagement support inclusive local economic development, which can be seen as a 'soft strategy' for easing social polarisation, socio-economic segregation and intra-national inequalities.

1. Introduction

Urban settlements form a mix of productive capability and efficiency of reproduction, which in combination make it possible to generate prosperity. Yet both local conditions and their environments change over time, which implies that cities cannot sustain their wealth by merely maintaining their existing conditions. It is actually detrimental to the long-term resilience of a community to assume that the level of welfare achieved can be maintained by following the existing economic trajectory. In the 1960s and 1970s this became apparent in most of the industrialised cities in the Western countries, which started to lose their manufacturing jobs as companies relocated their productive functions to low-cost countries in the name of competitiveness and profit maximisation.

In meeting the challenge of adjusting to the conditions of competitive global economy, local governments have started to pay attention to smartness. Its introduction to urban development emerged from the application of new information and communication technologies (ICTs) in infrastructure services aimed at improving the functionality and

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efficiency of cities. Soon, however, it was given a broader and more strategic role in urban development, economic restructuring, and the promotion of growth. Furthermore, since the 2000s this agenda started to diversify, and, due to various emerging technology trends, such as open source software, Big Data, Internet of Things, augmented reality, ubiquitous technologies, and location-based services, it provided new perspectives on how smart city agenda can be applied to urban economic development.

The penetration of new ICTs into economic and social life makes practically all interactive and transactional processes technologically mediated, which tends to restructure the nodal points and hubs of such interaction. Hence the emergence of product and industry platforms and related interconnected ecosystems as a new precondition for economic development and growth [1]. To generalise, such factors as connectedness, sharing, and interdependence have paved way for the emergence of platform enterprises, which have given impetus to the rise of the platform economy [2], and analogously there is a gradual transition towards platform cities, which facilitate interaction, exchange, and transactions through physical and virtual platforms or real-virtual hybrids.

This paper aims to contextualise agency in local economic development by highlighting its embeddedness in an increasingly complex socio-cultural setting and relationality that is essential in understanding economic and social processes in a technologically-mediated environment. This suggests that concepts such as open innovation and co-creation are not just minor trends but indications of a more pervasive change in the underlying logic of social interaction and related transformative processes [3-5]. Emerging interconnectedness and multilayeredness has a connection to both the increased dynamism of economic and social processes as well as increased flexibility in territorial governance [6]. Such developments also have a potential to increase local choices, ad hoc social formations, virtual nomadism, and individualism, as platforms can reduce gatekeeper functions and facilitate self-expression and interactive processes, allowing dynamic and context-sensitive aggregation of individuals' interests. This creates a natural connection with such tendencies as the democratisation of innovation and the participatory turn in public governance.

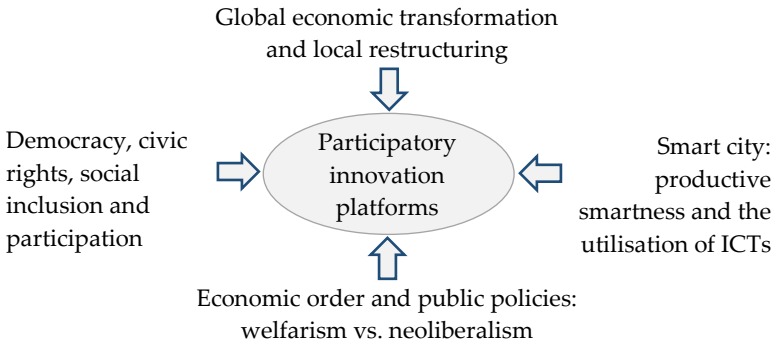


Figure 1. Key topics of this paper.

This article provides a contextual analysis of the role of citizen participation in innovation platforms. We seek answer to the following question: What are the forms and implications of citizen involvement in innovation platforms that facilitate urban economic renewal in the welfare society context? The empirical evidence is gathered from the participatory platforms of the cities of Helsinki and Tampere in Finland.

2. Methodology

This paper presents a theoretically-oriented case analysis of two leading Finnish high-tech cities and their national context (on case study methodology see [7]). Discussion focuses on the cities of Helsinki and Tampere, which represent two leading Finnish cities with an explicit commitment to the smart city agenda in their innovation and economic development policies. They have established various innovation platforms, and, more importantly, exemplify the participatory turn in the rationale of such platforms.

Empirical data is gathered from policy documents, media sources, and previously published research papers, which are reviewed to provide an accurate picture of platform design and activities in these two cities. On the basis of qualitative assessment and descriptive institutional analysis the discussion continues with a critical contextual interpretation of these platforms.

The discussion is framed with a theorisation of urban economic renewal with three major layers of analysis: the *smart city* discourse providing a view of the idea of smartness in the development of urban communities, *platform* theory depicting the forms and functioning of micro environments designed for user, customer, and citizen involvement in innovation processes, and the theory of *participation* offering a critical view of the forms and functions of citizen involvement in a facilitated development and innovation process. The contextual view of participation in innovation platforms goes beyond the factual participatory processes by conceiving of such processes in their historical, cultural, and societal settings, which in this case refers primarily to the role of political and administrative institutions in the economy and the critical assessment of the outcomes of their interplay. In this sense, the analysis has a connection to sociological institutionalism and political economy [8-9].

3. Theoretical framework

3.1. Urban economic renewal

The urban agenda for the global age has been in the making during the post-WWII years, which highlights the interconnectedness of the global and the local, sometimes referred to as glocalisation [10]. A prelude to this policy agenda was the Second United Nations Conference on Human Settlements (Habitat II) held in Istanbul, Turkey in June 1996. Its sentiment was captured in the background report for Habitat II written by Jordi Borja and Manuel Castells [11], who addressed the consequences of economic globalisation and the digital revolution for local politics and policy. That was the time

of the rising importance of cities and regions on the global scene. Borja and Castells emphasised the need to set new objectives and to introduce new instruments when redesigning urban policy on a wider scale. These include balancing economic development and quality of life; taking the huge differences between rich and poor cities onto urban policy agenda; creating inclusive cities; and providing employment, housing, education, and health care as basic rights to be properly addressed by cities. Much later this agenda was transformed into a metropolitan agenda that further emphasises metropolitan area's role in fixing broken politics and fragile economy, paying less attention to global solidarity and more to the need to release local forces and empowering them to strive for success in an interconnected world [12].

The new urban agenda has not risen without tensions. We have indeed witnessed the emergence of concepts that are seemingly antithetical aspects of urban development. First, there is the widely documented emergence of a new urban politics, which echoes the urban growth machine thesis proposed by Logan and Molotch [13]. In such a setting local growth coalitions attempt to enhance the economic value of urban space and attract mobile capital in the restless quest for wealth and its accumulation with the justification that everyone benefits from economic growth, if not directly, then at least through the trickle-down effect. This development paved the way for the emergence of an entrepreneurial and competition-oriented style of urban governance [14].

Counterbalancing forces to such a one-dimensional urban development policy, be they essentially neoliberal or developmentalist, have emerged from green and egalitarian values, strengthened by the pressing needs of territorial communities to protect their natural environment [15]. Such ecological demands are not in all respects entirely separate from pro-business approaches, as evidenced by ecological modernisation and the partial greening of capital. In any case they point clearly to our shared responsibility for the future of globe, and give thus impetus to considering alternative economic models, such as smart growth and the sharing economy, alternative city conceptions, such as sustainable city and sharing city, and alternative lifestyles, such as downshifting. Many such concerns are now also the province of local and regional governments, making the agenda genuinely pluralist and multi-scalar [16].

At the level of the everyday life of urban communities a key issue is how to revitalise cities in order to maintain their ability to provide welfare to their citizens in a sustainable manner. Such attempts have been referred to by various terms in urban studies. This article focuses on urban economic renewal. Conceptually, *urban renewal* can be defined as a movement which addresses urban problems and aims essentially to revitalise urban communities. There are various forms of such renewal, of which many today focus on the development of downtown and waterfront areas for the purpose of increasing their appeal and vitality. Representative cases of high-profile urban renewal in Europe include HafenCity in Hamburg, Germany, Temple Bar in Dublin, Ireland, the development centred around Guggenheim Museum in Bilbao, Spain, and London Docklands and Liverpool One in England [17-18]. The core of such renewal is in strategic local economic development, not least because more often than not such efforts are investment-intensive, concern various groups of stakeholders and spearhead local

efforts towards economic development. One of the most important strands of this trend can be termed *sustainable economic renewal*, which mobilises local forces to enhance community well-being not only by strengthening local businesses but also by improving urban environment, quality of life, and social inclusion. This approach fosters environmental integrity, social cohesion, good governance, and equitable economic opportunity [19-22].

The idea of urban economic renewal has two sides, proactive and reactive. The *proactive side* has been predominantly understood as the application of the principles of sustainable development to a local economy, including such strategic issues as how to truly benefit the local economy instead of promoting, for example, "mcdonaldisation" and "walmartisation" which create leakages that tend to fling profits and a critical part of the development potential outside the community [22]. Another aspect of this agenda is the much debated issue of economic restructuring, which is essentially a proactive way of tackling the contextual challenge of economic transformation [23]. The *reactive side* can be defined analogously with resilience in the context of natural disasters (e.g. [24]) as a community's ability to resist or cope with the direct impacts of structural and cyclical economic changes in terms of job losses and diminished entrepreneurial activities. Broadly defined, the welfare impact of economic changes depends on the ability of the economy to cope, recover, and reconstruct and thus to minimise aggregate consumption losses. In this article our focus is on the proactive side of economic renewal.

A paradigmatic case in which urban economic renewal comes into the picture is a medium-sized urban community that has experienced long periods of economic prosperity built around a major industry or company and that has then suffered economic decline when those industries substantially reduced their workforce and in some instances closed down completely. While investigating such cases, Mayer and Greenberg [25] found that the response to such a weakened economic position was typically delayed. In many cases a decade or more was required before a plan to attract new business and diversify the employment base was developed. Other challenges typically included environmental and labour stigmas that the cities needed to overcome. Their cases imply that a lack of both leadership and a shared vision within a community is likely to prove economically disastrous [25]. To generalise, in the rapidly changing world there is a need to smarten up economic renewal. This implies a need to maintain and improve local transformative capacity, pointing to the idea of smart city, for it carries with it a promise of increasing local capacity to enhance knowledge processes and to facilitate the interaction and coordination that are vital for urban renewal.

Cities need to show a high degree of adaptability to global and technological change with an economy moving to higher levels of productivity. The various authorities of the region need to work together at the interface between sectorality and territoriality to meet regional long-term needs for water, transportation, housing, and economic development. All such urban-regional functions are based on the reflexivity of the urban actors involved, those who can learn, repair, and redesign their sub-systems in a

wider regional context. The smoothness and success of such a systemic whole depends to a large extent on the collective intelligence generated by the collaborating actors [26-27, 23].

3.2. Platforms for urban economic renewal

3.2.1. A smart city framework for urban development

Since the late 1990s the key issue in smart city discourse has been digitalisation, even if recently a range of other dimensions of smartness in urban life have also been discussed [28-36]. The following six dimensions have been mentioned as key application fields: people, environment, economy, governance, mobility, and living [37-39, 35]. The essence of smart city revolves around technologically enhanced systemic and collective intelligence. The social side of such intelligence assumes that a heterogeneous group of people is generally able to provide smarter solutions than an individual expert, i.e., diversity trumps expertise [40-41]. This connects the smart city discourse to inclusive, open and user-driven innovations as critical elements of smart urban development [23, 42]. It resembles the idea of adding citizens and users to the institutional triangle of government, business, and academia, referred to as the Quadruple Helix [43]. In recent discourse such a dimension has been radicalised by associating smartness with a kind of social intelligence at the intersection of physical space, digital technologies, and mediated forms of sharing, thus creating an important connection with justice, solidarity, and sustainability [44]. Concerning the last point, in the wake of global environmental concern sustainable development has become an integral part of the smart city agenda [45-46, 31]. Hence a connection with the idea of sustainable city [35, 23].

In the economic context, smartness can be analysed both at firm and community level, depending on where one's research interests lie. Concerning the community-level, a range of institutional and structural aspects of urban development come under the spotlight, including flexibility of labour markets, the facilitation capacity of the institutional environment, and urban-regional governance capacity and leadership [47]. The smart city framework urges city governments to develop open innovation environments, or more broadly, urban innovation ecosystems [48]. The idea is to stimulate experimentation, innovation, and commercialisation by bringing users and developers into the same micro-environments and empowering stakeholders, including non-elite groups, in innovation ecosystem. In the urban context, such technological opportunities must be assessed against the economic, social, and environmental objectives of the city [49]. In this article the focus is on innovativeness, which is one of the critical factors of urban economic renewal and forms an activity area in which user, customer, stakeholder, and citizen involvement has increased considerably within the last ten years.

3.2.2. Platform functions in innovation process

Platform is a physical, technological or social base on which economic and socio-technical processes are built [50-51, 23]. They used to be physical, local and exclusive, but have diversified due to the long-lasting modernisation process. In economic life the emergence of such platforms is actually quite recent phenomenon, for in increasingly innovation-driven competition firms have started to open their innovation processes by adopting the open innovation paradigm [52]. Another important trend in this field is the emergence of web-based, delocalised platforms and the entire new business models based on it, manifesting the deep impact of digitalisation on platformisation.

Platforms facilitate people's value creation by providing methods relevant for the interconnected actions that work through the critical mass of users and their inputs. They provide a structured and enabling environment for technologies, applications or social processes with a potential of smartening up their performance and development ([50, 23], cf. [53]). What is essential in platforms, and open platforms in particular, is their ability to replace hierarchical structures as a means of control, which is important if such a platform is supposed to be inclusive and support creativity [55, 36]. A paradigmatic participatory innovation platform is not fully open, user or community driven arrangement that supports joint innovation or co-innovation. Rather, in its characteristic form it is asymmetric (ownership of innovation is not shared) and structured (facilitators, working methods and tools) facilitation mechanism organised or sponsored by public authorities, which either widens or deepens the involvement of non-elite stakeholder groups in innovation processes especially by bringing them together with firms and other institutional players. Actual forms of participatory innovation platforms may vary considerably, however.

Platforms that facilitate open knowledge, planning, policy, and innovation processes include public meetings and hearings, neighbourhood regeneration projects and other *institutionalised urban planning procedures* [18]. There are literally thousands of such platforms all over the world. Besides these, there are *living labs and open innovation platforms* as well as *innovation incubators, accelerators, and programmes* that support specific economic functions, such as innovativeness, entrepreneurship, and startupping (e.g. [56]). Some of the innovation and business networking platforms are ad hoc or regular *events* rather than organised units, such as BarCamps, Pecha Kuchas or Meetups, or regular innovation and start-up events as in the case of Slush in Helsinki, which attracts entrepreneurs, venture capitalists, and media from around the world for a few days every year to look for new business opportunities. As a category of its own we may mention *business-driven projects and platforms*. A good example of such a scheme is the Business Improvement District (BID), which is primarily about partnership-based community asset utilisation and place-shaping [57-58]. In addition, the creation of *virtual communities and new community networks* has for decades paved the way for the new style of promoting and facilitating community development. More recent phenomena in this field are various *Web 2.0 style forums and creative ad hoc communities* that combine the harnessing of local development potential with social innovations and innovative product development, such as Social Innovation Camps [23].

Innovation platforms primarily perform four major functions: (i) providing open access and encouraging broad-based stakeholder involvement; (ii) enhancing individual, group, and community creativity; (iii) facilitating open dialogue and sharing; and (iv) supporting convergent thinking, decision-making and policy integration [55, 36, 59-62]. Through such functions platforms bring added value to local knowledge, creativity and innovation processes, which are critical to the smartness of local economic renewal.

Government's intervention in platform formation has its pros and cons. Some academics argue that a government's support for and active involvement in innovation platforms with several independent participants may be in the public interest, as long as the participants have sufficient common interest in the planned innovation, there is sufficient trust between them, and the required human and financial resources are available for joint learning and development. In addition, attention should be paid to concrete objectives and outputs, such as inventions and their commercialisation, in order to be able to work in a focused manner and measure the results [63].

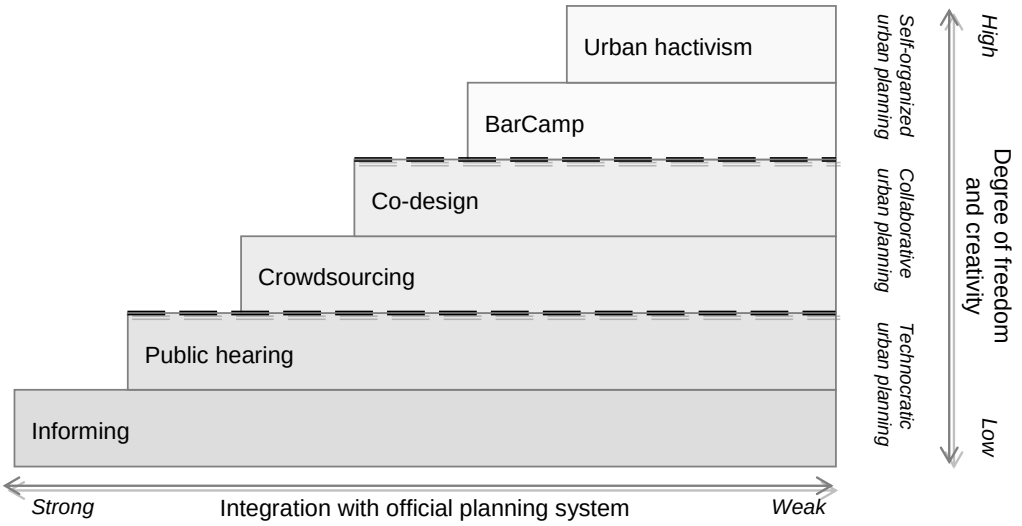
3.3. Theorising citizen involvement in local platforms

In urban planning expert-based, hierarchically organised policy making and governance have led in the post-war years to an erosion of process and output legitimacy due to the increased complexity of societies and their institutional fabric. *Complexity* refers to the density and dynamism of the interactions between the elements of a system, making system outcomes unpredictable and hard to control and, for this reason, defies such well-known policy strategies as coordination from the centre. Wagenaar [64] argues that participatory and deliberative models of governance are effective in harnessing complexity because they increase interaction within systems and thereby both enhance and utilise their diversity and creativity.

The development of media and new technologies has contributed significantly to the increase in complexity in business, governance, and social life. It has brought about new local information networks as a part of communicative ecology, and these have a critical facilitative role in determining the direction for urban transformation. An early indication of this trend was the increased relevance of user-generated content in social media, which, together with new forms of e-participation and co-creation and the impact of ubiquitous connectivity and other trends that changed the real-virtual interface, have transformed the urban communicative landscape and the precondition for urban informatics [65-66]. What emanates from this is a *collective intelligence*, be it aggregation of opinions or the wisdom of crowds [67]. In order for such practices to develop in a balanced and responsible way, there is a need for a participatory culture that supports, guides and controls such development [66]. Interestingly, this technology-oriented perspective leads to the emphasis of the very same thing as the complexity theory, i.e., the relevance of diversity and creativity.

The utilisation of diversity and creativity requires open participation at community level. Among the most well-known typologies of citizen participation and influence is

Sherry Arnstein's [68] ladder of citizen participation, which aptly describes some key aspects of participation viz. a representative system of government. Since then the number of models and typologies of participation has proliferated. If we add to traditional technocratic forms of citizen engagement in urban planning some new forms of involvement, ranging from open space technologies to pop-up planning and civic hacking or urban hactivism, we get a contextual view of the forms of participation, which starts from professionally controlled technocratic planning, continues to a higher degree of tokenism in professionally supported or facilitated collaborative planning and at the other end of the continuum shows a high degree of autonomy in self-organised *ad hoc* planning. The underlying assumption is that as a rule the higher the degree of autonomy and creativity, the lower the integration in official planning system. This scheme is illustrated in Figure 2.



Source: Anttiroiko, A.-V. 2016. City-as-a-Platform: The Rise of Participatory Innovation Platforms in Finnish Cities. Sustainability, 8(9), article 922.

Figure 2. Degrees of integration and creativity in urban planning.

A classic approach in product development is to identify the degrees or modes of user involvement: design for users, design with users, and design by users [69]. An analogous scheme applied to urban planning has been developed by Sarah C. White [70]. Her model of the forms and functions of participation includes four *forms* all based on different rationales: (a) *nominal participation* is used by powerful urban regimes to give legitimacy to development plans and projects; (b) *instrumental participation* is primarily a means towards a pre-decided end, which often enhances the utilisation of community assets and human capital; (c) *representative participation* gives community members a voice in the decision-making and implementation of policies that affect them; and (d) *transformative participation* results in the empowerment of those involved, which, as a truly decentralised manner, potentially leads to radical changes in community life if community members are in favour of such changes. Each mode of participation is an expression of some basic *function*, which we may call respectively display, means, voice, and power to change.

The value stances behind the top-down and bottom-up planning models have different interpretations of the four previously mentioned forms and functions of participation.

White looks at this issue as a power game and develops her model further by describing how the bottom-up interests of people and communities and the top-down interests of urban regime and growth coalition relate to the modes of participation. *Top-down interests* emphasise hierarchy, expertise and order, and thus start the process from seeking legitimation, and possibly proceeding towards higher-level functions of efficiency, sustainability or entrustment, depending on local conditions and the aims of regime politics and town planning machinery, whereas *bottom-up interests* take self-organised transformation as their ideal, and proceed thus in a reverse order to functions and forms of participation, starting from empowerment and continuing to leverage, effort (alternative cost) and inclusion. Such opposing views create a dynamic field of the politics of participation, which can be seen in conflicts between pro-growth and anti-growth movements, welfarism and neoliberalism, and conservatism and anarchism. On this basis we can obtain a theoretically-oriented view of how nominal, instrumental, representative or transformative participation is in each case, and how each of them relates to top-down and bottom-up interests in urban renewal [70]. It is worth remembering that it is not always self-evident who benefits from each planning initiative and how [13]. At the concrete level the question is, for example, how will the real-estate business, the political regime, the creative class, the middle class and disadvantaged groups contribute to and benefit from stakeholder-engagement in urban economic renewal.

4. **The cases of Helsinki and Tampere**

4.1. Smart cities on a national agenda

In the developed world economic restructuring is closely linked with technological development. When global competition started to intensify and new ICTs became a key aspect of economic restructuring in the 1980s, cities throughout the developed world directed their attention to high-tech development, which prompted the establishment of suburban science parks and high-tech industrial parks. Soon the spatial organisation of high-tech industries started to slowly shift towards urban innovation districts, knowledge parks and user-involving innovation environments. Content-wise, policy programmes broadened from narrowly-defined ICTs associated with both hardware and software development to a range of emerging areas, such as nanotechnology, biotechnology, robotics, artificial intelligence, game industry, alternative energy, new materials, and the like. At the same time the themes of industrial and economic development programmes also diversified, including such frameworks as cultural, creative, sustainable, smart and sharing economy.

In the Finnish case, restructuring efforts have followed a conventional route in that during the post-war decades attention was gradually redirected from heavy industries to high-tech, later to be further narrowed down to selected emerging industries while at the same time diversifying to services and creative industries. An indication of the recent trend is the national innovative cities programme known as *INKA*. Together with the programmes of Tekes, the projects organised within the Centres of Strategic Excellence (SHOK) and the research projects financed by the Academy of Finland, the

finance of R&D&I is heavily inclined to various aspects of smartness. It is worth emphasising that this development is internationally oriented, including the efforts of Team Finland (institutional actors who collaborate on internationalising the Finnish economy) to increase global networking with thematic association with smart city and selected emerging industries (on the national strategic development of Finnish innovation-driven and knowledge-based economy, see [71]).

4.1.1. Innovative Cities programme

Innovative Cities (*Innovatiiviset kaupungit* or INKA in Finnish), is a programme designed for 2012-2020 with the purpose of supporting the birth and growth of high-level expertise-based competitive companies and thereby expediting the emergence of innovation hubs in Finland. INKA is a partnership between the state and the leading cities, which simultaneously reflects the new metropolitan policy that has fairly recently arrived in Finland. The programme emphasises intercity collaboration, aiming to offer companies chances to seek partners and finance outside their home cities. INKA enhances cities' capability to create new knowledge-based business development environments and pioneering markets.

INKA is a thematically focused programme, with five core themes, each being coordinated by one designated city:

- Smart city with renewing industry: Tampere
- Bioeconomy: Joensuu
- Sustainable energy solutions: Vaasa
- Health of the future: Oulu
- Cybersecurity: Jyväskylä

Smart city with renewing industry theme is coordinated by Tampere Region, having the cities of Lahti, Oulu and Turku as well as the capital region as its partners. It is a framework programme that reflects national attempts to maintain innovativeness and attractiveness through the creation of globally competitive innovation hubs.

4.1.2. Smart city collaboration

Beside national programmes another way of pooling resources, networking, sharing experiences, and scaling up new practices is bottom-up based inter-municipal collaboration. The most important framework for such collaboration to date is the Six City Strategy – Open and Smart Services (abbreviated to 6AIKA in Finnish), a strategy for sustainable urban development carried out by the six largest cities of the country: Helsinki, Espoo, Vantaa, Tampere, Turku, and Oulu. The strategy will be carried out between 2014 and 2020 with the aim of creating new know-how, business, and jobs. The strategy is a part of the implementation of Finland's EU structural fund programme for sustainable growth and jobs 2014–2020. This shows the connection with the EU framework, in which smart city has become an important framing concept.

The primary objective of the Six City Strategy is to strengthen Finland's competitiveness by using the country's six largest cities as innovation development and experimentation environments. The strategy has three focal areas: (a) open innovation platforms, (b) open data and interfaces, and (c) open participation and customership. The innovation platforms are used to create and test new services and products in real-world conditions. The data generated and opened up by the cities serve as the raw material for developing new services. Finally, the principle of open participation and customership is to invite the entire urban community to design and develop service innovations. In addition to this, the last theme supports employment and participation, especially among people with poor employment prospects. Forum Virium Helsinki is responsible for the national coordination of the Six City Strategy (on the Six City Strategy, see http://www.forumvirium.fi/en/the-six-cities-strategy).

4.2. Helsinki – a city as an open living lab

The city of Helsinki is the capital of Finland, the largest and most internationalised city in the country. Even if municipalities have traditionally been independent and born the responsibility for their own development, the cities of the metropolitan region have started to collaborate on economic development, which includes the drafting of a joint innovation strategy [72]. Its overall objective is the success of the metropolitan region in global competition through the intensification of collaboration between the key institutional actors and better mobilisation of innovation potential of the region. It is an instrument for the realisation of the vision of Helsinki Region as a world-class innovation hub based on science, arts, creativity and learning capability and on the power of good service, which benefits citizens in the region and Finland as a whole (on the innovation environments in Helsinki, see [73]).

4.2.1. Forum Virium Helsinki as an innovation intermediary

Forum Virium Helsinki was set up in the mid-2000s on the initiative of the business community. The motivation was to support the creation of new business opportunities both domestically and internationally through a shared platform, thematically focused collaboration, and product development [74]. Forum Virium Helsinki is a stakeholder-involving innovation consortium of the city of Helsinki. Its organisation has from the beginning been based on ideas of partnership and openness [75]. The idea is that the city of Helsinki covers the basic costs, while projects are funded separately from various sources [76].

The main goal of Forum Virium Helsinki is to develop the essential building blocks for smart and open cities of the future. A concrete aim is to create better services, new businesses, and to forge links to international markets. The Forum itself can be characterised as an *innovation intermediation platform* which develops needs-based and internationally competitive digital services in collaboration with private businesses, public organisations and citizens in the Helsinki metropolitan area [75]. It has proved to be at its best in building bridges between the public and private sectors. Its development projects reflect such bridging, for they are primarily designed to solve

problems in the public sector, but solutions are developed in collaboration with private enterprises and residents of the city. It reflects a new urban development paradigm in the sense that the development of urban services starts from the everyday lives and needs of citizens [76].

Forum Virium Helsinki's core activity is to manage development projects. The activities of the Forum focus on the following: smart city; new forms of media; growth company services; and innovation communities (living labs). From the platform perspective, two of these are particularly interesting. First, the *Smart City Project Area* is involved in the development of digital urban services that make traveling and living in the city easier. These services include among others real-time traffic information for citizens. Another mission within this project area is the opening up of public data. With open access to public data, new and more versatile services are created by individuals and companies. Lastly, this set of activities focuses on testing smart city services in the real-life setting of Helsinki metropolitan area. The goal is to keep the capital region as one of the leading testing environments for digital services (see Forum Virium Helsinki at http://www.forumvirium.fi/en/project-areas/smart-city). Another project area of special importance for citizen involvement is known as *Innovation Communities*. This family of activities tests and develops user-driven innovation processes, methods, and tools. It brings together companies, public sector organisations, research institutions, and citizens. Together they make up an ecosystem where the best practices are shared (on the Innovation Communities of the Forum Virium Helsinki see http://www.forumvirium.fi/en/project-areas/innovation-communities).

4.2.2. Helsinki Living Lab

One of the most characteristic means of implementing user-driven innovation in Helsinki region is the Living Lab concept [47]. Living Labs serve as magnets in the innovation ecosystem: city governments use them to promote economic development by generating social, service, and governance innovations; higher education institutions use them to bring their teaching and research closer to developers and users; and innovative companies use them for ideation, testing, and product development. Through such a diversity of engaged actors and the principles of openness and co-creation, Living Labs actually do a great deal to shape the entire idea of smart city in the metropolitan region [49].

The Helsinki Living Lab network was set up in 2007 to meet the challenges of product development. It provides a platform that aims at promoting user-driven methods and tools for improving the real-world development of products and services [74]. Helsinki Living Lab is also a communications hub and a brand to enable companies and the public sector to get in touch and cooperate with all the different Living Labs in the Helsinki metropolitan area. It operates through different projects, such as Forum Virium Helsinki's Living Labs, Arabianranta Living Labs, Laurea Living Labs and Pasila Living Labs (Helsinki Living Lab at http://www.helsinkilivinglab.fi/). Their profiles vary but they all rely on user-driven innovation. In the case of Helsinki they follow usually a three-phase methodology: identification of stakeholders and selection

of users; interaction and iterative co-design of prototypes; and lastly appropriation and implementation, referring to the testing of the final outcome and collecting feedback [77].

4.2.3. Citizens and users in focus

In Helsinki's approach to innovation the city itself is seen as an open innovation environment, which is an extension of the idea of Living Lab. Smartness in such a context is more than just advanced infrastructures or state-of-the-art technological solutions. For Helsinki, the making of a smart city signifies advancing the open engagement of citizens and communities, pioneering in open data and transparency, and promoting agile service development, as described by Jarmo Eskelinen, CEO of Forum Virium Helsinki [74]. This implies that citizens are involved in different roles and their involvement has different functions; some projects giving them a voice, some securing their rights as political actors, and others utilising their knowledge and experience as service users. Such a variety is visible in the projects of Forum Virium Helsinki.

The picture obviously has an instrumental or commercial side, which approaches citizens primarily as users, customers or consumers. User-centred open innovation is the key to the way of working of the city of Helsinki as a living lab. Services are developed and tested together with the users and application developers. For example, the Walk and Feel Helsinki project was initiated in the summer of 2011 to help cruise passengers to become acquainted with Helsinki and provide them with a new way to explore the city. Next year an extended Walk and Feel Helsinki service was launched, placing NFC tags at every tram stop to enable passengers and tourists to receive information about the next tram's arrival (see Forum Virium Helsinki at http://www.forumvirium.fi/en/introduction). The city's infrastructure and services are built step by step through various smart city projects, which eventually both increase the smartness of traffic, facility control, and other aspects of urban life, and support the development towards a genuinely open city.

More representative and transformative aspects of participation emanate from the variety of new programmes and platforms. For example, Smart Kalasatama is to become a model for building a sustainable smart neighbourhood; Helsinki Region Infoshare (HRI) provides public data for anyone to use in their applications; Open Ahjo is an interface that provides access to the documents of the city of Helsinki; Helsinki Loves Developers organises developer meetups and a portal (dev.hel.fi); Open Finland Challenge is an innovation contest; CitySDK is an open data interface project; D-CENT offers citizens and associations open-source platform and tools for organising their activities; and Code for Europe provides creative people with opportunities to work in innovative cities [76]. All such smart city initiatives are expected to pave Helsinki's way to a smart urban future, in which citizens are more than just users or customers. They reflect the strategy of the city of Helsinki, which focus on the promotion of openness, democracy, and inclusion. One example of the decisive steps in this area is the HRI project mentioned above and its pioneering work in the field of open data. Another

example of "disruptive technology" is D-CENT intended to create new web-based tools and participatory platforms for citizen collaboration and open interaction between public authorities and citizens. There is a rise of new generation of platforms that bring government, academia and firms together with hackers, urban activists, social entrepreneurs, progressive enthusiasts, art communities and special groups defined by various demographic and socio-economic characteristics, which in due course dissolves fixities of roles in Quadruple Helix of the capital region.

4.3. Tampere – a stakeholder-involving open city

Tampere is one of the largest cities in Finland with some 225,000 inhabitants. It started to industrialise in the first half of the 19th century. The city's industrial heritage is expressed in one of its nicknames, 'Manse' or the Manchester of Finland. Such a heritage determines Tampere's approach to the smart city challenge, which emphasises the renewal of manufacturing firms, exploring advanced manufacturing technologies, smart specialisation, and the need to strengthen post-industrial economic sectors and related activities.

4.3.1. Open and smart Tampere

Tampere has based its restructuring on a range of partnership-based economic development programmes. Operating on a partnership basis eTampere (2000-2005) developed the digitalisation of the economy, governance, and social life [78]. BioneXt (2003-2009) focused on biotechnology by combining the strong technological expertise in the Tampere region with new biological and medical research. In the latter half of the 2000s Tampere's economic development policy was guided by Creative Tampere programme (2006-2011) with a focus on creative urban design and the development of creative industries. All these programmes indicate some changes in the approach to citizen participation, as at the time of eTampere the core issue was access, skills, and motivation of citizens to use new digital services, while Creative Tampere marked a shift towards creativity, sharing, and co-creation. The current economic development programme, Open Tampere (2012-2018), is a kind of integrative local framework, which contributes to the birth of new growth-oriented companies, creates global business, and promotes the restructuring of existing industries. Its reliance on openness hints at an understanding of the need to focus on open innovation in promoting economic development.

Tampere's current aspirations in economic renewal are best expressed in the recently published OPEN/SMART/CONNECTED strategy originally produced for the iCapital application, which is based on the previously mentioned Six City Strategy. It builds on three key elements: open innovation platforms, open data and interfaces, and open participation. The OPEN/SMART/CONNECTED strategy aims at further scaling up the three core elements to create service innovations, new jobs, and companies through practice-oriented pilots. The special focus of the scaling up activities is on the co-creation of health and well-being service innovations and on the promotion of citizen participation in the Tesoma district in Tampere. The latter represents an innovation-

driven urban renewal, including an urban district-focused innovation platform, "Oma Tesoma" [My Tesoma], which was set up in 2013. Tesoma is a fairly large suburban area in Tampere with some 20,000 inhabitants. It will be developed as an innovation platform to attract companies, residents, and local communities to create service innovations, business opportunities, and attractive living environments [79].

The Open Tampere programme has created "innovation factories" as spaces, operational models, and communities that permit fast innovation by bringing different actors together. The aim is to create new business and hence new job opportunities. Such thinking indicates a transformation towards platform-enabled local innovation policy. Accordingly, the focus is on small firms and start-ups, new digital economy, urban innovations, and smart city solutions, which are enhanced by open innovation platforms. The most important innovation factory is the so-called New Factory (*Uusi tehdas* in Finnish) accompanied by a few other innovation platforms [80]. New Factory is a paradigmatic example of recent trends in the creation of a new generation of innovation platforms with several platform-style micro-environments to support ideation, prototyping, and the utilisation of user experience. Konela ('*Kone*' is machine in Finnish) is an innovation centre for mechanical engineering and energy technology. The Institute of Biosciences and Medical Technology or BioMediTech is an institute specialised on biotechnology set up by the University of Tampere and Tampere University of Technology. Beside integrating and strengthening the local tradition of excellence in basic life-science research and teaching, it serves as a platform for discovery and innovation. Later in 2014 a more recent creation, Mediapolis, has been brought to this same scene to support the development of a mini-cluster in media industries (see http://mediapolis.fi/).

4.3.2. Demola as a stakeholder engagement platform

New Factory represents a new fashion in platform governance that contributes to the broadly understood local economic renewal. It was set up in 2010 with the backing of numerous local and national organisations [81]. It offers innovation matchmaking, mentoring, accelerator, and coaching services for start-ups, and two special innovation platforms, Demola to involve university students in creating demos and Protomo for prototype-driven startupping [82].

Demola was set up in 2008 as one of the projects supported by the Creative Tampere programme (2006-2011) and was later taken under the wing of New Factory. An important factor behind its establishment was the fact that the city with 220,000 inhabitants has some 38,000 students, with vast latent potential for urban economic development. We are not discussing here a conventional Living Lab, for while the latter incorporates the wider community in product and service development, Demola mainly involves students. The other difference is that instead of testing new products, which is typical of Living Labs, Demola focuses on generating concepts and creating demos and prototypes [83]. The projects organised in Demola fall into such thematic categories as business concepts, software, design and art, education, engineering, environment, governance, health care, media and communications, and social science.

What university students do in Demola is essentially to create demos or prototypes of novel ideas and services or products in response to problems brought to the platform by local companies or other organisations [84]. University students form *ad hoc* teams to create innovative solutions to such real-life problems [83]. Students are recruited for Demola on the basis of their own motivation and areas of interest. They can apply for available projects a few times during the academic year. Through participation they earn credits for their degrees and occasionally also receive monetary remuneration, depending on the value and potential of the results of their work.

Since its establishment Demola has served as a platform that has involved more than 150 partner companies with their needs for new concepts and solutions, and at the other side of the equation, has gathered some 2,000 students (of whom some 35 per cent are international students) working in teams for projects, of which some 350 have been completed so far (in 2015). One of the core principles of Demola is to reward those who contribute to the projects. This has led to a policy according to which the teams of students own the results of their work, which gives them a chance to develop the ideas further and create their own businesses. In addition, a project partner may also license the results from the teams [85; 83]. An indication of the success of the work accomplished in Demola is the high share of projects with licensed results (some 80%) which has generated over 1 million euros for students in the form of licensing fees. Another indication of the success of the model is that many students are recruited after the projects (some 15%) and that the willingness to become an entrepreneur rises considerably among participating students, on average from some 30% to 75% [84, 86-87, 23] (on the facts of Demola, see http://tampere.demola.fi/).

All in all, Demola expresses well the open innovation-driven developmentalism at the heart of Tampere's economic renewal. It enhances local learning through the guidance and support provided to students by industrial and academic partners, the facilitation of co-creation and creative development of original ideas, which often end up with wider variety of applications and configurations than originally envisaged, implying a high degree of creativity in the value creation process [83-85].

4.3.3. Koklaamo as a neighbourhood innovation platform

Innovation factories as stakeholder-engaging hubs in the city have been supplemented by a range of new innovation platforms since the launch of the Six City Strategy and the INKA programme in 2014. The overall aim of the city is to move from closed firm-based activities towards an open, collaborative and user-centred innovation model, within which co-creation and service design processes are organised collaboratively by the city government, local business, higher education institutions, and citizens.

The most illuminating example of this trend is Koklaamo (the Finnish project name refers to trial) set up within the Open Innovation Platform focal area of the Six City Strategy with the purpose of involving citizens in innovation-driven business development. Koklaamo is an open innovation platform for user-centred and agile co-

creation, which creates business opportunities for local micro-firms and small and medium-sized enterprises (SMEs), while at the same time encouraging the urban community to take a new role in and responsibility for improving the vitality of the city. The pilot area where Koklaamo's efforts to create business opportunities by meeting the needs of local inhabitants are designed for is a suburban residential district of Tesoma, which actually adds another engagement challenge to the platform.

The Koklaamo's working model includes four phases: (1) identification of citizens' challenges, problems, and needs; (2) creating feasible solutions together with firms involved; (3) agile testing of the solutions in a real urban environment; and (4) evaluation and actions that support the wide application and for the commercialisation of the solution. Each agile innovation project is organised in four workshops, in which Lean Service Creation method is applied. At the end of the process it is assessed whether the solution is immediately commercially viable or whether its further development would benefit from crowdfunding, partnership-based model or a pilot project funded from available sources (See http://omatesoma.fi/koklaamo/).

So far one innovation project has been completed and another one is going on to be completed by autumn 2017, the first one focussing on logistic needs of active families with kids and the latter one on traffic safety. Koklaamo is a newly created platform, which provides public managers, experts and facilitators opportunities to learn how to govern such innovation and business development process in a challenging suburban context. For example, the new methods of engaging firms as well as the new ways of integrating projects better into the existing institutional environment have already improved for the second project on the basis of the experiences gained from the first one. If the model proves to be successful, the plan is to extend it to other city districts or even scale it up as a whole-of-city solution.

5. Discussion

Finnish cities have systematically developed their capacity and smartness in order to facilitate economic renewal. A distinguishing feature of this process is the enhancement of citizen and user involvement in innovation platforms that reflects a wider attempt to democratise innovation-driven economic development and to create an open and inclusive society. Such an emphasis goes hand in hand with the participatory turn in urban governance, which makes it plausible to assume that new trends in innovation policy and participatory turn in urban planning are mutually reinforcing factors in community life, contributing to social and economic inclusion.

Both cities discussed here have their own characteristics. Most notably, Helsinki is in a class of its own as the national capital, a centre of creative economy and a trailblazer of urban culture, and its approach shows an apparent inclination to strengthen and utilise the critical mass of smart city activities as well as regional integration, while Tampere as middle-sized high-tech and university city has an inherently narrower focus and more streamlined approach to platformisation. That said, Finnish cities also show

converging features regarding their efforts to enhance participatory intelligence in innovation platforms, of which we will next point out five.

First, Helsinki and Tampere as well as a few other largest cities of the country have a similar strategic framework, that of the Six City Strategy (6AIKA), which focuses on the needs of the largest Finnish cities in their pursuit of a smart urban future. Through this strategy they all also have a connection to both the national and the EU-level economic development and innovation policy framework. Second, these two cities have designated a special smart city district (Arabianranta and Kalasatama in Helsinki and Tesoma in Tampere), which represent a smart city version of the innovation district development that has become prevalent in advanced countries [12, 47]. Even if the smartness of these districts may not be particularly pronounced, especially in the case of Tampere, they serve as symbolic actions to show outsiders the commitment of the city governments to develop these cities according to the most recent trends in technological and economic development. This reflects the fact that the emphasis in the creation of innovation environments has for some decades been moving from suburban technology parks to urban knowledge and innovation districts, and it seems that the Living Lab movement and platformisation are accelerating this trend. Third, another similarity between the two cases is the strategic role given to user and citizen involvement in increasing innovation capability and smartness in production and business, i.e., in both cases government-sponsored platforms facilitate the interaction between business and citizens, which is expected to enhance broadly defined productive intelligence [23]. Fourth, both case cities use inclusive platforms for improving public services, which in turn are used as a catalyst for the development of high-tech and smart industries. It is as if a neo-Weberian local state is utilising business and user involvement in order to adjust to changing times. Lastly, in Finnish cities the approach to innovation policy is balanced with socially motivated aims, such as enhancing social inclusion through platforms, improving the employment opportunities of disadvantaged groups, and providing open access to governance and innovation platforms. In fact, a strong emphasis on openness, social inclusion, and empowerment and a respect for citizens' political rights in policy-making processes clearly affects cities' development policy, local innovation policy included.

All in all, on the optimistic or constructive side of the picture of citizen participation in innovation platforms we may discern the emergence of new opportunities for all parties involved as well as diversification of the governance field, especially in terms of new intermediary roles for involved organisations and genuine plurality that grows out of grassroots participation. At best such processes become triggers that strengthen the "participatory turn" in urban governance and even go beyond that, supporting a parallel development of civic and associational initiatives, networks, hactivism and other forms of action outside the institutionalised public domain [94]. In the two case cities discussed here participation is a core element of public governance, which is extended to innovation-oriented economic development policy through innovation platforms. It reveals the duality of participatory structures due to the co-existence of instrumental and representative modes of participation, as evidenced in the practices of Forum Virium Helsinki and Helsinki Living Lab and of New Factory and Demola in

Tampere. The general impact of such participation is conducive to local economic renewal, which ultimately benefits the whole local population. However, some critical points become apparent if we consider the more contextual aspects of participation in innovation platforms.

The development of participation through *ad hoc* arrangements, projects and platforms reflects to a degree the instrumentalisation of participation, which in many cases allows only little room for affecting the conditions of participation, agenda-setting, and continuation after the termination of the project ([88], cf. [89]). Within such a framework citizen and user engagement can be seen as a way to enhance productive smartness. We may ask, however, how much the settings, processes, and expected outcomes of such processes are predetermined by local growth coalition and harnessed initially to serve the accumulation of parochial or mobile capital [13]. This remark puts participatory platformisation into a broader context with a historical reference to the neoliberal tendencies associated with innovation-driven local industrial policy. One of the indications of such a tendency is seen at local level when cities gradually change their policy orientation from welfare provision through publicly-funded services towards a more outward-oriented growth policy, which hits the most vulnerable groups in the local society hardest [14, 90]. Such a polity is labelled *neoliberal city*, built on such premises as individual freedom, free market economy, and small government [91]. In smart city development its illustrative developmentalist variant is a corporate smart city, a new town endeavour driven by the profit seeking of global high-tech companies and facilitated by entrepreneurial urban governments, ultimately leaving little room for ordinary citizens to participate in its making and accommodating mainly entrepreneurial, professional and well-to-do people [95]. In such a context participation in innovation platforms serves primarily two functions: instrumental participation supports innovation-driven business, while nominal participation legitimises the neoliberal economic order. Such a market-driven development in its own way enhances the development of the crowdsourcing paradigm and the democratisation of innovation [47, 4], although this "democracy" is thin as it is confined to participation in a business-driven innovation ecosystem and its solidarity structures are assumed to work indirectly through trickle-down economics. Such a narrowly defined innovation-for-all approach undoubtedly helps active and capable citizens to become part of the innovation-driven economy. It suggests, however, that there is a critical shortcoming of such a smart city discourse, for issues like urban poverty and inequality are not usually addressed within it at all [92].

Such a view reveals a suppressed structural tension that points to the contradictory aspects of local economic development as theorised in urban regime theory [93] and more so in the growth machine thesis [13]. There is, however, a need to see beyond such frameworks as they have difficulties in explaining the occasional urban sustainability compromise, as in the case of the smart growth programme in Austin, Texas. Austin's ability to sustain growth while pursuing sustainable city development was an institutional innovation that emerged as a result of struggles between the business community and local environmental activists [94-95]. Another major implication of such a structural tension is people's tendency to organise social action outside the

domain of the neoliberal urban regime by hacking the city, which builds a counter-vision and counterweight to neoliberal smart city in the spirit of the right to the city movement [96-97]. Even if there are signs of increased neoliberal tendencies in the Finnish cities, the discussion above has obvious limitations in making sense of Finnish participatory platformisation [98].

The cities of a welfare society, such as those discussed in this article, even if under economic stress and forced to cut public spending, operate within frameworks which guarantee their residents basic welfare. In such a situation competitiveness policy at national level and entrepreneurial aspirations at local level are justified by the aim to restructure the welfare society, which aims at the solidaristic redistribution of wealth. City governments also seem to be willing to promote restructuring by disruptive technologies, working methods and subcultures, as seen in the collaboration with open source and hacker communities within HRI, SluchHacks & Ultrahack and other projects and events. From such an environment emanates a special kind of people-centred version of the innovation-for-all conception [47].

Even if the local growth agenda is largely written by the growth coalition and a host of intermediary organisations and promotion agencies also in welfare societies, there is clear evidence for a tendency to make the local development processes genuinely inclusive. This is visible in Nordic countries in particular. Institutional embeddedness, compliance with norms, transparency, social inclusion, and structures of solidarity seem to tame the urban growth machine and thus ease the dual city or local polarisation tendencies. The tension between the rich and the poor is considerably eased in welfare societies, and thus the trade-off between pro-growth and anti-growth coalitions does not take such a heavy toll on the poor or disadvantaged groups as it does in neoliberal city [95]. This suggests that being able to benefit fully from citizen involvement in producing social coherence, accountability, economic robustness, and self-organisation [99] has its societal preconditions, and the welfare society context is in many respects a fruitful ground from which to reap such benefits due to its democratic sentiment and inbuilt solidarity structures. Whether such structures at national and local levels are able to withstand regional harmonisation tendencies and global competition is another matter, and appears to be a real challenge to welfare societies in the 21st century.

6. Conclusions

The role of citizen, user, and stakeholder participation in smart environments and platforms in major Finnish cities contributes to urban economic renewal by enhancing productive smartness. Such participation has an inherent instrumental dimension but its rationale goes beyond narrow-minded instrumentalism. Helsinki is approaching citizen involvement from a Living Lab point of view, while Tampere has built its approach on stakeholder-involving innovation platforms. In both of these cases urban development policy goes hand in hand with innovation policy, and these intersect in the open smart city framework. Finnish cities have taken the challenge of smartness seriously, and the six largest cities are even networked around this idea through their Six City Strategy.

This article addressed the role of participation in innovation platforms. The two cases above, Helsinki and Tampere, show that these cities provide a wide range of activities from user involvement in product development to citizens' rights to bring their concerns to open innovation platforms. Such participation may vary from nominal to transformative, although in most cases user involvement is 'instrumental' and citizen or resident involvement 'representative'. More 'transformative' modes of participation are associated with the opening of public data sets for public use free of charge and related open source and user innovation movements, which as a whole reflect the increasing intersection between urban hactivism and local public governance, as epitomised by the case of Helsinki.

In largest Finnish cities economic development policies are as a rule based on a balance between private and public interests. In the same way, inherent asymmetries of stakeholder-engaging innovation platforms between firms and participating citizens are to an extent compensated by welfare society structures, or in other words, asymmetries of micro-level innovation processes are counterweighted by structures of solidarity. Hence a less controversial view of the legitimation of participatory innovation platforms.

References

1. Bollier, D. *The City as Platform: How Digital Networks Are Changing Urban Life and Governance*; The Aspen Institute: Washington, D.C., USA, 2006.
2. Evans, P.C.; Gawer, A. *The Rise of the Platform Enterprise: A Global Survey*; The Center for Global Enterprise, New York, USA, 2016; Available online: http://thecge.net/wp-content/uploads/2016/01/PDF-WEB-Platform-Survey_01_12.pdf (accessed on 17 April 2016).
3. Chesbrough, H.W. The era of open innovation. *MIT Sloan Management Review* 2003, *44*, 35-41.
4. von Hippel, E. *Democratizing Innovation*; MIT Press: Cambridge, MA, USA, 2005.
5. Ramaswamy, V.; Gouillart, F. *The Power of Co-creation: Build It with Them to Boost Growth, Productivity, and Profits*; Free Press: New York, USA, 2010.
6. Somerville, P. Multiscalarity and Neighbourhood Governance. *Public Policy and Administration* 2011, *26*, 81-105.
7. Yin, R.K. *Case Study Research: Design and Methods*, 4th ed.; Sage: London, UK, 2008.
8. Nee, V. The New Institutionalism in Economics and Sociology. In *The Handbook of Economic Sociology*, 2nd ed.; Smelser, N., Swedberg, R., Eds.; Princeton University Press: Princeton, USA, 2005.
9. Mcloughlin, C. *Political economy analysis: Topic guide*, 2nd ed.; GSDRC, University of Birmingham, Birmingham, UK, 2014.
10. Swyngedouw, E. Globalisation or 'Glocalisation'? Networks, Territories and Rescaling. *Cambridge Review of International Affairs* 2004, *17*, 25-48.
11. Borja, J.; Castells, M. *Local and Global: The Management of Cities in the Information Age*, 2nd ed.; Earthscan: London, UK, 1999.
12. Katz, B.; Bradley, J. *The Metropolitan Revolution: How Cities and Metros Are Fixing Our Broken Politics and Fragile Economy*; Brookings Institution Press, Washington, D.C., USA, 2013.
13. Logan, J.; Molotch, H. *Urban Fortunes: The Political Economy of Place*; University of California Press, Berkeley and Los Angeles, CA, USA, 1987.
14. Harvey, D. From Managerialism to Entrepreneurialism: The Transformation in Urban Governance in Late Capitalism. *Geografiska Annaler*, Series B, 1989, *71*, 3-17.
15. Low, N.; Gleeson, B.; Elander, I.; Lidskog, R., Eds. *Consuming Cities: The urban environment in the global economy after the Rio declaration*. Routledge: London, UK and New York, USA, 2000.

16. While, A.; Jonas, A.E.G.; Gibbs, D. The Environment and the Entrepreneurial City: Searching for the Urban `Sustainability Fix' in Manchester and Leeds. *International Journal of Urban and Regional Research* 2004, 28, 549-69.
17. Klemek, C. *The Transatlantic Collapse of Urban Renewal, Postwar Urbanism from New York to Berlin*. University of Chicago Press: Chicago, USA, 2011.
18. Grogan, P.S.; Proscio, T. *Comeback Cities: A Blueprint for Urban Neighborhood Revival*. Westview Press: Boulder, USA, 2000.
19. Portney, K.E. *Taking Sustainable Cities Seriously: Economic Development, the Environment and Quality of Life in American Cities*. The MIT Press: Cambridge, MA, USA, 2003.
20. Hallsmith, G. *The Key to Sustainable Cities: Meeting Human Needs, Transforming Community Systems*. New Society Publishers: Gabriola Island, BC, Canada, 2003.
21. Hallsmith, G.; Lovins, L.H.; Miller, M..; Lietaer, B.; Juniper, C.; Fawbush, W. *Guide to Community Development*. Local Action for Sustainable Economic Renewal – LASER, Longmont, CO, USA, 2006; Available online: http://www.sustainabilityleadershipinstitute.org/downloads/Hallsmith_2006_LASERguide.pdf (accessed on 13 April 2016).
22. Roseland, M. *Toward Sustainable Communities: Solutions for Citizens and Their Governments*, 4th ed.; New Society Publishers: Gabriola Island, BC, Canada, 2012.
23. Anttiroiko, A.-V. Smart Cities: Building Platforms for Innovative Local Economic Restructuring. In *Transforming City Governments for Successful Smart Cities*; Rodríguez-Bolívar Manuel Pedro, Ed.; Springer International Publishing: Switzerland, 2015, pp. 23-41.
24. Hallegatte, S. *Economic resilience: definition and measurement*. Policy Research working paper, no. WPS 6852; World Bank Group: Washington, DC, USA, 2014. Available online: http://documents.worldbank.org/curated/en/2014/05/19456702/economic-resilience-definition-measurement-economic-resilience-definition-measurement (accessed on 8 April 2016).
25. Mayer, H.J.; Greenberg, M.R. Coming Back from Economic Despair: Case Studies of Small- and Medium-Size American Cities. *Economic Development Quarterly* 2001, *15*, 203-216.
26. Innes, J.; Booher, D. Metropolitan Development as a Complex System: A New Approach to Sustainability. In *The Governance of Place: Space and planning processes*; Madanipour, A., Hull, A., Healey, P., Eds.; Ashgate: Aldershot, UK, 2002, pp. 239-264.
27. Herrschel, T. Competitiveness and Sustainability: Can 'Smart City Regionalism' Square the Circle? *Urban Studies* 2013, *50*, 2332-2348.
28. Caves, R.W. Responding to the Information Needs of Citizens in an Open Society: The Role of Smart Communities. In *eTransformation in Governance: New Directions in Government and Politics*; Mälkiä, M., Anttiroiko, A.-V., Savolainen, R., Eds.; Idea Group Publishing: Hershey, PA, USA, 2004, pp. 216-233.
29. Komninos, N. *Intelligent Cities. Innovation, knowledge systems and digital spaces*; Spon Press: London, UK; New York, USA, 2002.
30. Komninos, N. *Intelligent Cities and Globalisation of Innovation Networks*; Routledge: London, UK; New York, USA, 2008.
31. Komninos, N. Intelligent cities: Variable geometries of spatial intelligence. *Intelligent Buildings International* 2013, *3*, 172-188.
32. Nam, T.; Pardo, T.A. Conceptualizing Smart City with Dimensions of Technology, People, and Institutions. In Proceedings of the 12th Annual International Conference on Digital Government Research: Digital Government Innovation in Challenging Times, College Park, MD, USA, 12-15 June 2011; ACM: New York, USA, 2011, pp. 282-291; Available online: http://demo.ctg.albany.edu/publications/journals/dgo_2011_smartcity/dgo_2011_smartcity.pdf (accessed on 10 May 2014).
33. Deakin, M.; Al Waer, H. From intelligent to smart cities. *Intelligent Buildings International* 2011, *3*, 140-152.
34. Piro, G.; Cianci, I.; Grieco, L.A.; Boggia, G.; Camarda, P. Information centric services in Smart Cities. *The Journal of Systems Software* 2014, *88*, 169-188.
35. Murgante B.; Borruso G. Cities and Smartness: A Critical Analysis of Opportunities and Risks. In *Computational Science and Its Applications – ICCSA 2013*, Proceedings, Part III, Lecture Notes in Computer Science, Vol. 7973; Murgante, B. et al., Eds.; Springer: Berlin, Germany, 2013, pp. 630-642.
36. Anttiroiko, A.-V.; Valkama, P.; Bailey, S.J. Smart cities in the new service economy: building platforms for smart services. *AI & Society* 2013, *29*, 323-334.

37. Cohen, B. *What Exactly is a Smart City*. Fastcoexist.com, 09/19.2012. Available online: http://www.fastcoexist.com/1680538/what-exactly-is-a-smart-city (accessed on 8 April 2016).
38. Anthopoulos, L.G.; Vakali, A. Urban Planning and Smart Cities: Interrelations and Reciprocities. In *The Future Internet: Future Internet Assembly 2012: From Promises to Reality*; Alvarez, F., et al., Eds.; Lecture Notes in Computer Science, Vol. 7281; Springer: Berlin, Germany, 2012, pp. 178-189.
39. Giffinger, R.; Kramar, H.; Haindl, G. *The role of rankings in growing city competition*. Presentation at XI EURA Conference, Milan, 9-11 October 2008; European Urban Research Association: Dortmund, Germany, 2008; Available online: http://publik.tuwien.ac.at/files/PubDat_167218.pdf (accessed on 29 June 2014).
40. Surowiecki, J. *The Wisdom of Crowds*; Anchor Books: New York, USA, 2005.
41. Howe, J. *Crowdsourcing: Why the Power of the Crowd Is Driving the Future of Business*; Three Rivers Press: New York, USA, 2009.
42. Antikainen, M.; Mäkipää, M.; Ahonen, M. Motivating and supporting collaboration in open innovation. *European Journal of Innovation Management* 2010, *13*, 100-119.
43. Carayannis, E.G.; Campbell, D.F.J. Triple Helix, Quadruple Helix and Quintuple Helix and How Do Knowledge, Innovation and the Environment Relate To Each Other?: A Proposed Framework for a Trans-disciplinary Analysis of Sustainable Development and Social Ecology. *International Journal of Social Ecology and Sustainable Development* 2010, *1*, 41-69.
44. McLaren, D.; Agyeman, J. *Sharing Cities: A Case for Truly Smart and Sustainable Cities*; The MIT Press, Cambridge, MA, USA, 2015.
45. Edwards, F.L. State and Local Governments Prepare for Climate Change. *The Public Manager* 2011, *40*, 22-26.
46. Hollands, R.G. Will the real smart city please stand up? Intelligent, progressive or entrepreneurial? *City* 2008, *12*, 303-320.
47. Komninos, N. *The Age of Intelligent Cities: Smart environments and innovation-for-all strategies*; Routledge: London, UK; New York, USA, 2015.
48. Bifulco, F.; Tregua, M.; Amitrano, C. Living labs for smart innovation: a user-centric approach. In *Advances in the Human Side of Service Engineering*; Freund, L., Cellary, W., Eds.; AFRE Conference, 2014, pp. 828-294.
49. Schaffers, H. et al. *Smart Cities as Innovation Ecosystems sustained by the Future Internet*. Technical Report, HAL – Inria, hal-00769635, 2012. Available online: https://hal.inria.fr/hal-00769635 (accessed on 25 April 2016).
50. Anttiroiko, A.-V. The Role of New Technologies in Reshaping Governance Platforms. *International Journal of Information Communication Technologies and Human Development* 2012, *4*, 1-13.
51. Cooke, P.; De Laurentis, C.; MacNeill, S.; Collinge, C., Eds. *Platforms of Innovation: Dynamics of New Industrial Knowledge Flows*. Edward Elgar: Cheltenham, UK, 2010.
52. Ghazawneh, A. The Role of Platforms and Platform Thinking in Open Innovation Networks. In Proceedings of the 43rd Hawaii International Conference on System Sciences (HICSS), Koloa, Kauai, HI, USA, 5-8 January 2010; IEEE: Washington, DC, USA, 2010, pp. 1-10; Available online: http://www.diva-portal.org/smash/get/diva2:287634/FULLTEXT01.pdf (accessed on 8 April 2016).
53. Janssen, M.; Estevez, E. Lean government and platform-based governance—Doing more with less. *Government Information Quarterly* 2013, *30*, Supplement 1, S1-S8.
54. Gawer, A. *Towards a General Theory of Technological Platforms.* Paper presented at the Summer Conference 2010 on Opening Up Innovation: Strategy, Organization and Technology, Imperial College London Business School, 16-18 June 2010; DRUID: Denmark, 2010. Available online: http://www2.druid.dk/conferences/viewpaper.php?id=501981&cf=43 (accessed 28 December 2013).
55. Wachhaus, T.A. Governance as a Framework to Support Informatics. *The Innovation Journal: The Public Sector Innovation Journal* 2011, *16*, article 5.
56. Cai, Q. Promoting Fairness in Public Policy? Supportive Policy for Social Entrepreneurship. In *Fairness in Public Policy: Efficiency, Equity, and Beyond*; Korean Association for Policy Studies KAPS International Conference, Seoul, South Korea, 17 June 2011; The Korean Association for Policy Studies: Seoul, South Korea, 2011, pp. 301-319.
57. PUMA. *Business Improvement District (BID)*. July, 2010. Progressive Urban Management Associates, P.U.M.A.: Denver, USA, 2010.
58. Grossman, S.A. Public-Private Partnerships: BID Collaboration in Philadelphia. *The Public Manager* 2010, *39*, 38-42.

59. Koliba, C.; Zia, A.; Lee, B.H.Y. Governance Informatics: Managing the Performance of Inter-Organizational Governance Networks. *The Innovation Journal: The Public Sector Innovation Journal* 2011, 16(1), article 3; Available online: http://innovation.cc/scholarly-style/koliba_governance_informaticsv16i1a3.pdf (accessed 13 October 2011).
60. Dais, A. ; Nikolaidou, M.; Alexopoulou, N. ; Anagnostopoulous, D. Introducing a Public Agency Networking Platform towards Supporting Connected Governance. In Proceedings of 7th International Conference, EGOV 2008, Turin, Italy, 31 August – 5 September 2008; Vol. 5184 of the series Lecture Notes in Computer Science (LNCS); Wimmer, M.A., Scholl, H.J., Ferro, E., Eds.; Springer: Berlin, Germany, 2008, pp. 375-387.
61. Wang, J.; Wang Y. Fairness of Policy Making – in Perspective of Knowledge Utilization. In *Fairness in Public Policy: Efficiency, Equity, and Beyond*; Korean Association for Policy Studies KAPS International Conference, Seoul, South Korea, 17 June 2011; The Korean Association for Policy Studies: Seoul, South Korea, 2011, pp. 635-658.
62. Sefertzi, E. *Creativity*. Report produced for the EC funded project INNOREGIO: dissemination of innovation and knowledge management techniques, January 2000; Available online: http://www.adi.pt/docs/innoregio_creativity-en.pdf (accessed on 11 October 2013).
63. Buerkler, E. Critical success factors for joint innovation: Experiences from a New Zealand innovation platform. *The Innovation Journal: The Public Sector Innovation Journal* 2013, 18(2), article 8; Available online: http://www.innovation.cc/scholarly-style/8-349buerkler-new-zealand_v18i2a8.pdf (accessed on 8 April 2016).
64. Wagenaar, H. Governance, Complexity, and Democratic Participation: How Citizens and Public Officials Harness the Complexities of Neighborhood Decline; *The American Review of Public Administration* 2007, *37*, 17-50.
65. Foth, M.; Hearn, G. Networked individualism of urban residents: Discovering the communicative ecology in inner-city apartment buildings. *Information, Communication & Society* 2007, *10*, 749-772.
66. Foth, M.; Choi, J.H.-J.; Satchell, C. Urban Informatics. In The 2011 ACM Conference on Computer Supported Cooperative Work (CSCW), Hangzhou, China, 19-23 March 2011; ACM: New York, USA, 2011, pp. 1-8; Available online: http://eprints.qut.edu.au/39159/1/39159.pdf (accessed on 13 April 2016).
67. Anttiroiko, A.-V. Smart Planning: The Potential of Web 2.0 for Enhancing Collective Intelligence in Urban Planning. In *Emerging Issues, Challenges, and Opportunities in Urban E-Planning*; Silva, C.N., Ed.; IGI Global: Hershey, PA, USA, 2015, pp. 1-32.
68. Arnstein, S. A ladder of citizen participation; *Journal of the American Institute of Planners* 1969, *35*, 216-224.
69. Kaulio, M.A. Customer, consumer and user involvement in product development: A framework and a review of selected methods; *Total Quality Management* 1998, *9*, 141-149.
70. White, S.C. Depoliticising Development: The Uses and Abuses of Participation; *Development in Practice* 1996, *6*, 6-15.
71. Halme, K.; Lindy, I.; Piirainen, K.; Salminen, V.; White, J. *Finland as a knowledge economy 2.0: Lessons on policies and governance*; World Bank: Washington, DC, USA, 2014.
72. Culminatum. *Innovation Strategy: Helsinki Metropolitan Area*; Culminatum - Helsinki Region Centre of Expertise: Espoo, Finland, 2005.
73. Schulman, H.; Mäenpää, P., Eds. *Kaupungin kuumat lähteet: Helsingin metropolialueen innovaatioympäristöt*. [Hot Springs of the City: The Innovation Environments of the Helsinki Metropolitan Region]. Helsingin kaupungin tietokeskus: Helsinki, Finland, 2011.
74. Eskelinen, J. Forum Virium Helsinki – kaupunkilaiset testaavat palveluja [Forum Virium Helsinki – Citizens Test Services]. In *Kaupungin kuumat lähteet: Helsingin metropolialueen innovaatioympäristöt*; Schulman, H., Mäenpää, P., Eds.; Helsingin kaupungin tietokeskus: Helsinki, Finland, 2011, pp. 34-35.
75. Forum Virium Helsinki. Available online: http://www.forumvirium.fi/en (accessed on 28 December 2013).
76. Forum Virium Helsinki: Avointa kaupunkia rakentamassa [Forum Virium Helsinki: Building an open city]. Forum Virium Helsinki: Helsinki, Finland; Available online: https://drive.google.com/file/d/0BxF0qlDY5bSQZy1WQ1pUVFNBeEU/view?pref=2&pli=1 (accessed on 25 April 2016).

77. Almirall, E.; Lee, M.; Wareham, J. Mapping Living Labs in the Landscape of Innovation Methodologies; *Technology Innovation Management Review* 2012, *2*, 12-18.
78. Kasvio, A.; Anttiroiko, A.-V., Eds. *e-City: Analysing Efforts to Generate Local Dynamism in the City of Tampere*. Tampere University Press: Tampere, Finland, 2005.
79. Kautonen, M. *Cluster- to platform-based innovation policy*. Innovationcapital.fi, 18 November 2015; Available online: http://innovationcapital.fi/innovation-story/cluster-to-platform-based-innovation-policy (accessed on 25 April 2016).
80. Tredea. *Innovaatiotehtaat* [Innovation Factories]. Tampereen kaupunkiseudun elinkeino- ja kehitysyhtiö Tredea Oy: Tampere, Finland; Available online: http://www.innovatetampere.fi/innovaatioymparisto/innovaatiotehtaat/ (accessed on 7 January 2014).
81. City of Tampere. Available online: http://www.tampere.fi/tampereinfo/ajankohtaista/5pz6R2Y6i.html (accessed on 31 December 2013).
82. New Factory (2013). Uusi tehdas / New factory. New Factory Ltd., Hermia Group: Tampere, Finland; Available online: http://newfactory.fi/ accessed 28 December 2013).
83. Lamminmäki, K.; Salminen, V. *Demola: open innovation platform*. The Innovation Policy Platform, Case Study, 2014; Available online: https://www.innovationpolicyplatform.org/sites/default/files/rdf_imported_documents/Demola_2014.pdf (accessed on 18 April 2016).
84. Davey, T.; Deery, M.; Winters, C.; van der Sijde, P.; Kusio, T.; Rodríguez Sedano, S. *30 Good Practice Case Studies in University-Business Cooperation*. Part of the DG Education and Culture Study on the Cooperation Between Higher Education Institutions and Public and Private Organisations in Europe; Davey, T., Baaken, T., Deery, M., Galan-Muros, V., Eds.; European Commission: Brussels, Belgium; Available online: http://ec.europa.eu/education/higher-education/doc/studies/munstercase_en.pdf (accessed on 28 December 2013).
85. Kilamo, T.; Hammouda, I.; Kairamo, V.; Räsänen, P.; Saarinen J.P. Applying Open Source Practices and Principles in Open Innovation: The Case of the Demola Platform. In *Open Source Systems: Grounding Research*; Hissam, S.A., Russo, B., de Mendonça Neto, M.G., Kon, F., Eds.; IFIP International Federation for Information Processing, AICT, Vol. 365; Springer: Berlin, Germany, 2011, pp. 307-311.
86. Bessonova, A. How Startups Are Built In Tampere: Case of Demola. *ArcticStartup*, September 01, 2011. Available online: http://www.arcticstartup.com/2011/09/01/how-startups-are-built-in-tampere-case-of-demola (accessed on 25 January 2014).
87. Salomaa, A. *Innovation in Higher Education: Case Demola Co-creation platform for talented students, companies and universities*. Demola network, 2013; Available online: http://ec.europa.eu/education/events/2013/20131118/salomaa_en.pdf (accessed on 25 January 2014).
88. Kuokkanen, K. Developing Participation through Projects? A Case Study from the Helsinki Metropolitan Area. University of Helsinki, Faculty of Social Sciences: Helsinki, Finland, 2016; Available online: https://helda.helsinki.fi/bitstream/handle/10138/160808/DEVELOPI.pdf?sequence=1 (accessed on 15 April 2016).
89. Hollands, R.G. Critical interventions into the corporate smart city. *Cambridge Journal of Regions, Economy and Society* 2015, *8*, 61-77.
90. Hall, T.; Hubbard, P. The entrepreneurial city: new urban politics, new urban geographies? *Progress in Human Geography* 1996, *20*, 153-174.
91. Hackworth, J. *The Neoliberal City: Governance, Ideology and Development in American Urbanism;* Cornell University Press: Ithaca, NY, USA, 2007.
92. Thomas, V.; Wang, D.; Mullagh, L.; Dunn, N. Where's Wally? In Search of Citizen Perspectives on the Smart City. *Sustainability* 2016, 8(3), 207, 1-13, doi: 10.3390/su8030207
93. Stone, C. *Regime Politics: Governing Atlanta, 1946–1988*; University Press of Kansas: Lawrence, KS, USA, 1989.
94. Long, J. Constructing the narrative of the sustainability fix: Sustainability, social justice and representation in Austin, TX. *Urban Studies* 2014, *53*, 149-172.
95. Tretter, E. Sustainability and Neoliberal Urban Development: The Environment, Crime and the Remaking of Austin's Downtown. *Urban Studies* 2013, *50*, 2222-2237.

96. Stimmel, C.L. *Building Smart Cities: Analytics, ICT, and Design Thinking*; CRC Press: Boca Raton, FL, USA, 2016.
97. Harvey, D. *Rebel Cities: From the Right to the City to the Urban Revolution*; Verso: London, UK; New York, USA, 2012.
98. Anttiroiko, A. City-as-a-Platform: The Rise of Participatory Innovation Platforms in Finnish Cities. *Sustainability* 2016, *8(9)*, article 922. doi:10.3390/su8090922.
99. Boonstra, B.; Boelens, L. Self-organization in urban development: towards a new perspective on spatial planning. *Urban Research & Practice* 2011, 4, 99-122.