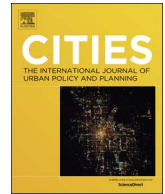


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Creating urban platforms — Opportunities and challenges for innovation in commercial real estate development

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ABSTRACT

Current theories on commercial urban development are dominated by the concept of linearity, which does not adequately take into account the demands of adaptation posed by the pace of change in digital developments, a pace that stands in marked contrast to the pace of change in physical developments. In the hi-tech sector, platform ecosystems have been employed to accommodate innovation and change. This paper explores the potential application of platform ecosystem theory to the commercial urban development process, where there is now great uncertainty regarding the future economic implications and societal requirements of physical commercial space. The boundary conditions for value creation in platform ecosystems are as follows: modularity, standardisation, complementarity and connectivity. Each is explored through a survey of key actors in recently completed commercial urban developments. The analysis identifies significant differences in the capacity of public- and private-sector actors to promote the creation of platform ecosystems, particularly in the complementary actions of development participants. Applying an approach to urban development based on a platform ecosystem might offer great opportunities, but will also be limited by the major challenges identified in this paper.

1. Introduction

The pace of change affecting urban built environments has increased remarkably in recent decades. Climate change and carbon reduction commitments are altering existing systems, such as for energy production and transportation. In addition, the digital revolution is changing the traditional business models of fields such as retail, transportation and hospitality in a way not previously seen (Rydin, 2010). As a consequence, the socio-technical infrastructures of a city need to be increasingly adaptive to support innovations, socio-technological transitions and sustainability (Hodson & Marvin, 2010; Säynäjoki, Inkeri, Heinonen, & Junnila, 2014). Yet, the existing urban development regimes are dominated by linearity – a search for the right solution based on the prevailing rationality (Davies, 2004; Healey, 1991; Inness & Booher, 1999; Rydin, 2010; Säynäjoki et al., 2014).

Linear and hierarchical models of management are known for their efficiency (Teece, 1986; Williamson, 1979), but they are less suitable during highly unpredictable technological and market shifts (Velu, Barrett, Kohli, & Oliver, 2013). Adopting a more systemic view of urban development with an emphasis on partnerships, networks, co-creation of value and the promotion of innovation and adaptability is required

(Doak & Karadimitriou, 2007; Guy & Harris, 1997; Hodson & Marvin, 2010; Klijn & Koppenjan, 2000; Kuronen, 2011; Trevillion, 2002; Weltevreden, Atzema, & Frenken, 2005). However, there is a lack of research on how systemic conceptualisations of urban development may be operationalised and utilised in empirical research as the basis for recommendations made to policymakers and practitioners.

In the hi-tech sector, a platform ecosystem has been used as a concept to describe a technology-based business system that is constructed around a central point of control, the platform (Ceccagnoli, Forman, Huang, & Wu, 2012; Cusumano & Gawer, 2002; Gawer & Cusumano, 2008). Through the shared resources of the platform, organisations leverage their own performance and co-create value through specialisation and complementary offerings (Gawer & Cusumano, 2002; Thomas, Autio, & Gann, 2014a, 2014b). Value-creation in a changing environment rests on a platform ecosystem's ability to adapt and evolve (Bresnahan & Greenstein, 1999; Cusumano & Gawer, 2002; Thomas et al., 2014a, 2014b).

In this paper, we argue that platform ecosystem theory can provide a non-linear approach to analysing the adaptive capacity of urban developments. Our aim is to identify the opportunities and challenges related to shifting the current, linear urban development practices

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towards a more systemic and adaptive approach. Specifically we ask:

- *How does the current process of urban commercial development promote the creation of platform ecosystems to potentially support a more adaptive urban design process?*

In order to consider this research question, we build our study on a comprehensive review of platform ecosystems by Thomas et al. (2014a, 2014b), who identified the concepts of modularity, standardisation, complementarity and connectivity as the key boundary conditions for the value creation potential of platform ecosystems. Hence, our two research sub-questions are as follows:

- *How are the boundary conditions necessary for value creation in platform ecosystems — modularity, standardisation, complementarity and connectivity — currently being implemented in urban commercial developments?*
- *How does implementation of the boundary conditions vary between the key actors involved in urban commercial development?*

The paper is divided into four parts. First, through a literature review, we evaluate the evidence that urban development can be conceptualised as a systemic process and analysed through a platform ecosystem lens. Second, we present the methodology of the study and the operationalisation of the boundary conditions necessary for value creation in platform ecosystems. We also present the data collected through a survey targeted at key actors in commercial development. Third, the results of the analysis are introduced by identifying significant differences in the capacity of public- and private-sector actors to promote the creation of platform ecosystems. Fourth, the key findings and conclusions are discussed.

2. Urban developments as platform ecosystems

2.1. Urban areas as ecosystems

Business ecosystems are dynamic and purposive networks in which participants co-create value based on non-linear value creation, non-market governance mechanisms and the co-evolution of participants (Adner & Kapoor, 2010; Iansiti & Levien, 2004a, 2004b; Jacobides, Knudsen, & Augier, 2006; Moore, 1993; Pierce, 2009; Ritala, Agouridas, Assimakopoulos, & Gies, 2013; Teece, 2007). The similarities between cities with shared ecological systems was already recognised in the 1980s in academic literature concerning city development and planning (e.g. Harvey, 1989; Mäntysalo, 2000; Kuronen, 2011). Concepts such as complex adaptive systems (CAS) and adaptive non-linear networks, as discussed in previous studies, have direct links with the business ecosystem concept (Doak & Karadimitriou, 2007; Inness & Booher, 1999; Peltoniemi & Vuori, 2004). Urban areas in particular are locally bound systems of economic activity that combine a complex network of different actors — developers, residents, service providers, financiers and public authorities — all of whom produce value in a co-evolving manner for a number of stakeholders and customers, such as residents, local businesses and communities (Luhmann, 1990, 1995; Mäntysalo, 2000; Inness & Booher, 1999; Trevillion, 2002; Healey, 1998).

The platform of an ecosystem consists of the services, tools, technologies, standards and other assets that other members of the ecosystem can use to enhance their own performance and co-create value through specialisation and complementary offerings (Gawer & Cusumano, 2002; Iansiti & Levien, 2004a; Li, 2009; Nambisan & Sawhney, 2011; Thomas et al., 2014a, 2014b). A platform exhibits a diversity of ownership and control with respect to both the complementary assets and the components that make up the platform (Cusumano & Gawer, 2002; Gawer & Henderson, 2007).

Value creation for the various actors in urban areas is connected to the physical infrastructures of a city. The city's infrastructure and

institutions can be seen as a platform for multiple forms of value creating activities, both of which operate on and utilise a shared technological and institutional foundation, such as logistic systems, utilities, city planning, construction regulations and safety.

In addition, existing academic research has identified the fact that business ecosystems are organised around a shared focal point, such as location (Adner & Kapoor, 2010; Teece, 2007), a central organisation (Moore, 1993) or technology platforms (Thomas et al., 2014a, 2014b). Prior studies define urban development as a spatial process consisting of the technical infrastructure, services and the contractual and institutional arrangements related to a particular location (Webster, 2003). Thus, we conclude that urban areas are ecosystems organised around *both* a shared location and technological platforms.

The success of a platform ecosystem is based on its ability to create value for the actors connected to the platform. The value can include innovation leverage, production leverage (i.e. the (re)use of a collection of assets and the interfaces and standards that make it possible to share them with drive economies of both scale and scope) or the leveraging of transaction economies (Thomas et al., 2014a, 2014b). These different types of leverage in turn are affected by the technological architecture of the platform. In a recent, comprehensive review of platform ecosystem literature, Thomas et al. (2014a, 2014b) identified the concepts of modularity, connectivity, standardisation and complementarity as the key boundary conditions for the value creation potential of platform ecosystems' technology architecture. In this study, we elaborate on these particular boundary conditions.

2.2. Urban development as platform-creating process

Urban development is as a spatial development activity aimed at organising the interests of a network of actors and coordinating their actions in goal-oriented, purposeful ways that are directed at achieving the desired development goals (Gualini & Majoor, 2007).

Institutional models of urban development focus on the roles, behaviour and decision-making of different actors, their interrelationships and the related impact on the development outcome (Ball, 1998, as cited in Guy & Henneberry, 2002). D'Arcy and Keogh (2002) have presented an institutional hierarchy of property markets on three levels: the institutional environment, the property market as an institution and property market organisations. The organisations involved in urban development include public representatives, consultants, financiers, constructors and clients directly or indirectly involved in commercial property, while institutions consist of the practices and networks that influence the ways in which organisations and individuals operate and are interrelated (Ball et al., 1998).

According to Thomas et al., 2014a, 2014b the concept of an ecosystem shares several characteristics with the traditional institutional approach. First, both constructs address the network of actors being embedded within a network, which influences the power of each participant to capture or direct the actions being taken (D'Arcy & Keogh, 2002). Second, both ecosystems and organisational fields have governance systems consisting of regulative and normative elements. Third, both address the need for joint logic in their organising principles, a logic that is available to organisations and individuals alike and that can easily be elaborated upon. In addition, the ecosystem construct complements the traditional institutional approach with the aspect of collective value creation.

The existing literature on the emergence of platform ecosystems has identified four key phases in a platform's lifecycle: birth, expansion, leadership and self-renewal (Moore, 1993). During these phases, the involvement of different actors and the resources employed vary by type and intensity.

Event-sequence models unpack the urban development process into its constitutive events (e.g. Miles, Berens, & Weiss, 2000; Syms, 2010; Goodchild & Munton, 1985). Cadman and Austin-Crowe (1978), in their classic work, divide the development process into four events:

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