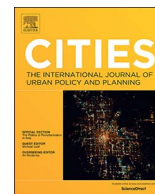




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## Place quality in innovation clusters: An empirical analysis of global best practices from Singapore, Helsinki, New York, and Sydney

Niusha Esmailpoorarabi<sup>a</sup>, Tan Yigitcanlar<sup>a,\*</sup>, Mirko Guaralda<sup>b</sup>

<sup>a</sup> School of Civil Engineering and Built Environment, Queensland University of Technology (QUT), 2 George Street, Brisbane, QLD 4001, Australia

<sup>b</sup> School of Design, Queensland University of Technology (QUT), 2 George Street, Brisbane, QLD 4001, Australia

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### ABSTRACT

Digital disruption has accelerated the transition from a manufacturing-based neoclassical economy to an innovation and knowledge generation based one. Urban discourse, at the same time, has focused on the design of appropriate spaces to foster knowledge economy. Innovation clusters, in consequence, have paid further attention to cater for the needs of knowledge industries and workers—including particular care on quality-based issues to attract them. Despite the lack of a comprehensive understanding on place quality in the cluster scale is evident, academic literature focused on the quality-based issues mainly at the region and city scales. This paper aims to identify and classify indicators of place quality at the cluster scale through a review of the literature, and placing some of the global best practices under the microscope—i.e., One-North (Singapore), Arabianranta (Helsinki), DUMBO (New York), MPID (Sydney). Methodology of the empirical investigation includes an inductive case study approach that employs descriptive and explanatory methods. Findings of the study reveal insights into attributes of place quality that need to be considered while planning, designing, and managing innovation clusters.

### 1. Introduction

Over the last two decades, a global phenomenon emphasising a knowledge-based and technology-driven economy has occurred. In this new economy—characterised by digital disruption, knowledge-based activities, and creativity—knowledge has become central for driving economic growth (Baum, O'Connor, & Yigitcanlar, 2009; Cooke, 2017; Lönnqvist, Kapyla, Saloniemi, & Yigitcanlar, 2014). This economy is not only about the processes of producing knowledge-intensive products and increasing profit, but also about creating an intangible value. Knowledge economy emphasises on education and skills acquisition, while providing information systems and networking infrastructures to facilitate the generation and spill-over of knowledge (Carrillo, Yigitcanlar, García, & Lönnqvist, 2014; Van Winden, Van den Berg, & Pol, 2007). The process of new economic growth, accordingly, is tangled with knowledge industries, knowledge workers, innovative atmospheres, networking systems, and innovative products—where their qualitative attributes are also paramount (Murphy, Fox-Rogers, & Redmond, 2015; Scott, 2006). Within this new economic system, intangible experience is often more central than tangible material gains (Yigitcanlar, Velibeyoglu, & Martinez-Fernandez, 2008).

Earlier speculations argued that digital technologies and their

disruption would make place irrelevant and cause the death of public spaces and traditional cities (Hall, 1996; Webber, 1964). In spite of ubiquitous technology—that allows knowledge workers and industries to locate wherever they want—, geographic space still has a critical role in the new economy. The resurgence of third places is evident in gentrified contexts, where boundaries between work and private environments are blurred (Oldenburg, 1999). Today, the vitality of knowledge industries and workers mainly relies on digital interactions. However, they still value face-to-face interactions and networking, which lead to formation of creative atmospheres, and generates experiences of unique settings and locations (Storper & Venables, 2004). Planning our cities, in the age of global knowledge economy, requires a knowledge-based urban development (KBUD) approach (Yigitcanlar et al., 2017; Yigitcanlar & Velibeyoglu, 2008). It is a physical response to the new socioeconomic paradigm (Frenkel, Bendit, & Kaplan, 2013a; Yigitcanlar & Bulu, 2015). KBUD, as a sustainable socio-spatial strategy, firstly emerged at the global best practices such as Silicon Valley, Cambridge Science Park, and Sophia Antipolis, and then adopted by leading cities in Europe, North America, Australia, and Asia—e.g., Austin, Barcelona, Boston, Delft, Manchester, Melbourne, Singapore, Toronto (Yigitcanlar, O'Connor, & Westerman, 2008; Yigitcanlar & Sarimin, 2015). These cities have planned their digital infrastructures, green technologies, and

\* Corresponding author.

E-mail addresses: [niusha.esmailpoorarabi@hdr.qut.edu.au](mailto:niusha.esmailpoorarabi@hdr.qut.edu.au) (N. Esmailpoorarabi), [tan.yigitcanlar@qut.edu.au](mailto:tan.yigitcanlar@qut.edu.au) (T. Yigitcanlar), [m.guaralda@qut.edu.au](mailto:m.guaralda@qut.edu.au) (M. Guaralda).

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other infrastructural KBUD requirements, as ways to revitalise stagnant urban environments, provide economic opportunities, and strengthen their global competitiveness (Benneworth & Ratinho, 2014; Lee, Hancock, & Hu, 2014). Studies highlight that the neoclassical approach has its limitations on dealing sufficiently with the needs of knowledge industries and workers (Frenkel, Bendit, & Kaplan, 2013b; Zaheer & Nachum, 2011). This directs attention to the social impacts of innovation clusters (Mendez & Moral, 2011).

Innovation clusters—e.g., creative hubs, innovation districts, science, knowledge or research precincts, technology parks, and the like—where innovation activities that cluster together are not isolated from a knowledge community-based revolution (Evers, 2008). The new generation of innovation clusters provide plenty of third places for living, learning, playing, and networking—rather than solely focusing on workspaces (Yigitcanlar, 2010). These clusters are being increasingly recognised as not only economic engines, but also as the home of creative class (Van Winden, De Carvalho, Van Tuijl, Van Haaren, & Van den Berg, 2013; Yigitcanlar & Velibeyoglu, 2008). They are platforms of flourishing work conditions with high-quality services that offer a distinctive urban image of the locality—e.g., cafes and bars in a historic or bohemian urban areas (Florida, 2005; McCann, 2008). They demonstrate that place quality strongly influences locational choices of knowledge industries and workers. These aspects need to be precisely taken into consideration in the planning, design, development and management stages of these clusters (Pancholi, Yigitcanlar, & Guaralda, 2017a).

Although there has been considerable amount of literature underlining the importance and influence of place quality on KBUD, our understanding about the impacts of place quality at the cluster scale is still limited. Indeed, many elements of place quality are relevant to more than one scale—e.g., regional, city, cluster, neighbourhood scales. However, cluster scale is recognised as specifically important, because it is the scale where the actual quality of a space is designed and realised, and day-to-day activities occur (Durmaz, 2015; Trip, 2007).

Against this backdrop, this paper aims to identify indicators of place quality and their impacts on shaping the appealing of innovation clusters. The research intends to address the question of: How does place quality contribute to the attractiveness of innovation clusters? In order to tackle this issue, the research undertakes an in-depth review of the literature, and places four global best practice innovation clusters under the microscope—i.e., One-North (Singapore), Arabianranta (Helsinki), DUMBO (New York), MPID (Sydney). These innovation clusters are investigated through an inductive case study approach that applies descriptive and explanatory methods.

Following this introduction in Section 1 of the paper, innovation cluster and place quality concepts are investigated thoroughly from the literature in Section 2. Then, the methodological approach is elaborated in Section 3. This is followed by introducing the theoretical framework for place quality in innovation clusters. Four best practice cases that are the focal point of the investigation are also presented in this section. Afterwards, results of the empirical study are revealed in Section 4. Finally, in Section 5, the key findings are highlighted, and potential impacts of introduced indicators on the success of investigated best practices are discussed.

## 2. Literature on place quality in innovation clusters

To date, the most popular definition of the cluster concept is the one proposed by Porter (1998). He defined a cluster as “a critical mass of companies in a particular field in a particular location, whether it is a country, a state or region, or even a city” (Porter, 1998, p. 10). As such, an innovation cluster is a local industrial specialisation that is generally organised around universities, research institutions and, knowledge-based industries, with a high internal and external networking and knowledge sharing capabilities (Evers, 2008; Millar & Ju-Choi, 2010). Even though some studies focus more on city and regional aspects of clusters (Baum et al., 2009; Brocker, Dohse, & Soltwedel, 2012; Cooke,

2001), innovation clusters mainly refer to district- or neighbourhood-scale spaces; such as science and technology parks, research hubs, industrial precincts, and creative clusters, where knowledge- and innovation-based activities beneficially agglomerate together (Durmaz, 2015; He & Gebhardt, 2014; Heebels & Van Aalst, 2010; Pancholi, Yigitcanlar, & Guaralda, 2014). While place-less nature and low transaction cost of knowledge-based products seem to invalidate the initial theory of clustering (Porter, 1990, 1998), knowledge-based industries still tend to follow a place-based clustering pattern. Innovative capacity of knowledge industries increases when firms share ideas, products, and services in tangible and face-to-face basis (Homan, 2014). These clusters also restructure economic capability of cities and regions, and develop new businesses and alliance between local governments, universities, and knowledge industries and workers (Parker, 2010; Yigitcanlar, Guaralda, Taboada, & Pancholi, 2016).

Innovation clusters typically appear in three forms: (a) Science clusters, where knowledge-intensive service sectors—e.g., universities and R&D centres—are located around business districts; (b) High-tech clusters, which focus on the development of high-tech manufacturing activities—e.g., ICT or biotechnology; (c) Creative clusters, which are shaped based on cultural knowledge generation—e.g., movie-making, media, arts, design (Brocker et al., 2012). Nevertheless, innovation clusters are in a transition phase towards mixed functional types to provide better support to the expectations of knowledge industries and workers (Cooke, 2001). While mixed functional generation of innovation clusters mainly contain universities, R&D centres, and business districts inside or around their boundaries, it seems the current typology contains only two broad types of clusters: (a) Creative; (b) High-tech. These both types attempt to present a welcoming place to live, work and play as well as providing a sense of life and beauty for knowledge industries and workers. As knowledge industries and workers are the driving force of knowledge economy, concentration of talent has become as significant as concentration of infrastructure for flourishing the growth of innovation clusters (Esmailpoorarabi, Yigitcanlar, & Guaralda, 2016a). Thus, to systematically foster, attract and retain knowledge industries and workers, the following questions have been repeatedly asked: Where do knowledge industries and workers choose to locate, and why?

Today, knowledge workers increasingly prefer to be located in urban innovation clusters—especially for specific place quality and day-to-day vibrant lifestyle offerings. In other words, knowledge workers prefer authentic locations, which fulfil their sophisticated lifestyles and fit their creative identity—rather than just where the high-paying jobs are (Yigitcanlar, Baum, & Horton, 2007). Literature highlights these characteristics of urban environment as quality of place, and considers three main components: (a) What is there: the built environment plus specific amenities; (b) Who is there: the diversity of population; (c) What is going on: street life, buzz (Florida, 2005; Kloosterman & Trip, 2011). From this perspective, place quality mostly relies on the intangible conditions of a place, or soft factors, including quality of life, urban ambiance, cultural and social characteristics as well as levels of diversity, tolerance and openness of the population (Bereitschaft & Cammack, 2015). However, some scholars emphasise the importance of classic conditions of place, or hard factors, to describe place quality and locational choices of knowledge industries and workers—e.g., investment availability, job opportunity, cost of living (Darchen & Tremblay, 2010; Lawton, Murphy, & Redmond, 2013).

There is also a third approach, which claims that attracting knowledge workers involves a mix of hard labour market and economic factors as well as soft quality-based factors (Brown & Mczynski, 2009). In recent years, this approach has gained high popularity (Bontje & Musterd, 2009; Boren & Young, 2013; Durmaz, 2015). Such balanced viewpoint is also more likely to support desired urban policy and planning outcomes. New urban strategies such as KBUD, knowledge cities, smart cities, city branding, and knowledge clustering that invest on quality-based factors as well as hard factors are potentially more

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