Multi-stage Strategic Approach in Spatial Innovation: How Innovation District Matter?

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Abstract. In the 21st century globalised economy, innovation is a crucial factor within strategies targeted at growing and sustaining competitiveness of regions and cities. Accordingly, the creation of knowledge process, along with sharing and commercialisation, became an effective response to the pressures generated by globalisation in order to increase the competitive advantage. The emerging trend of innovation-led urban planning initiatives provides strong evidence of how cities are implementing strategies to promote innovation mainstreaming. Hence, these innovation-oriented policies, which are targeted at reshaping cities, are currently translated in the creation of innovation districts. This paper aims at identifying the actors who foster the innovation process at urban level, and analysing their influence throughout the innovation district life cycle. Firstly, the authors assess the role played by public and private sector in the different stages of innovation district development, by adapting the Urban Land Institute conceptual framework in the Innovation Life Cycle District Assessment. Secondly, empirical research works are defined in order to test the ILCDA. The Boston Innovation District and the IDEA District are the two case studies under investigation, by pointing out the policies and planning initiatives undertaken in the Seaport area of Boston and in Downtown San Diego, respectively. Findings from this research highlight the level of public private partnership effectiveness in supporting the development of innovation districts. Useful lessons can be drawn in encouraging planners and policy-makers towards undertaking combined actions at the different stages of the development process.

Keywords: Innovation economy · Urban regeneration · Maps-Led

1 Introduction

Over the last decades, innovation has increased its importance within the pattern of economic growth, moving to the central stage of economists and policymakers concerning the factors that enable the process. According to the "innovation based growth theory", economic prosperity results from increase in knowledge, scientific and technological improvements, along with the development of an effective private-public partnership [1, 2]. Innovation is therefore considered as crucial factor of nations central strategies targeted at growing and sustaining competitiveness in the 21st century globalised economy [3]. As an extensive body of knowledge corroborates, cities and innovation are nowadays strongly linked and their tangible effort in providing a

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favourable context for innovation to prosper, can be read in the emerging trend of innovation districts proliferating globally. Although several research studies attempted to scrutinise the dynamics that lie behind the creation of an innovation district, complying with the innovation economy forces [4–7], less emphasis has been placed on the key role played by the actors involved in the district development process. This paper puts the body of knowledge forward on the triggering actions, implemented by city governments and investors, influencing the innovation space patterns, through the application of a LCA methodology. The paper investigates the Boston Innovation District and the IDEA District case studies, by focusing on the implementation process of the innovation-led strategies undertaken in Boston and San Diego. Accordingly, the research is developed to identify the success factors to grow, develop, and sustain technology innovation ecosystems in cities in order to perform policy actions. This paper is organised in three parts. After a scientific background in describing the spatial dimension of innovation, the paper highlights the physical environment where the dynamic innovation ecosystem takes shape, i.e. the innovation district. An overview of the LCA implementation on the newly conceived urban model is then provided. In the second part, the methodology inherent with the breakdown of the innovation district evolutionary process is applied to the case studies analysis. In particular, the Innovation Life Cycle District Assessment (ILCDA) adapted by the Urban Land Institute conceptual framework, is defined to analyse multi-stage strategic approach undertaken in the BID and IDEA districts. Finally, findings and conclusions are discussed.

2 Innovation Economy and Spatial Patterns

2.1 The New Geography of Innovation

In recent times, the research on the spatial dimension of innovation provides controversial views, confirming the complexity of the phenomenon. On the one hand, an extensive body of knowledge corroborates the idea that innovation economy prefers regional systems as location for creating and spreading new knowledge [8–10]; on the other hand, the opinion that cities and innovation are strongly linked is becoming progressively popular [11], given the high concentration of innovation across and within cities and metro areas [12]. As a matter of fact, the urban environment proves evidence to encompass the suitable economic and cultural dynamics in order to generate radical innovations and boost the development of new industries [13]. Nevertheless, significant is the innovation economy potential in regenerating local economic areas and promoting local assets [14]. In this regard, cities are experiencing massive transformations by fostering "knowledge-intensiveness and technological advancement … in order to become competitive providers of first class living for highly skilled global work-force" [15]. All the above mentioned observations lead to the conclusion that a process of urbanisation of innovation is now occurring. A physical shift of innovative businesses from suburban corridors and science parks to inner-cities areas is taking place, prompted by companies' need to relocate in areas that ensure close connectivity among people and give direct access to markets and finance, in order to support the innovative entrepreneurial activities [16]. It follows that, policymakers are

responsible for the institutional and regulatory framework in order to manage the re-urbanisation and influence the amount of innovative activity through the adoption of designated policies.

2.2 Innovation Districts

The tangible effort of cities at providing a favourable context for innovation to prosper, can be read in the emerging trend of innovation districts proliferating globally. Specifically, they are "geographic areas where leading-edge anchor institutions and companies cluster and connect with start-ups, business incubators, and accelerators. Compact, transit-accessible, and technically-wired, fostering open collaboration, and offering mixed-used housing, office, and retail" [17]. By bringing together in geographical proximity this unique combination of economic, physical, and networking assets, the idea generation is stimulated and the entrepreneurial activity facilitated [18]. Innovation district urban form and function cannot be defined a priory. However, according to their location and the type of businesses settled within their boundaries, they have been categorised into three models: (i) Anchor Plus Model; (ii) Re-imagined Urban Areas Model; (iii) Urbanised Science Parks Model [17]. From the above mentioned considerations, it stands to reason that innovation districts represent the physical environment where the innovation ecosystem takes shape. However, the relation between the two has a multi-dimensional and non-linear nature: on the one hand, innovation districts reflect the city's wider economic, social and political systems, and they cannot flourish without the innovative ecosystem in which they are embedded; on the other hand, innovation districts on their own do not generate any innovation ecosystem. This leads to the conclusion that "a city does not become an innovation hub simply by promoting the establishment of an innovation district … successful districts are driven by larger trends than site availability" [20].

2.3 Life Cycle Assessment

Innovation spaces are required as key component of new urban regeneration initiatives within cities wider strategy of urban growth, in enhancing competitiveness by nurturing and accelerating the innovation process, and in improving liveability by providing solutions for a more efficient land use [14]. However, achieving successful innovation districts requires tools to guide the actions implemented by city governments and investors at different points of their development. A valid response to this challenge is provided by the Life Cycle Assessment (LCA), a methodological framework traditionally focused on the improvement of goods and services [21]. Although it was born from the increasing environmental awareness of businesses towards achieving sustainability goals [22], the LCA provides a holistic perspective that is increasingly applied to policy-making issues analysis [23]. Accordingly, Belussi and Sedita [24] investigated the factors that influence the origin, development and maturity of industrial districts within their evolutionary processes. Specifically, "districts do indeed often follow an evolutionary path from in-fancy to a growth phase, followed in turn by maturity and subsequent stages of stagnation and decline or revitalization". This methodological framework allowed to examine the specific triggering factors at the

basis of the district existence, and to describe the mechanisms that characterise their evolutionary path.

3 How Cities Build Their Innovation Economy Through a Multi-stage Strategic Approach: Evidence from Boston and San Diego

3.1 Methodological Framework

The study gives validation of the LCA analytical method in identifying the triggering actors, and relative actions, affecting the innovation districts' evolution at different stages of their life cycle. In so doing, the 'product oriented' conceptual framework built within the Urban Land Institute research on the innovation economy [20], was adapted to evaluate the wide-range of issues concerning the multi-stage strategic approach undertaken in two purposely selected case studies, namely the BID and IDEA districts.

Hence, the Innovation Life Cycle District Assessment (ILCDA) has been built (see Fig. 1), and the three stages of the above mentioned districts' development have been analysed, i.e. start-up, activation, and maturing. Firstly, the role played by the public and private sectors in nurturing the innovation ecosystem and in supporting specific locations as urban innovation districts has been investigated. Secondly, the efforts to foster the ecosystem conditions and to catalyse development in a specific location have been considered. Finally, the analysis of the strategies to sustain the environment for innovation as the district matures have been scrutinised. Thus, after a brief description of the two case studies, the actions implemented by the different actors involved at different stages will be examined.

Fig. 1. ILCDA framework to analyse the innovation district multi-stage strategic approach. Source: Author's elaboration, 2017.

3.2 Case Studies Description and Results' Discussion

The Boston Innovation District provides an outstanding case study of thousand acres transformation into a centre of knowledge economy, fostering innovation,

collaboration, and entrepreneurship [25]. In 2010, Major Menino declared his vision to redevelop the declined industrial area of the South Boston Waterfront through a District able to meet the needs of innovators, creating a job magnet, and an urban lab on the shore. The vision had a few main features: (i) the desire to cluster innovative entrepreneurs to increase proximity and density; (ii) the openness to industries of every kind; (iii) the adoption of a framework characterised by expedited decision making and planning flexibility, allowing the neighbourhood to develop organically and disperse innovation across the city [26].

On the other hand, Downtown San Diego stands for the innovation economy attempt to create a vibrant city centre driven by a "Design jobs cluster, nourished by Education, enriched by the Arts and focused on Innovation" [27]. Specifically, following the 1980s Centre City Development Corporation's general strategy targeted at revitalising the 'dormitory' character of Downtown San Diego, in 2010 two developers brought forward the **I.D.E.A. District**, in order to make the downtown attractive for the emerging workforce and bring jobs back to the city centre. The vision targeted 35 blocks located in the Upper East Village neighbourhood, where the presence of growing design businesses and educational institutions hungry for collaboration, as well as the availability of urban land all contributed to create a new design industry cluster framework.

Starting from the analysis of the *start-up stage*, it has to be acknowledged that coordinated actions between city government, landowners and developers are critical to transform the vision of an innovation district into reality. In the case of Boston, the public sector acted as the main operator, attracting private investments, creating jobs and providing the necessary services [28]. Indeed, the start-up stage was launched by the Mayor Menino, who entrusted the main public planning agency, namely, the BRA (Boston Redevelopment Authority) for the management of the District. The BRA, from the beginning, partially funded the project and, through public-private partnerships, helped to "ease the financial burden of the project on the City's budget" [29]. Several development tools have been promoted by public actors in this stage (e.g. variation of zoning regulations, and tax relief programs), attracting businesses in the area and increment tax revenues to fund specific public projects [28]. The city of Boston has led the project also in the *Activation stage*, being the host institution "instead of the host being a university or research firm" [30]. This brought to the identification between the District and the city and the adoption of a "hands-off approach" with some exceptions, such as the move of Vertex Pharmaceutical, facilitated by the Mayor. The Public actors further facilitated the development of physical and social infrastructures to build up a community [28], the move of educational institutions and the establishment of entertainment options. Public actors managed some of the innovation spaces also in the *Maturing stage* through the room rental model, that discounts off the fees for helping those organisations, mission-based programs, and start-ups that cannot afford the rent (personal communication, June 25, 2016). They further facilitated the establishment of shared workspaces, incubators and new residential options, including flexible housings. Boston has also worked to "institutionalise more dynamic processes of public planning and service delivery" [26]. As the District continues to be transformed by new mixed-use development projects, and retain workspace variety for different firm types and sizes, the perceptions of the area are starting to change. This is due to the

disproportionate increase of both home values and average rents experienced over the last years. Thus, the district is attracting talents, but after they grow their business, they move out because economically they cannot sustain it in the long term (personal communication, June 22, 2016).

In the San Diego case there were unbalanced efforts, since the private sector made several of the most important enabling interventions. Indeed, the I.D.E.A. Partners have been the lead agents in the process of change, by replacing the public sector in understanding the city's competitive advantage and identifying the innovative industries to attract in order to create the critical mass capable of driving economic growth, together with the selection of the most appropriate location for the development. Furthermore, they started developing a shared vision by involving residents, local businesses and civic leaders in order to build consensus around the principles of the plan. Engaging the community of residents and innovators, through an effective outreach strategy, turned out to be crucial given the little support demonstrated from the outset by the local administration that failed in defining a tailored long-term strategy, as well as in simplifying the urban regulations to speed up the planning process. The private sector leadership was paramount also in the *Activation stage*, when, besides important catalytic investments, significant were the efforts to draw the attention of some anchor firms, universities and innovation hubs to settle in the district. Partnerships with other investors and developers have been established, leading to further development initiatives, such as the Makers Quarter, for fostering the work-live-play environment required by start-ups, tech companies, and talents. Moreover, the developers re-shaped the image of the neighbourhood as a more vibrant location through the strategic use of the tactical urbanism. The public sector role, also in this stage, can be defined somehow idle; the neighbourhood did not benefit from a centralised plan and the zoning requirements of the Community Plan 2006 remained unchanged. Thus, the city government did not undertake any effort to facilitate the mixed-use development and make the area more attractive to new businesses, since neither financial tools, nor system of development rights have been used in order to encourage strategic firms to relocate. The I.D.E.A. District is still at the very beginning of the *third stage* of its development, thus, the actions further implemented by the public and private sectors can be deduced by the current state of affairs. The public actors are starting to show their interest in the innovation processes going on in the downtown area and are facilitating the move of educational institutions, such as the UCSD (personal communication, May 16, 2017).

4 Conclusions

Given the shift of the geographical distribution of innovation from suburbs to urban areas, cities must constantly reinvent themselves in order to provide an environment that is conducive to innovation and remain competitive in the 21st century globalised economy. Figure 2 shows the synthesis of the results of the analysis of the main actions implemented by different actors at different stages of development.

As clearly visible, although on the one hand downtown San Diego naturally provides a compact urban structure, vital for productive collisions to take place between

STAGE	ACTIONS	BOSTON	SAN DIEGO
Start-up	City government as lead partner	●	○
	Public land ownership	●	○
	Public provision of the institutional framework	●	○
	Public regulatory framework	●	○
	Innovation Industries identification	○	●
	Zoning regulation change	●	○
	Tax incentives	●	●
Activation	Innovation-oriented urban policies	●	○
	Development of public Infrastructures	●	○
	Presence of a leading-edge anchor institution	●	○
	Strong set of private initiatives	○	●
	Tie between public leadership and private financing	●	○
Maturing	Public price controls	○	○
	Community involvement	●	●
	Provision of cultural projects and events	●	●
	Metropolitan connotation of the district	●	●
	Gentrification and homeless management	○	○

Fig. 2. Main actions of the public and private sectors in different stages of innovation district development. Source: Author's elaboration, 2017.

firms, people, capital, and ideas, on the other hand the city government has not been a leading partner in boosting the innovation ecosystem by providing the institutional and regulatory framework in order to manage the re-urbanisation and influence the innovative activities through the adoption of designated policies. The exception is represented by the UCSD Extension moving to downtown, where the city government put some regulations and guidelines given its ownership of a small property within the block subject of intervention. Thus, the landownership issue played a key role in discouraging any collaboration between actors: since the city owned a considerably small portion of downtown land, around the 20%, the prevailing private interests led the entire intervention of redevelopment. The innovation economy, indeed, took over from the manufacturing industry sector located in the downtown area, and the role of real estate turned out to be essential for its physical transformation. The reasons are well explained by the rate and capability of the real estate to adapt to the new innovation market requirements, determining a strong competitive advantage for the innovation system in which they operate [32]. Thus, the set of private initiatives currently happening, although operating independently, pursues the same objective to deliver an inspiring and accessible environment that attracts talents and fosters innovation. In addition, cultural projects and events turned out to be paramount in tailoring the district vision to the specific needs of the future users, creating value and sense of place within the community. The landownership has had an important role also for the spatial innovation. Indeed, the prevailing private ownership of the already consolidated urban fabric of Downtown San Diego does not allow to read a clear innovation spatial matrix, except for some regeneration interventions. On the other hand, the experience in Boston, linked to a public entrepreneurship approach, shows the results of a clear public intention to physically regenerate the area from the outset. Thus, the innovation spatial matrix is expressed through the creation of a dynamic living laboratory delivering built-environment goals, arising from scratch and targeting the community of

innovators, and expressing place-based strategies. The public entrepreneurship approach adopted in Boston helped also to speed up the process and make it more efficient. It also gave the sparkle for establishing strong partnerships and absorbing the energy from the private sector and non-profit organisations. "The entire project relies heavily upon the principles of the shared economy and the connections between public leadership and private financing" [30]. The City changed the zoning regulation to accommodate R&D functions and offered tax incentives to attract businesses in the area [29]. As in the case of San Diego, the community involvement has been among the main goals, implemented through social and physical infrastructures [29]. Yet, the BID has become, over time, "less about start-ups and more about the expansion of Boston itself", so that "there's innovation going on there, but that's no longer the primary focus" [31]. Several amenities and facilities have been built in order to create a new neighbourhood to serve the whole city. Thus, in both cases, the Districts assumed a metropolitan connotation, becoming a pretext for physically regenerating the areas and expanding the cities. This is reflected by the rocketing real estate prices that created a tension between the economic growth driven by innovation and the hidden negative externalities generated by the Innovation District model. The dark side refers to the fact that the rewards tend to benefit only a few people, widening the gentrification gap and worsening, possibly, also the homeless issue. The "business model" of Innovation Districts, becoming unaffordable to the most and favouring the concentration of poverty in a few areas, adds to the effects of the existing high poverty rate in the two cities in question that rank already among the first places nationally.

Overall, it emerged that the Innovation District model cannot be started in a vacuum, since, being a place-based tool, it got attached to the rest of the ecosystem. In view of the two analysed case studies, it emerges the necessity to have a leading-edge anchor institution helping a critical mass of innovators and companies to take shape. The lack of innovation-oriented economic urban policies and economic development measures to foster the ecosystem preconditions and control the city's urban regeneration has proved crucial to the attraction and retention of anchor institutions and the development of human capital. Indeed, the high rents and the lack of any tax incentives are the main factors that can discourage companies from locating in these districts. Thus, the case studies provide clear evidence that the multi-stage strategic approach, implemented by concerted actions of public and private sectors, is crucial to create and nourish a successful innovative environment. The support of the public actors is fundamental for the coordination of the initiatives and the public benefits provision, for avoiding the unintended consequences linked to the phenomenon of aggregation of talents, such as the rocketing real estate prices and the consequent gentrification, that could benefit mainly middle and upper class people. Public initiatives, including zoning and investments, are fundamental also for supporting diversity, necessary for triggering innovation. The easiness of the bureaucratic processes can help to employ less public resources, encouraging also the public actors to be creative "in aligning stakeholder interests to move the project forward" [29].

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