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Smart Specialisation Strategies as Drivers for (Smart) Sustainable Urban Development

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Additional information is available at the end of the chapter

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Abstract

The *place-based* approach is at the forefront of the current European cohesion policy reform. The *Smart Specialisation Strategy (S3)* boosts economic development through research and innovation. It is built on *place-based* areas showing higher potential for growth. Although S3 is deeply rooted in the uniqueness of the place, its implementation is still far from being clearly spatial-led. The research programme MAPS-LED (Multidisciplinary Approach to Plan Smart specialisation strategies for Local Economic Development), financed by RISE-Horizon 2020, aims at filling this gap. This chapter discusses a novel concept developed with the aim to incorporate a spatial component in the innovative urban clusters, e.g. *the urban pattern as cognitive infrastructure for S3*. The preliminary findings from the case study of Kendall Square, a former brownfield located in Cambridge (MA), in close proximity with the Massachusetts Institute of Technology, led to conclude that it is essential to complement S3 implementation with spatial interventions in the built environment to create a *physical ecosystem* supportive of innovation, including: shared facilities and private small businesses facilitating interaction; public services and facilities that allow preserving uniqueness of the place and inclusiveness. Furthermore, the spatial pattern has to be supportive of a walkable and dense environment.

Keywords: smart specialisation strategies (S3), sustainable urban development, innovation districts, social innovation, Kendall Square, MAPS-LED, urban pattern as cognitive infrastructure

1. Introduction

Policy makers, planners, stakeholders at all latitudes constantly face the issue of developing and implementing better policies to support local economic development and offer people better

living environments and well-being. How it is made, varies a lot. Nowadays, the European Commission is undertaking the huge effort of launching something that explicitly implies risk-taking and therefore particularly needs and evidence-base for actions. The research role is to reflect on this challenge from a theoretical perspective that might possibly suggest paths and solutions.

This chapter stems from a broader research project financed by the European Commission and aimed at approaching the issue of strategy building, developing and implementation from the perspective of architects and planners, temporarily contaminating themselves with economic matters to try to bridge the gap between shape of the built environment and economic growth. The Smart Specialisation Strategy (S3) will be discussed through a spatial-oriented perspective, arguing that if *place* matters, then also *space* matters, with all the implications within a concept that incorporates environmental behavioural science, ecosystem and social values, cultural assets and identity. All these elements are absolutely essential in a *sustainability* perspective. Therefore, the overall discussion has in the background the *fil rouge* of demonstrating how sustainable development (environmental, social and economic) can be systematically embedded in S3, in particular, in the urban built environment.

This chapter briefly explains what Smart Specialisation Strategy is and then discusses it in a critical perspective, by clarifying explicit and less evident theoretical legacy of this rationale, with the aim to support the construction of a robust logical framework suitable to produce further novel approaches. Because of the dynamic nature of the topic, even the theoretical section, rather than relying on a review of the literature, is nurtured by up to date interviews. The chapter includes a discussion of the research hypothesis through empirical data gathered in a US case study, Kendall Square. The major expected impact of this research is the opportunity to support current implementation of S3 policies in Europe, both in competitive and in lagging behind regions. To reinforce the transferability of the provisional findings, the field work in the States has been preceded by some exploratory investigation in Europe, aimed at observing the current gaps to be filled on the basis of the gap analysis of extant S3. The current state of S3 in the Greater Manchester Area (Northern England) and in the Calabria Region (Southern Italy) has been analysed, both on desk and through a set of informal unstructured discovery interviews with key stakeholders, in order to find out weaknesses and potentials. This preliminary analysis showed that both in lagging behind regions and in competitive regions gaps in the current S3 still exist, and that a spatial-led approach could be supportive in filling them. Therefore, although at a preliminary stage, the conclusions in this chapter may be of interest for European planners, policy makers and stakeholders looking for effective implementation of S3 in a spatially-oriented perspective.

2. Setting the overall policy framework for S3

The Smart Specialisation Strategy (S3) is an essential component of the current Europe 2020 Strategy, seeking to bring Europe towards a smarter, more inclusive and sustainable growth [1]. In particular, S3 is a strategy for economic development that targets research and innova-

tion and involves an incremental approach based on the development of a shared vision. It is built on place-based areas showing higher potential for growth and needs to be developed by involving multiple stakeholders with a strong commitment to prioritise in a knowledge-led perspective, not necessarily focusing on the high-tech sector, nor on sectors that are already strong [2].

S3 has been introduced in the late 2000s as the main result of the work conducted by the Research Commissioner Janez Potočnik's expert group, also known as the Knowledge for Growth (K4G) expert group, founded by the European Commissioner in March 2005 with the task to address the issue of embedding innovation for promoting growth within the European Member States, legacy from the Lisbon strategy. Not only the European Commission, but also other organisations such as the OECD are highly interested in this innovative approach [3] that has been recently systematised in the literature [4, 5]. A key concept underpinned in the Smart Specialisation is the importance of knowledge, not meant as a mere technicality, rather than as *embedded knowledge* among the actors of the economic ecosystem. Stemming from this position, the methodology for developing appropriate strategies rooted in embedded knowledge could not be anything different from an ascending, bottom-up approach, characterised by *discovery* and *risk-taking*, and finally, leading to something *unique*. As clarified by Foray et al.: "It should be understood at the outset that the idea of smart specialisation does not call for imposing specialisation through some form of top-down industrial policy that is directed in accord with a pre-conceived grand plan" [6]. It is suggested that, rather than relying on external consultants to develop an abstract strategy, policy makers should elicit a process of entrepreneurial discovery, in order to find out what are the assets, even still hidden, that could be worth supporting. These latter could be niches of excellence, and the process of discovery in itself should act as an activator to unleash their potentials by making entrepreneurial actors "play leading roles in discovering promising areas of future specialisation, not least because the needed adaptations to local skills, materials, environmental conditions, and market access conditions are unlikely to be able to draw on codified, publicly shared knowledge, and instead will entail gathering localised information and the formation of social capital assets" [6].

Moving forward, the S3, also named Research and Innovation Strategies for Smart Specialisation (RIS3), is now "a key part of the proposed EU Cohesion Policy reform supporting thematic concentration and reinforcing strategic programming and performance orientation" [7].

By overcoming a one-size-fits-all approach, "the RIS3 requires an integrated and place-based approach to policy design and delivery. Policies must be tailored to the local context, acknowledging that there are different pathways for regional innovation and development" [7].

A key aspect of smart specialisation is the emphasis on the principle of prioritisation in a *vertical* logic—to favour some technologies, fields, population of firms—*non-neutral*. Foray and Goenaga suggest to summarise the principles of S3 as follows: (1) Granularity, that is, the level should not be too high; (2) Entrepreneurial discovery, with entrepreneurs -in the broadest sense—who discover, produce information and transform the activities; (3) Priorities will not be supported forever; (4) S3 is an inclusive strategy; (5) S3 has experimental nature and risk taking is needed [8].

The legal basis for incorporating the RIS3 within the current programmes is provided by the Regulation (EU) 1301/2013 of the European Parliament and of the Council of 17 December 2013. The implementation of RIS3 across the EU has to be ensured by managing authorities through dedicated and mandatory policy frameworks. EU Member States and regions are required to have S3 in place according to the RIS3 *ex-ante conditionality*, that is, a compulsory requirement that if not met in the agreed timeframe, prevents managing authorities from keeping on spending the given EU funds. Support in putting the RIS3 forward is offered by the European Commission particularly through a specific tool, the S3 Platform [9].

Influences on the construction of the conceptual framework of the S3 can be found in several theoretical positions and theories. On the basis of the industrial Italian experience, the concept of *industrial district* was developed in the 1980s by Becattini [10, 11], drawing from the Marshall agglomeration theory [12]. In particular, he considered the local community as a sort of social glue suitable to produce economic added value. In this approach, the seeds of the communitarian root of the concept of *embeddedness* were planted [13]. It will take about two decades for them to fully blossom.

With less emphasis on the social component of the proximity, and more attention for the scale advantages, in the 1990s, Porter developed the concept of *cluster*, defined as: “A geographically proximate group of interconnected companies, suppliers, service providers and associated institutions in a particular field linked by externalities of various types” [14]. As possible examples, Porter mentioned the financial services cluster in New York City, the cluster producing medical device developed in the Boston area, and the IT clusters existing in Texas (Austin) and in the Silicon Valley. The cluster rationale was deeply intertwined with the concept of competitiveness [15].

Building on this concept, recognising the importance of the cluster structure in the US economy, huge and systematic efforts have been done even at institutional level to pursue a reliable and shared knowledge on cluster dynamics, leading to the construction of a dedicated platform, such as the Cluster mapping platform: “The U.S. Cluster Mapping website is a national initiative that provides open data on regional clusters and economies to support U.S. business, innovation and policy, (where) users will find interactive, robust data and tools to understand clusters and regional business environments, improve institutions, and locate appropriate partners across the country” [16].

The relevance of clusters to the US economic success and the political awareness on the significance of this topic clearly emerge, while analysing the data contained in the platform. Clusters, far from being a theoretical concept, have become a conceptual framework to coordinate and even further activate all scales of *clusterizable* initiatives, encompassing national, regional and local stakeholders, entrepreneurs, companies, associations. In theory, the potential underpinned in the US platform is that the richness of details creates an outstanding opportunity not only for advancing in terms of knowledge, but also for supporting further networks and, finally, the *entrepreneurial discovery* that S3 is seeking to promote. In practice, the impact of the US platform on reinforcing clusters can be further exploited [17].

Following the work conducted by the Department for Competitiveness in Harvard, while on one side of the Atlantic the US Department of Commerce, Economic Development Administration was turning an academic platform into an official public initiative by funding the Clustermapping platform as a federal programme, on the other side of the Ocean also the European Commission decided to introduce an analogous platform, namely the Cluster European Observatory, whose architecture is similar to the US prototype [18]. In Europe, the dataset made available through the Cluster Observatory platform is coupled by another platform that targets companies and is specifically aimed at eliciting clusters reinforcement and further development, namely the ECCP (European Cluster Collaboration Platform) [19].

The common goal of the US and EU platforms is not only to build a structured knowledge on the cluster policy both in the States and in Europe, but also to create opportunities for making cluster work in a rationale embedding shared knowledge and entrepreneurial discovery as major triggers. This is a common trait that makes cluster policy useful to support successful S3 implementation, behind the simple network rationale.

The notion of *entrepreneurial discovery* was introduced by Hausmann and Rodrik [20] as a *self-discovery process* and is constantly recalled by Foray and Goenaga [21], which clearly mention the legacy of the New Industrial Economy approach in discussing the above mentioned five principles of S3. This core feature of S3 leads to another key concept at the forefront of current European strategies, that is, *social innovation*. A strong link exists between the S3 strategy, the cluster policy and the concept of social innovation as developed by the European Commission, a cross-cutting approach suitable to be implemented as trans-sectoral innovation. In the Guide to Social Innovation—commissioned by DG Regional and Urban Policy and completed with DG Employment, Social Affairs and Inclusion with inputs by various other Directorates General (such as, among others, DG Enterprise and Industry and DG Research)—social innovation is defined as: “the development and implementation of new ideas (products, services and models) to meet social needs and create new social relationships or collaborations. It represents new responses to pressing social demands, which affect the process of social interactions. It is aimed at improving human well-being. Social innovations are innovations that are social in both their ends and their means. They are innovations that are not only good for society but also enhance individuals’ capacity to act” [22].

Social Innovation is deeply intertwined with socially- oriented and citizens- led urban regeneration and entails the granularity of the scale where it is more likely to happen through catalysts such as shared knowledge and innovation building. Cross-fertilisation between S3 and Social Innovation can be pursued at the strategy implementation stage. The Guide suggests that Social Innovation can be included in the Smart Specialisation Strategy and Plan and /or incorporated in Social Innovation Clusters/Park (Step 4 and Step 8) [22].

The concept of social innovation may be supportive when seeking to understand some features in S3, that still lack a clear spatial definition. In particular, if the concept of *granularity*, and in particular of *spatial proximity*, is precondition to achieve cross-fertilisation across ideas and expertise, as advocated by almost all the examples suggested as good practice in the guide, what is the *metric* of proximity? Is the proximity needed for enacting social innovation processes the same scale of proximity necessary to activate effective clusters or some specific

kind of clusters, perhaps those that are more relying on innovation? Can we measure this proximity?

If cooperation is based on mutual trust, personal knowledge and social reputation, in some cases the scale of proximity requested for activating successful clusters overlaps with the scale of the proximity necessary to enable successful social activation processes. Cluster theory mainly rests on the opportunity for up-scaling economic mechanisms, thus creating advantages for the participating companies, and, in addition to it, also on shared knowledge and exchange of competences within a given network, while this latter is central in social innovation mechanisms and in S3. In fact, the geography of clusters overlaps with the labour markets, and—typically—cluster analysis and clusters data gathering are conducted at a regional scale. The innovation component, essential in the social innovation process and in S3, can be optional in clusters, ideally—but not *necessarily* innovative. These and other similarities and differences are systematically discussed in a recent report commissioned by the DG Research of the European Commission and produced by a group of independent experts chaired by Ketels. In particular, the most important differences between clusters and S3 follow: “S3 focuses on specific innovation-intensive sectors while clusters apply to a broader set of sectors in the economy. S3 aims to exploit emerging linkages between economic activities that can cut across traditional cluster boundaries.... The explicit goal of cluster policies is often to enhance the performance of existing clusters(...). Clusters are potential elements of a regional innovation eco-system, while S3 are wider policies aimed at transforming this eco-system. Clusters can come close to “smart specialisation domains” if they stimulate new types of knowledge spillovers with a high leverage effect on the growth path of the economy” [8].

Several attempts have been made in the cluster literature to find out a possible taxonomy; however, in knowledge-intensive clusters, the triple helix concept (referred to the relationship between universities, enterprises and government) is essential. As Porter has been highlighting since 1990, four intertwined factors concur to the creation of a competitive environment for companies, depicted in the form of a diamond. This combination works in two ways, since investing in public good, always seen as a typically public activity, becomes important for the private sector itself [23]. In an ecosystem approach, private *vs* public interests’ boundaries finally blur. The same concept of producing social services as a matter of business is gaining growing interest in the private sector [24]. The multiple actors involved with different roles in supporting the economic growth depict the complexity of the entrepreneurial ecosystem, from which S3 should stem. As stated by Foray and Goenaga, those who are asked to promote S3 by discovering “the domains of R&D and innovation in which a region is likely to excel given its existing capabilities and productive assets”, are “entrepreneurs in the broader sense (innovative firms, research leaders in higher education institutions, independent inventors and innovators)” [19]. As in S3, also in cluster policy the whole context matters.

3. S3: how far do place and space matter?

The importance of a site-specific and context-related approach is at the forefront of the current cohesion policy reform, since in 2009 the “Barca report” was released. Following an intense

discussion, nurtured by three thematic hearings, one workshop and five policy seminars involving 80 both EU and non EU experts, this report clarifies that a possible failure in the European policies is due to a lack of *place-based* approach, thus advocating for the opposite, i.e.: “A place-based policy is a long-term strategy aimed at tackling persistent underutilisation of potential and reducing persistent social exclusion in specific places through external interventions and multilevel governance. It promotes the supply of integrated goods and services tailored to contexts, and it triggers institutional changes. In a place-based policy, public interventions rely on local knowledge and are verifiable and submitted to scrutiny” [25].

By supporting a territorial based approach, the “Barca report” suggests to ground the reform on pillars, consistent with the S3 approach, such as including the promotion of a learning process, of experimentalism, of mobilisation of local actors. The similarity between the locally-grounded approach of S3 and the place-based approach stemming from the Barca position, converging towards a *non-neutral* approach, has been highlighted by Foray [26]. The position expressed in the “Barca report” has been framed within the current debate between *spatially-blind vs place-based* approach in policy implementation. According to Barca et al. [27], a spatially-blind approach is that supported by the World Bank’s report [28], that recommends to design policies without taking in consideration space, in order to ensure efficiency, equal opportunities and improvement of the life conditions, as well as it is spatially-blind the Sapir et al. report [29], that recommends to pay little attention to the sub-national scale. Under the second approach, the place-based one, in addition to the Barca Report and among others, it is possible to include in particular the OECD [30] position, that recommends a region-specific perspective capable to unleash assets and to exploit synergies.

More in depth [27], in the place-based approach it is essential to consider the interaction between institutions and geography in order to understand the best policy options for a given territory. Moreover, also the impacts of a policy should be assessed by considering those two factors, thus requiring tackling both the regional and the local context.

In terms of governance, the importance of a closer level of proximity to the local assets and knowledge leads to the inadequacy of the national scale in capturing appropriate policies, more specifically: “(...) by acknowledging the limits of the central state to design good local development policies, place-based strategies recognise the need for intervention based on partnerships between different levels of governance” [27].

Since the early documents on the spatial perspective of European policies, culminating in the 1999 European Spatial Development Perspective [31], the importance of a spatially-led perspective in European policies has been advocated from different authors since long time and the debate is still relevant [32, 33]. The spatial perspective is the physical setting for enabling place-based policies grounded in the specific territories. A lack of territoriality even interferes with a transparent exercise of democracy [34], thus, far from being a merely geographic concept, space and territory are real and proper enablers of context specific policies and related implementation. Moreover, because in the current EU programming period the concept of *territoriality* is embedded within important and innovative policy instruments, such as the Integrated Territorial Investments and the Community-Led Local Development, gaps in a place-based approach would undermine the effective implementation of new instruments

holding a high potential of unleashing context specific assets. A better awareness of the governance within place-based S3 could support the creation of effective network of stakeholders for the Community Local Led Development strategies implementation, an innovative approach in the ESRF and ESF programmes implementation drawn from the LEADER approach and not yet fully developed outside the rural contexts. Despite of their strong roots in a place-based approach, S3 are still far from being clearly spatial-led strategies. This may depend on the original conceptualisation of S3, developed from a spatial idea [35]. It can be therefore problematic to translate them into genuine place-based policies, reflecting a consistent social innovation based institutional framework, particularly in those regions, still lacking in clear and updated spatial frameworks.

In order to fill this gap, a research programme has been proposed and accepted for grant under the Horizon 2020 programme, namely MAPS-LED (Multidisciplinary Approach to Plan Smart specialisation strategies for Local Economic Development) [36]. This program, run by a consortium of 6 universities in EU and in the US aims in particular at connecting three important key-factors including: (1) Governance—both in cluster policies and in terms of embeddedness; (2) Localization—as spatial and place-based approach; (3) Territorial network—as innovative milieu supporting social innovation, also based on urban-rural links. The project is building a novel methodology to assess and exploit the potential of different clusters, networks and chains in shaping spatially-led S3 policies for local economic development through a spatial-led approach. After having explored the potential of S3 both through spatial planning (city-region and S3) and regional economy (cluster policy, territorial milieu and S3), the project will develop and test a tailored evaluative tool suitable to capture the socio-economic spillovers of S3. By understanding how S3 can be translated and implemented into spatially-oriented local development policies, in line with the territorial agenda of Europe 2020 incorporating a place-based dimension, the expected results are: (1) to identify and examine S3 in terms of spatial, social and environmental factors; (2) to take into account local needs and opportunities driving regional policy interventions not only to emphasise “Key Enable Technologies”, but also to empower local innovation process—tacit knowledge, embedded social networks, innovative milieu; (3) to build and test an evidence-based methodology for recognizing and assessing emerging and potential S3, corroborated by successful factors of existing clusters [36].

4. Urban patterns as cognitive infrastructure for successful S3

Shifting from the regional towards the urban scale, the concepts of social innovation, entrepreneurial discovery and local embeddedness can be found in the recent theorisation of *innovative district*. Starting from a metropolitan centred perspective, the importance of the scale and related *metric* is a recurrent concept for understanding the assets of the place: “The next economy must have four characteristics: higher exports, to take advantage of rising global demand; low-carbon technology, to lead the clean-energy revolution; innovation, to spur growth through ideas and their deployment; and greater opportunity, to reverse the troubling, decades-long rise in inequality. Metros will take the lead on all four fronts. Our open, inno-

vative economy increasingly craves proximity and extols integration, which allows knowledge to be transferred easily between, within, and across clusters, firms, workers, and supporting institutions. The vanguard of these megatrends is largely found not at the city of metropolitan scale (...) but in smaller enclaves, which are increasingly being called innovation districts” [37].

The scale of the innovation districts is clear. They are walkable urban environments, typically featured following the current urban design tendency of creating vibrant spaces offering a variety of uses, shared places, and accessibility. If we look at an innovation district as the brain of an innovative cluster [38], it follows that urban patterns have to be treated as cognitive infrastructure of the collective knowledge production.

What is the rationale that creates value out of the proximity? Recent studies focus on the creation of successful groups of players capable of activating cooperation on the basis of the mutual trust [39]. Building on this concept, an extensive literature is blossoming in support of mutual trust and cooperation as triggers for successful social dynamics (for example [40]). What cluster potentially does is that it increases the roles of reputations by increasing the frequency of interaction and also how observable actions are. Therefore, innovative urban spaces, in order to be supportive for a specific kind of entrepreneurs, those who are willing to cooperate in producing shared knowledge, has to support density, accessibility, and also shared spaces that make good and cooperative actions *frequent and observable* [41].



Figure 1. MIT innovation cluster, March 2016 (Courtesy of the MIT).

The first attempt to corroborate this research hypothesis has been done through the investigation of the hidden mechanisms supporting the outstanding competitiveness of a US based innovative district, the Kendall Square in Cambridge, MA (**Figure 1**). The history of Kendall Square is intrinsically related with the presence of the Massachusetts Institute of Technology, which makes this case study, obviously, almost unique. However, because of this uniqueness,

it can well explain how, even in an outstanding context in terms of innovation, still spatial factors play a significant role and are considered relevant both by public and private actors. Kendall Square is a former brownfield located in Cambridge (MA), opposite side of Charles River. It started in 1868 as an industrial district and consolidated this function with the opening of the first underground line nearby. The presence of the Massachusetts Institute of Technology dates back to 1916. Following the Second World War, the area entered an era of decline, which the Cambridge Redevelopment Authority (CRA), established in 1955, sought to reverse also through the clearance of 29 acres of land for the accommodation of NASA. Because of a change in the federal government strategies, the plan was no longer implemented, and the vacant land was partly redirected to the Department of Transportation. A shift in the approach to the redevelopment of the area, managed as a detached industrial estate, happened first with the implementation of the East Cambridge Riverfront Plan, then with the 2001 Citywide Rezoning. Walkability, quality of open spaces and mixed-use real estate became the norm in the area [42, 43]. Recent massive capital investments confirm the tendency to invest in the area with high quality interventions [44]. The importance of the urban structure as catalyst for local development is acknowledged both by public and private stakeholders [45, 46]. As emerges from the current planning documents (**Figure 2**), the connection between urban fabric and attractiveness of the area for private companies is evident: “A dynamic public realm connecting diverse choices for living, working, learning, and playing to inspire continued success of Cambridge’s sustainable, globally-significant innovation community” [47].



Figure 2. Kendall Square open spaces (Source: [42], p. 28).

Furthermore, recent studies on the companies' behaviour in this area proved how the cluster traditional policies based on subsidising "anchors" that—once settled down—would attract smaller companies, is now coupled by a bottom-up oriented perspective, in which a significant number of small, dynamic, highly innovative companies create the favourable ecosystem for attracting big companies, interested in having an interaction with young talents and possibly in incorporating smaller (and cheap) companies with higher potential for growth [48]. Therefore, public policy makers should also support the creation of a cluster of innovative and cutting-edge start-up companies, rather than seeking to attract a big one to make them follow. This creates the need for urban environments that are attractive, as Florida suggests, for young talents [49]. How much companies value the competitive advantage of being in this kind of environment is testified by what recently happened to a leading pharmaceutical company in the Kendall area. Biotech is one of the historical companies located in Kendall Square, founded by a MIT professor, Sharp, who at the time he launched the company, wanted to work close to his laboratory. Despite of its roots in the area, in recent years a controversial decision was made, to move the Biotech headquarters to the cheaper suburb of Weston. In a few years, this decision was questioned and the willingness to return to the area prevailed [50]. The reasons are clear: "Other biotech companies have come to the neighbourhood to take advantage of the healthy infrastructure in Cambridge and its vibrant bioscience community. While there were many individuals and organisations involved, MIT faculty members and administrators indeed played a major role in reviving Kendall Square, because they understood that in order to build a thriving bioscience programme, they would have to build a thriving community of talented people—at MIT and beyond" [51]. This view is shared by experts on cluster and industrial policies in the Massachusetts, who suggested that what brought Biotech back to the Kendall area was the "atmosphere" [52].



Figure 3. Open spaces and public services around the Kendall Square area (author's picture).



Figure 4. Companies located in the Kendall's immediate surroundings: Akamai (author's picture).

Private companies perceive the economic benefit of being localised in an innovative district, and are willing to pay the extra costs associated with a more expensive location in order to get extra benefits in return, including the well-being (and related increase of productivity) of their employees and the opportunity to benefit from the powerful network of informal and multi-disciplinary connections, made possible by the specific features of the urban fabric (Figures 3–12).



Figure 5. Companies located in the Kendall's immediate surroundings: Biogen (author's picture).



Figure 6. Restaurants, coffee shops, in the Kendall's surrounding (author's picture).



Figure 7. Amenities in the Kendall's immediate surroundings (author's picture).



Figure 8. Companies located in the Kendall's immediate surroundings: Genzine (author's picture).



Figure 9. Companies located in heart of Kendall: Microsoft (author's picture).



Figure 10. Bike sharing facilities in Kendall (author's picture).



Figure 11. Transit station, bicycles, pedestrians: a walkable environment (author's picture).



Figure 12. Large sidewalks, benches, bus stops: a pedestrian friendly place (author's picture).

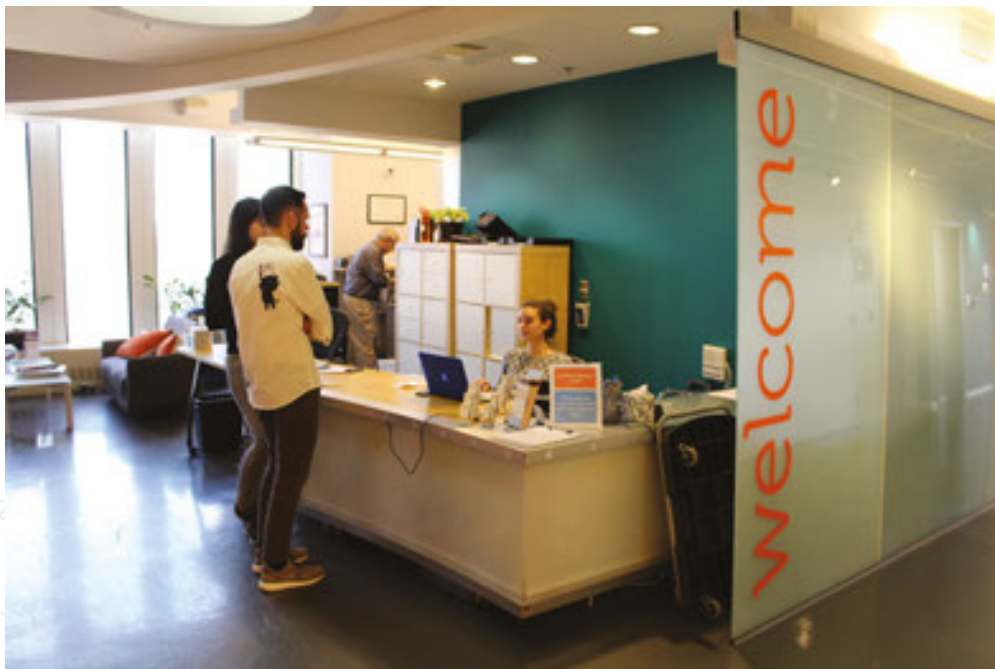


Figure 13. Concierge in the Kendall Square CIC building (author's picture).

Besides the urban pattern encouraging knowledge and innovation building, Kendall Square also includes key-hotspots for informal decision making and cross-clustering, such as the Cambridge Innovation Centre, CIC [53]. The CIC is not an incubator neither an accelerator, it is a private entrepreneurial activity based on renting shared and flexible office spaces designed with an innovative rationale. It currently hosts over 700 companies across two buildings, located in Kendall Square and in downtown Boston, about 500 of which are start-ups. The

Kendall Square building includes the Venture Café, a sister non-profit with the mission of bringing together entrepreneurs, venture capitals and the greater Boston start-up community. The field work conducted in the Kendall Square CIC (**Figures 13–16**), complemented by interviews with CIC Relationship Managers [54, 55], proved the exceptional level of services provided to the companies hosted. The quality of the concierge, of the reception desks at each floor and of the complimentary meeting rooms and working spaces is outstanding. Flexible and high quality spaces are offered for a reasonable cost, since prices range from \$425 to \$1500/person/month all included (stocked kitchens, conference rooms, Internet, printing & copying, phones, high-end furniture, operational & technical support and concierge). However, it is the style of management of the spaces that really makes the difference in conceptual terms. Each floor is equipped with a common kitchen, offering free food that varies on each floor in order to encourage people to move around the building. Cross-fertilisation of innovative ideas is considered the major asset offered to the hosted companies that are mixed across the floors and not clustered by sector. Collaboration complements cross-fertilisation, since companies looking for specialised services might find them within the CIC itself, resting on the assistance of the Relationship Managers, whose presence is ensured at all floors. It is the personal knowledge of the Relationship Managers with the individual company that orients the potential advice. The institutionalised role of a facilitator is a concrete example of coupling proximity with the opportunity of experiencing frequent and observable interactions. Further informal interviews with local stakeholders [45, 46, 56] confirmed the extraordinary role played by the CIC in building a favourable physical ecosystem, spurring innovation and supporting start-ups creation. Also, the CIC allowed some large companies, such as Google, to temporarily settle down in the area of Kendall Square prior to making the final decision of moving there with the entire headquarters.



Figure 14. Complimentary meeting rooms in the Kendall Square CIC building (author's picture).



Figure 15. Complimentary shared spaces (author's picture).



Figure 16. Venture Café (author's picture).

In conclusion, it is essential to complement S3 implementation with spatial interventions of the built environment that may facilitate the construction of a *physical ecosystem* supportive of innovation. These spaces include: shared spaces and private small businesses facilitating interaction, both informal and formal, both specialised and multi-disciplinary; public services

and facilities that allow preserving uniqueness and inclusiveness. Furthermore, the spatial pattern has to be supportive of a walkable environment, offering effective transit and public transport facilities. The economic benefit for the private companies located in such areas is proved by the empirical findings from the case study, although not yet quantified.

Further research development includes the effort to quantify with monetary proxy the extra benefits above mentioned, incorporating in the assessment the public services and facilities in the area. This goal will be achieved by spatialising clusters first, then companies at the urban scale, then mapping the network of spaces that are supportive of social innovation and entrepreneurial discovery.

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