

CREATING A KNOWLEDGE-BASED CITY: A SPATIAL EXAMINATION OF THE UNIVERSITY OF HELSINKI'S MAIN LIBRARY

*Tommi Inkinen*¹

¹University of Helsinki, Department of Geosciences and Geography, PO BOX 64, Finland, tommi.inkinen@helsinki.fi

Knowledge-based urban development (KBUD) may be defined by the economy, the environment, change in social conditions and urban lifestyles, and the development of governance. My paper incorporates three spatial dimensions into this fourfold framework. First, there is the regional context of the city of Helsinki as a KBUD node in Finland, and, similarly, the role of the University of Helsinki as a resource for producing highly educated individuals for the needs of a knowledge-economy. Second, this is the new main library for the University of Helsinki, and as such it is a localized project renovating and creating physical spaces and architectures that is designed for knowledge distribution and dissemination across all mediums. Third, urban image creation has significance as the library is part of the World Design Capital Helsinki 2012 program promoting the international image of Helsinki as a knowledge-based (design) city. Conceptually libraries are experiencing extensive change as they transform from the task of exchanging and warehousing physical books and journals towards becoming fully interactive electronic information service centers. The integration of spatial characteristics into a KBUD framework brings forth theoretical openings for education, social conditions, and urban imaginary.

Keywords

Libraries, Urban Design, Urban Development, Urban Images, Universities

1. Introduction

Urban space is an evolving entity directed by the planning decisions of public authorities. Healey [1] has provided an extensive account of the fragmented planning philosophies and realities to be found in contemporary societies. The renovation of old structures in intensely populated and planned urban cores provides alternatives for the reuse and redesign of physical structures and therefore results in urban regeneration and the development of urban spaces. Numerous potential combinations exist when it comes to maintaining parts of the old structures and adding new elements to them. In the case of the University of Helsinki's main library, the exterior structures were largely maintained and partly redesigned, as interior structures were fully rebuilt and redesigned.

In this case, the context of knowledge-based urban development (KBUD) involves recognition of the planning and spatial characteristics of a knowledge-creating institution and the urban images resulting from the mixture of ideas and impressions given by the city and its cultures [2]. This article focuses on two main concepts: KBUD and the spatial formation of urban space. My approach incorporates theoretical considerations from both domains in order to illustrate the fusing nature of both theoretical frameworks, as modes of thought, into the terminology that seeks to explain a city in the making. The theoretical discussion is contextualized by the city of Helsinki and more particularly by a physical building project

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conceived by the University of Helsinki – the project for a new main library.

The paper sets two main tasks for itself:

- 1) To present a combination of KBUD and spatial theory
- 2) To express the subject of this case study in accordance with the theoretical frame

In order to take up these tasks the paper is structured as a triad: this introduction is followed by a theoretical section explaining the essentials of both the KBUD frame and spatial theory. These approaches are synthesized in order to assess and interpret key-dimensions of knowledge cities: the empirical section includes the presentation and contextualization of the project together with spatial theories. The paper concludes by addressing the emerging topics and problematic of urban development with its implications for urban images and design.

2. Theoretical view: cities as spatial constructs

2.1 Knowledge-based urban development and spatial theory

KBUD has recently gained an extensive amount of research interest. Knight's [3] work has been updated and further modified by Yigitcanlar and Lönnqvist [4], who provide a thematic four dimensional framework applicable for KBUD measurements. They identified several theoretical bases for their four dimensional KBUD framework. The content based KBUD frame has, for example, been applied in macro-level analyses of urban development. Spatial concepts created within theoretical geography on the other hand are operationalized mainly as metacategories. The intertwining of several conceptual elements brings forth the complexity of understanding urban design and its development. Essentially the KBUD framework could be combined with spatial theory, which is commonly used in human geography.

One particular goal of the KBUD literature has been to produce an integrative platform for understanding the multidimensionality and theoretical interlinkages concerning urban conditions and knowledge-based development, not only in terms of economic success, but also to include environmental, governmental, and societal issues. The first layer within the KBUD framework is economic development, which Yigitcanlar et al. [5] define as finding its theoretical base in endogenous growth theory stressing the importance of location as a collection of resources for economic growth. The second layer involves socio-cultural development that derives from Florida's analysis of creativity together with older considerations of human and social capital as resources of localized (urban) development [6].

Social mix and cultural diversity has been identified as two of the potential contributors to ensuring a coherent social condition. The third layer recognizes the importance of the environment and nature in urban locations, as several studies have indicated that residents' satisfaction regarding their living areas and neighbourhoods increases along with the environmental diversity of the urban structure: parks, green areas and urban farming are resources that can increase residents' living conditions and life styles in the physical environments that large and intensely compact cities represent. The final, fourth layer comprises institutional development that brings governance and government into the KBUD frame. Governance practice, participation, and transparency are elemental parts of this domain together with collaborative models for creating public-private-partnerships in order to create and establish new solutions for public services [7]. Yigitcanlar et al. [5] also argue that actor network theory [8; 9] and planning theory are other foundations for the institutional layer. Institutional collaboration models and partnerships are manifestations of this domain.

An understudied element in knowledge-based development is its connection to stereotypes and images that impact on the appreciation and endorsement of international organizations, global investors, and

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multinational corporations. Images are important. The KBUD frame elaborately intertwines elements crucial for urban image building and contributes to the indicators used in international benchmark studies to rank cities and their surroundings. The societal conditions depicted by the KBUD indicators (such as regional GDP per capita, or research and development investments per capita) still need to be distinguished from other factors contributing to “urban image”. These include the physical appearance of urban spaces such as the cleanness of streets and other public spaces, the physical condition and quality of building exteriors, and the quality of transport systems. The physical structure alone is not enough. Image creation and urban branding also builds on experiences and social interactions within the city space. The subject of this study, namely, the publicly accessible university main library is an excellent case as it comprises all the elements connected to both the KBUD frame and spatial theory.

2.2 The spatial formation of knowledge spaces

The conceptualisation of space is constructed by using theories and propositions presented in the field of human geography. There are three key references: First, Lefebvre’s [10] work regarding the production of space. Second, the philosophy of Foucault [11], regarding the power-relations that determine the outcomes of behaviour in spatial reality, has been highly influential in the theoretical development of the spatially bound power relations that occur in architectural domains. Third, the linguistic philosophy of Wittgenstein [12] brought about a recognition that the language (and via that the semiotics) of space matters particularly when considering the conceptual certainty of spatial formations. The theorisation of space in contemporary human sciences was strongly influenced by these intellectual works.

Simonsen [13] collected theoretical ideas concerning the structuring of space as a geographical metaphor as a platform for human activity. The triad presented by Simonsen includes key elements of Tuan’s [14] thinking of space and place as experimental conceptual entities that are realized in daily life in urban spaces. The spatiality of a location in an urban structure (such as a library) may, therefore, be divided into the material (architectural) space, the social (power) space and the cognitive (experienced) space in order to explain the relationship between social theory and space. Together these domains configure location as a context with a past, present, and the future. Tuan’s work includes a section that considers for architectural form and he illustrates with various examples the importance of the experience associated with the history and context of a location. This is highly relevant for this study due to the image and history of the University of Helsinki (the largest and the most prestigious university in Finland), its context within the city of Helsinki (dispersed structures on campuses that are fragmentally located around the city space), and the social structuring associated with educational levels (universities as educators of the “elite”). The main principle of spatial KBUD formation is rather straightforward: space requires the recognition of its physical aspect and design (architecture and infrastructure) in which social interactions emerge, develop, and transform. These domains are realized through the layers of the economy, the environment, (social) culture, and institutional governance.

Concerning practical definitions of the theory of spatiality in geography and other spatial sciences the following distinctions are often considered. First, there is the geometrical and absolute understanding of space that is commonly applied in exact sciences and engineering. Space is defined as an exact and measurable context-free abstraction (e.g. mathematical N-dimensional space) or as a geographically fixed location referring to the idea of space as a container following the treatise of Foucault [11] – space is observable and manageable by a set of rules and borders. In the context of planning and urban design, the absolute understanding of space may be seen as the identifiable localizing of individual buildings and structures, which, as single entities, perform their function in the overall plan [also 15]. This is often called “material spatiality” – a structural view of architectural design manifesting itself as layouts and visualizations.

The second understanding of the spatial structuring of the urban environment recognizes the relationship

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between objects and entities. This theoretical conceptualization is commonly defined as relative space. Relative locations and structures are treated as measurable relations. Commonly these include the number of persons using the locations, the time distances between locations, and the relative sizes that urban structures or entities have. For example, the annual passenger flow from terminal A compared to terminal B might be a measurable indicator for understanding their importance in the overall traffic flows of the city.

The third common conceptual distinction is the most complex one and is referred to as “relational space”. Spatial reality is understood through the symbols and human interactions that take place in a spatial continuum. The recognition of history and locational context is elemental in this process. Relational space also involves considerations regarding cultural traditions, practices, and the way in which societies are organized. Relational space manifests itself in human behaviour and imaginings concerning cities and their images. Impressions and emotions concerning different locations, their histories and development trajectories are impressively present in the case of the library studied here. It comprises the essence of universities as centuries-old bodies of knowledge creation, the role of libraries in the dissemination and distribution of created knowledge, and the importance of the compact human settlements that we know as cities, linked to the current nodes of global-knowledge networks of contemporary societies.

Imaginaries and images of cities translate to the relational aspect of urban space as, in several cases, cities benefit financially from being recognized as leading knowledge cities. Their reputation for development and their successfulness in implementing innovative new solutions in order to create new businesses and financial opportunities through technological advancements bring meetings, seminars, congresses, and delegations to these locations. This reputation also attracts potential investments and global networks to urban locations further advancing their development.

2.3 Changing essences of physical and virtual boundaries in knowledge spaces

Hammond [16] considered the effects and transformations of urban space in Bath, England, where a new architectural design was constructed in a cultural heritage environment. Her approach provides a critical essay on the problem of spatial restructuring, architecture, and urban imagery. Evidently, the process of urban redesign and rebuilding requires the recognition of the overall urban structure and the “spirit” of the city and its location. This has been recognized in the case of the new main library of the University of Helsinki. The façade is composed of red tile bricks as was the older building structure before it. Only the oversized window design indicates the renovated new modernity behind it.

The library performs its function in terms of its physical as well as its virtual (digital) structure. The physical building in which traditional books and materials are housed, the loaning function to distribute them to customers, and the physical attractiveness of the building and furniture comprise the traditional structure for a library’s operations. The digital and virtual aspect has however gained extensively in importance during the last two decades and has for a majority of university researchers become a more important aspect of the library’s function than the physical one.

The digital forms of journals, books, and data that are accessible through libraries have become one of the main cost sources for them. The digital availability of an extensive range of leading journals, for example, is one of the key-factors behind the success of researchers in publishing articles that require references from the most up-to-date literature. The financial costs of digital materials cause increasing differentiation between universities. The digital domain also poses a new conceptual and practical challenge. Would it be possible to produce only online library services and disregard the physical domain? This discussion relates to the “end of geography” and the “death of the tyranny of space” theorizations of the late 1990s after the emergence of the internet as an information distribution channel [17; 18; 19].

3. A case study of the University of Helsinki's new main library

3.1 A brief remark on the case method and materials

There is an extensive amount of literature concerning visual methodologies [20; 21] and qualitative methodology in general [22; 23]. Yin [24] has written a widely used book on case study research. As he [24: page 40] states "one rationale for selecting a single-case [...] design is that the single case represents the critical test of a significant theory." This case is an illustration of a single structure that may be considered in the light of presented theories on urban design and development. The recognized position of Finland and Helsinki in international benchmark studies justifies further the selection of this case as an exemplifier of the KBUD frame within spatial theory.

My empirical approach is based on over 100 site visits as a library user and as an observer. The material includes photographs and the computer identified existence of virtual networks. There are two main wireless local area networks (WLANs) available in the library ("HUPnet" by the University of Helsinki and an international "Eduroam" network). Additionally, I use information materials from the library and marketing visualizations in these materials. I also hold tacit knowledge based on discussions with stakeholders in the library project that have an impact on the concluded interpretations.

The photographs presented are means to illustrate the elements of spatial theory (material, social, and experienced spaces) in accordance with knowledge creation functionalities (interior solutions for collaboration) and image creation attributes (exterior look, use of design, and creating a sphere for a location). In total the library offers seating for working purposes for approximately 1,000 library users. The daily amount of visitors is around 5,000 and there are around 100 employees working in the library complex. The building was designed by the Finnish architectural office Anttinen Oiva Ltd.

3.2 Physical structure and technical knowledge resources

I will begin with an examination of the physical properties of the library. Figure 1 illustrates the exterior design of the new university main library. There are three essential elements that bring forth the design functionality of the knowledge dissemination paradigm. First, the extensive availability of internet access via both wired desk-tops and WLAN lap-tops creates the platform for virtual knowledge dissemination based on the physical technology infrastructure. For the library user, the building has free-of-charge WLAN available for all those having university accounts in any Finnish polytechnic or university (i.e. HAKA identification) – the technological linkages between organizations, knowledge resources, and public sector services (Finnish universities are all public sector institutions) brings forth the institutional development from the KBUD framework. Corey & Wilson [25] called for this type of mindset for planning processes concerning technology's integration into urban designs and for further contributing to intelligent solutions. The library building in Helsinki supports these ideas with a clear and explicit distinction from the "old" way of thinking about libraries and aims to give momentum to the process of improving knowledge dissemination.

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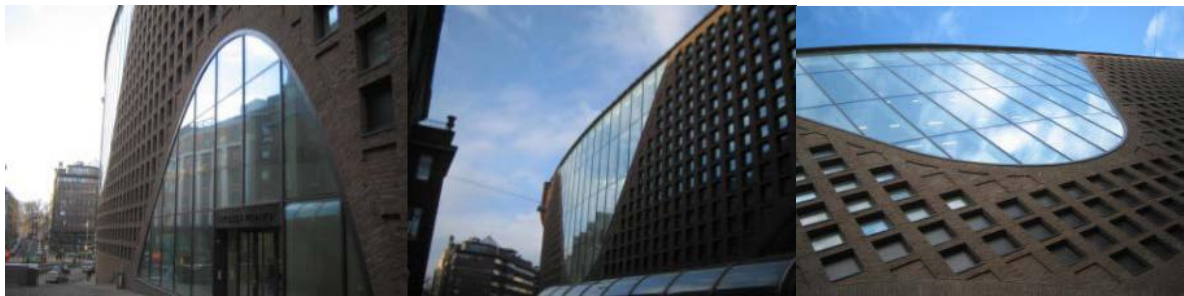


Figure 1 Exterior designs of the university's new main library (photographs Tommi Inkinen 4/2013).

Second, the physical layout design has several individual working spaces (small rooms) for anywhere between one and ten individuals with AV-equipment (Figure 2). The social dimension of spatial theory is explicitly identifiable in the goal of creating multiple means, not only for knowledge retrieval, but also for joint knowledge creation in team-work spaces. The material design creates a possibility to conduct team-work, which is not a common feature in public libraries. The transparent glass walls in particular give a broad sense of a joint sharing of the library's space even though these spaces are separated in terms of their functionalities. Thus material space supports social interaction with the physical characteristics of the library (see Figure 3). The integrated spaces both separate and include library users into segments (particular space use) and into a collective (overall spatial structure visible).

Additionally, Figure 2 shows the architectural detail that gives the whole interior of the library its atmosphere. The applied colour scheme (light white paint with wood) indicates traditional ties to Finnish design. The interior was designed keeping in mind the centuries old role of the University of Helsinki as a knowledge creator for the needs of Finland, which contributes to both the economic and the social domains of KBUD frame. This traditional role was also reflected in its design, which respects the functional tradition and clean Nordic style. The integration of high-end design seats into the eye-catching properties of the interior highlights the idea of combining the human function (e.g. reading) into the building's design.



Figure 2 Interior portraits including high-end furniture (photographs Tommi Inkinen 2013).

The physical design is also used to prevent unwanted problems emerging from the surroundings. The access to the library via subway (underground) is directly beneath the building and it is connected to the library. However, the direct route has been made difficult seemingly on purpose (only one elevator, access only through one narrow corridor from the far side of the building). The design implies the exclusion of "unwanted" and potentially trouble-making persons. This may be interpreted as conditioning – the generous goal of making the library a living room for "all" is narrowed to include those generally expected to use libraries according to traditional social conventions. This sets questions for enhancing the socio-cultural dimension applied in the KBUD framework.

3.3 Social interaction and joint creation of knowledge

An elemental aspect in the whole library project has been to produce an information “living room” for all the inhabitants of and visitors to the city of Helsinki. This was clearly indicated in the opening ceremony of the library where both the rector of the university and the mayor of Helsinki defined aspects of the importance of the new library to the city. Figure 3 includes three photographs fusing the material space into a social interaction. The picture on the left indicates a “lounge” type of thinking in the positioning of the furniture that enables social interaction as well as single working spots next to the large main window. The photographs in the centre and on the right, on the other hand, show examples of working spaces separated by glass walls available for both silent reading and collaborative work.

The library also hosts a bookstore-café serving food and beverages on the first floor. The bookstore is run by the University of Helsinki Press. Serving of wine and other alcoholic drinks on the library’s premises indicates the idea that the library is as an “urban node” and a space for relaxation (and consumption) thereby expanding the original function of libraries. It is uncommon in Finland for public buildings (such as libraries) to serve food and drinks. This indicates that the vision for the library involved recognizing that the university library should provide a large palette for different types of services for library users.



Figure 3 Spaces for silence, interaction, and collaboration (photographs Tommi Inkinen 2013).

Social interaction causes also potential problems in library spaces. There have been some contradictions in the intended use of the interior that has confused users of the library. For example, the distinction between silent spaces and loud spaces (social) has not been clear. Evidently, the special element of libraries (requirement of silence) has been and still is a challenge if social collaborative work is to be enhanced within the physical structure. This fact nicely brings together the problems associated with designing both collaborative (voice full) and silent working spheres into the same structure. In addition, the idea of a “living room” widens the parameters even further as the main content of social interaction is not necessarily work (study) oriented. The functioning of the physical space in social interaction results in the experiences and images obtained from the location.

3.4 Experiences of the image-based knowledge city

The third aspect of spatial theory is the self-gained experience of space that refers to the emotions and mentally signified spatiality [26; 27]. Helsinki’s World Design Capital status in the year 2012 was an important event in promoting the urban image of the Finnish capital. Urban images play an essential role in attracting people to travel to Finland as well as foreign investments [e.g. 28] as the traditional portrait of Finland (and its capital) has relied on the “thousands of lakes”, clean environment and Northern environment – not on urban design or urbanism in general [29]. The University’s new main Library is a structure that elementally gives a boost and content to its surrounding immediate environment. The library also functions as an image-marketing tool both for the university and the city. The choice of building materials and the eco-efficiency of the building are examples of environmental dimension in the KBUD frame. This contributes to the environmentally friendly knowledge city image pursued by the city

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administration.

The contribution to the urban image of Helsinki and the promotion of knowledge-based high-technology city is evident. The structural (physical) attributes fused with the online virtual information resources represents the micro-dimension of a knowledge intensive space. The collaborative working spaces within the library together with its state-of-the-art equipment also reflect the appreciation that this knowledge center is one of the most visual parts of the university. However, the invisible significance of the new library building should also be considered. One option is to look at the hard figures concerning the library's knowledge resources as it has nearly 30 kilometres shelf space for books (if lined). In addition, the total number of physical book loans amounts to 2.5 million annually, even though the availability of digital books has increased. The digital distribution of research materials, data, and other resources (such as audio and video recordings) comprise an understudied segment within the urban design literature. The recognition of ordinary customers and everyday users of library services is the other side of the coin. The main library has exceeded its visitor and loaning goals and has achieved several goals in becoming the "citizens' information living room".

In addition to the invisible properties and projected images of the city and the library building itself, its relative accessibility and central location are essential. The library is located in the center of Helsinki and is therefore highly accessible. The library's location and the use of evidently high-end design both in its physical structures and interior furniture together with its social spaces and high user numbers all combine to create a theoretically founded knowledge-based location. The high-end design of public institutions is a challenge in terms of the finance required to realize such a project and in terms of finding an appropriate central location as well as connecting the process with other activities (promotions, design capital rhetoric and pro-active marketing) and the development of an urban image for international purposes.

4. Discussion: theory meets practice or architecture meets geography?

The case study presented here of the University of Helsinki's new main library building illustrates the interlinkages between a KBUD framework and theorizations of space. The KBUD framework may be interpreted as a starting point for creating an urban image and a locational awareness of what a "knowledge-based city" is and how to measure it [e.g. 4]. Considering the elements of the KBUD frame, the library building clearly comprises elements for environmental urban development, as the design process itself has stressed green values and sustainable durability. The case also highlights social qualities and culture through the main functions of the library: disseminating, collecting, and warehousing knowledge. It is also appropriate to ask, what a "library" in a contemporary information society is and does [see 30; 31; 32; 33; 34]. Libraries have expanded their functions strongly towards being information dissemination centers and away from the old functional definition of maintaining and warehousing books for loan purposes.

To summarize the main arguments: first, an urban image (interpreted) reflects the urban reality (measured). KBUD provides an important platform for innovation as various studies, which have applied the framework in international and national benchmark studies, have shown. Images benefit from the renovation and restructuring of urban space. This single building (University of Helsinki's main library) contributes to the attractiveness of the city. This involves recognizing that stakeholders and organizations are relevant for the KBUD framework. Universities are the most obvious examples of knowledge-creating organizations. Libraries on the other hand function as knowledge dissemination nodes.

The second argument is the blurring of the line between the material (physical) and the immaterial (electronic). The library itself as a physical structure stresses elements important to Nordic architectural traditions. The immaterial aspect on the other hand includes the role of the library in Helsinki's World Design Capital year 2012 and the "image of the city". In a technological sense, the extensive availability of desk-top computers and WLAN internet connections for users' lap-tops provide the physical infrastructure

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for document sharing and knowledge distribution. The fundamental role of universities as educators of professionals and researchers contributes further to the knowledge-creating organizational theme manifesting itself as design architecture. Spatial theory proved to be a well-functioning platform for assessing the elements and functions of cases whereas the KBUD framework connects a single case into a broader macro perspective of knowledge measurement and benchmarking. The case indicated the following main considerations:

- Libraries still function and are regarded as potential landmarks for KBUD
- Urban design and spatial theory contribute to our understanding of KBUD
- The case study highlights the issue that urban image creation involves stakeholder collaboration

These points provide an interesting platform for future research. Landmark buildings, their backgrounds, and particularly public sector owned premises include a number of potential research questions particularly concerning the structuring of urban space. Theoretical claims could be further tested with specific high profile projects in a spatial as well as a social sense. The global image of the location and “sphere” of a city further justifies case study founded analysis that share universal characteristics identifiable in each case.

5. Conclusions

The lesson that may be learned from this study by other locations seeking to gain prestige and a higher profile in knowledge-based development is that it is beneficial for cities to participate in and be nominated for (or win) international awards or recognition. In the case of Helsinki, its World Design Capital status had an impact both on the time-frame of the new library’s building process and the opening date. The building is also designed to promote both the university as well as the city. The KBUD framework identifies the factors that should be promoted if a city wishes (or desires) to project a positive image that will result in international recognition. Spatial theory provides an interesting supplement to the KBUD framework if considered through material spaces. Urban planning and design, architecture, and urban regeneration provide platforms for everyday life in sphere of the city. These platforms are supplemented with innovative products and knowledge resources affiliated with a particular city, which contribute to its overall image. There are observable positive synergies between urban images, universities, and city organizations that are not realized automatically. Serious tensions may emerge, for instance, between the financial requirements of renovating and maintaining a library’s functionalities in an era of continuously increasing costs for academic journals and books. In recent times, in particular, Finland has been experiencing a situation in which new collaborative funding solutions must be found in order to meet the requirements of a stagnated economy.

Based on this study, the following research demands may be identified as a call to continue the development of conceptual conversations and integrations. First, the combination of spatial concepts into societal frameworks such as KBUD provides challenging and exciting new theoretical openings when considering of urban space, infrastructure, and the people living in a city. Second, a comparison of landmark buildings and their importance for urban image creation might result in interesting findings concerning their similarities and diversities. Additionally, the consideration of the property rights, ownership, and organizational statutes that proprietors possess adds an interesting future challenge and prospect for case-study research in knowledge-creating cities. As the case of Helsinki shows, university libraries possesses a number of qualities not directly visible either in terms of locational characteristics or physical forms but which require a deeper inquiry into the spatial orders within the city. These orders have an impact on the images and stereotypes related to particular spaces (and their host organizations)

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and therefore also impact on overall city portraits.

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