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URBAN DREAMS AND ECONOMIC REALITIES – AREAS OF INNOVATION BETWEEN THE DEMANDS OF THE KNOWLEDGE SOCIETY AND THE REQUIREMENTS OF INNOVATIVE INDUSTRIES

PARALLEL SESSION 3

Dimensions of technology

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Theme Block 4 - IMPACTING SOCIETY the role of STPs/AIs beyond their walls
Sub-Theme: 4.2 Dimensions of technology

Urban dreams and economic realities – Areas of innovation between the demands of the knowledge society and the requirements of innovative industries

Executive Summary
The attractiveness of high-technology companies for skilled, creative and international talent is one of the most important factors for their global competitiveness. Recent research shows that highly skilled people increasingly demand their work place to be a place to work, live and socialize - thus, a more urban environment. As recent developments in metropolitan areas show, cities in general are challenging the classical model of science and technology parks.
In three Berlin-based case studies the authors have undertaken a survey and expert interviews examining the image and perception of the respective area of innovation as well as the role of multifunctional urbanism in the generation of innovation and new knowledge.
However the authors argue that STPs and areas of innovation will and should not become like cities entirely. They need to maintain their profile and USP as distinct knowledge and innovation hubs to generate long-term economic, real tech-based growth and R&D based innovation.

Key words: Areas of innovation, science parks, knowledge society, urbanism

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I. Introduction

The attractiveness of high-technology companies for skilled, creative and international talent and 'star scientists' is one of the most important factors for their global competitiveness following the paradigm "jobs follow people" (Florida 2002). Consequently, in the knowledge economy highly skilled people increasingly demand their work place to be a place to work, live and socialize.

Cities and in particular metropolitan areas are taking advantage of this development. The Berlin case study showcases the city's transformation to an attractive location for skilled international talent and start-ups, SMEs as well as large companies and its subsidiary organizations (McKinsey 2013, Berlin Senate 2013). These firms and organizations do not use specific science park-related infrastructure or the geographical proximity to co-located higher education institutions (HEI) and research and development (R&D) centres, but the entire urban infrastructure, its wide business and research eco-system (local 'buzz') and urban feel. Consequently the city centre in particular has evolved to a living lab for the generation and testing of new innovations and business models - between and across different industries and sectors.

Hence, cities in general are challenging the classical model of science and technology parks (STPs) and other types of areas of innovation (AI). In response to the challenges of 'global' place competition, science parks themselves have had to respond to the talent's needs in order to stay attractive for STP resident firms and research institutions, which heavily rely on highly mobile talent Recently, STPs and other types of innovation habitats[2] are implementing increasing number of measures to become more urban and cater to the talents' and, in return, companies' needs. IASP strongly promotes the idea of science and technology parks becoming city-like, urbanized areas of innovation (IASP conference 2013). As a result, urban redevelopment projects such as 22@BCN in Barcelona have become role models for urban revitalization and fostering innovation in the knowledge economy (Private Municipal Society of the Barcelona City Council 2014, IASP conference 2013).

The authors argue that the classical STP model needs to adapt to the recent global and local demands on innovation habitats. However, being urban may not necessarily be a path to success *per se*. Consequently, two central questions arise for areas of innovation and certain sub-types such as science parks and knowledge cities: What is the role of urbanity in generating innovation? Which distinct features of urbanity do specific technologies fields as well as industries and research areas demand and require, respectively?

In this paper, we apply the concepts of triple helix and quadruple helix to the renewal of modern territorial seedbeds of innovation (areas of innovation) such as science and technology parks as well as knowledge cities. Here, we elaborate the distinct impact of urbanity overall, urban infrastructures and agglomeration effects (Jacobs 1969) from the highly mobile and skilled talent's point of view (i.e. employees and students) and STP users', respectively. We additionally consider that an urban reorientation of areas of innovation may provoke an area of conflict between the demands of their actual users' and STP resident organizations.
The paper is structured as follows. Section 2 provides a brief overview of the literature of territorial innovation systems (TIS) and triple helix. It also introduces the approach of the quadruple helix. In addition, the distinction between science parks and knowledge city is elaborated. Section 3 outlines the authors' empirical findings from three case studies of areas of innovation in Berlin. Finally, the authors draw conclusions and policy recommendations for a future-oriented development and reorientation of distinctively oriented science parks and innovation habitats embedded in the recent academic discussion of TIS in Section 4.

II. Theoretical background: Areas of innovation, the knowledge society and urban integration

As a theoretical basis, we refer to the two distinct types of areas of innovation – 1) science and technology parks and 2) knowledge cities. Furthermore, this section stresses the strong interrelation between these distinct approaches within the broader concept of territorial innovation systems (TIS) (Moulaert and Sekia 2003) and the organizational models of the triple helix (Leydesdorff and Etzkowitz 1996) and the 'extended version' of the quadruple helix (Carayannis and Campbell 2009, Dubina et al. 2011).

Science and technology parks are property-based initiatives that are characterized by a spatial concentration of university and non-university research institutions, technology-oriented firms – primarily SMEs. Additionally, entrepreneurship-support institutions such as (mostly public) business incubators supplement these innovation hubs. As a result, science and technology parks act as interfaces between businesses, universities and other research institutions (Kühn 2003). Their role as territorial innovative seedbeds and interfaces between the private sector and scientific institutions has been thoroughly examined (e.g. Vedovello 1997; Huber 2012; Siegel et al. 2003a,b,c; Fugukawa 2006; Kulke 2008; Brinkhoff et al. 2012; Brinkhoff et al. forthcoming).

Regarddless of the mode of governance, STPs pursue several objectives in terms of their impact on localized business-to-science relationships and the region in general. Objectives associated with inter-organizational linkages comprise the promotion of newly created knowledge and innovation, facilitating the entrepreneurship of new technology-based firms (NTBF), enhancing the growth of existing high-technology firms, attracting new companies (e.g. SMEs and MNEs) involved in cutting-edge technologies, and fostering strategic corporate alliances. Regarding their regional impact, STPs aim to contribute to the region's economic growth and innovative capacity as well as to the regional identity and image (Siegel et al. 2003c).[3]

In the knowledge economy, STPs are currently experiencing a revival as organizational links between scientific institutions, companies and the public administration within the regional 'triple helix' (Hansson 2007). Brinkhoff et al. (forthcoming) stress that modern STPs and areas of innovation generally have to become active knowledge-coordinating institutions by fostering and managing direct personal relationships and also by promoting indirect linkages among knowledge organizations and knowledge workers via space (individual-space-(individual)).

The concept of the **'knowledge city'**[4] embraces an integrated approach of urban planning and, consequently, a more complex and multifunctional urban structure to areas of innovation. In contrast to STPs, it puts an emphasis on the multifunctional character of such innovation habitats – combining the mono-functional orientation of the classic science park model on predominantly business- and research-oriented activities and the city's function as a place for living, recreation, retail and services as well as education. Importantly, these multiple functions are directed towards the knowledge workers and the talent at the knowledge city (Kühn 2003). Overall, scientific institutions in knowledge cities are aligned to the regional economic structure and provide complementary expertise and knowledge to identified growth sectors (Franz 2007, 2009).

So far, this rather utopian type of areas of innovation can only be scarcely observed nowadays. In most cases, these innovation habitats are recently established knowledge cities, based on a comprehensive master plan and realized in suburban areas on Greenfield sites or urban brownfield sites as 'new towns' next to the existing urban agglomeration (Kühn 2003). The concept of

[3] A comprehensive overview of the definitions and properties of science parks is provided by Chan et al. 2009.

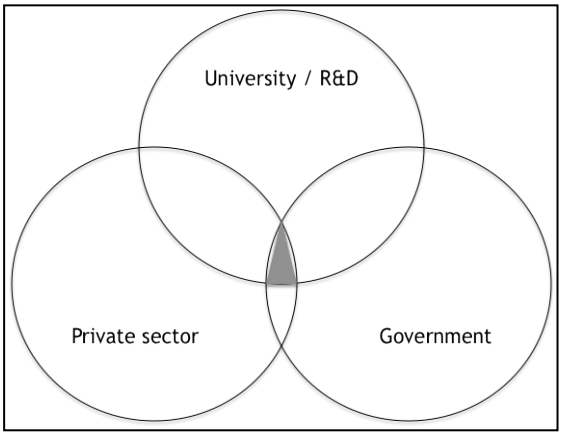
[4] IASP (2014) – the network of science parks and areas of innovation - utilizes 'areas of innovation' as the overall term for geographically constituted innovation habitats, of which science, technology and research parks (STPs) are a specialized

knowledge cities spatially typifies the combination of the central functions of being (i.e. living, work, recreation, education, basic services and transportation), emphasized by the social geographical approach of the Munich School (Leng 1973).

Jane Jacobs (1969) underlined the strong connection between economic diversity and innovation in cities ('urbanization effects'). Accordingly, the spatial concentration of a diverse set of industries - complementary in their knowledge – and related businesses, supporting educational and research institutions as well as skilled people promote the generation of (formal and informal) knowledge spillovers. Also, high urban density, a critical supply of consumer-oriented services and public spaces foster frequent face-to-face interaction, (un-)intentional exchange of information and, thus, learning processes ('local buzz') (Bathelt et al. 2004). Both spatial models of STPs and knowledge cities are based on this complex interplay of social, geographical, cognitive and technological proximity among knowledge workers and organizations.[5]

The **triple helix** has become the most popular metaphor for models of TIS (e.g. Leydesdorff and Etzkowitz 1996; Etzkowitz and Leydesdorff 1997). It takes a closer look at regional innovation dynamics based on multi-faceted inter-linkages between the three pillars: private sector, universities and R&D centres as well as the public administration (see Figure 1) (Etzkowitz and Leydesdorff 2000, Youtie and Shapira 2008, Leydesdorff 2012). Within the triple helix model, universities play a major role in knowledge-based societies (Etzkowitz and Leydesdorff 2000) and inhibit a knowledge-hub-function (Youtie and Shapira 2008). In contrast, the public sector is particularly responsible for the supply of financial funds and public infrastructure (e.g. public transport, roads and utilities), as well as in many cases, site management and innovation management-related activities and entities (Leydesdorff 2012).

Figure 1 Triple helix model

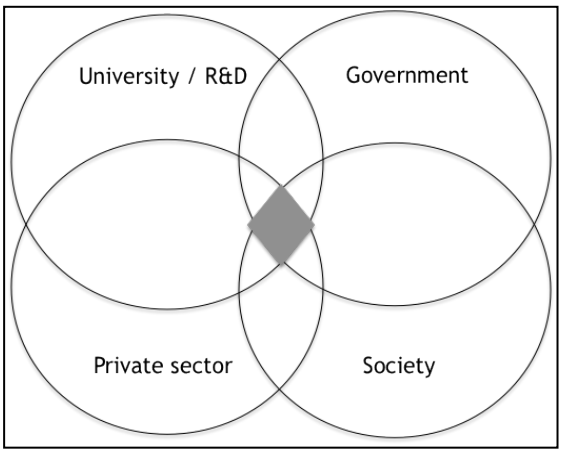


Source: own draft based on Leydesdorff 2012

In addition to the three pillars of the triple helix, the extended model of the **'quadruple helix'** also emphasizes the increasing importance of the society and public, respectively, in the dynamic and complex innovation process in the knowledge economy (see Figure 2). On the one hand, the civil society is characterized as the very sophisticated demand, which creates new demands for innovative and creative solutions (e.g. products and processes). On the other hand, the public represents the skilled talent and knowledge carriers that are needed to create new knowledge and generate new innovations (Afonso et al. 2010). Thus, the knowledge economy is heavily affected by the knowledge society, while the maturity of both bias the level and quality of knowledge and innovation that can be absorbed and demanded for further processes. The quadruple helix

incorporates the increasing interrelation between technological innovations and social innovations in the knowledge economy. The creative class approach by Florida (2002), which stresses the society's cultures, lifestyles, values, creative industries and art that influence territorial innovation systems, is also closely linked to the quadruple helix model (Carayannis and Campbell 2009, Dubina et al. 2011).

Figure 2 Quadruple helix model



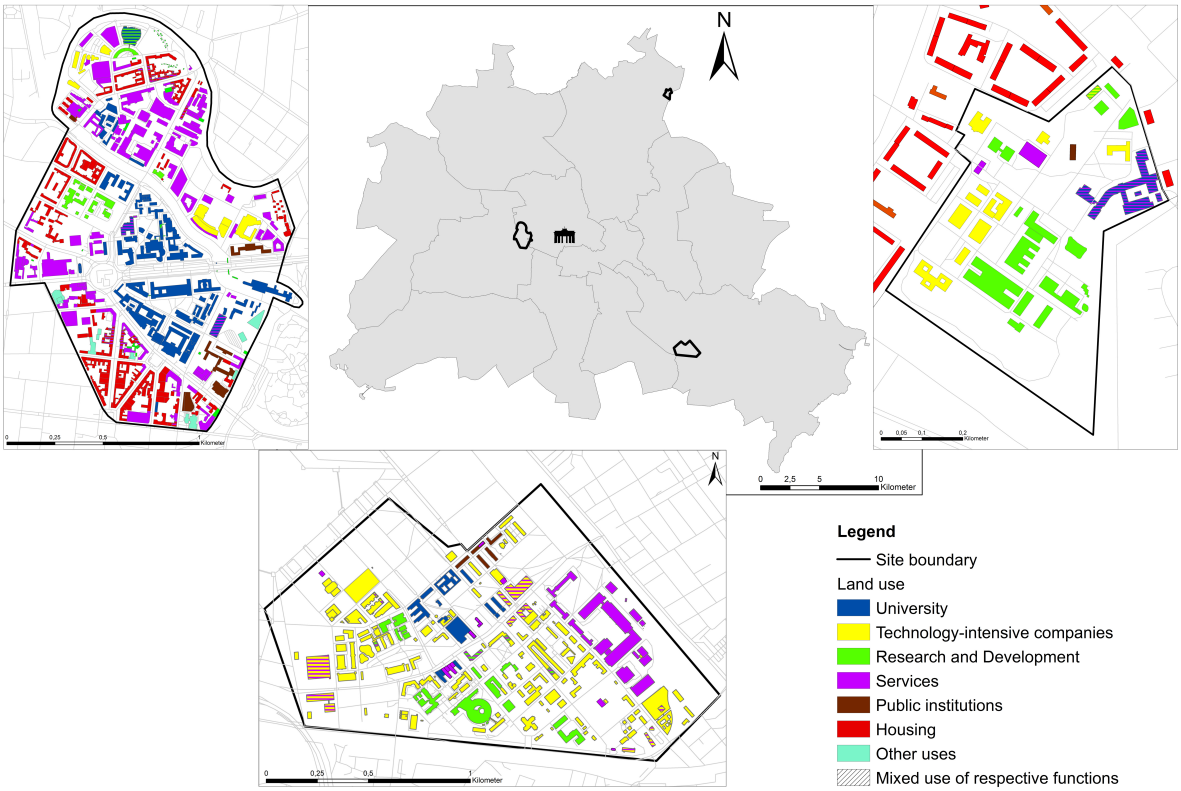
Source: own draft based on Carayannis and Campbell 2009, Leydesdorff 2012

To the authors, the concept of the triple helix with its three major pillar institutions is best applied to the spatial model of classic STPs. In contrast, the quadruple helix highlights the significant role of the society in today's knowledge economy, which is well replicated spatially within the concept of the knowledge city.

III. Case studies: Three Berlin-based areas of innovation

The study was conducted in three Berlin-based areas of innovation (see Figure 3): the Berlin-Adlershof science and technology park in the South-eastern part of the city, the Berlin-Buch science and technology park in the Northeast of Berlin and the inner-city Campus Charlottenburg[6]. The first two areas of innovation trace back to a history of more than 75 to 100 years of non-university research and development. In contrast, Campus Charlottenburg has rather been known for university-related activities.

Figure 3 The three case study sites' location in Berlin



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STP Berlin-Adlershof[7] *(subsequently referred to as Adlershof)*

The Berlin-Adlershof science and technology park was established in 1991. As of 2013, about 460 high-technology companies with an employment of ca. 5,600 people primarily operate in the six key clusters optics and photonics, material and micro system technologies, ICT, environmental technologies, energy and biotechnology. Furthermore, 11 non-university research institutions and six natural science departments of the Humboldt-Universität zu Berlin (HUB) with ca. 2,950 employees and approximately 9,450 students are located at the site with an area of ca. 4.2 km^2. Overall, all organizations generated a total of ca. € 1 billion in turnover in 2013 (WISTA-MANAGEMENT GmbH 2014a, b).[8] Today, Berlin-Adlershof, which is managed by the public company WISTA-MANAGEMENT GmbH, is the largest science and technology park in Germany.[9]

Berlin-Adlershof has a high share of SMEs, which work in more practical-oriented industries, where innovation is more incremental and demand-led than science-based. Consequently, basic university research hardly complies with the market-oriented demand of co-located high-technology firms (OECD 2010, Brinkhoff et al. 2012). Contrarily, strong horizontal and vertical interdependencies are established among co-located businesses as well as between businesses and non-university research institutions. Also, multi-faceted (formalized) relationships are observed between the university and other scientific institutions at the science park (Kulke 2008, OECD 2010, Brinkhoff et al. 2012).

7 We refer to solely to the science and technology area of the Adlershof-Johannisthal development site.
8 The STPS Berlin-Adlershof also comprises a large number of media and general service companies. In addition to the explicit high-technology and science park, 540 companies with a turnover of ca. € 810 million and ca. 7,150 employees

STP Berlin-Buch (subsequently referred to as Buch)

Similarily, the Berlin-Buch science and technology park was established in 1995. This is one of the largest life sciences, health and biotechnology nodes in the Berlin-Brandenburg capital region, sited on approximately 32 hectares. The Max Delbrück Center for Molecular Medicine (MDC) Berlin-Buch and the Leibniz-Institute for Molecular Pharmacology (FMP) wcurrently comprise of approximately 1,670 researchers, PhD students, medical students and staff are the dominating research centres at the site. Furthermore, three are also three clinical building complexes, which are part of the Charité Medical School[10], where clinical research is conducted, and HELIOS Kliniken GmbH on-site. In vicinity to the three clinics and two large R&D centres, a business park with approximately 50 companies predominantly in life sciences that employ about 750 employees, complements the research hub in life sciences. Berlin-Buch is managed by the BBB Management GmbH, which is a joint company of the state of Berlin and the two R&D institutions MDC and FMP (BBB Management GmbH 2014, MDC 2014, FMP 2014, OECD 2010).
Berlin-Buch with its focus on life sciences shows strong science-to-industry links. In particular large pharmaceutical and biotechnology companies in Berlin (such as Pfizer Germany, Bayer-Schering Pharma, Berlin-Chemie etc.) take advantage of rather science-based innovation, and consequently strongly exploit clinical and basic research (OECD 2010).

Campus Charlottenburg (subsequently referred to as Charlottenburg)

The inner-city university and research stretch Campus Charlottenburg is home to the two universities Technische Universität Berlin (TU Berlin) and University of Arts Berlin (UdK), which employ about 9,000 people and cater to ca. 34,000 students combined. In addition to these two HEI, one polytechnic institute, four R&D institutes of the Fraunhofer Society, several other non-university R&D institutions11, many SMEs, several branches of large international companies, one business incubator as well as multiple cultural and administrative institutions are located in this area of innovation with an area of ca. 4.5 km^2. In contrast to the two previously described case study areas, Campus Charlottenburg lacks a central management entity that is responsible of the comprehensive site management and marketing. The association project Campus Charlottenburg, which was initiated in 2009, rather serves as a binding and coordinating umbrella organization including all site-related partner organizations for the future development and realization of site development projects. In a master plan, overall objectives such as for example prospective site planning, restructuring and investment projects are defined. In contrast to Adlershof and Buch, Campus Charlottenburg hosts
ICT and engineering firms, in connection with the TU Berlin as well as a small share of creative small and micro firms connected with the UdK, rather than research-intense high-tech industries (Adlershof Projekt GmbH 2011, Campus Charlottenburg 2014).

IV. Methodology

The goals of the presented research is to capture the employees' and students' evaluation and perception of urban structures at the study sites as well as the assessment of the relevance of urban functions for networking and generating innovations in these innovation habitats.

For this purpose, two different approaches are chosen. For the evaluation of urban factors by the respondents, a quantitative questionnaire was used to find out the level of satisfaction with the given urban structures, there usage intensity, as well as opportunities for improvement. Comparing the results of each site follows the assumption that the respondents' assessment differs with respect to each site's location within the urban landscape of Berlin as well as their endowment of

[10] Charité is the medical school of Humboldt-Universität zu Berlin and Freie Universität Berlin resulting from a merger in

urban functions (c.f. Munich School), with peripheral locations being more negatively evaluated due to their lack of multifunctionality. This first step considers the question of whether innovation sites will have to pursue a strategy of implementing more on-site urban features to increase their attractiveness for highly qualified professionals. A total of 697 students and employees were interviewed at all three areas of innovation (see Table 1).

Table 1 Sample size and expert interviews

	STP Adlershof	STP Buch	Campus Charlottenburg
Employees and students (2012)	23,360	2,932	45,575[12]
Size of sample	258	105	334
Share of sample of population	1.1	3.6	0.7
Expert interviews	3	2	5

Source: own table

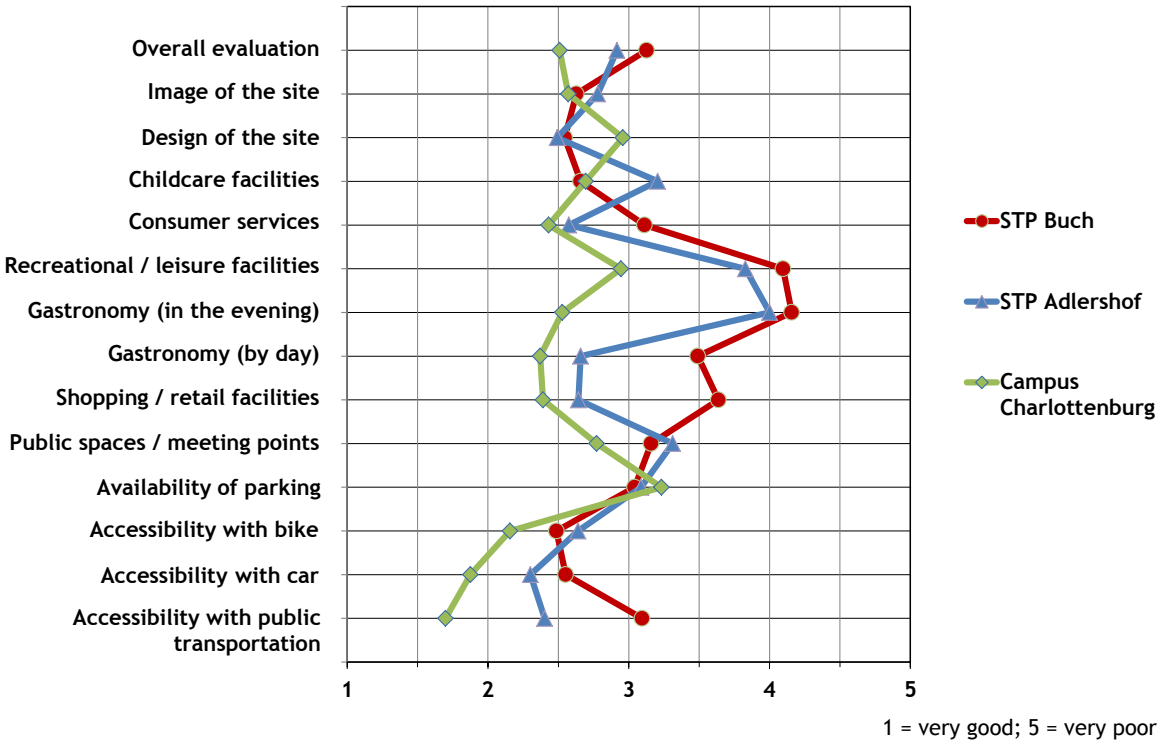
To complement to the respondents' perspective, ten experts were interviewed to assess the importance of urban functions with regard to on-site networking activities and the innovation process Here it is assumed that networking activities benefit from a broader variety of urban functions such as services, gastronomy or leisure facilities, used as 'third places' and meeting points. Interviews were conducted with the respective campus managements[13] and further key actors at the site (intermediaries, university, important companies).

V. Results of the study

The respondents' evaluation of urban structures at the three sites differs significantly. In particular, factors such as connectivity, availability of services, catering and shopping facilities as well as recreational facilities, which contribute to an urban atmosphere, are assessed differently (see Figure 4). While the very densely populated Charlottenburg receives positive responses regarding its existing urban structures, facilities in Adlershof and Buch are evaluated quite critically. Particularly Buch, which is characterized by its peripheral location within Berlin, as well as by its small size, is particularly characterized as non-urban, lacking a multifunctional urban landscape. Adlershof, however, despite a similar peripheral location is rated with regard to urban facilities like shopping options, gastronomic supply during day time and availability of other services much better than Buch and only slightly more critical than Charlottenburg. Adlershof has improved its position slightly in relation to previous studies concerned with its urban structure (Kulke & Kitzmann 2012), resulting from an urban diversification process initiated by the management, promoting the establishment of i.g. gastronomy and service supplies.

Figure 4 Assessment of urban structures (own chart)

12 Due to the diversity of companies and institutions and a lack of comprehensive statistics of Campus Charlottenburg, only



Source: own draft

In spite of a lack of diversity, Buch and Adlershof are rated significantly better in terms of their campus design. Here, the respondents favor the campus atmosphere with a higher share of green spaces, a lower spaciousness, and thus, shorter distances between the given facilities against the densely built-up inner-city neighborhood of Charlottenburg.

The evaluation of urban structures is reflected in the usage of those structures as well as in improvement suggestions and each sites image among the respondents. While Charlottenburg is used in a fairly diverse way (shopping, services, recreation), and thus, is perceived to some extent as vibrant neighborhood and shopping destination, Adlershof and Buch are predominantly used and perceived solely as places of work and study (see Figure 3 and Table 2), where only a small share of the employees and students is spending time in addition to their work and study environment. Despite the initiated diversification of Adlershof's facilities, there is still an obvious backlog with regard to the development of urban structures, which is not yet attractive to the respondents. However, the respondents think of both sites as spaces for research and technology development and perceive them as being more innovative than Charlottenburg, where innovative structures are not as apparent and more hidden by the urban environment.

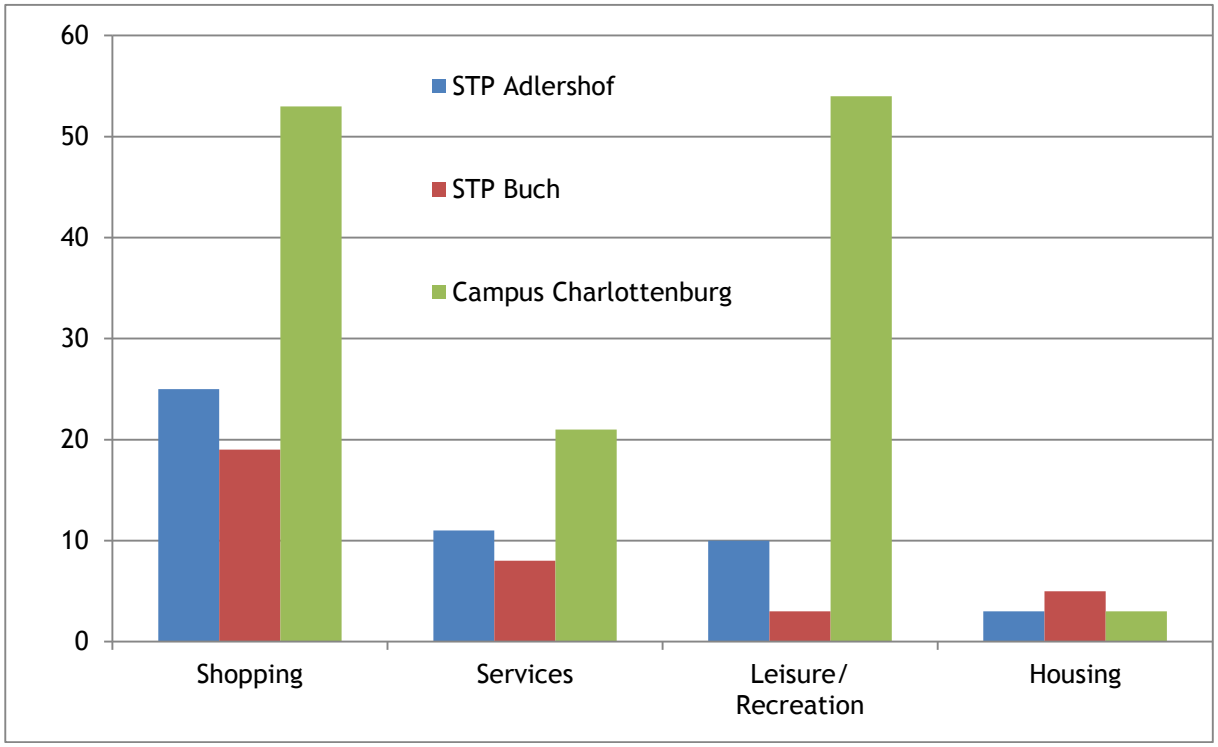


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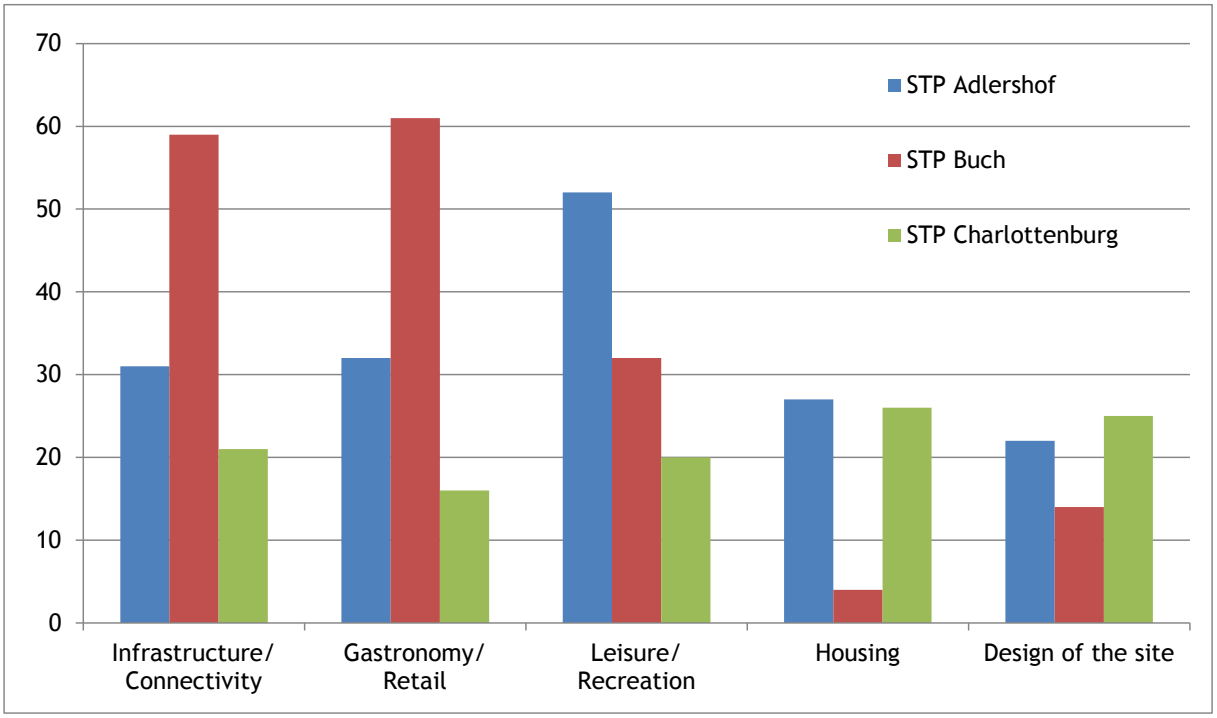
Table 2 Perception of the sites (% of all respondents - multiple answers possible)

	STP Adlershof (n= 258)	STP Buch (n=105)	Campus Charlottenburg (n=334)
as a place to work/study	74	71	81
as a site for higher education and research	73	71	64
as a center for technology development	38	30	22
as a business location	31	15	12
as a vibrant neighborhood	0	1	20
as a shopping destination	3	3	35
as an innovative site	18	25	10
as a dynamic site	12	16	12

Source: own table

The respondents' suggestions for improvement reveal a demand for diversifying supply options concerning gastronomy, shopping, as well as leisure activities in Buch and Adlershof, indicating a demand for after-work activities (see Figure 6). In contrast, improvements in Charlottenburg should address the site's design, since the site is intersected by one of Berlin's most heavily trafficked arterial roads, which fragments the potentially cohesive campus atmosphere. Furthermore, respondents are discontent with the actual housing situation, as dwelling units are rather unavailable, particularly for students. This bottleneck is underlined by the small percentage of employees and students living in Charlottenburg. Although Buch and Adlershof either exhibit the same low percentage of on-site housing, reasons differ remarkably. While the campus management has not yet established extensive housing options in Adlershof, campus Buch is located next to a 6.000-unit housing development, which does, however, not fulfill the employees' quality requirements, as the units are composed of GDR-era prefabricated tower blocks. Furthermore, the neighborhood reveals a rather problematic social structure. Subsequently, respondents in Buch, in contrast to Adlershof and Charlottenburg, do not wish for improvements concerning additional



Source: own chart

The survey reveals very clearly the respondent's highly differentiated and critical assessment of the on-site structures. The results show a general demand for multi-functionality at all sites to advance from mere work and study places to vibrant urban landscape. While Adlershof and Buch are criticized for their missing diversity of supply facilities (shopping, restaurants) as well as recreational activities, an thus, for having no urban appearance at all, the case of Charlottenburg, however, stated clearly the issues of urban density for the employees and students in terms of available housing, the site's design and a lacking campus atmosphere, in contrast to that present at Adlershof and Buch. In summary, respondents wish for a broad variety of urban functions within a low-density campus-like atmosphere, with green spaces and short distances between facilities.

This demand for diversifying existing on-site structures, however, poses the question, whether urbanity, aside from creating a feel-good atmosphere for employees and students, has a considerable impact on daily working routines, influencing networking activities and innovation. It is assumed that more urban locations offer advantages for networking, offering more "third places" and meeting points for the encounters and exchange external to workplaces.

The expert interviews, however, illustrate quite unexpected results. Although all interviewees confirm that an urban atmosphere creates a more attractive working environment in general, they indicate that such structures are not crucial for the economic success of innovation sites. Rather, it is important to create appropriate conditions for companies settling at the sites. Since companies working in the high-tech industries (Adlershof and Buch) as well as in ICT (Charlottenburg) dominate all three sites, a multifunctional urban landscape is only of minor importance, since those companies *"working in technical domains, do not need the urban milieu as much as for example the creative industry. This is related to the type of knowledge, being more research intensive, producing and using more analytical and applied knowledge, not needing this stimulating context of a vibrant metropolis"* (Exp. Charlottenburg). Particularly in Charlottenburg, local networking activities are of minor importance for IT companies, as contacts are rather of a national and global nature, indicating the irrelevance of an urban campus atmosphere.

In Adlershof and Buch, however, intensive local technology-oriented networks are conducive to strong interactions between research institutions and high-tech firms. This mutual exchange benefits from close proximity and the compact nature of the sites. Adlershof *"does not have a huge variety of cafeterias, cafes, pubs. Thus, it focuses on a few and there you meet people then again and again. (...) Here you get interconnectedness automatically"* (Exp. Adlershof). In Buch, the

Subsequently, *"the large central platform every day is actually the common canteen, which is actually the ultimate communication platform"* (Exp. Buch).

Nevertheless, the management of both sites is well aware of the necessity of providing a certain quality of stay to employees and students. Adlershof in particular finds itself in a new phase of development, following the initial construction of suitable infrastructure of R&D institutions and knowledge-intensive companies. *"(...) furthermore, and that is what is actually the focus of our work, you also need a social infrastructure as well"* (Exp. Adlershof). This reflects a distinct development process, which has been initiated to develop the site from a classic science park into an area of innovation with a multifunctional urban environment. However, such developments are of minor importance for economic prosperity. Instead, the management uses the created functional diversity and the students of the Humboldt-Universität zu Berlin to overcome the rather staid image of a science park. This diversification process, however, takes place rather slowly, incorporating the employees' and students' perspective, enquired in an image study of the site initiated by the management.

In Charlottenburg all five interviewees explicitly highlight the shortage of available office space and vacant plots. Particularly innovative start-up firms are concerned by the increasing prices of office space as they have limited financial means available, resulting in severe issues settling as they *"never would get any space in the expensive rental market of the western inner-city"* (Exp. Charlottenburg). Even the Technische Universität Berlin has no options for expansion. The lack of a public integrated management company is apparent in contrast to Adlershof, where the site's management is a fully owned subsidiary of Berlin and controls the available parcels of land. Charlottenburg, however, is characterized by a small-scaled structure of private owners, where market forces regulate real estate prices. To address this issue the Innovation Centre of Charlottenburg (CHIC) was established, assisting interested start-ups with their search for suitable and affordable premises. In addition, the CHIC cooperates with the Regional Management City West, an institution of the district of Charlottenburg-Wilmersdorf and the hybrid platform as an intermediary between the Technische Universität Berlin and the University of the Arts Berlin on behalf of the Senate. Integrating such actors reveals that an urban environment is not sufficient to stimulate networking and innovative structures, but highlight the necessity for mediating actors to turn such urban location with a high density of innovative research institutions and companies in an interconnected innovation site.

The interviewed experts only modestly share the employees' and students' desire for a more diverse urban landscape. Although a multifunctional structure is well acknowledged as satisfying the employee's demand for an attractive working environment, the benefit for the prosperity of the sites is doubted. While Adlershof and Buch benefit from the sites compactness and a small variety of meeting places, the urban site of Charlottenburg, is experiencing problems in strengthening its innovational character, by a shortage of space for new innovative firms as well as caused by an extensive and fragmented urban and institutional landscape hindering an unified campus feeling and a straightforward networking.

VI. Conclusion

The paper highlights the inherent tension of areas of innovation between economic necessities and users' / talent's aspirations. Although the findings of the survey reveal a strong need to enhance the multifunctional urban character of the selected sites, urban amenities appear to only play a minor role in the every-day inter-organizational networking and innovation processes. Regarding the dynamic evolution of innovation habitats, the authors argue that newly created and established areas of innovation must balance the disparate needs of the high-tech economy and the knowledge society as the same time. Thus, they need to integrate themselves within the greater context of science parks representing the classical triple helix model and multifunctional knowledge cities embracing the users in the quadruple helix model. Consequently, their orientation must cater to their specialized technology areas and niches, research expertise and business profile.
The paper showcases that all three selected areas of innovation are currently undergoing this constant process of adapting to the disparate needs and demands of a diverse set of target groups.

pillars of the regional triple helix, in the current – more advanced – stage emphasizes the inclusion of 'soft' place-making (e.g. services, recreation and housing).
In contrast, the findings of the Charlottenburg case study indicate the problems in establishing an area of innovation within an organically grown urban environment. Already existing structures such as urban density, high real estate prices, low availability of production space etc. hinder the relocation of the new complementary entities that would cultivate a new creative hub.

In conclusion, the case studies' findings underline that progress towards multifunctional city-like areas of innovation should not be realized at all costs. In their history, most science parks, for example, have build-up a unique core of research-related infrastructure, specialized cluster profiles and localized knowledge. Subsequently, the authors argue that STPs and areas of innovation will and should not strive to become an ideal city-type location. More importantly, they need to maintain their profile and 'unique selling proposition (USP)' as distinct knowledge and innovation hubs to generate long-term economic, real tech-based growth and R&D based innovation.
Nevertheless, classical and real-tech-oriented STPs must also fill in a particular gap by combining and embracing areas of high-technology and 'urban' sectors such as design and ICT through cross-innovation in the future (as the recently sky-rocketing Internet and mobile industry in Berlin is suggesting) (Hargadon und Sutton 1997, Hargadon 2003).

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