Investigating the competencies for Serviceability of urban areas

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Abstract

The serviceability is connected generally to the business processes and even to the descriptions of variety of building types. However the discussion of urban development is more connected to master plans and long term processes instead of capturing the service aspects and service dominance logic. In order to fill that cap, serviceability could be discussed through creating a holistic framework by connecting the structure of the *network city, service dominance logic* and *servicescape.* The intention is to capture the shift from traditional *designscape* to servicescape. Van Schaik (2009) emphasizes importance of socio-spatial systems as a structure of urban development. The urban system is both a social and physical system at the same time; it is too complex to handle using only a layered approach, because it is impossible to maintain a distinction between separate layers, especially those representing subsystems or sectors. The socio-spatial system is concerning activities, which provide a platform for different stakeholders to act in the new way. Additionally Hiller (2009) states that cities as complex systems are made of two sub-systems: a physical sub-system (buildings linked by streets, roads and infrastructure) and human-sub-system (movement, interaction and activity).

The purpose of this study is to analyse the created framework of serviceability capabilities in the context of socio-spatial systems. The empirical data is gathered from case study from Helsinki metropolitan area. The used methods are document analysis and participatory workshop. The results indicate that the shift towards servicescape as one crucial element of socio-spatial system is dynamic by its nature. The question is not about the shift from one stable solution to another updated version but the shift is more towards activity-based urban development. The issues like learning, communicating, changing, connecting, collaborating and controlling are the important determinants. The outcome of this study is adding an activity-based perspective to urban development discussions.

Keywords: serviceability, network city, service dominance logic, servicescape, socio-spatial

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1. Introduction

The processes of urban development have been the interest in many researchers but more than the focus in urban design research is in solutions and outcomes. The interest in this paper is to understand *the process of urban development and to focus on especially to socio-spatial systems.*

The space can be studied as absolute, relative and relational phenomena. Absolute space is geometrically defined container, where artefacts and humans are placed with geographical co-ordinate. Relative space relationship between artefact and peoples is related to the context. Relational space forms by interactions between social relationships and connections in certain context. (Koskela 1994.)

In the past, urbanists have considered the socio-spatial systems with limited view as only a container of social activities. Space contains actions and social relations, which intimately involve in our daily lives. It affects the way we feel and what we do. In turn people alter space and construct new environments to better fit their needs. Shields (1991) use the term social spatialisation to designate the on-going spatial construction of the spatial at the level of the social imaginary (collective mythologies, presuppositions) as well as the interventions in landscapes (for example built environment). Therefore, a dual relationship exists between people and space; people act according to social factors (gender, glass, race, age, status) within given and in reaction to a given space. When a city converts a vacant lot into a basketball court, the type of activity and interaction of group of persons within the space will change. On the other hand, people create and alter space to express their own needs and desires. (Gottdiener M and Hutchison R 2011.)

The socio-spatial systems approach is linked very closely to the research of usability of built environment, which has been on going about 10 years in CIB W111 workgroup. This group has defined the learning environments as 'the socio-psychological, physical and digital settings, in an organisation or community context, in which learning occurs and which affects learners achievement and attitudes'. (Alexander, CIB W111, 2009.)

Usability in the built environment is context dependent, a product of user experience related to the social relations amongst users and to the interaction between users and facilities. Usability has been found to be strongly related, not only to relationships between people and physical settings, but also to clear strategies for the organisation of work and the use of facilities. Usability is the relationship with the user and space about *efficiency* (easiness to perform with little use of resources), *effectiveness* (deliver of desired effect) and *satisfaction* (feelings, attitude) (ISO 9241) and in addition to that usability is time, place, context and situation bound concepts. Warell (2001) states that product designers suggest two categories for functionality: technical functionality and interactive functionality.

Serviceability is related to the interactive functionality. The serviceability of the urban area is a multidimensional phenomenon, which aims to respond to the single question: *Is the area fit for its purpose*? It is the capability of the area to perform the function(s) for which it is designed, used or required to use. In order to capture the phenomenon it is important to

develop the framework of serviceability. The framework provides a starting point for the discussion of new approaches to the urban area and city development, which tend to analyse stable and long-term master plans instead of dynamic and process-orientated phenomena in areas. The shift towards *socio-spatial analysis* is needed and sustainability as a megatrend can be one driver to more dynamic approaches, both in practice and research, and provide good insights into understanding the serviceability of the areas in general.

The *framework of the serviceability* of the urban area is based on a matrix connecting Dupuy's (1991) "three levels of operators that [re]organize urban space" model and service dominant (S-D) logic, as described by Vargo & Lusch (2008). This matrix frames the servicescape (Niemi & Nenonen 2011).

A suburb of Helsinki metropolis is analysed by these chosen criteria. At first the elements of framework are described.

2. Framework for serviceability of urban area

The approach of this serviceability is discussed through three main topics: the structure of the network city, service-dominant logic and servicescape.

The first perspective on the serviceability of urban areas has to include the different players and actors of the urban area. One can analyse them by using Dupuy's levels and differentiating the operators. There are three levels of operators that (re)organize urban space. The first level operator consists of *different physical networks* (the road network, telephone network, rail network, etc.). The second level operator (of the *production network*, *consumption network* and *domestic network*) and third level operator (of the network of an *urban household*) are virtual networks. They are both dependent on the first level operator to create interactions between people. (Dupuy 1991.)

The second perspective on the serviceability of urban areas is performed through service-dominant logic. Service-dominant (S-D) logic is a unified understanding of the purpose and nature of organizations, markets and society. The global economy is moving towards models in which "service logic" dominates (Vargo and Lusch 2004) challenging traditional ways of evaluating productivity, innovation and growth. The primary components of S-D logic are: (1) *the conceptualization of service as a process, rather than a unit of output*; (2) *a focus on dynamic resources, such as knowledge and skills, rather than static resources, such as natural resources*; and (3) *an understanding of value as a collaborative process between providers and customers*, rather than what producers create and subsequently deliver to customers. (Vargo and Lusch 2008.)

The third perspective explains the components of servicescape. The socio-spatial system is connected by definition to interaction between people and buildings. In order to understand the platform where the interaction happens one has to be able to capture both the tangible and intangible platform for that. This platform can be defined as servicescape.

Booms and Bitner (1981) define *servicescape* as "the environment in which the service is assembled and in which seller and consumer interact, combined with tangible commodities that facilitate performance or communication of the service". It is also suggested, that employee satisfaction, productivity and motivation can be influenced by servicescape (Becker 1981; Davis 1984; Steele 1986; Sundstrom and Altman 1989). Three important aspects of servicescape within a building suggested by Bitner (1982) include: 1) *Ambient Conditions* (e.g. temperature, air quality, noise, music, odour, etc.); 2) *Space/Function* (e.g. layout, equipment, furnishings, etc.); 3) *Signs, Symbols, and Artefacts* (e.g. signage, personal artefacts, style of décor, etc.).

The servicescape concept is scalable and has been studied in connection with urban environments and areas. Julier (2005) discusses *designscapes* as the design hardware of buildings, streets and public spaces and how they are used to differentiate and communicate. On the other hand, this is reviewed as a reference to the marketing strategies of place branding. The emotional software of brand identity programmes, as carried out through literature, websites, the copyrighting of slogans and other largely two-dimensional platforms comes into view. Hall (2008), states that place branding lies at the intersection of tourism, geography and marketing. Contemporary place branding requires the use of hardware, in the form of servicescapes and designscapes that are developed via architecture, design and heritage; and software, in the form of branding, marketing and promotion. Rosenbaum and Massiah (2011) state that a servicescape comprises objective, measureable and managerially controllable stimuli but also subjective, immeasurable and often managerially uncontrollable social, symbolic and restorative stimuli, which all influence customer approach/avoidance decisions and social interaction behaviours. Furthermore, customer responses to social, symbolic and restorative stimuli are often the drivers of profound person–place attachments. As Rosenbaum and Massiah (2011) propose, a servicescape paradigm that links marketing, environmental/natural psychology, humanistic geography and sociology is relevant.

Servicescape is a tapestry of ambient conditions, space and functions and as well as visual objects and it offers a ground for serviceability description. The serviceability framework for appraisal areal performance is formed by three factors; characteristic of area, strategic intention and emergence. In this paper we focus on areal characteristic by five themes: changing, connecting, communicating, collaborating, controlling. The strategy intention creates relationship between different domains of functions, integrates time horizon and links meanings with ends. Here the weight is on sense of direction. Emergent development is related to systems of existence and it refers to entity resulting form the rising and new phenomena, feature or activity level. Here the weight is on adjusting (Fig.1).
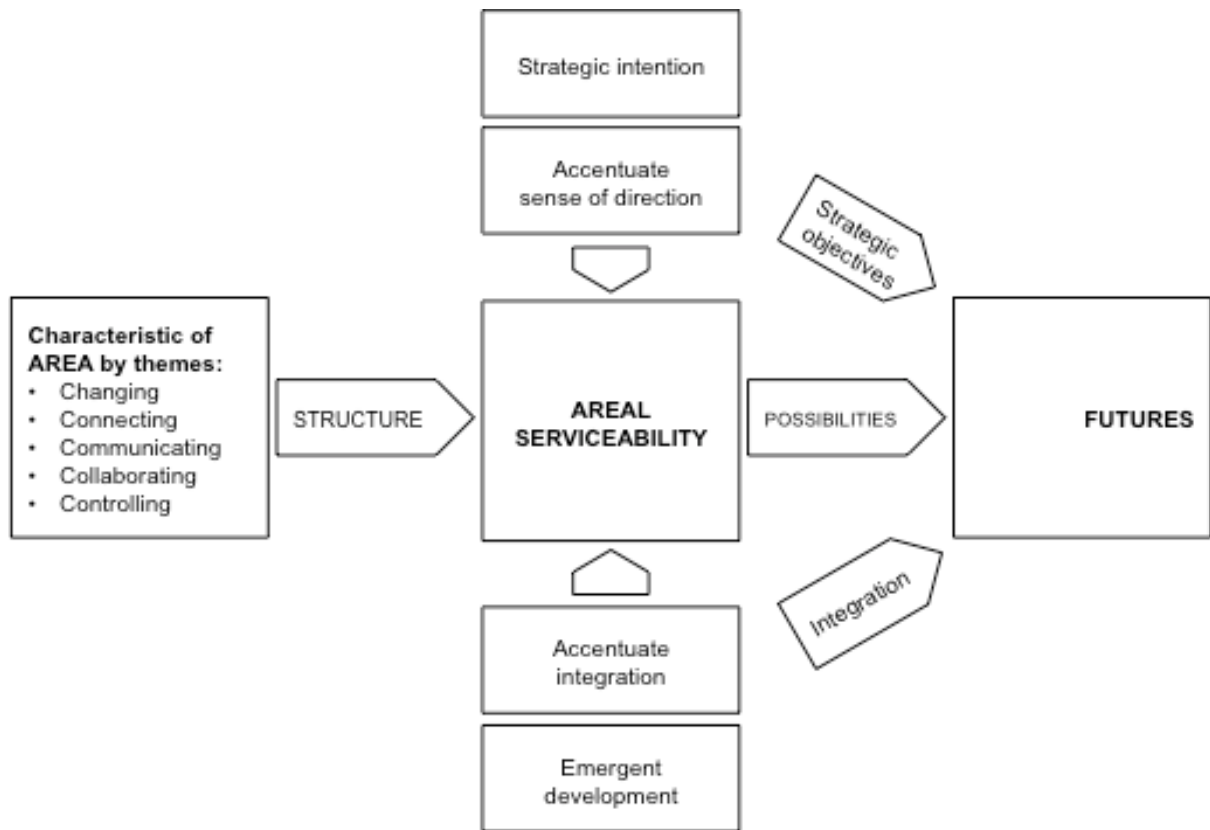
Figure 1: A Conceptual framework of Serviceability

The structure for analysing the case is formed by using the elements of perspectives the network city and service-dominant logic will provide a servicescape as a platform for the area. This serviceability factors are linked with capability cluster which are described next:

Changing

The *change* is a natural phenomenon of a development, but *how to react for* a change. Changing occurs both physically and perceptually and it is more about changing a *mindsets*. Often a change is not an instant but rather phenomena, which consist of different phases and sequences. Temporary projects, which become transformative and the place can have "meanwhile uses"- functions. The main question how to manage the speed and disruption of change and the uncertainty; unpredictable changes in politics, economics, and technologies. One solution is to become more resilient and adaptable from spatial, organisational and operational perspectives. Involving people in early phase of development process decreases the unwillingness for change. Flexibility and resilience is the capability to recover from the changes.

Connecting

In order to connect people, place and every day practices and businesses we need to understand physical and perceptual connection. Connectivity is a capability to connect the physical environment as well as, the connection between different communities with help of

social media and social networks. Even the usage of social media is vivid; it is not replacing the actual social contacts around different topics. With the help of the connectivity, different kind affordance can be offered like networking of activities and business, cultural and social relationships within the site and externally. Connectivity is noticed as flow of networks or transportation networks (e.g. roads, streets pipes, aqueducts, power lines) or nearly any structure, which permits either vehicular movement or flow of some commodity or people. It combines different modes of transport, for example, walking and car to model multi-modal journeys. Connectivity is ability build or maintain link between two or several areas, like the relationship to the sub region and the city centre.

Communicating

Communication is capability to interact with different people and a city offers a platform for living and interaction. Communications is about sending a message and interact with others. Identity, image and brand are related but means different things. *Brand* simplifies the message and creates the motivation hook. A brand can be seen as a collective agreement of the image. *Identity* is more about who you are, what you think about yourself and how you present yourself. Identity should express personality. Visual identity is name, logo, website, advertising. *Image* is how others view you. It is the feeling or opinion about the service, product, company or person. Feelings are difficult to manage. Branding techniques can be applied to any product, service, company or person and even for area. Capability to create experiences: sense of place and diversity. Often decision are based on feelings and therefore it is important that those who are involved in planning process are aware of this phenomena and creates (communicates) solutions, which in best possible way supports the end user choice.

One-way communication is based on informing; consulting or advising and is seen as top down communication. Two-way communication (bottom up) is a process in which participants create and share information in order to research mutual understanding. Communication can raise awareness and change perceptions to support cultural, behavioural and physical change. (Worthington et al. 2012.)

Collaborating

Collaboration is capability to collaborate informally and formally. Complexity, and the value of diversity are two key phenomena of to day; regional development projects encountered questions are "wicked", "messy" and "fuzzy", and simply one of the profession or industry cannot solve them alone. The partnerships are in public or /and private sectors, which for instance helps in sharing resources. Collaboration should not be seen as restrictive practices, the best way is creatively balancing conflicting interests. It is about working across different scales, interests, functions and cultures and this helps to build up community spirit. The collaboration can be informal or formal process, which is deriving the service provision. New partnerships, public-private-people partnerships finding common and shared values within the public and private actors.

A continuous series of small events is essential to gradually raise awareness and change perceptions. Initially engaging individuals in the community who are willing to be pro-active

and responsible, who then spread a climate of confidence and opportunity for change, results in a paradigm shift.

Controlling

Controlling is a continuous management process, which has a forward looking attitude. Controlling is balance between creating and reinforcing the vision and mission and then managing the process of change through combination of regulatory controls and behaviour (Worthington et al. 2012). Questioning the hierarchy in city planning, not top-down but bottom up, which have the local line and specific area and actors. It is interesting to follow development of area management and areal operators besides the development of the physical environment and the temporal development and control. Control can be managed through working partnerships between key stakeholders with agreed goals such as a strong leadership is finding project champion who has the ability to keep the different parties aligned and engaged. Orchestrating a process of change and sustaining other champions who are committed and keep the project alive. (Worthington et al. 2012.)

3. Method

A suburb of Helsinki metropolis is analysed by these described created serviceability themes. The information is basically collected from authority interviews and consultants report of the area. A co-workshop was held, which gave input to a structure for future analysis. The participants were from different countries and they had several years experience in areal development projects. The study follows the structure of exploratory case study in order to evaluate relevance of the created framework.

4. Case Pitäjänmäki

Pitäjänmäki is one of the Helsinki suburbs and has all the potential to be success area. It is *accessible* and located around 10 kilometres to the northwest/west of Helsinki Central railway station and it is a station on the VR commuter rail network. There are several bus connections from Helsinki city centre, which takes only ten minutes to Pitäjänmäki. Additionally, there is cross traffic in metropolitan area.

The Pitäjänmäki of today is a suburb of 16 565 (2011/12) residents and approximately 22,500 jobs. The main dwelling area in Pitäjänmäki is located on West and East Reimarla on both side of Konalatie road. The neighbourhoods containing detached and semi-detached housing still hold some buildings from the villa community period

Development of the Pitäjänmäki (P) can be seen as transformation form traditional industry to ICT and knowledge-based industry. The railway connection has had an important role in area development. The Strömberg factories started in 1911 and the first privately owned Krönckel brewery in the mid-19th century. This first period can be seen as *(P1.0) Brewing industry and Engineering works*. Next step was taken at eighties when the ICT related industry started to grow (P2.0 /Piimäki) and now on 21th century it is to define common vision and motivation to create "*positive twist*" in (P 3.0). This positive twist is about creating

new concepts for the office premises and residential use. Piimäki is one of the largest concentrations of IT-related jobs in Finland (Nokia, ABB, etc.) The area still contains traditional industry as well like groceries, cosmetics, electrical device production, jewellers, paint and a diverse selection of smaller businesses.

The Pitäjänmäki surroundings are open and active only during office hours. Pitäjänmäki and Konala form a continuous service area. The basic services are better than average in Helsinki (day-cares, schools, health centre, pharmacy, library, church, post office and plenty of recreational services in activity centre). The only what is missing according to inhabitants is the swimming pool. The trend is the same as elsewhere in reducing the commercial service like banks and corner shops.

5. Findings of the case

The analysis is based on description of the area, accessibility and services, which is structured by following themes: changing, connecting, collaborating, communicating and controlling.

Diversity is a good way to describe case area. There are different-aged properties and extremely varied businesses. These can be seen as strengths to build on. But on the other hand there is out dated stock of real estate and high underutilization and low rental level. On the year 2010 vacancy rate was over 12% and the companies kept on leaving from the area. The rents were at giveaway prices, but still the real estate owners were not succeeding to find tenants. The situation has continued ever since. The real estate owners have definitely thought to change the purpose of the usage for a hotel, residential building or even to demolish the building.

To secure the sustainable development it is a need for vitality and new business ideas. The challenge for the owner of the real estates is to create new business models and practices. There have been several development projects with the city and local actors. The inspiring example has been Manchester-case with the idea of a new living room for the citizen and visitors; the disaster has turned to a positive boost for a change making.

The other good example is to transform city streets over to public space uses like in Dumbo-case in New York. A triangle on Pearl Street underneath Manhattan Bridge was once a car parking spot and was turned to "*a new living room for the neighbourhood"* an oasis of green with chairs, table and umbrellas and art. The implementation was rapid; in two months local collaboration transformation was completed.

Changing *(The history, current status and future, vision of the areal development)*

On the average cities or suburbs has taken generation to mature as well as Pitäjänmäki, which has several historical layers in business life. The important milestones of the area development is firstly the beginning of traditional industry and later the transformation to ICT and knowledge-based industry. Robust industry and diverse history works as a competitive advantage (for the idea of the area and concepts of space). In Pitäjänmäki there are several

head quarters for companies. The *current status and the future* are influenced partially by structural change in economics and recession. Even Pitäjänmäki has centralized location at the metropolitan area and good accessibility and public transportation. The *owners* meet impossible economical equations, which does not improve the investing in developing in a future.

Communicating (*General Areal characteristic, atmosphere and imago of the area*)

It is considered that Pitäjänmäki has a weak and fuzzy general image, pedestrian traffic, parks and recreation area and too homogeneous business mix. In order to improve the functionality and vitality of the area the business-related development and increasing services is needed. A concentrated area marketing and communication enables to build a strong areal image.

Connecting (*Accessibility, access, features and use of street and traffic networks and areas)*

The central purpose of the city is to enable social and economic transactions of ideas and goods between people. Successful places require the appropriate balance of interconnectedness, movement, awareness, encounter and exchange at every scale to provide environments in which different kinds of human activity can unfold and thrive. Cities can connect or separate by bringing people into social or economic relationship or keep them apart. To maximize development opportunities, connections should be considered across scales, functions and time (Worthington et al. 2012).

There is one remarkable weakness in traffic of Pitäjänmäki; the main street is used for through-traffic. There is also lack of parking places or they are placed unevenly. According to a study one way to improve the area functionality and general image is to invest in transportation and transportation services and perhaps speed up the realization of the planned rail traffic.

Collaborating

The next phase for Pitäjänmäki is to create a positive twist in order to return a positive imago and attractiveness. This is done by recognition of the area uniqueness and also competitiveness. Quite important is to recognise the possible opportunities area. There is a need to produce proposals for action and also a model for economically resilient solution. It is crucial to improve further the area development procurements. There is a need to increase participant knowledge, capability and common understanding.

The future is in workplaces, living, services, and transportation and recreation services, which have huge impact to the area vividness functionality and comfort. The main idea is to create a holistic plan and divide area in fields of operation sectors. The collaborating is on city level as a formal plan but Pitäjänmäki has also active inhabitants community, which can be consider as informal. Pitäjänmäki has been develop rather fragmentally during different decades and it needs a holistic plan or roadmap which to follow. The idea is to create/

update not only for today but also for the future activity-based solutions, which can be either temporary or permanent by nature. It is not from inception to completion and occupation; it needs to be replaced by the well-accepted practices of community consultation and participation in the process.

6. Conclusion

The purpose of this study was to analyse the created framework of serviceability capabilities in the context of socio-spatial systems. The empirical data was gathered from a case study in Helsinki metropolitan area. The goal of this paper was *investigate the competencies for serviceability of urban areas* and to classify the key elements that create service-based competitiveness.

In order to assess areal serviceability we need to know history, current status and future and even the vision of the areal development. General areal characteristic, atmosphere and imago are relevant when assessing communication. Connecting is physical, social and virtual accessibility, features and use of street and traffic networks and areas. Controlling has forward-looking attitude and is crucial in transforming processes.

Five C's (changing, connecting, communicating, collaborating, controlling) helps structure the material in hand but it definitely needs a support material, quantitative facts and figures in order to make more tangible analyses and to allow comparison between the approaches.

Cities are seen as self-regulating systems. Cities are in continuous flux, adapting to the changing environmental, political, economic and social context (Worthington et al. 2012). Five C's fits best in analysing open- ended project spread over time within, which defined projects with clear goals, budgets and deadlines could be identified. Nevertheless the used approach is also scalable in city and in district scales and particularly in observing certain everyday practices.

The research is descriptive by it is nature and serves as a starting point for testing the proposed model. The reliability of the model is based on the fact that the perspectives are gathered using both the literature and interviews. The five C's doesn't offer strong evaluation tool but it helps in recognizing different phenomena's in city development. However, the validity of the proposition is still weak and need to be tested in future research in a specific manner. The proposition will be transformed in the iterative process, during further studies.

The outcomes offer a potential input for discussions on the objectives of urban economics and planning. The results support increased awareness and understanding the serviceability of urban areas as a process orientated and user-systematic way. The proposed framework for areal serviceability is utilized in designing new greenfield area and, furthermore, in responding to changes in existing areas.

References

Alexander K (2009) "Usability of Learning Environments". *Usability of Workplaces CIB W111 Research Report, (available online http://cibworld.xs4all.nl/dl/publications/pub330.pdf)*

Becker F D (1981) *Workspace: Creating Environments in Organizations*, New York, Praeger.

Bitner M J (1992) "Servicescapes: the impact of physical surroundings on customers and employees". *Journal of Marketing 56: 57-71.*

Buchanan R (1992) "Wicked Problems in Design Thinking", *Design Issues. 8 (2): 5-21, (available online http://www.hum.aau.dk/~kanstrup/PDP/EkstraLitteratur/Buchanan.pdf)*

Dupuy Gabriel (1991). *L'urbanisme des réseaux – théories et méthodes*, Armand Colin Editeur, Paris.

Dupuy Gabriel (2000). *Network urbanism*. OASE 53. Sun Publishers, Nijmegen.

Gottdiener M and Hutchison R (2011) *The New Urban Sociology*. 4th ed. Boulder, CO: Westview 394.

Hall C (2008) "Servicescapes, designscapes, branding, and the creation of placed identity: South of Litchfield, Christchurch". *Journal of Travel & Tourism Marketing, 25 3: 233-250.*

Hiller B (2009) "*The city as a socio-technical system: a spatial reformulation in the light of the levels problem and the parallel problem".* Keytnote paper to the Conference on Spatial Information Theory.

http://www.manchester.gov.uk/info/856/local_development_framework/1528/the_guide_to_development_in_manchester/1[accessed on 21.2.2013]

http://www.streetsblog.org/2007/08/15/a-parking-lot-becomes-a-neighborhood-living-room/ [accessed on 21.2.2013]

Julier G (2005) *"Urban Designscapes and the Production of Aesthetic Consent".* Urban Studies, 42 (5-6): 689-688.

Kornberger M (2012) "Governing the City: From Planning to Urban Strategy". *Theory, Culture & Society, 29(2): 84-106.*

Koskela H 1994 "Tilan voima ja paikan henki-yhteiskuntateoria ja humanismi uudessa aluemaantieteessä". Helsingin yliopiston maantieteen laitoksen julkaisuja B42.

Niemi R and Nenonen S (2012) Serviceability of urban areas – definition and key elements*, paper presented at ERES2012 Edinburgh Conference – Urban Economics and Planning.*

Rosenbaum M S and Massiah C (2011) An Expanded Servicescape Perspective. *Journal of Service Management*, special issue, selected as a best paper at the American Marketing Association Services Marketing Special Interest Group (SERVSIG; Ray Fisk and Lia Patrcio Guest Editors), 22 (4): 471-490.

Schaick, J van (2005) "Integrating the social and spatial aspects of the urban system: Comparing the models of Heeling, Dupuy, Castells and Lefebvre". In ED Hulsbergen, IT Klaasen & I Kriens (Eds.), Shifting sense: Looking back to the future in spatial planning (pp. 251-263). Amsterdam: Techne Press.

Schaick, J van (2005). Shift towards networks: integrating social and physical subsystems of the city through stratified models. In R Maze (Ed.), In the making / First Nordic design research conference, 1-5. Göteborg: Interactive Institute.

Shields R (1991) *Place on the margin: Alternative geographies of modernity*. Routledge, New york.

Sotarauta M (2004) *"*Strategy Development in Learning Cities. From Classical Rhetoric towards Dynamic Capabilities". Sente, Working papers.

Steele F (1986) *Making and Managing High-Quality Workplaces*. New York: Teachers College Press.

Sundstrom E and Altman I (1989) "Physical Environments and Work-Group Effectiveness". *Research in Organizational Behavior*, 11: 175-209.

Vargo S L and Lusch R F (2004) "Evolving to a New Dominant Logic for Marketing"*. Journal of Marketing, January,* 68: 1–17.

Vargo S L and Lusch R F (2008) "From Goods to Service(s): Divergences and Convergences of Logics". *Industrial Marketing Management* 37: 254-259.

Warell A (2001) "Design Syntactics: A Functional Approach to Visual Product Form", Theory, models and methods. Dissertation, Chalmers University of Technology, Gothenburg, Engineering and Industrial Design, Product and Production Development.

Worthington J and Bouwman H (2012) Place of Connection, Utrecht, (available online http://learningcitiesplatform.files.wordpress.com/2012/11/final-report-lcp-i-version.pdf)