Guest editorial: Volume 5, Issue 2, 2014

Changing building typologies

Kerstin Sailer
Space Syntax Laboratory, Bartlett School of Architecture
University College London (UCL)

editorial

Guest editorial: Volume 5, Issue 2, 2014

Changing building typologies

Kerstin Sailer

Space Syntax Laboratory, Bartlett School of Architecture (UCL)

'There is no building type in which a division of people, objects, and machines, and their spaces, into classes and categories, as the first step towards their organised and purposeful interface, is not of primary importance.' (Markus, 1987, p.468)

This issue of the *Journal of Space Syntax* is concerned with building types, but also the idea of change. Change is difficult to grasp as it is happening and can often only be rationalised in hindsight. Describing change from within can be a considerable challenge.

Still, change is a fascinating topic and has brought forth a plethora of concepts and theories across different academic disciplines. Organisational theory, for instance, has produced a rich discourse on change. The social psychologist Kurt Lewin prominently argued that change is a constant in every society and what differs is the amount of change or stability present in the system at any one point in time. His model of change focused on a stable state that becomes 'unfrozen', then changes and finally 'refreezes' (Lewin, 1947). For a long time this idea was the standard approach towards change, with scholars adding nuance to the debate for instance by confirming change happened as 'punctuated equilibrium' (Romanelli and Tushman, 1994; Tushman and Romanelli, 1985). More recently, however, scholars began to shift their attention away from stability as a starting point and instead argued that change should be treated as the norm in organisational life (Tsoukas and Chia, 2002).

If we accept change as a continuous force in society and one that is increasingly seen as the norm rather than the exception, we can begin to consider what this means for the production of architecture and built form. In particular, this Special Issue asks how building typologies are changing.

Classifying architecture by type is nothing new. We can look back on a long history of thought on the classification of buildings by type, as for example traced from the late 18th century until modern times by Forty (2000). Most commonly, buildings are classified either by use (hospitals, schools, prisons, etc.) or by morphology (buildings with courtyards, pavilions, long halls, etc.). Steadman (2014) calls these 'activity types' versus 'built form types'. In many cases, however, classifying buildings according to type meant a focus on use types, for instance in Pevner's *History of Building Types* (Pevsner, 1976), but also in Markus' investigation of power and control in the emergence of new building types during the period of the Enlightenment and the Industrial Revolution (Markus, 1993). This resonates with design practice, where architects tend to specialise in the production and design of a certain use type of building. This is particularly the case for more complex building briefs such as laboratories, hospitals or schools, which require specialised knowledge on processes, functional requirements and building service technologies.

Interestingly, this focus and specialisation on use types cannot be found in early considerations of space syntax. In *The Social Logic of Space*, Hillier and Hanson (1984) argue that the fundamental rationale of any building is the ordering of space,

which also introduces an ordering of relations of people. Rather than discussing buildings by type, Hillier and Hanson focused on the shared aspects of all buildings: how they define the boundary between the inside and the outside; how they transform people into visitors or inhabitants by assigning them different levels of access and allowing them various degrees of control, which in turn create and support organisational roles; how buildings regulate this interface between visitors and inhabitants by bringing people together or keeping them apart; how visitors and inhabitants can occupy different strategic locations in buildings either deep in the plan or shallow, thus defining elementary and reversed buildings. A series of examples as diverse as possible set the scene of the investigation and made a case for a broad and generic argument: ranging from the Mongolian yurt to the Bedouin tent; from the Ashanti palace to English cottages and Victorian town houses; from a Parish church to an Ashanti shrine; from Bentham's Panopticon to the Viennese 'Narrenturm'.

In a similar vein, Hillier, Hanson and Peponis (1984) tackled the question 'What do we mean by building function?' with a focus on generic patterns of buildings. They argued that global function could be described by a series of interfaces governed by integration and control. A typology, i.e. the 'churchness' of a church and the 'schoolness' of a school was defined as the interface between visitors or inhabitants and thus determined by the social and spatial operating systems of generating or constraining encounter patterns. This definition enabled an understanding of buildings as user-driven without limiting the analysis of buildings to use types.

Space is the Machine (Hillier, 1996) still highlights the importance of generic function, which unites all buildings. Hillier sees these generic functions realised in movement and intelligibility, since they relate to "aspects of human occupancy of buildings that are prior to any of (…) [the] differ-

ent functional programmes that buildings of different kinds accommodate" (Hillier, 1996, p.284). However, this seminal piece of work also reflects an emerging focus on use types by investigating 'Visible Colleges' and the production of knowledge in research laboratories.

At that time, the space syntax study of buildings by use types was already well on the way. The foundations laid in early space syntax, which established a unifying framework, allowed the flourishing of a rich research tradition of investigating buildings within their respective typologies, i.e. as separate studies of *factories* (Peponis, 1983, 1985), *offices* (Grajewski et al., 1992; Hillier and Grajewski, 1990; Penn et al., 1999; Rashid et al., 2006; Sailer and McCulloh, 2012; Sailer and Penn, 2009; Sailer et al., 2012), *hospitals* (Haq and Zimring, 2003; Alalouch and Aspinall, 2007; Peponis and Zimring, 1996), *museums* (Peponis and Hedin, 1982; Hillier et al., 1996; Hillier and Tzortzi, 2006; Rohloff, 2009; Tzortzi, 2007; Wineman and Peponis, 2010; Psarra, 2005), *schools* (De Jong, 1996; Heitor and Marques Pinto, 2012; Pasalar, 2003, 2007), *department stores and shops* (Koch, 2007; Penn, 2005), *libraries* (Both et al., 2013; Koch, 2005; Capille and Psarra, 2013), or in fact *homes and houses* (Hanson, 1998; Hillier et al., 1987), to name just a few. Aiming to capture, define and describe the ever elusive 'social' element of architecture (Forty, 2000) could thus be seen as the major milestone of the space syntax approach, and it seemed that doing so under the framework of use types was most fruitful at the time.

Most recently, however, scholars have begun to reconsider the question of comparative building analysis using larger samples in order to find unifying elements across building use types, for instance features that allow user cognition (Peponis, 2012) or the detection of similarities or dissimilarities between building types (Abshirini and Koch, 2013).

It seems that both approaches – analysing buildings within a use-type as well as aiming to

unpack what unites and separates the different use-types - are equally important and relevant for our understanding of the social logic of buildings.

Another stream of research is worth mentioning in this context. Considering usage in general, or more specifically taking the concerns and needs of building users into account has been vividly discussed in the 1960s and 1970s, most prominently by architects such as Herman Hertzberger. He went as far as to condemn architecture which focused on 'outward appearances' and asked: 'What can architecture be other than concerning oneself with situations in daily life as lived by all people? It's rather like clothing, which must after all not only suit you well, but also fit properly.' (Hertzberger, 1991, p.174) This very question of usage and daily life is currently experiencing a renaissance, evident in a diverse range of recent publications (Cupers, 2013; Till, 2009; Awan et al., 2011; Bergdoll, 2010; Maudlin and Vellinga, 2014). In *Use Matters*, Cupers for instance argues that the complex lifeworld of how architecture is inhabited, consumed and used has long been a blind spot, but is recently re-addressed by both practitioners and scholars: 'From the resurgence of activism and social engagement in architecture to the development of new spaces of interaction using the latest technologies, the interest in the agenda of the user across many creative disciplines today delivers new promises for the social role of design.' (Cupers, 2013, p.1)

Together with an increasing popularity of user-focused design strategies in architectural practice[1], such as evidence-based design (Sailer et al., 2008; Ulrich et al., 2008) or data-driven design (Bier and Knight, 2014), these developments form the background to this Special Issue on the change of building typologies. With a focus on usage and the social logic of buildings, a renewed consideration of what defines a building, how typologies are classified by use and how these classifications might be shifting becomes relevant.

Buildings have always been changing, both through physical adaptations and changes of use (Hollis, 2009). The same is true for building typologies, if we consider long enough time periods. Steadman (2014) for example powerfully argues how changes in buildings systematically occurred through the influence of the generic functions of lighting and ventilation. Electricity fundamentally changed possible building shapes, but also usage patterns.

Current changes in building typologies are clearly centred on the merging of activity types, which can be observed in many examples:

- *Apple Stores*[2] are completely centred on customer experience rather than on selling or displaying products, which used to be the traditional focus of a shop. They invite the public to come into their buildings and play with their devices to form strong community links and a feeling of belonging to a club. Mobile pay points and interactions with staff contribute to an atmosphere of a shop which is not centred on the idea of selling goods immediately, but rather on building relationships and creating a strong branded experience (see for instance: Palaiologou and Penn, 2013), which in turn creates profitability for the company indirectly, as people wish to purchase Apple products.

- *Retail banks* are also rethinking their business models, aiming for greater customer centricity, as a recent McKinsey Report highlighted (McKinsey, 2013). Banks all around the world are experimenting with new concepts and designs for their branches[3], offering business lounges and spaces for clients to work and hold meetings (Umpqua Bank, San Francisco), providing free Wi-Fi and coffee alongside banking expertise (Capital One Café, New York City), banning cash from the branch and

focusing on customer advice services (SNS Bank, Netherlands), or specifically targeting young customers through unconventional design solutions (ING, Turkey, or FRANK by OCBC, Singapore). Traditional activities occurring in banks, such as making payments or getting cash is increasingly replaced by other services and use patterns.

- The *British Library*[4] is experimenting and redefining what a library is. They not only invite scholars to use their collections and read books, but also open their doors to a growing community of business entrepreneurs and nomadic workers using the spaces, for instance the individual desks in front of the Kings Library, or inside the recently re-launched Business and IP Centre. The library in addition commissions exhibitions, organises talks, seminars, workshops and hosts comedy shows, poetry slams, musical concerts and club nights.

- Ronde Bike[5] is offering a joint cycle workshop, community meeting point and café in Edinburgh, thus combining previously distinct activities such as bicycle repairs (workshop) and leisure (café) under one roof.

The above mentioned examples highlight how different activities, which used to be hosted in separate building types now come together in the same building to create synergies and new usage dynamics; for instance work (office), knowledge acquisition (library) and entertainment (theatre) are now all co-located in the British Library. The examples also illustrate the important role of technology in driving this change, either explicitly by bringing

Figure 1:

The most popular seats in the British Library.

A series of individual furniture pieces fully equipped with desk lamps, power sockets and tables for mobile working in front of the Kings Library.

technology mediated uses into buildings (free Wi-Fi, mobile working), or implicitly by allowing certain activities to disappear from physical buildings (online banking or shopping) so that other activities take centre stage (as for instance in the Apple Stores).

Unlike other changes in the history of the industrial revolution, the speed of current change in technology has been argued to be unprecedented and fast-paced. In 1965, Moore made the case for an ever-increasing speed in the development of electronics. His proposition that the number of transistors in integrated semiconductor circuits and therefore computing power would double every two years, was later labelled Moore's Law. To date, his prediction of exponential growth in computing power still holds. His writing in the 1960s showed incredible foresight: 'Integrated circuits will lead to

such wonders as home computers—or at least terminals connected to a central computer—automatic controls for automobiles, and personal portable communications equipment.' (Moore, 1965) (p. 114). While it could be argued that the size of a computer processor cannot shrink indefinitely until it reaches atom-size, it has been proposed by Kurzweil (2001) that a new paradigm appears as soon as one technology or method is exhausted, resulting in continued exponential growth by the 'Law of Accelerating Returns'. One particular example Kurzweil uses is the mass adoption of technological inventions, for instance telephone, radio, television, personal computers, mobile phones or the internet, which certainly follows this trend of increasing speed of change (see Figure 2).
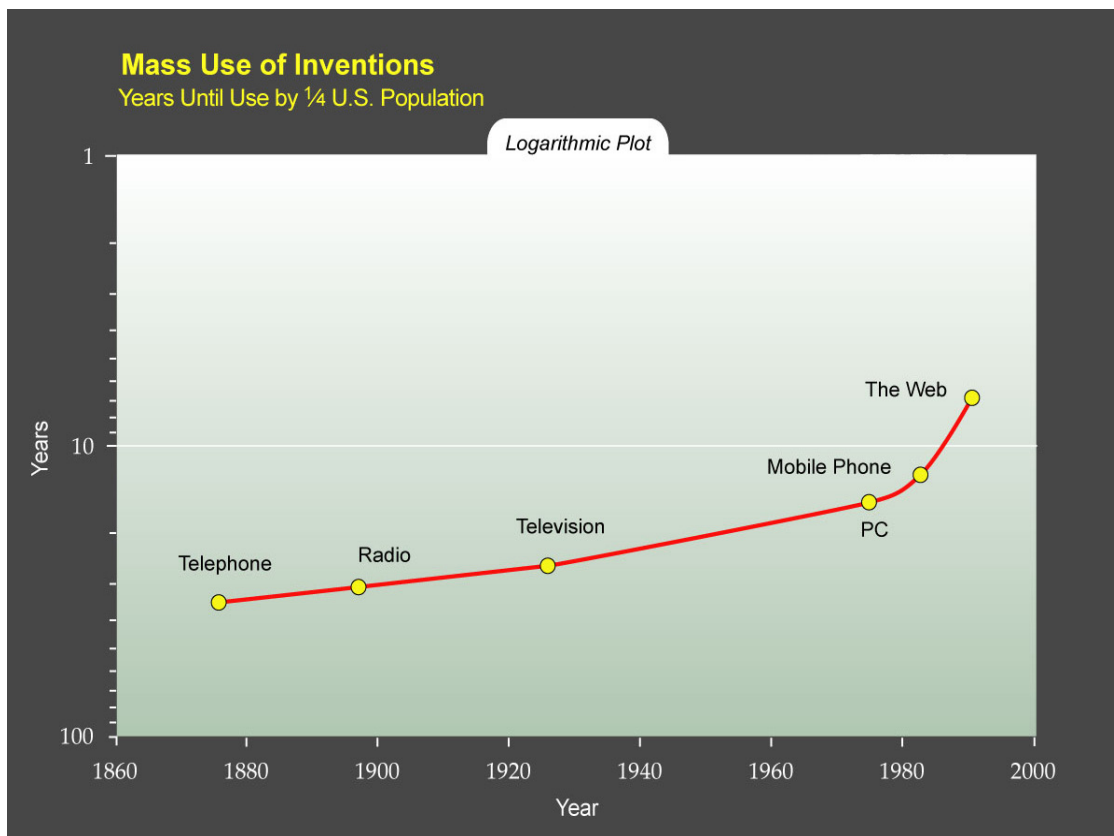

Figure 2:

Increasing speed of change in mass use of technological inventions.

(Source: By courtesy of Ray Kurzweil and Kurzweil Technologies, Inc. [CC-BY-1.0 (http://creativecommons.org/licenses/by/1.0)], via Wikimedia Commons.)

Guest editorial:
Changing building typologies

Sailer, K.

Notes:

[6] *Call for Papers on 'Chang-
ing Building Typologies':
http://128.40.150.106/up-
loads/joss/JOSS_5_2_CBT_
CALL.pdf (Last accessed:
17 December 2014).*

How the new inventions of the mobile phone and the internet have caused changes in human activities and usage patterns across a range of different settings has been discussed by the recent book *Networked* (Rainie and Wellman, 2012). Based on empirical research on the use and adoption of information and communication technologies (ICT), the authors argue that a triple revolution has occurred in the way in which people relate to each other and get together, which is exactly the same theme that Hillier and Hanson have taken up in *The Social Logic of Space*, i.e. how people are brought together and kept apart. The following three strands are identified: 1) The Social Network Revolution, which has enabled people to reach out to others beyond a predefined tight knit group; 2) The Internet Revolution, which has empowered people to gain information and communicate in new ways; and 3) The Mobile Revolution, which means that people can access information and networks on the go. In coming together this triple revolution has shifted 'people's social lives away from densely knit family, neighbourhood, and group relationships toward more far-flung, less tight, more diverse personal networks' (Rainie and Wellman, 2012, p.11) – a phenomenon that was coined 'Networked Individualism'.

The concept of spatial versus transpatial solidarities (Hillier and Hanson, 1984) can be applied in this context. Speaking in spatial terms, 'Networked Individualism' refers to a shift from spatial solidarities to transpatial solidarities. Rather than defining communities and social groups by spatial proximity (neighbourhood, local community, local church, etc.), individuals can curate and manage their relationships to others based on their identities, roles and interests and hence transpatial solidarities. At the same time, spatial solidarities do not lose their importance, but become curated and transformed into individualised time-space routines. People, especially from the so-called 'Creative Classes'

(Florida, 2002, 2005) tend to choose in which neighbourhoods, cities and even countries they want to live; they choose which companies they want to work for; and they increasingly choose where they want to take their work (the traditional office, a co-working space, a café or completely on the go in airports, trains, etc.). An extreme example of this new world of everywhere working is the company Automattic (better known as the creators of Word-Press), which allows staff to work entirely remotely and does not even provide a fully-fledged office space (Berkun, 2013).

It is against this background that the call for this Special Issue of the *Journal of Space Syntax* proposed in a deliberately provocative way that 'the reality of what is happening inside buildings nowadays is much more complex, diverse and multi-layered than a single word can describe' [6]. This call aims to shed light on the observed changes in usage patterns, building descriptions and classifications, to draw specific attention to phenomena, to sharpen our perception, to channel the discourse and to allow for critiques to emerge.

The issue is divided into a thematic section focusing on Changing Building Typologies and a non-thematic section, featuring academic work submitted to the Journal outside of the call.

The thematic section provides two parallel streams of enquiry: three scholarly papers reflect different aspects of the theme of Changing Building Typologies from theoretical, empirical and computational points of view. In addition, eight shorter Forum pieces interpret the theme from the perspective of practitioners, asking how this change of buildings and typologies is perceived, observed and tackled in practice.

Philip Steadman, in his paper on department stores ('The changing department store building, 1850 to 1940', p.151-167) sets the scene by tracing the history of a particular building type during a particularly interesting time period – the outgoing

19th century and the first half of the 20th century. He identifies four different sets of influences contributing to the change of the building typology of the department store, i.e. developments in society and technology, changes in activities carried out in businesses, differences between built forms for the same function and the arising competition between them, and failures in the built form accommodating functions, which led to corrections of the built form. Essentially, Steadman argues that activity types and built form types created strong interdependencies leading to a co-evolution of type. The paper provides a rich and beautifully illustrated historical account of space usage (shopping as a leisurely activity, the rise of the female shopper), access and location issues of stores (transport, importance of railways), economic aspects (lower prizes due to economies of scale, the rise of large businesses with high staff numbers), and considerations of building structure (from top-lit atria to horizontal department stores lit electronically, from bazaars to arcades). The material grows out of Steadman's seminal book *Building Types and Built Forms* (Steadman, 2014) and significantly develops the argument with new insights into the department store as a new building type. Steadman reminds us that changes have always occurred in buildings: activities of shopping as well as the built forms of department stores dramatically transformed in less than a hundred years' time. The framework applied to the department store as a type is transferable to other building types and provides a useful lens by which to trace historical changes.

The second paper of the thematic section ('Changing building typologies: The typological question and the formal basis of architecture', p.168-189) builds on this by contextualising today's changes with historical developments. Daniel Koch not only explicitly challenges and critiques the assumption that buildings and typologies are currently changing in a fast-paced fashion, he also questions

whether and how the fixation on classification and typologies frames the debate and anchors it within a particular functionalist and modernist reading of architecture. Providing a potted history of the developments of houses and shops as two exemplar building types, Koch intelligently weaves in a diverse set of architectural theories to argue that the way in which we categorise and classify buildings becomes a strategic choice, often hiding continuous change and adaptations in usage patterns and built form. This paper nicely complements Steadman's contribution on department stores by furthering our understanding of shops with a slightly different focus and more nuances added. In addition it shows how particularly in homes, the question of changes in use are fundamentally related to societal changes and a way of thinking, coined as 'ideology of function' by the author. Using the design of flats for singles in the early 20th century as an example, Koch illuminates how the design for single women (for instance created by Grete Schütte-Lihotzky) significantly differed from designs for bachelors, i.e. single men (for instance that created by Mies van der Rohe at exactly the same point in time). In essence, the paper brings fresh and debatable views to the table and contributes to the discourse on the 'formal basis of architecture', while at the same time remaining committed to considering the social logic of space.

Christian Derix and Prarthana Jagannath take a different stance in the third paper of the thematic section ('Digital Intuition – Autonomous classifiers for spatial analysis and empirical design', p.190-215) and address the question of changing building typologies from a computational point of view. Essentially, the authors reinterpret the idea of type by working with typologies derived from a process of merging various attributes of building layouts rather than using traditionally assigned and previously defined rigid typologies. The process of merging attributes is not only computationally

challenging and interesting, but is also a refreshing intellectual contribution: instead of separating spatial structure from usage patterns in order to correlate spatial and social variables (which forms the standard approach of space syntax research), Derix and Jagannath discuss various aspects of configuration and spatial structure together with functional definition of spaces and strategic usage decisions. Implicitly they draw on Gibson's idea of affordances (Gibson, 1986), which were defined as action possibilities latent in the environment, thus cutting across the environment-behaviour divide and arguably relating to both sides equally. The analysis and computational modelling is conducted in the context of spatial resilience and infrastructure security. Using floor plans of three banks as a basis, the authors on the one hand extract information on spatial configuration (to understand degrees of visibility and visual control), topological infrastructure (distribution of degree or betweenness values of spatial elements to understand redundant routes and resilience of a layout) and proximity of spaces to the entrance (to understand potential risk of escape of intruders). On the other hand, data is collected on asset values (attractiveness of functions to potential intruders). Diverse sets of those metrics are then combined using 'self-organising feature maps' in order to present data profiles of each individual spatial element. Thus it can be shown which spaces and layouts are most at risk (for instance those with little visual control, high proximity to the entrance, low betweenness and high asset values close by). The authors develop various visualisations and outputs of this modelling technique. They also show how this methodology can be applied to different sectors and could thus inform design processes by enabling strategic choices based on managing the complexity of interrelated features and functional assignments of space in new ways.

The thematic forum invites readers to reflect on buildings, types, usage processes and inherent changes from the view of practitioners. The idea for this series of 'Observations from practice' was born out of an email conversation with John Peponis, who suggested that practitioners might be able to add to the description of new trends in the definition of building types in order to complement the scholarly debate envisioned for the Special Issue. The response from practitioners, architects and consultants to this invite to contribute was overwhelming and highlights how the theme resonates with developments happening outside of the ivory tower of academic research.

The first thematic forum piece by Oliver Marlow of Studio TILT (''I was curious about how it would happen.' – Designing buildings for flexibility and change', p.216-220) argues that architecture is heavy and slow, but spatial agency is quick. Challenging some fundamental assumptions about architecture, this contribution describes the co-design methodology utilised by Studio TILT to systematically engage users. Essentially Marlow proposes that people are the real subject of architecture, and this is how change can be brought into buildings.

Tim Mason takes up the topic of flexible buildings ('Creating adaptable architecture', p.221-226) and looks back on key projects of Rogers, Stirk, Harbour and Partners, asking how they weathered transformations, or indeed how they afforded continuity and change over the years and decades. The Centre Pompidou, the Lloyds Building and the Welsh National Assembly as case studies highlight how the practice's approach to design, which centred on the interplay between permanence and transition may have facilitated the creation of an 'adaptive' built form.

The idea of flexibility is re-interpreted by Rebecca Goldberg and Josef Hargrave of ARUP ('Circadian workplaces: Can curated working experiences help improve work wellness and productivity?', p.227-231), this time focusing on the question how workspaces can accommodate the diversity

of human and cultural experiences. The authors take a refreshing view on the much overused idea of 'flexible working' and propose that design could be used more explicitly to curate experiences of building users, for instance by using new ways of individualised lighting and colour control systems.

Flexibility on a much bigger scale is addressed by Emma Hutton and Arjun Kaicker of Foster + Partners ('Choice, change, connection: A new generation of learning and working environments', p.232-236) in their quest to anticipate future needs of building users. In the case of the design for the Yale School of Management, new classroom models were developed in collaboration with the users including full scale mock-ups. A second example of an ongoing project, the Comcast Innovation and Technology Centre in Philadelphia discusses the challenge of accommodating highly collaborative work processes in a high-rise tower.

Ray Pradinuk of Stantec takes the reader into a different domain – that of hospital design ('Hospital configuration and culture', p.237-240). The author proposes that spatial configuration has an impact on the social web of relations in a hospital, but criticises that this is rarely considered. Changes towards an interdisciplinary and patient-focused care process centred on 'Communities of Interest' rather than 'Communities of Practice' even stress the need to consider communication cultures. This forum article presents research insights from an exemplary hospital in the Netherlands and shows how this information was used in the design of a North American hospital complex, changing their typical corridor system into an atrium with a vertically integrated collaboration centre. Hence Pradinuk's article combines changes in usage with the concern for new built form types.

A new use type is featured in the contribution of Ros Pomeroy of Spacelab and Chrystala Psathiti ('Changing the high street retail bank into a brand led customer lounge', p.241-244). They trace

changes in high street retail banking and investigate usage patterns of the customer lounges of Virgin Money, which are a new type of space somewhere in-between a club, an airport lounge, a café and a branded retail space. Using observations on the diversity of activities in three lounges, the authors approach a first definition of this emerging building typology.

A focus on the user is also the topic of Max Martinez of Space Syntax Ltd, illustrating how cities and buildings are transformed ('User-focused design: A view from practice', p.245-249). Spanning across the different scales from single project to the urban realm, the author discusses projects in Broadgate and the South Bank in London. Essentially it is argued that despite all changes and transformations, patterns of movement and co-presence continue to be created by design and as such form the fundamental function of buildings and cities.

The last thematic forum piece is contributed by Rosamund Diamond of Diamond Architects ('Walk the line: What do people really want from public space?', p.250-254), which finally moves to a bigger scale and looks at transformations in public spaces using temporary buildings as intervention devices. The author compares strategies for activating public use both from a top-down and bottom-up approach and identifies consequences of changes.

Taken together, the Forum pieces draw a vivid and rich picture of changes happening on the ground that designers, architects and consultants are asked to react to in their day-to-day practice. They also highlight how engaging with users and systematically considering their needs can be seen as an underlying trend for architectural practices that are concerned with change, transformation and flexibility.

In the non-thematic section, Imad Al-Hashimi and Mohammed Mansour ('Developing a morphology-based Huff model using space syntax to analyse consumer spatial behaviour: A case study of Am-

About the author:

Dr Kerstin Sailer
(k.sailer@ucl.ac.uk) is Lecturer in Complex Buildings at the Space Syntax Laboratory, Bartlett School of Architecture at University College London, and Director of Research and Innovation at Spacelab. She is fascinated by the impact of spatial design on people and social behaviours inside a range of buildings such as offices, laboratories, hospitals and schools. In both her research and professional consultancy practice she aims to unravel the complexity of the relationship between people and space. An architect by training, her research interests combine complex buildings, workplace environments and space usage with social networks, organisational theory and organisational behaviour. At the Bartlett she leads the module 'Buildings, Organisations, Networks' in the MSc 'Spatial Design: Architecture and Cities'. She is a Fellow of the Higher Education Academy in the UK.

man', p.255-271) enriches a traditional gravitational model used to define and estimate a trading area and best location for a shopping centre (the so-called Huff model) with a syntactic analysis using Amman as a case study. The newly proposed model using topological distance from a segment map was found to outperform the traditional Huff model.

Two book reviews complete this issue: Tania Oramas Dorta reviews Philip Steadman's *Building Types and Built Forms*, while Sergio Porta reports from his 'journey around and across an area of culture and professional practice' provided by the book *Explorations in Urban Design: An Urban Design Primer,* edited by Matthew Carmona.

As the Guest Editor it is my hope that this Special Issue on Changing Building Typologies has raised awareness for the theme, identified future research streams and will inspire both scholars and practitioners to continually engage with questions of usage, activities in buildings, social processes, change, flexibility and adaptability.

Kerstin Sailer
Guest Editor

References

Abshirini, E. and Koch, D. (2013), 'Visibility analysis, similarity, and dissimilarity in general trends of building layouts and their functions'. In: Kim, Y. O., Park, H. T. and Seo, K. W. (eds.), *Proceedings of the Ninth International Space Syntax Symposium*, Seoul: Sejong University Press.

Alalouch, C. and AspinalL, P. (2007), 'Spatial attributes of hospital multi-bed wards and preferences for privacy'. In: *Facilities,* Vol. 25**,** p.345-362.

Awan, N., Schneider, T. and Till, J. (2011), *Spatial Agency. Other ways of doing architecture,* Abingdon and New York: Routledge.

Bergdoll, B. (2010), 'Introduction'. In: Lepik, A. (ed.), *Small Scale, Big Change: New Architectures of Social Engagement,* New York: Museum of Modern Art.

Berkun, S. (2013), *The year without pants : WordPress.com and the future of work,* San Francisco: Jossey-Bass.

Bier, H. and Knight, T. (2014), Data-Driven Design to Production and Operation. In: *Footprint,* Vol. 15**,** p.1-8.

Both, K., Heitor, T. and Medeiros, V. (2013), 'Spaces for knowledge: Strategies in academic library planning and design'. In: Kim, Y. O., Park, H. T. and Seo, K. W. (eds.), *Proceedings of the Ninth International Space Syntax Symposium*, Seoul: Sejong University Press.

Capille, C. and Psarra, S. (2013), 'Space and planned informality: Strong and weak programme categorisation in public learning environments'. In: Kim, Y. O., Park, H. T. and Seo, K. W. (eds.), *Proceedings of the Ninth International Space Syntax Symposium*, Seoul: Sejong University Press.

Cupers, K. (ed.) (2013), *Use matters: an alternative history of architecture,* Abingdon and New York: Routledge.

De Jong, M. (1996), 'Spatial Structure and Use of School Buildings'. In: Gray, M. (ed.), *IAPS 14 Conference Proceedings: Evolving Environmental Ideals - Changing Way of Life, Values and Design Practices*, p.129-140.

Florida, R. L. (2002), *The Rise of the Creative Class : And how it's Transforming Work, Leisure, Community and Everyday Life,* New York: Basic Books.

Florida, R. L. (2005), *Cities and the creative class,* London: Routledge.

FORTY, A. (2000), *Words and Buildings. A Vocabulary of Modern Architecture,* London: Thames and Hudson.

Gibson, J. J. (1986), *The ecological approach to visual perception*, Lawrence Erlbaum Associates.

Grajewski, T., Miller, J. and Xu, J. (1992), *Building Structure - Social Possibility or Handicap? An Analysis of a Research Organisation and its Building*, Stockholm: Swedish Council for Building Research.

Hanson, J. (1998), *Decoding Homes and Houses*, Cambridge: Cambridge University Press.

Haq, S. & Zimring, C. (2003), 'Just down the road a piece. The development of topological knowledge of building layouts'. In: *Environment and Behavior,* Vol. 35**,** p.132-160.

Heitor, T. and Marques Pinto, R. (2012), 'Thinking critically towards excellence in school buildings using space syntax as a catalyst for change'. In: Greene, M., Reyes, J. and Castro, A. (eds.), *Eight International Space Syntax Symposium,* Santiago de Chile: Pontificia Universidad Catolica de Chile.

Hertzberger, H. (1991), *Lessons for Students in Architecture,* Rotterdam: Uitgeverij 010 Publishers.

Hillier, B. (1996), *Space is the machine. A configurational theory of architecture,* Cambridge: Cambridge University Press. [Available at: http://eprints.ucl.ac.uk/3881/].

Hillier, B. and Grajewski, T. (1990), *The Application of Space Syntax to Work Environments Inside Buildings: Second Phase: Towards a Predictive Model.* London: Unit for Architectural Studies, The Bartlett School of Architecture and Planning, University College London.

Hillier, B. and Hanson, J. (1984), *The social logic of space,* Cambridge: Cambridge University Press.

Hillier, B., Hanson, J. and Graham, H. (1987), 'Ideas are in things: an application of the space syntax method to discovering house genotypes'. In: *Environment and Planning B: Planning and Design,* Vol. 14**,** p.363-385.

Hillier, B., Hanson, J. & Peponis, J. (1984), 'What do we mean by building function?' In: Powell, J. A., Cooper, I. and Lera, S. (eds.), *Designing for building utilisation*, London: Spon Ltd.

Hillier, B., Major, M. D., Desyllas, J., Karimi, K., Campos, B. and Stonor, T. (1996), *Tate Gallery, Millbank. A Study of the Existing Layout and New Masterplan Proposal*, London: University College London.

Hillier, B. and Tzortzi, K. (2006), 'Space syntax: The language of museum space'. In: MacDonald, S. (ed.), *A Companion to Museum Studies,* Malden/Oxford: Blackwell Publishing.

Hollis, E. (2009), *The Secret Lives of Buildings. From the Parthenon to the Vegas Strip in thirteen stories,* London: Portobello Books.

Koch, D. (2005), 'Parallel spatial scales - Discerning cognitive levels of space'. In: van Nes, A. (ed.), *Proceedings of the Fifth International Space Syntax Symposium*, Delft: University of Technology, Vol. 2, p.373-386.

Koch, D. (2007), *Structuring Fashion. Department Stores as Situating Spatial Practice.* Doctoral Thesis, KTH Stockholm.

Kurzweil, R. (2001), 'The law of accelerating returns'. In: *Kurzweil Accelerating Intelligence Essays* [Available at: < http://www.kurzweilai.net/the-law-of-accelerating-returns>. Accessed 04 December 2014].

Lewin, K. (1947), 'Frontiers in group dynamics: Concept, method and reality in social science; Social equilibria and social change'. In: *Human Relations,* Vol. 1**,** p.5-41.

Markus, T. A. (1987), 'Buildings as classifying devices'. In: *Environment and Planning B: Planning and Design,* Vol. 14**,** p.467-484.

Markus, T. A. (1993), *Buildings and Power. Freedom and Control in the Origin of Modern Building Types,* London: Routledge.

Maudlin, D. and Vellinga, M. (eds.) (2014), *Consuming Architecture. On the occupation, appropriation and interpretation of buildings,* Abingdon and New York: Routledge.

McKinsey (2013), 'Banking on customer centricity. Transforming banks into customer-centric organizations'. In: *EMEA Banking Practice,* McKinsey.

Moore, G. E. (1965), 'Cramming more components onto integrated circuits'. In: *Electronics*, p.114-117.

Palaiologou, G. and Penn, A. (2013), 'The branded experience: Decoding the spatial configuration of flagship stores'. In: Sonnenburg, S. and Baker, L. (eds.), *Branded Spaces*, Wiesbaden: Springer Fachmedien Wiesbaden.

Pasalar, C. (2003), *The Effects of Spatial Layout on Students' Interaction in Middle Schools: Multiple Case Analysis.* Doctoral Thesis, North Carolina State University.

Pasalar, C. (2007), 'Spaces for learning through better social interaction'. In: Knapp, E., Noschis, K. and Pasalar, C. (eds.), *School Building Design and Learning Performance with a Focus on Schools in Developing Countries*, Lausanne: Comportements.

Penn, A. (2005), 'The complexity of the elementary interface: Shopping space'. In: van Nes, A. (ed.), *Proceedings of the Fifth International Space Syntax Symposium*, Delft: University of Technology, Vol. 1, p.25-42.

Penn, A., Desyllas, J. and Vaughan, L. (1999), 'The space of innovation: Interaction and communication in the work environment'. In: *Environment and Planning B: Planning and Design,* Vol. 26**,** p.193-218.

Peponis, J. (1983), *Typology and Social Functions of Factory Space*, Doctoral Thesis, London: University College London.

Peponis, J. (1985), The Spatial Culture of Factories. In: *Human Relations,* Vol. 38**,** p.357-390.

Peponis, J. (2012), Building layouts as cognitive data: purview and purview interface. In: *Cognitive Critique,* Vol. 6**,** p.11-50.

Peponis, J. and Hedin, J. (1982), The layout of theories in the Natural History Museum. In: *9H,* Vol. 3**,** p.21-25.

Peponis, J. and Zimring, C. (1996), Designing friendly hospital layouts. The contributions of space-syntax. *Journal of Healthcare Design,* Vol. 8**,** p.109-16.

Pevsner, N. (1976), *A history of building types,* London: Thames and Hudson.

Psarra, S. (2005), 'Spatial culture, way-finding and the educational message. The impact of layout on the spatial, social and educational experiences of visitors to museums and galleries'. In: Macleod, S. (ed.), *Reshaping Museum Space. Architecture, Design, Exhibitions.* London and New York: Routledge.

Rainie, L. and Wellman, B. (2012), *Networked: The New Social Operating System*, Cambridge MA: MIT Press.

Rashid, M., Kampschroer, K., Wineman, J. and Zimring, C. (2006), 'Spatial layout and face-to-face interaction in offices - a study of the mechanisms of spatial effects on face-to-face interaction'. In: *Environment and Planning B: Planning and Design,* Vol. 33**,** p.825-844.

Rohloff, I. K. (2009), *Museum Gallery Layouts and their Interactions with Exhibition Narratives and Space Use Patterns: An Investigation of the YCBA, the MoMA and the HMA Galleries*, Doctoral Thesis, Michigan: University of Michigan.

Romanelli, E. and Tushman, M. L. (1994), 'Organizational transformation as punctuated equilibrium: An empirical test'. In: *The Academy of Management Journal,* Vol. 37**,** p.1141-1166.

Sailer, K., Budgen, A., Lonsdale, N., Turner, A. and Penn, A. (2008), 'Evidence-Based Design: Theoretical and Practical Reflections of an Emerging Approach in Office Architecture'. In: Durling, D., Rust, C., Chen, L.-L., Ashton, P. & Friedman, K. (eds.), *Undisciplined! Proceedings of the Design Research Society Conference*,

Sheffield UK: Sheffield Hallam University. [Available at: http://shura.shu.ac.uk/492/]

Sailer, K. and McCulloh, I. A. (2012), 'Social Networks and Spatial Configuration - How Office Layouts Drive Social Interaction'. In: *Social Networks,* Vol. 34**,** p.47-58.

Sailer, K. and Penn, A. (2009), 'Spatiality and transpatiality in workplace environments'. In: Koch, D., Marcus, L. and Steen, J. (eds.), *Proceedings of the Seventh International Space Syntax Symposium,* Stockholm: Royal Institute of Technology.

Sailer, K., Pomeroy, R., Raheem, A., Budgen, A. and Lonsdale, N. (2012), 'The generative office building'. In: Greene, M., Reyes, J. and Castro, A. (eds.), *Proceedings of the Eighth International Space Syntax Symposium*, Santiago de Chile: PUC.

Steadman, P. (2014), *Building Types and Built Forms,* Kibworth Beauchamp, Matador.

Till, J. (2009), *Architecture Depends,* Cambridge MA: MIT Press.

Tsoukas, H. and Chia, R. (2002), 'On organizational becoming: Rethinking organizational change'. In: *Organization Science,* Vol. 13**,** p.567-582.

Tushman, M. and Romanelli, E. (1985), 'Organizational evolution: A metamorphosis model of convergence and reorientation'. In: Cummings, L. L. and Staw, B. M. (eds.), *Research in Organizational Behaviour*, Greenwich, CT: JAI Press.

Tzortzi, K. (2007), *The interaction between building layout and display layout in museums*, Doctoral Thesis, London: University College London.

Ulrich, R., Zimring, C., Zhu, J., Dubose, J., Seo, H.-B., Choi, Y.-S., Quan, X. and Joseph, A. (2008), 'A review of the research literature on evidence-based healthcare design'. In: *Healthcare Leadership, White Paper Series,* Vol. 5.

Wineman, J. D. and Peponis, J. (2010), 'Constructing spatial meaning: Spatial affordances in museum design'. In: *Environment and Behavior,* Vol. 42**,** p.86-109.