

SOCIO-TECHNICAL TRANSITIONS THEORY

A multi-level and change-oriented perspective on organisational space

*Jenni Poutanen**

1 Background

This section will introduce the theory of socio-technical transitions (STT) that is interpreted as an extension of the socio-technical system theory (STS; see also Chapter 3 on systems thinking). Applied to organisations, STS is based on two basic assumptions. Firstly, organisations are systems where changes in a part lead to changes in another part (Katz & Kahn, 1978, as cited in Gustafsson, 2006). Secondly, organisations are “in an interrelationship with their surroundings, affecting and being affected in a constant state of flux”, and thus are open to influences in their environments (p. 231). The STT theory follows similar thinking but expands on inspecting how socio-technical systems significantly transition from one system to another, thereby fulfilling changing societal functions, such as housing (Geels, 2002). The background of the STT is in the sociology of technology, institutional theory, evolutionary economics, niche management, and technological transitions (Geels, 2002; Geels & Kemp, 2007; Geels & Schot, 2007). In the STT, technology itself has no power, but it fulfils its function only with human agency, social structures, and organisations (Geels, 2002, p. 1257). Thus, technological transitions also involve user practices, regulation, industrial networks, infrastructure, and symbolic meaning. To study the systemic transitions, the multi-level perspective (MLP) was developed by, e.g., Geels (2002) and Rip and Kemp (1998). In the MLP, the socio-technical transitions are inspected through three levels: the landscape, regime, and niche innovations, each differing in scale and stability (Geels, 2002; Geels & Kemp, 2007; Geels & Schot, 2007). Hence, the transitions are “outcomes of alignments between developments” with varying tempo and nature of interactions between these levels (Geels & Schot, 2007, p. 399).

According to Geels and Schot (2007, p. 404) “the three levels are structures that differently influence local practices, where actors (inter)act”. The levels are in the nested hierarchy to each other (Geels, 2002) (see Figure 5.1). The highest, *landscape level*, is on the macro-scale and creates an exogenous environment that consists of deep structural trends and heterogeneous factors, such as macro-economic or deep cultural patterns (Geels, 2002; Geels & Schot, 2007). Thus, it refers to a wider external structure or context for the interactions of actors. The landscape level

*jenni.poutanen@tuni.fi

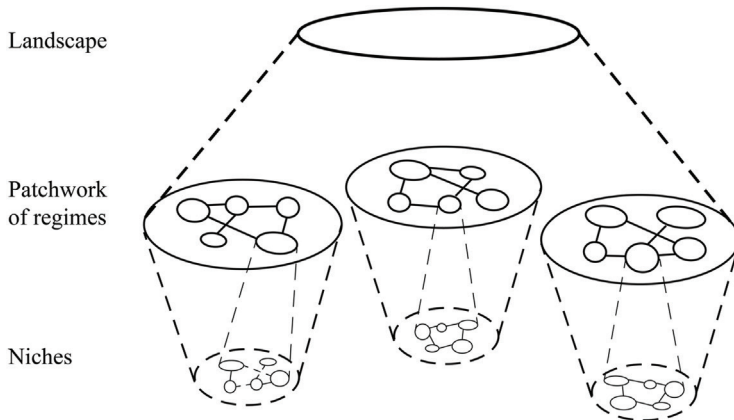


Figure 5.1 “Multiple levels as a nested hierarchy” (Geels, 2002, p. 1261) interpreted

does change, but the tempo is slow, usually in the course of decades. Whereas, Geels (2002) and Geels and Schot (2007) define the *regime level* at meso-scale and accommodating the community of social groups, such as policymakers, users, scientists, and their activities. The socio-technical regimes consist of the rules that enable or constrain activities within communities. The level stabilises developments in various ways through, e.g., regulations and standards, and investments in the built environment, but this internal stability is simultaneously dynamic. Innovations happen within the regime, but the nature of the innovations is incremental. Then again, according to Geels (2002) and Geels and Schot (2007), radical innovations take place in the *niche* in the micro-scale phenomenon (see also Chapter 14 on radical innovation theory). Niches are important as they work as incubators for innovations. They create an environment for learning processes as well as for the building of social networks between dedicated actors. Initially, the novelties created at the niche level are unstable socio-technical systems with low performance, and where the tempo of changes is fast (see also Chapter 4 on the St. Gallen Management Model).

In the transition process, all levels interact because the landscape developments create pressure on the regime, and if regime actors fail to respond to the pressure, it allows niche-level innovations to break through, thus replacing the existing system (see Figure 5.2) (Geels & Kemp, 2007; Nieminen et al., 2011; Rytönen, 2016). Furthermore, Geels and Schot (2007) have defined different transition pathways according to the timing and nature of multi-level interactions. In the *transformation* pathway, the landscape creates only moderate pressure on the regime at a moment when niche-innovations are not yet developed enough to alter the regime, and regime actors respond with modifications. In the *de-alignment and re-alignment* path, the landscape change is like an avalanche, large and sudden, and the regime comes under much pressure leading to internal problems and collapse. In this path, multiple niche-innovations co-exist but are not yet sufficiently developed by the time of the landscape pressure. Niche-innovations compete for dominance, eventually leading one to win and re-align the regime. On the contrary, the pathway of *technological substitution* differs from the previous so that the niche-innovations are sufficiently developed, but the dominance of the regime has prevented them from breaking through it. Then, in the case of strong landscape pressure, radical innovations are able to replace the regime. Geels and Schot (2007) continue that in the *reconfiguration* pathway, a sequence of multiple innovations takes place and a new regime grows out of the old

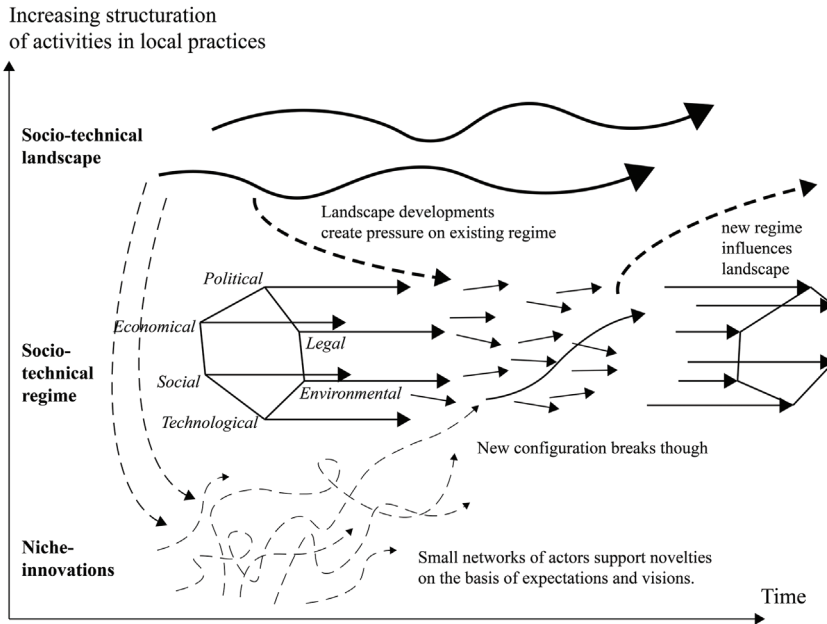


Figure 5.2 “Multi-level perspective on transitions” (Geels & Schot, 2007) adapted with built environment aspects by Schmidt III and Austin (2016)

when symbiotic niche-innovations are “initially adopted in the regime to solve local problems” (p. 411). Moreover, if the landscape creates a disruptive change, a *sequence of transition pathways* can take place. According to Geels and Schot (2007), this leads first in slow speed to transformation with moderate changes, then to the reconfiguration of the regime, followed by substitution or de- and re-alignment of it.

2 Applicability to workplace studies

Firstly, in the context of workplaces, STT provides a framework to structure interlinked knowledge on *nested levels*, thus revealing connections in the multi-level perspective. Secondly, it places focus on the *interactions between*, and the *stability* of each level. In other words, the STT theory places the focus on the *internal and external changes* of the workplace, but especially the changes deriving from the niche level that may transform the status quo of the office. Thirdly, the *tempo* of the changes varies within and between each level. As *time* is conceptually central in the design of the workplace, therefore, the adaptable architecture is brought into the discussion.

The “complex, unit-crossing, change-connected” office design and relocation work would benefit from an integrated perspective (Gustafsson, 2006, p. 222). In the STT/MLP, the different levels are analytical and heuristic concepts, and the interconnected aspects are inspected not only in terms of each scale but also in terms of their interaction, dynamics, and impact (Geels, 2002). Through the analysis of organisation, it is possible to understand the different but interconnected scales (Dale & Burrell, 2008). Organisations are made by humans and are embodied by humans and artefacts, thereby, existing within a physical setting; but the organisations are also

able to span the boundaries of different scales from the personal to global (Gustafsson, 2006). Hence, workplace design is discussed in the light of organisational spaces.

2.1 Workplace as an object of analysis

As stated previously, the theory of socio-technical transitions was developed to study the organisational fields such as the land transport system (Geels & Schot, 2007). On the other hand, the workplace is a system that is much smaller in scale. According to Geels and Schot (2007), and in order to apply the framework, researchers need first to define the empirical level of the object of analysis. The following organisational levels are distinguished in institutional theories: individual, organisational subsystem, organisation, organisational population, organisational field, society, and world system. In workplaces, organisation, space, and architecture are intertwined and affect the daily lives of people, regardless of how aware people are of this (Dale & Burrell, 2008) (Figure 5.3). Many organisational space studies are founded in Lefebvre's (1991) three notions of conceived space, perceived space, and lived space (Kingma et al., 2018; Weinfurter & Seidl, 2018) that can be interpreted as the formal representations of space, spatial practices, and experiences and interpretations of space (Peltonen, 2011). Hence, organisational space is not only material but also social, experienced as well as digital (e.g. Dale & Burrell, 2008; Nenonen, 2005; Weinfurter & Seidl, 2018) (Figure 5.4). Thus, space can be seen as a process that is produced not only through planning but also through organisational members inhabiting, occupying, and imagining it (Stephenson et al., 2020). Therefore, the social-spatial environment of the workplace is a complex socio-technical system.

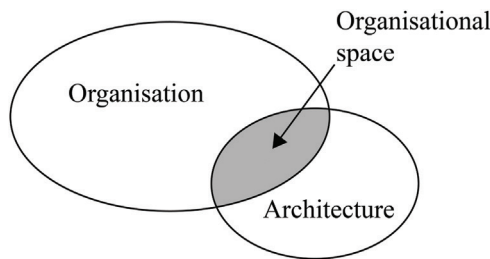


Figure 5.3 Workplace as a system of organisation, space, and architecture

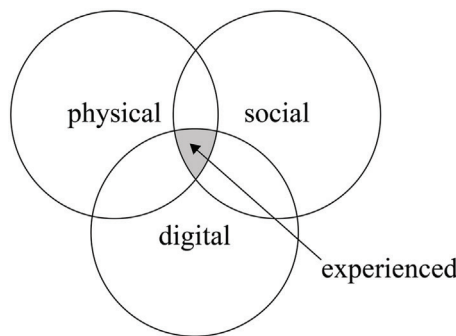


Figure 5.4 Organisational space aspects: the interlinks of physical, social, digital, and experienced environments

According to Lefebvre (1991), there are also different levels of social production and reproduction of space that are interconnected between global and local levels. In other words, between the 'abstract space' of the macro-scale (e.g. globalisation) and 'lived space' of everyday lives in micro-scale, placing the macro-scale of 'space' in contrast with the micro-scale of 'place' (Dale & Burrell, 2008). Hence, as Dale and Burrell (2008) argue, organisation can also be seen as the mediator between scales in the construction of social-spatial practices. Thus, formulating a meso-scale in the regime level that is more stable and permanent (Geels & Schot, 2007) and where organisational space is a factor both contributing to and changing the organisation (Dale & Burrell, 2008), but the embedded practices of organisations also "transform spatial relations beyond the entity of the organisation itself" (Kingma et al., 2018, p. 8).

To apply the STT to the research of the organisational space and especially its design, they are viewed as an *organisational sub-system*, as defined by Geels and Schot (2007). However, it is noteworthy, that in the STT theory, all three levels are similar kinds of *structures* that differ only in scale and permanency (Geels & Schot, 2007). In other words, if a regime is studied in the system of an organisation, then niche-level innovations should be studied in that system as well. Hence, the concept of scale in the STT poses difficulty in relation to the scales of the built environment. The different sizes of the levels are not directly relatable to, e.g., the room, building, and site (e.g. van der Voordt et al., 1997), nor are they directly relatable to individual and organisational levels (Dale & Burrell, 2008; Weinfurter & Seidl, 2018). Also, the viewpoint of organisational space as a process challenges the notion of scale as a nested and predefined hierarchy and focuses on dynamic qualities of space, for example, activities that scale up and down (Stephenson et al., 2020).

2.2 Levels and impact

Applying the framework to the research of workplaces, one of the well-known *landscape-level* changes is the development of mobile and digital technologies. Their impact on the design and management of workplaces and organisational spaces have been tremendous, but the transition has taken two decades, most likely also due to the longevity of the built environment as naturally prone to stability (Geels & Kemp, 2007, and as later discussed). However, the tempo of the landscape-level transitions differs (Geels & Schot, 2007). For example, the COVID-19 pandemic changed work practices to remote working almost overnight and was enabled by the decade(s)-long continuous change in mobile infrastructure.

In terms of workplaces, the *regime level* consists of policy, laws, and regulations (related to workplace design), as well as dominant conditions and practices (Geels, 2002) that define the workplace's physical, social, and digital environments (Nenonen, 2005). In STT, in a central role are the actors, i.e. both the producers and the users of the workplace, and their dynamic and complex interplay with the structure and active role as creators of new rules and functions (Geels, 2002; Nieminen et al., 2011; see also Chapter 10 on principal-agent theory). Schmidt III and Austin (2016) emphasise that buildings are not just mere systems of components, but "systems of representations outlined in composition and experienced in perception". A building should be defined not only by its performance (what a building does), but by the human experiences (use) and perception (aesthetics) it creates that are always bound in the evolving context. However, due to conventions, "architecture continues to be defined in response to a brief, defining each space for a particular sub-function or activity" (p. 48).

Thus, *regime*, and buildings, can be seen consisting of Lefebvre's *representations of space* and *spatial practices*. The first is characterised as conceived spaces that are designed by scientists, architects, and planners as deliberate constructions of space to address, e.g., functionality and control

in material form (Lefebvre, 1991, as cited in Dale & Burrell, 2008, p. 7; Weinfurter & Seidl, 2018) and which create the physical boundaries. Whereas spatial practices are empirically perceived spaces that are day-to-day, taken for granted, experienced spaces (Dale & Burrell, 2008, p. 7; Weinfurter & Seidl, 2018) which are created in the interaction between people and place (Peltonen, 2011). Hence, ‘spatial practice’ can be interpreted as the boundaries of administrated space, allowing, for example, whether the user can alter the space or not (Peltonen, 2011).

As stated, the *regime level* creates boundaries where niche-level innovations can or may take place. Architecture creates the (social-spatial) boundaries and connections, separations and integrations, and the amount of hierarchy between spaces (Dale & Burrell, 2008; Weinfurter & Seidl, 2018). In other words, spatial configuration strongly supports the development and maintenance of social relations in organisations, where the factors fundamentally contributing are patterns of circulation, copresence, co-awareness, and encounters (Wineman et al., 2009). For example, university campuses are traditionally “dominated by faculty-specific buildings that incorporate outdated, formal designs and support individual knowledge practices” (Rytönen, 2016, p. 26). Thereby, the regime in the built environment is challenged by cross-organisational buildings and informal campus spaces that enhance communal sharing of knowledge and thus supporting social networks that are essential for innovations (Rytönen, 2016; Geels & Kemp, 2007).

The *spatial practices* are present in the lowest level as well. *Niche-level innovations* happen constantly in the interaction between people, spaces, and technology that may, or may not, change the regime level of the workplace. In other words, the scale of an individual (micro-) is not equal to niche level, but an individual is a part of the organisational sub-system and an actor in it as each of the levels consist of interlinked factors. However, the niche level can be interpreted as consisting also of Lefebvre’s (1991) representational space that is ‘lived space’ fusing the material and cultural aspects (Dale & Burrell, 2008; Weinfurter & Seidl, 2018) and consisting of user experiences and interpretations (Peltonen, 2011) that happen only in the mind of an individual (Figure 5.4).

In terms of workplaces and organisational spaces, e.g., societal changes create novel ways of using spaces, and in turn, spaces create possibilities or hindrances for novel uses. Therefore, niche-level innovations can, for example, be various novel practices to differentiate locally and be able to compete globally (Rytönen, 2016) as well as novel ways of using spaces or the changes of uses, and appropriations of existing spaces to novel use. They can also be (small-scale) spatial experiments or retrofits (e.g. Peltoniemi et al., 2017). Organisations can create temporary experimental spaces, where novel practices are protected and shared (Bucher & Langley, 2016; Reinecke, 2018, as cited in Stephenson et al., 2020). Moreover, niche-innovations may also raise novel ways of producing spaces in a collaborative manner, and so forth, which all, in turn, alter design guidelines or the workplace culture. For example, in the context of university organisations, the niche-innovations level consists of the approaches and experiments attempting to respond to the needs of contemporary university communities (Rytönen, 2016).

2.3 Examples of interlinked aspects

As stated, the STT provides a framework to combine the interlinked aspects at different levels together. For example, how behavioural studies from the niche level correspond to design solutions and spatial configurations, and how those in turn correspond with the rules and regulations, and so forth. For example, according to Weinfurter and Seidl (2018), the organisational space consists of boundaries, distance, and movement. These notions are further defined by distribution in space, isolation of space, differentiation of spaces, and intersections of spaces

(Weinfurter & Seidl, 2018). From the viewpoint of workplace design, these relate to how the spaces are arranged in relation to each other, i.e. the spatial organisation, and to the quality and the materiality of the boundary and the adjacencies. For example, the material of the boundary of the space, such as the transparency of the wall, allows for visual connection, hence contributing to the closeness–openness of the space and creating different experiences according to the user. The physical boundaries are alone a separate aspect but significant in relation to, for example, the adjacencies. The material of the boundary also contributes to the look and thereby the image the organisational space creates. And, in turn, the material choices are limited with regulations.

2.4 Tempo of the changes in built environment

Applying STT to the *design and research of the workplace*, the *tempo* of the transitions needs to be further addressed, as the built environment is prone to slow changes, and it also contributes to the stability of the regime (Geels & Kemp, 2007, p. 443). Moreover, in the design industry, buildings and architecture are often seen as static end-products intended for first use (Pelsmakers et al., 2020; Schmidt III & Austin, 2016). On the contrary, time should be seen as a fundamental design variable and accept that buildings and architecture change over time to sustain. The inter-linked spatio-functional features and socio-cultural goals and values (van der Voordt et al., 1997) have different time spans depending on the permanency of the building layer (Schmidt III & Austin, 2016). Buildings can be seen as vessels that carry “the evolving assemblages of administrative intentions, material artefacts and human groups whose design is crucial for the emerging forms of the collectives shaped in the ongoing flux of organising” (Peltonen, 2011, p. 819).

Thus, the built environment of a workplace is in constant flux, but the tempo of the changes varies depending on cyclical (day/night, weekly, seasonal) and linear (short- and long-term) timeframes (Pelsmakers et al., 2020). According to Schmidt III and Austin (2016, p. 45), the cyclical and linear timeframes will reflect the relations of political, economic, social, technological, environmental, and legal aspects in particular situations (Figure 5.5). Moreover, recognising time as embedded in social, spatial, and embodied experience signifies that time also creates multiple experiences and that architecture expresses ideas of particular time bound to the material environment (Dale & Burrell, 2008), but the legitimacy of these ideas may change over time, and design and redesign of space responds to an individual organisation’s needs but also to changes in institutional conditions (de Vaujany & Vaast, 2014). Yet, buildings are always contextual entities, with a myriad of stakeholders, each interested in different aspects, that add to the complexity and uniqueness of the task (Schmidt III & Austin, 2016).

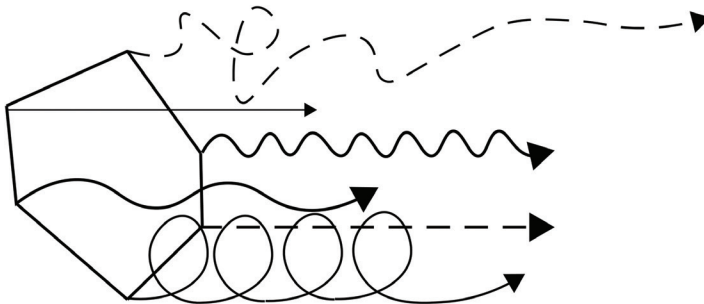


Figure 5.5 Change drivers affect built environment in both cyclical and linear timeframes

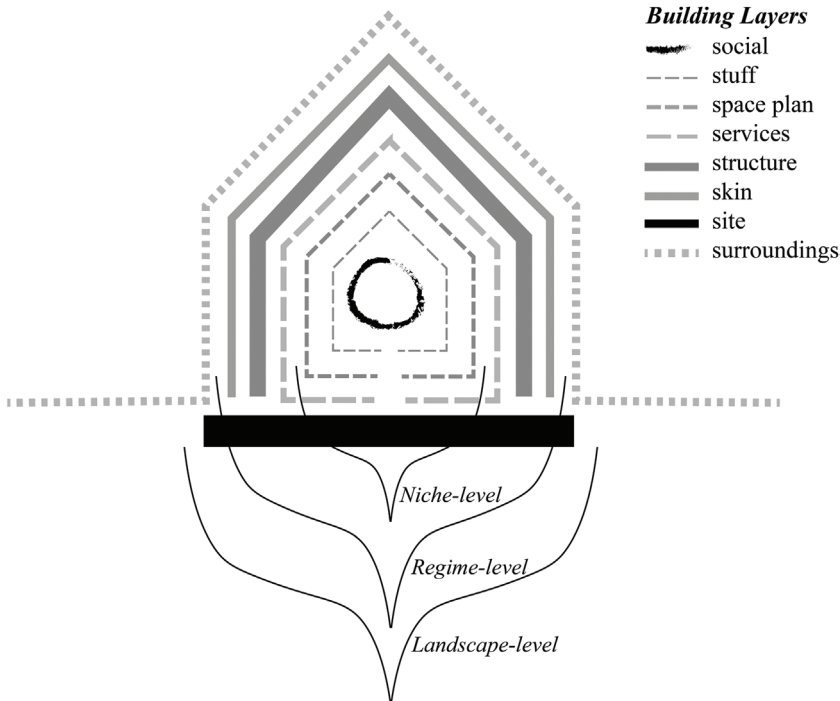


Figure 5.6 “Buildings as layers” with socio-technical transition levels. According to Brand (1994) the layer timespans are, stuff: 1 day to 1 month, space plan: 3–30 years, services: 7–15 years, skin: 20 years, structure: 30–300 years, site: eternal (Schmidt III & Austin, 2016)

Schmidt III and Austin (2016) have accumulated from the literature the following change drivers that affect the buildings and thus the built environment of a workplace: (a) *physical* changes are related to, e.g., weathering; (b) *economic* changes to financial issues, such as market fluctuation in real estate; (c) *functional* changes to, e.g., user needs (see also Chapter 16 on user-centred design thinking) but also issues related to landscape-level changes such as type of work (ways of working); (d) *technological* changes include, e.g., landscape-level information technology change, but also, e.g., product life cycles; whereas (e) *social* entails all from landscape-level lifestyle and demographic changes to the regime and niche-level skills of the user; and (f) *legal* changes incorporate, e.g., regime-level safety regulations and government incentives (p. 48; see Figure 5.2).

These change drivers can be seen on the other hand deriving from but also affecting on different levels, depending on the interpretation of scale and viewpoint. As the change drivers alone are a myriad, the key concepts in responding to changes in the built environment are adaptability and flexibility. In terms of permanency, dynamic building types, such as offices, healthcare, and schools, are more prone to changes than stable building types (museums, government) (Schmidt III & Austin, 2016). For the purpose of this chapter, the concept of ‘buildings as layers’ allows applying the levels of STT in the built environment of workplaces and inspecting the tempo of changes within and between levels.

The ‘buildings as layers’ model, originally developed by Brand (1994), separates and categorises a building into a set of interdependent layers that change in different timeframes, and the more the layers are connected, the greater the difficulty and cost of adaptation (Brand, 1994, as cited in Schmidt III & Austin, 2016, p. 55). The extended model by Schmidt III and Austin

(2016) is based on eight layers: *social*, *stuff*, *space plan*, *services*, *structure*, *skin*, *site*, and *surrounding* (Figure 5.6). Social layers entail everything from individual, work group, department, branch, and organisation (p. 55). Thus, the changes to the social layer happen in all three levels, niche, regime, and landscape. The niche level can be interpreted to consist of the layer of ‘stuff’, in other words of the components and objects that are located inside a space, and also of the layer of the ‘space plan’, i.e. the components that define the spaces the users inhabit. The components of these layers have the shortest lifespan, and they are also the most independent of the other layers that would allow for user-driven changes in a faster tempo. In a building, the longest lifespan is naturally on the *structure* layer, according to Brand (1994, as cited in Schmidt III & Austin, 2016), 30 to 300 years, and the most dependent layer is the *services* layer, thus hindering changes (Schmidt III & Austin, 2016); both add to the stability of the built environment.

The whole building, with all its layers, can be seen as the regime, where the niche-level innovations emerge in the core layers (Figure 5.6). In the layer of ‘stuff’, the social causes of change are related to tasks or users, and their effect on the physical environment is in the form of equipment and furniture (Schmidt III & Austin, 2016, p. 155). In both the ‘stuff’ and the ‘space plan’ layers, the social causes are in the activity and operations that affect the spatial arrangement. Whereas ownership changes, affect in the ‘space plans’ and on the function.

As stated, the novelties in the niche level renew the system from the bottom up, and new compositions are created in fast tempo, but they require time and a suitable environment to stabilise (Geels & Kemp, 2007). This relates to utilising experiments in developing work practices and workplace designs for enhanced individual wellbeing in work and thus adding productivity. The impact of a singular experiment may remain light, but in the course of time, a stronger impact is created through a series of experiments (Peltoniemi et al., 2017, Figure 5.7). Hence, in existing conditions, the ‘stuff’ and ‘space plan’ layers would allow experiments in the built environment that would otherwise be estimated as high risk, for example in the ‘structure’ layer. These are also linked to organisational change, as the continuous management of physical space is typically handled at ‘low organisational level’, whereas in ‘high, strategic level’ the larger changes are made in the organisational structure that is often strongly connected with changes in a physical setting (Gustafsson, 2006). In other words, major *transitions* are made top-down, but major transitions naturally have different timespans from minor renewals. Hence, the

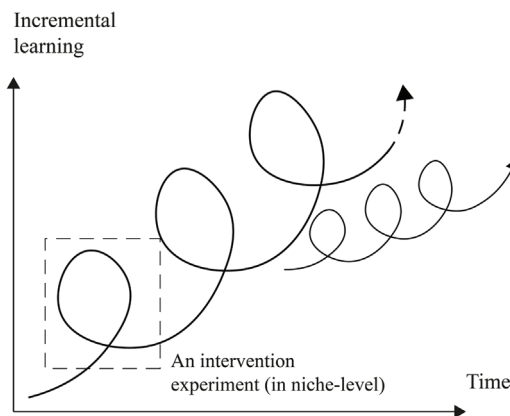


Figure 5.7 Impact on learning in relation with time: “Pop Up Development Model for Productive Knowledge Work” (Peltoniemi et al., 2017)

different timespans of building layers allow for stability of the regime, and at the niche level, there is less permanency but faster changes and innovations.

3 Methodology/research approach

This section will discuss how to operationalise the multi-level perspective on the research of the design of the spaces. The benefit of the STT is seen in the focus on the transitions within and between different levels, especially how the niche-level innovations may transition to the regime. While adaptable architecture examines how changes within a system, i.e. the building, are allowed for, the socio-technical transition theory focuses on how one system transitions into another system. Thereby the STT focuses on the underlying reasons, and especially on the examination of the effects of the internal, small-scale changes, i.e. the niche-innovations, but also on the effects of the external factors deriving from the landscape level that influence the change of the workplace. Therefore, a possible future research application could be to employ the MLP framework as a matrix. Firstly, the matrix would allow us to integrate and restructure the interdisciplinary knowledge on the organisational space and its design as well as adaptable architecture into various scales and interconnected dimensions and would also highlight the different tempos of the changes. Secondly, the matrix could be applied to study the systemic change of the workplace, but it could also be used as a development tool.

At the same time, application to empirical research depends on the object of analysis Geels and Schot (2007), as no ready-made methods or approaches to operationalise exist (Smith et al., 2010, p. 444, as cited in Nieminen et al., 2011, p. 56). For example, by linking the STT studies with organisational change management, Bögel et al. (2019) have created an integrative framework for analysing the organisational change in transition initiatives. In the multi-scale heuristic, they interpret macro-level factors as the institutionalised logics that frame organisational activity. Whereas, meso-level factors focus on the organisational level and include the design and nature of transition initiatives and intra-organisational factors. In their heuristic, the micro-level factors relate to the social psychology of individual participants. STT is widely adopted in many fields, but the scale of the systems is often far greater than that of the workplace (see e.g. Raven et al., 2012).

Workplaces are complex and constantly evolving systems. Whereas, existing phenomena and known systems are often studied through the empirical systematisations of reality and with delimited factors that inevitably narrow understanding about the phenomena (Smith et al., 2010, p. 444, as cited in Nieminen et al., 2011, p. 56; Geels, 2002; Geels & Kemp, 2007; Geels & Schot, 2007; Rytönen, 2016). Therefore, qualitative narratives may illustrate the change more comprehensively, and indeed, STT research has employed qualitative methods primarily.

The inquiries on different levels might require different methods of material and data collection that in turn might create difficulties in the cross-comparison of the levels. However, in qualitative studies, employing the characteristic triangulation and inspecting transitions first in micro-scale (e.g. social-spatial relation in the scale of an individual) allows accumulating knowledge to the sub-system scale. Pre- and post-occupancy evaluations also capture the emergent patterns of use or the impact of experiments and spatial interventions which, together with longitudinal studies, would illustrate the effects of the series of experiments. Case study interventions and experiments, on the other hand, are also part of the action research approach. Moreover, for example, the strategic workplace changes are planned rather than emergent events. But the impact of the transition from one workplace to another can likewise be collected with pre- and post-occupancy evaluations. For example, the effects of changes in the spatial

arrangement over time can be evaluated with a combination of both quantitative and qualitative methods, such as the Space Syntax family (e.g. Sailer et al., 2012).

4 Limitations

A multi-level perspective was created to study socio-technical transitions in the level of organisational fields (e.g. Geels & Schot, 2007), which questions the applicability to workplace research and organisational space that are much smaller in scale. This raises the question of whether the theory should be employed in the system of organisational field rather than organisational sub-system, i.e. the development of workplaces in general rather than a specific workplace.

Secondly, the STT theory's relation to the scales of the built environment is ambivalent, and the application solely to the design of the workplace is partially contradictory to the idea of the theory. Therefore, to formulate a comprehensive understanding, it is essential to study the interplay between physical, social, digital, and experienced environments (e.g. Nenonen, 2005). However, the STT fails to provide ready-made methods.

Another question arises if the MLP levels bring unnecessary layers into the organisational space discussion because the different scales (from organisational to the individual), as well as interrelated factors of time and change, are all addressed in the organisational space literature (e.g. Dale & Burrell, 2008). On the other hand, the STT focuses especially on the (niche-level) transitions, and the framework could help to structure dispersed information and add a rich layer to thinking about spatial design over time.

5 Theory relevance to practice

The framework of the STT theory may help practitioners to evaluate the impact of the strategic choices on the operational level and implications on spatial design, as MLP provides analytical and heuristic concepts to structure the interlinked factors to different levels (Geels, 2002; Geels & Schot, 2007). In other words, the main issues defined at the strategic level lead to a myriad of aspects at the operational level, and using the framework would also make visible the connections between aspects related within and between each level. In turn, as the framework highlights the niche level, for example, purposefully created changes in practices, designs, and their use (see e.g. Peltoniemi et al., 2017) would shed light on how these niche-level changes can be employed in a larger scale to alter the regime, i.e. the status quo. For example, prior to the strategic workplace development, experimenting with the layout and practices of the current workplace would, on one hand, allow testing with, e.g., an activity-based environment (ABE) and, on the other hand, the niche-level changes could work as an educator with the move to the ABE. Moreover, given the STT's focus on niche-level innovations, it could highlight the user-initiated practices and changes, thus providing a structured tool to support workplace management at the micro- and niche-innovations levels.

6 Further reading

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