

SPACE MEETS KNOWLEDGE

THE IMPACT OF WORKPLACE DESIGN ON KNOWLEDGE SHARING

by
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ABSTRACT

Over the last two decades ‘knowledge management’, which can be described as the intentional management of knowledge (Nonaka and Takeuchi, 1995; Alavi, 1997; Garvin, 1997; Wiig, 1997; Davenport, 1998; Ruggles, 1998; Hansen, 1999; Zack, 1999a) has become increasingly important to organisations. In large part this has been fuelled by the exponential growth of the knowledge economy and the increasing number of knowledge workers who have – so it seems – become as essential for many firms as financial capital is for their competitiveness and survival. Thus academic and management practitioner attention has shifted in the last two decades towards research into knowledge management, which has emerged as a particularly relevant and significant area of study within the field of organisational science.

As a result, a growing number of organisations have recognised the need to better understand the processes that transform data into information and information into knowledge, particularly in the context of how this can be used to improve an organisation’s ability to innovate and strengthen its competitive advantage in the marketplace.

In exploring knowledge management, organisational theorists and researchers have been looking at individual factors ranging from personal characteristics and incentives that increase individuals’ willingness to share information to organisational factors such as velocity and uncertainty. Further, they have studied how these factors influence both the need to learn at work and the different forms of, and approaches to, informal learning.

The recent knowledge management debate has begun to focus attention on the importance of the physical workplace to those engaged in knowledge work. There is a noticeable knowledge gap in this respect as an in-depth examination is largely missing in terms of the role that the physical workplace plays in creating barriers and opportunities for knowledge sharing. While some knowledge-intensive organisations that look for new ways to enhance their knowledge worker performance have experimented with new office solutions, these forays have had mixed

results. The effective design of good workplaces for knowledge sharing remains a major challenge for many organisations. This indicates a need for a more detailed analysis of knowledge sharing in a diverse range of physical work settings.

From a technology perspective, there have been significant developments during the last twenty years that support people in their work and allow them to work independent of time and location. Interestingly, in an era when teleworking is becoming more widely accepted, a number of leading companies like Apple, Yahoo! and Google are holding on to (or have started embracing) the belief that having workers in the same place is crucial to their success (Isaacson, 2011, Grubb, 2013, Moyer, 2013). This appears to be based on the view that physical proximity can lead to casual exchanges, which in turn can lead to breakthroughs for products.

For this precise reason, this research included a case study of Google – being one of the aforementioned leading companies – to provide both theoretical and managerial insights into the impact on knowledge sharing on the design and use of the physical workplace. The Google case study comprised an initial examination of the organisational context and workplace design, and a subsequent investigation of factors that affect interaction with others in the work environment. For this purpose an employee perception survey, a social network analysis and a space syntax analysis was utilised.

The employee perception survey of 513 participants revealed patterns of facilitating and inhibiting factors in the work environment; team members with high information exchange needs preferred and valued frequent, informal opportunities for the exchange of information.

Exchanges of knowledge among participants were often brief and were perceived to require limited space with options for noise-regulation. Spontaneous and opportunistic knowledge-sharing transactions were valued, and technology provided an additional supportive platform for this type of information exchange to occur. Participant complaints about the highly interactive work environment most often addressed their sense of being over-scheduled and having to deal with malfunctioning technology.

The social network analysis revealed a clear balance between close-knit intra-team interactions at frequent intervals, while allowing some channels for interaction with other teams on a less frequent basis. When comparing these findings with the allocation of employees within the spatial configuration of the office, a tight fit can be observed.

The space syntax analysis in this particular study confirmed the conclusion from the social network analysis that social interaction and physical space are mutually reinforcing. It revealed that factors such as

Visibility and Visual Integration appear to play only a small part in generating additional interactions, compared to Proximity.

The relationship between the physical elements of the workplace and knowledge-sharing behaviour is the central concern of this research. A comprehensive research model was therefore developed to investigate this relationship in more depth, alongside hypotheses for examining the human and organisational factors that influence knowledge sharing in relation to the mental, social, virtual and physical components of organisations that together make up the workplace, often referred to as “organizational ecology” (Jackson and Suomi, 2002, p. 2). By applying the concept of organisational ecology, it is possible to better understand organisational performance, including the results of knowledge sharing and collaboration. This is achieved not just by examining any single facet, component, or element of the overall system but also by looking at the interdependencies and the overall pattern that emerges; to understand the whole picture it is necessary to study it as a whole rather than individual elements in isolation.

The study further adopts the theory of planned behaviour (TPB) in order to construct a comprehensive research model that allows to explore the effect of physical space on knowledge sharing behaviour in the context of a multitude of other influencing factors. The TPB developed by Ajzen (2005) has emerged as one of the most popular and influential social-psychological models for explaining and predicting human behaviour in specific contexts (Chennameni, 2006). Ajzen explained the basis of TPB as follows: “According to the theory of planned behaviour, people act in accordance with their intentions and perceptions of control over the behaviour, while intentions in turn are influenced by attitudes toward the behaviour, subjective norms, and perceptions of behavioural control” (2001, p. 27). In the research model, the latter three components have been further specified through series of subcomponents:

The subcomponents that constitute knowledge-sharing attitudes include the effect of perceived organisational incentives, reciprocal benefits, reputation enhancement, the loss of knowledge power, and the enjoyment derived from helping others. The subcomponents that constitute the subjective norm include the impact of the perceived organisational culture that is in place, and the perceived nature of the knowledge work involved. The subcomponents that constitute perceived behavioural control include the mental, social, physical and virtual space of an employee.

A comprehensive survey instrument was created to measure the constructs in the research model. The research sample was generated at Bestuursdienst Rotterdam (BDR), an organisation of about 520 employees with the mission to support the city council in translating its

political ambitions into well thought out and clearly planned initiatives and policies for the City of Rotterdam. In short, BDR can be characterised as a knowledge work organisation, translating abstract political ambitions into concrete initiatives through the development of policies and plans requiring close collaboration and communication between its employees and departments.

The conclusion of the BDR study was that comparatively weak outcomes could be attested as to the effects of the physical workspace. The most obvious reason for the tenuous relationships is that the effects are indeed weak in reality. Arguably, the impact of workspace explains only a small fraction of human behaviour. Another explanation could be lagged effects; it may be that employees do not yet fully exploit the opportunities of a certain workspace in the relatively short time of occupancy (read: 6 months) because it takes some time for routines and traditions to develop.

The physical work environment has been said to have a plethora of effects (Nenonen, 2004) so although the current research model is limited to explaining knowledge-sharing intentions and behaviour, there are likely to be many more direct or indirect effects. For instance, a better workspace helps to increase creativity (McCoy, 2005), contributes to strengthening the internal service quality (Edvardsson et al., 1997), improves work outcomes (Lee and Brand, 2005) and job performance (Vischer, 2007), reduces stress (McCoy and Evans, 2005), influences physical well-being (Lund et al., 2006) resulting in higher presence (Nielsen et al., 2004), decreases staff turnover intentions (Lund et al., 2001) and evokes other subjective reactions (Gamberale et al., 1990). Workspace has also been shown to influence a company's organisational culture and to facilitate the communication, teamwork and creativity that are necessary to sustain a culture of continual innovation (Earle, 2003). Based on these prior empirical findings, an examination of the other outcome variables explained by the research model appears to be promising. Even if the physical space only has a small effect, it is likely to have this effect on many different outcome variables.

That being said, in a comparison of research outcomes between the cases of Google (Chapter 4) and BDR (Chapter 6), a contradiction emerges in terms of what is perceived by employees in each respective organisation as to the relative importance of the workplace in conducting their knowledge work. Based on research observations, the physical environment appears to play a role to an individual's personal needs in functional, emotional and social ways.

- The functional features that emerged as most striking include air quality, thermal comfort, lighting, acoustics, office furnishings and spatial layouts in offices.
- Two significant emotion-related design features emerged, namely the employment of participatory design and the use of symbols in offices. These features aim to increase emotional engagement.
- The features of social capital that emerged as most striking are intrinsic motivation and identification, the blending of professional and personal life, and trust and psychological safety. These features increase the social network for organisations.

In summary, the perceived satisfaction derived from, and relative importance of, functional aspects of the workplace differs here and there between both cases, but are not significant enough to provide a strong argument to explain the clear disparity in perceived importance of the workplace to perform knowledge sharing behaviour. In the way in which emotional needs are addressed in the two cases, however, there is much more evidence that each organisation adopted a clearly different approach. This could potentially provide a rationale for the observed difference in outcomes between the cases. There are also substantial differences in the social environments at Google and BDR. Therefore, one could argue that emotional and social aspects have made a more profound impact on the perceived importance of the workplace in knowledge sharing behaviour than the mainly functional aspects.

Since the advent of the built environment as a legitimate research topic, theories have tended to be focused on process. As a result, theories that focus on users of buildings have tended to be positioned somewhere between a deterministic explanation of the relationship between the environment and human behaviour, at one end of the scale, and one that seeks to minimise the impact of the built environment on users at the other (Hillier and Leaman, 1973; Lang, 1987). Based on the findings in the case comparison, it could be argued that human behaviour is indeed influenced to an extent by the built environment in which it occurs – but it is equally clear that it is not determined by it; in a given situation, the influences on the behaviour of the users of a building are greater than merely the space they occupy, and include their attitudes, expectations, feelings and intentions, and as well as the social context in which they are engaged.